Building Blocks of Tabletop Game Design

An Encyclopedia of Mechanisms

Geoffrey Engelstein
Isaac Shalev

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Geoff:

To Susan, for a wonderful 40 years, and to our children, Brian and Sydney, for always challenging my strategies across the game table, and challenging my ideas across the kitchen table.

Isaac:

To my wife, a quick nod of appreciation.
Let's not make a scene about this.

To my children, Jesse, Alex, and Maya, you are
the gaming partners of a lifetime.

To my design partner, Matt Loomis, from whom I learned
more than I could contain in this slim volume.

Lastly, to my brother, Kuty Shalev, my constant gaming partner,
my first DM, my first co-designer, my Kickstarter patron and
my coach, mentor, and cheerleader in all my pursuits.

Contents

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Foreword

A game is a language.

In a way, when you sit down with someone to play *Chess*, *Poker*, or *Cosmic Encounter*, you are beginning a conversation.

Each move you make in the game is a way for you to express yourself to your partner—a way for you to make meaning. Every reckless aggression and coy bluff, every greedy power grab and defensive stall for time is a word, a phrase, a statement in the language of the game.

These conversations we have with each other, as we play games, can be awkward and confusing. Or deliciously cruel. Or wildly creative and unexpectedly beautiful. The kind of conversation that tickles parts of your mind that you didn't know were there, the kind of conversation that sticks with you, turns acquaintances into bitter rivals, and later into the best of friends.

But a game is not just a language.

It's more complicated than that. The moves we make as we play are a language built on top of yet another language. Beneath the meaning we express through the moves of the game is a kind of hidden grammar.

You move a pawn, pass a ball to a teammate, or maneuver your virtual avatar: all of them are statements made through gameplay. But what are the structures that make *those* meanings possible? The rules that permit action? The blood and bones and spirit that animates the body of the game as it is played?

That, exactly, is the subject of *Building Blocks of Tabletop Game Design*. So prepare yourself. Between these covers lies the hidden grammar of games. The structures behind the structures. The DNA of fun.

This book is a dictionary for the secret language of games.

You see, although games and play are ancient human endeavors (the Egyptian game *Senet* is at least 5,500 years old), it's only in the twentieth century that games shifted from folk culture to authored media. And as

tabletop games, role-playing games, and video games have become industries of their own, we've done our best to understand them.

If you are reading this book, you are likely to be a serious game player. Like many others, you play games, discuss them, dissect them, and sometimes even design new ones. And for many years, many smart designers, critics, players, and scholars have been searching for the right way to talk about games, to understand how they work, and to figure out how best to approach the creation of new designs.

That's why *Building Blocks of Tabletop Game Design* is so significant. The incredibly detailed pages that follow, pages that crack open the inner components of tabletop games, constitute a kind of *Rosetta Stone* for game grammar.

Make no mistake. This book is a big deal.

Building on their own impressive accomplishments as designers, their relentless intellectual curiosity, and a seemingly limitless connoisseurship of analog and digital games, Geoff and Isaac have put together a tremendously rigorous, wonderfully insightful, and astoundingly accessible encyclopedia of the elements that make tabletop games tick.

Why is this project so important? As someone who has studied, designed, and taught game design for 25 years, this volume is the sort of book I realize now I always needed. A manual for game mechanics. A foundation for structural analysis. An inspiration for new ideas. A sourcebook for teaching design.

On its surface, *Building Blocks of Tabletop Game Design* might seem like a deeply geeky endeavor, an obsession with rules and structures. The kind of overly formalist ludology that has (rightfully) gotten into so much trouble in recent years. And in part it is. But look deeper. In games, what seems like pure abstract structure is inseparable from human experience. Chapter 4, on resolving game actions (those things players do to make meaning) begins in statistics and the mathematics of randomness. But then it moves into the thorny terrain of the prisoner's dilemma, engaging with psychology and diplomacy and even ethics—structures that help shape how people treat one another.

Reading any one of the dozens of modules in this book is like lifting up a big mossy rock in the forest. Underneath, there's an unexpected universe of complexity, a miniature ecosystem of moving parts, just waiting to be discovered.

The language of games is everywhere.

All of this gushing praise is well deserved. This book is a landmark in the study of games. But don't let that fool you. As enchanting as it is, *Building Blocks of Tabletop Game Design* is not a magic bullet that is going to suddenly let you understand exactly how every game works, become a tournament winner, or guarantee that your next design will be a hit.

The hidden grammars that this book describes, the structures behind the structures, are only part of the picture. *Building Blocks of Tabletop Game Design* doesn't investigate how games tell stories, or impact the lives of their players, or embody ideological values, or fit into larger cultural landscapes, or even how they might make a profit. That's just not what this book is about. And that's perfectly all right. Its titanic strength comes from its incredibly tight focus on the fundamental elements of games.

Despite these limitations, is this book still useful? Hell yes. I was recently trying to design a bidding structure for a game, and found myself jaw-droppingly enlightened, reading Chapter 8 on Auctions, which details no less than 16 distinct bidding structures. Without a doubt, I will use this text in my classes. I am planning, for example, to assign a project by having each student turn to two random pages in this book and then create a game that combines both mechanics.

But there's more. The insights and ideas in *Building Blocks of Tabletop Game Design* can be applied outside of games.

How can we resolve an argument between two entrenched opposing positions? How should a winner in a multicandidate election be determined? What economic incentives lead to the best distribution of wealth? What's the right way to ensure fairness for all? These are dilemmas of modern society. And they are also the kinds of problems with which game designers wrestle on a daily basis. Believe it or not, the answers to these deeply important questions might begin to be answered by looking at the structures within structures of this book.

Lastly, games are beautiful.

Don't get me wrong. I don't want to leave you with the impression that this book is valid only because it is useful. It doesn't matter that *Building Blocks of Tabletop Games* might be used to help teach classes, or even make society better. This book is important because it is a heartfelt and soul-enriching love letter to games.

It is a lens to help us see the games we adore with fresh eyes. An advanced seminar in the complexity of systems. A spell book filled with recipes for

creative play. *Building Blocks of Tabletop Game Design* unpacks the mystery of how these nerdy, knotty, collections of rules—boxed up with cards, dice, and colorful tokens—produce something which is in fact the very opposite of rules.

For those ready to appreciate the beauty of games, the joy leaps off of every page. Isaac and Geoff have given us whole new ways to have conversations with the people and the games we love.

Happy reading.

Eric Zimmerman
Game Designer and Arts Professor,
NYU Game Center,
New York City, April 2019

Acknowledgments

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Authors

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Geoffrey Engelstein is the designer of many tabletop games, including *The Ares Project*, the *Space Cadets series*, *The Dragon & Flagon*, *The Expanse*, and more. He is the host of Ludology, a bi-weekly podcast about game design in its seventh year, and a ten-year contributor to the *Dice Tower* podcast with his bi-weekly "GameTek" segments discussing the math, science, and psychology of games. He has published *GameTek: The Math and Science of Gaming* (2018), which was re-published as *GameTek: What Games Can Teach Us about Life, the Universe and Ourselves* by Harper-collins in early 2019. He is on the faculty of the NYU Game Center as an adjunct professor for board game design, and has been invited to speak about game design at PAX, Gen Con, Metatopia, and the Game Developers Conference. When not talking about, designing, or playing games, Geoff runs Mars International, a product development firm focusing on consumer and medical device engineering. He has a BS in physics and a BS in electrical engineering from the Massachusetts Institute of Technology.

Isaac Shalev is the designer, together with his longtime collaborator Matt Loomis, of a variety of board games including *Seikatsu, Ravenous River*, and *Show & Tile*. He is also the co-host of *On Board Games*, one of the longest running and most-respected tabletop game podcasts. Over the last five years, Isaac has interviewed people from every corner of the industry, including top designers, publishers, distributors, illustrators, convention runners, store owners, and more, and brought their insights to the gaming community at large. Isaac also writes about game design at www.kindfortress.com, and his series on tabletop game design patterns is a favorite among game designers. Isaac's eclectic work in the game industry includes advising publishers, editing rulebooks, speaking about game design at schools, running board gaming fundraisers, and organizing PACT—the

Playtesters Alliance of Connecticut. When he's not playing games, making games, or talking about games, Isaac runs Sage70, Inc., a data strategy consultancy that works exclusively with nonprofit organizations. Isaac lives in Stamford, Connecticut, with his wife, three kids, a dog, and a lawn that grows unreasonably quickly.

Introduction

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There is no better time to be a tabletop board gamer. Hobbyists will debate whether the mid-1990s, which saw the rise of *The Settlers of Catan* and *Magic: The Gathering*, was the golden age of gaming, or whether today is that golden age. No matter what your personal view may be, there is no doubt that modern tabletop gaming is in a period of exceptional fertility and is flourishing.

Games have come a long way since humans invented dice, pawns, and boards, and archeologists regularly turn up these artifacts at sites dating back 6000+ years ago. The standard deck of cards has its beginnings over 1000 years ago, and with the advent of the printing press, games became an ever-cheaper and more ubiquitous luxury. The history of the last century or so of games encompasses mass-market titles including *Monopoly*, *Scrabble*, *Clue*, and *Trivial Pursuit*, as well as the emergence of a whole new genre of tabletop games. The genre is so new that a single name has yet to meaningfully describe it, though suggestions have included hobby games, designer games, and other, stranger terms like TGOO ("these games of ours"). No matter what you call them, today's games feature higher levels of player agency, meaningful decisions, and substantially improved production values, and offer something entirely new to players, as compared to mass-market games.

Others have written about how war games developed into modern games in America, and the countervailing rise of a European design sensibility in the post-World War II period that rejected war as a setting, and direct conflict as a game dynamic. Our goal here is different. We'd like to address not how games evolved, but how games are designed.

Even as gaming itself has taken flight, and even as thousands of new games are published each year to an ever-expanding audience of gamers, one critical aspect of gaming remains in a nascent stage: the art and craft of game design itself. Games have taken great advantage of modern communication networks and methods to spread, but we encounter challenges in spreading the

knowledge and skills needed to design these games. In substantial part this is because we do not yet have a strong shared vocabulary for discussing design.

In creative industries, from literature to film to video games, practitioners, participants, and critics develop a shared language, a common reference library, and a set of skills, approaches, and techniques for their field. Film directors learn the difference between a jump cut and a dolly zoom, and how different technical approaches produce different effects. Audiences and critics follow along, recognizing homages and allusions, and appreciating variations and innovations.

Tabletop game design is at a somewhat earlier stage, and this book is our attempt to begin to build a broader game design vocabulary and body of knowledge. Rather than attempting to formalize a specific game design language—an approach that is both daunting and perhaps premature—we've chosen to look at the building blocks of games themselves: the mechanisms or, if you prefer, the mechanics, as they're also frequently called by gamers. (We'll use the terms interchangeably through this book.)

The second-best piece of advice any new designer gets is to play more games. (The first piece of advice, by the way, is to create a physical prototype as quickly as possible.) Playing more games helps designers learn and grow by seeing, first-hand, a large variety of possible game experiences and mechanics. This is no different than any other creative fields: every artist is enriched by experiencing the art and craft of other creators. Yet games, like books, can take a long time to experience, to master, and to fully appreciate, particularly for games that require large player counts, have long play times, or demand many repeated plays.

In an effort to accelerate the learning process, we present this book, which is a compendium of game mechanisms, grouped together thematically, that map the territory of modern gaming. Our goal is not to give a list of steps or instructions for how to design a game. To use a cooking metaphor, this is not a recipe book, but rather a catalog of ingredients, and how they can enrich a dish. We define close to two hundred different mechanisms and variants, spanning topics like Movement, Game End and Victory, Economics, and more. Within each topic, we discuss how different mechanisms create different player experiences, what types of games these mechanisms give rise to, common pitfalls in implementing them, and even some of the physical user-interface issues raised by these mechanisms. With each mechanism, we present illustrative examples and games for further study, running the gamut from modern classics to contemporary new releases, as well as some lesser-known titles that nonetheless have much to teach. A good resource for learning more about the included examples is the website, BoardGameGeek.com, which contains a massive game database featuring images and rulebooks that can assist in further inquiry.

Our hope is that this book serves many purposes. New designers can certainly benefit from reading this book and taking in many mechanisms in a short period of time, but this book can also be used as a reference. Whether you're an experienced designer looking for an overview of auctions, for example, or a gamer interested in exploring the worker placement genre, this book offers an easy way to review the topic and learn more. We feel this book will be of use to educators, students, professional and amateur designers, and anyone interested in reading about game design.

As important as what this book is, is what it is not: a comprehensive listing of all game mechanisms. Though we strove to be broad and inclusive, an exhaustive compilation of all game mechanisms was never our intention, and is arguably impossible. While we do brush lightly on topics like narrative, dexterity, and pantomime, for example, there remains a lot of unmapped terrain. Similarly, while we do sometimes bring in examples from war gaming, miniatures gaming, classic card games and collectible card games, we largely center ourselves on modern board and card games. These lines are certainly artificial, and we have not sought to put forward a definition of what games are in drawing the lines as we did. Rather, we are eager to look to a future that continues to stretch, experiment with and reconsider what games can be in light of new innovations in gaming.

We also do not mean to imply in any way that the well of new mechanisms has run dry. The opportunity for innovation in gaming is limitless.

Our intention is to make it easier for designers to learn to design, to talk with one another about design, and to mine the existing canon of board games for insight into how to design better games. We hope this collection is useful and inspirational to designers, and we look forward to playing the next generation of their games.

A Note on References in This Book

For your convenience, whenever we refer to another part of this book, we include a chapter reference, presented as an abbreviation. For example, the abbreviation ACT is for the chapter about Actions. A reference like ACT-02 means the second section of the Action chapter. This additional information may be helpful to you in understanding the context of the reference, even if you don't choose to look it up right away, and may help in searching for references in digital versions of this text.

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Game Structure

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The first choice designers make about a game is the game's basic structure. Who wins? Who loses? What's the overall scope of the game experience? Will it be just one game, or perhaps a series of hands? Maybe the game will encompass many scenarios, with game-state information persisting from play to play? The last 20 years of tabletop gaming have brought us enormous innovation in game structures, with no signs of slowing down.

Game structure raises the question of what it means to actually play the game. In a cooperative game, is the discussion among the players over which action to take the core of the gameplay, or is it the active player executing the action that is core? In games which limit communication, is the main gameplay overcoming the communication limits, or solving the puzzle the game presents? Designers need to be sensitive to participation issues in team games as well, because the game itself may force most of the action over to one teammate at the expense of another.

In this chapter we'll consider both the traditional structures like competitive and team games, as well as the latest ideas in scenario-based, legacy, and consumable games.

STR-01   Competitive Games
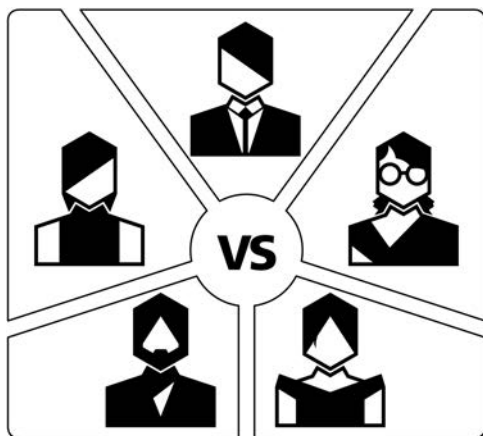
Description

A game with two or more players and a single winner.

Discussion

This is the most familiar game structure, the one we encounter as children in games like *Candyland* and *Snakes & Ladders*. Competitive games still make up the large majority of the market for tabletop games. They typically offer a symmetry of expectations: putting aside the impacts of unusual luck and skill, each player begins the game with a roughly equivalent chance at victory. When this promise is broken, the game is considered imbalanced, and may even be tagged with the label "broken." As we'll discuss later (see "Variable Player Powers" in this chapter and "Variable Setup" in Chapter 6), players may have perfectly symmetric factions and starting conditions, or highly asymmetric ones. But in both cases, it's important that the game offers roughly even chances of victory to each player.

In many games there is an asymmetry which in-game balancing alone can't solve, like the first-mover advantage in chess or the service advantage in tennis. Competitive games often balance these advantages through meta-structures, like tournaments, that offer each player an equal number of chances to play from the advantaged position. In multiplayer games, this may be less practical. Instead, players may be offered opportunities like the

bidding in bridge, betting in poker, or the early alliances in *Diplomacy,* to balance any perceived or actual inequities.

The promise of balance in a competitive game gives rise to a number of related issues, like methods for determining victory and breaking ties. Tiebreaking, in particular, is interesting because determining a winner in a competitive game depends upon the game storing information that allows us to decide who played the better game. For many games, this information may not be available. Once we have to look beyond who scored the most victory points, or who crossed some finish line first, there may not be relevant game-state information that could allow us to reasonably determine which of the tied players played best. And yet, in competitive games, many players disdain a game that ends in shared victory. Experience-oriented designers should consider that players tend to recall how a game ended more than the rest of the play experience, and designers should seek to avoid an indecisive conclusion.

Sample Games

Acquire (Sackson, 1964)
Candyland (Abbot, 1949)
Chess (Unknown, ~1200)
Diplomacy (Calhamer, 1959)
Snakes & Ladders (Unknown, ~200 BCE)

STR-02 Cooperative Games
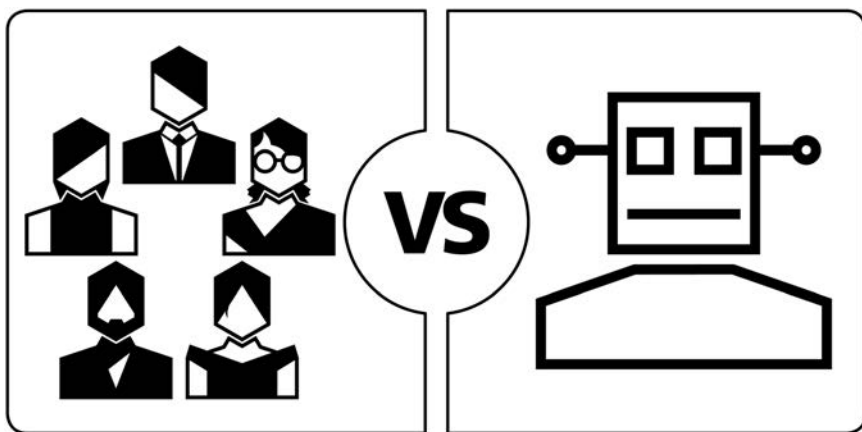
Description

Players coordinate their actions to achieve a common win condition or conditions. Players all win or lose the game together.

Discussion

Quite a few games call for cooperative play among players, including team games, one-vs.-many games, role-playing games, and games with secret traitors. These can be viewed as belonging to a hierarchical category of cooperative games. Some might even include solo games in this group. For our purposes, we'll treat each of these as separate categories, and limit ourselves here to "pure" cooperative games in which all players play on one side and win or lose as a group.

Since 2008, when Matt Leacock released *Pandemic*, the genre of cooperative tabletop games has exploded. Earlier games like *Sherlock Holmes: Consulting Detective*, *Arkham Horror* and *Lord of the Rings* laid a foundation, and enjoy enduring popularity, but Leacock started a wave of innovation in cooperative gaming that continues to reshape modern gaming a decade and more later.

Cooperative gaming is notable because it lowers barriers to entry for a game. Disparities in skill level can often make a competitive game a sour experience both for the expert and the newcomer. Complex competitive games can be intimidating to new players, and being coached by your opponent

introduces some negative play dynamics because of the misaligned incentives of helping your opponent. The power imbalance between the players can also create awkward social dynamics. Cooperative games put players on the same team and help create comradery while allowing experienced players to help teach both the mechanics and strategy of the game without facing conflicting incentives. For many new players, cooperative games are not only a gateway into gaming, but a mainstay of their ongoing consumption of games.

Cooperative games can broadly be placed into two categories: those with an artificial intelligence (AI) and those without. Cooperative games with an AI, like *Sentinels of the Multiverse* and *Mice and Mystics,* feature an opponent or opponents that players must contend against, whose behavior is governed by some kind of simple artificial intelligence, encoded by the designer. In *Sentinels,* the AI is driven by a deck of cards that governs the actions of the enemy villains and the players they will target. *Mice* has a simple algorithm that players use to control the play of enemy figures.

Non-AI games like *Hanabi*, the revolutionary Antoine Bauza title, and *Mysterium,* present players with a puzzle to solve, and some kind of limitations of time, resources, and interaction that players must contend with. However, these games have no villain or opposing force that drives the action and actively confronts the players.

Another distinction between different kinds of cooperative games is whether each player retains agency over their in-game resources, actions and choices, or whether they seek consensus for all decisions, even if they nominally represent separate in-game characters. We might call the former game a partnership game, and the latter a collaborative one. In general, cooperative games will tend to be played collaboratively unless the rules specifically and substantially impede this collaboration and force players to make independent decisions rather than build consensus. Examples include limits on communications, time, and focus.

For some players, collaborative play contributes to the "alpha player problem," also known as "quarterbacking," in which some player takes control of the group discussion and decision-making and creates a negative play experience by overriding other players. There are many possible reasons for the rise of an alpha player problem, many ways that problem can manifest, and a thicket of contributory social dynamics that are beyond the scope of this work. While some players and designers believe that the alpha player problem is a group-composition problem, or a problem of unshared assumptions, rather than a design problem, some design choices will make a game more vulnerable to alpha player takeovers. In particular, when all players share the

same information, and the game state is not too complex, the tendency is for alpha player behavior to arise.

At the other end of the spectrum are games which cannot be taken over by an alpha player. *Magic Maze* and others of its type make player communication a game mechanism, such that players can't freely share information or advise one another on how to play. *The Mind* takes this to an extreme by forbidding players from having any kind of communication about which cards they hold. These types of communication limitations may be presented like any other rule, but they don't actually create a bright line of which conduct is and is not permitted. Rather, these games can be played somewhat differently by each group, with the precise contours of allowable communication varying by tacit or overt agreement. This approach is deeply polarizing, and some players will utterly reject these kinds of games or cast doubt on whether they are games at all. That said, these communication restrictions have the potential to create incredible experiences that connect participants to one another on an almost mystical level.

Communication limitations are only one approach to preventing players from achieving consensus-based play. *Space Cadets, Space Alert,* and *FUSE* introduce a real-time element that forces players to make independent decisions because there is no time for players to collaborate. Other games attempt to strongly connect players to their roles, provide them with hidden information, or make operating their roles especially complicated. *Mechs vs. Minions* and *Spirit Island* both make it challenging for players to decipher each other's powers and possibilities. *Sentinels of the Multiverse* attempts something similar by providing each player with a unique preconstructed deck. Escape room games from *T.I.M.E Stories* to the *Exit* and *Unlock* series sometimes bar players from sharing information too specifically as well. The variety of challenges and puzzles these games offer, and even the various roles that players can take in the solving effort, all help ensure that every player finds a satisfying way to participate in the game.

Another notable trend in co-op game design is the conversion of one-vs.-many, "overlord"-style games into co-ops with the assistance of an app. *Mansions of Madness: Second Edition* and *Star Wars: Imperial Assault* both introduced apps that allow the games to be played cooperatively. More generally, games are being released with cooperative and solo modes alongside competitive modes of play. Sometimes, as has been the case with *Orleans* and *Oh My Goods!,* cooperative modes have been introduced in expansions to competitive games.

The ongoing design exploration of cooperative games and their possibilities is one of the most exciting and fruitful trends in tabletop gaming today. Designers are encouraged to experiment with this popular and adaptable game structure.

Sample Games

Arkham Horror (Krank, Launius, Petersen, and Willis, 1987)
Exit: The Game (Brand and Brand, 2016)
FUSE (Klenko, 2015)
Hanabi (Bauza, 2010)
Lord of the Rings (Knizia, 2000)
Magic Maze (Lapp, 2017)
Mansions of Madness (Koneiszka, 2011)
Mechs vs. Minions (Cantrell, Ernst, Librande, Saraswat, and Tiras, 2016)
Mice and Mystics (Hawthorne, 2012)
The Mind (Warsch, 2018)
Mysterium (Nevskiy and Sidorenko, 2015)
Oh My Goods! (Pfister, 2015)
Orleans (Stockhausen, 2014)
Pandemic (Leacock, 2008), and the complete line of *Pandemic* games
Sentinels of the Multiverse (Badell, Bender, and Rebottaro, 2011)
Sherlock Holmes Consulting Detective: The Thames Murders & Other Cases
    (Edwards, Goldberg, and Grady, 1981)
Space Alert (Chvátil, 2008)
Space Cadets (Engelstein, Engelstein, and Engelstein, 2012)
Spirit Island (Reuss, 2017)
Star Wars: Imperial Assault (Kemppainen, Konieczka, and Ying, 2014)
T.I.M.E Stories (Chassenet and Rozoy, 2015)
Unlock! series (Various, 2017)

STR-03   Team-Based Games
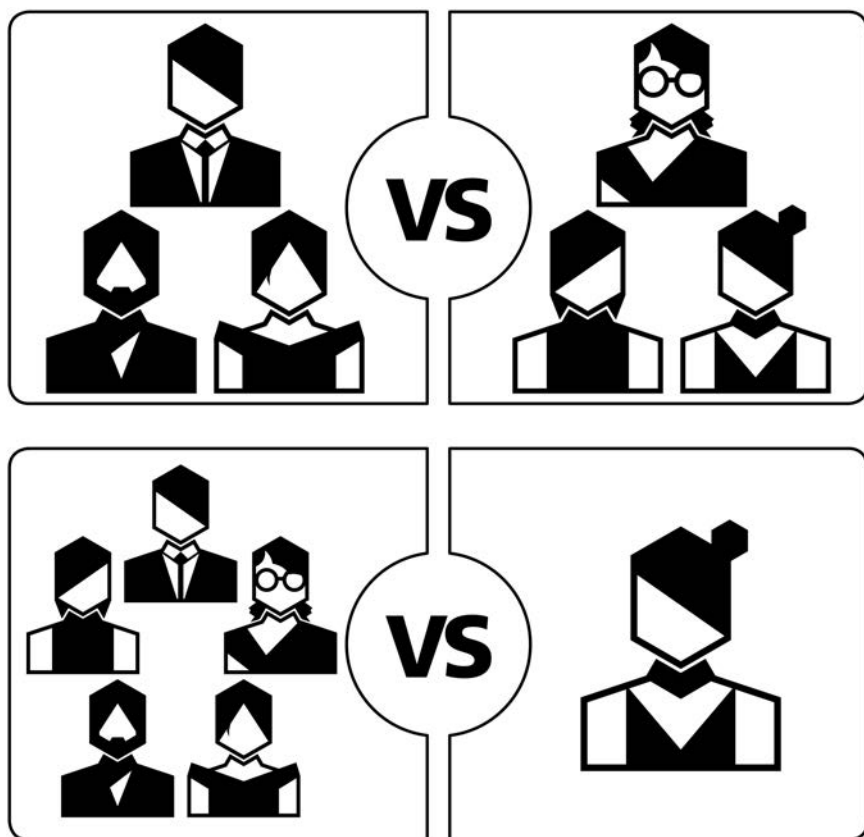
Description

In team-based games, teams of players compete with one another to obtain victory. There are a variety of possible team structures, including symmetrical teams like 2v2 and 3v3, multiple sides like 2v2v2, and even One vs. All.

Discussion

Team-based play is an ancient human pastime and is prevalent in sports, classic card games, and war games. Thematic board games that model some conflict often have to deal with a bilateral narrative, whether in the conflict of good versus evil like in *War of the Ring*, the eponymous conflict of *Axis & Allies*, or

the entirely fabricated battle between villagers and their lycanthropic tormentors in *Werewolf.* Team games allow designers to faithfully recreate these two-sided conflicts while making space for more players at the table.

Most team games assign players to one team or another at the outset and allow collaboration and communication among partners. In some cases, partners may share territory and resources, or even move each other's pieces around the board. Early editions of *Axis & Allies,* for example, featured Commander-in-Chief rules to model the historical reality of coordinating attacks by multinational armies.

Assigning players to teams in secret is a common trope in social deduction and betrayal-style games. In *Werewolf,* the werewolves know one another, but the villagers are left to deduce who is a fellow human and who might devour them in the night. In *Battlestar Galactica*, neither humans nor Cylons are revealed to one another, leading to intense suspicion and paranoia. *Battlestar Galactica* features a further twist: team assignments are not static, and a player might start the game as a human, only to become a Cylon in a mid-game loyalty phase that can potentially reassign players from the human to the Cylon side.

Some games support partnering at the meta-game level. In *Risk, Diplomacy,* and many other games, the rules specify that alliances can be formed and broken freely. There are even games that further encode these alliances into the rules. *Dune* provides for different end-game conditions for alliances with different numbers of factions, includes a specific phase when alliances may be formed, and has rules governing the conduct of allies (e.g., they may not attack each other). *Eclipse* establishes economic advantages for allying with other players, while limiting the number of these allegiances, and enforcing in-game penalties on betrayers. There is a great deal of fluidity between games that allow for coordination in play and those that have explicit mechanisms to support that coordination.

Another common approach to team-based games is that in which players perform different roles in the game. This goes well beyond the distinct player abilities common to many co-op games. Party games from *Celebrity* to *Taboo* to *Codenames* feature one player in a clue-giving role, with one or more teammates in a guessing role. This structure is especially suitable for party games because of the concurrent play of the guessers, and the ability for the game structure to support large numbers of players at any one time. It also allows players to easily enter and exit from a game without negatively impacting the overall play experience for other players.

It's not just party games that embrace role separation, though. *Space Cadets: Dice Duel* and *Captain Sonar* both use the setting of operating some kind of ship to cast players as engineers, radar operators, captains, and weapons specialists. Each player plays a mini-game to model their function within the ship, and the broader game is the sum of these coordinated parts. Sometimes these roles can be fixed for the whole game, sometimes players will rotate through the roles every round, and sometimes the game itself will force players to change roles. This last approach can be thematically interesting and appealing to experienced players, but can be especially challenging for new players, who can easily be disoriented when forced to change roles. It also makes teaching these games much more difficult, since, in theory, every player needs to know every mini-game before play can begin. Designers need to take this into account, perhaps by reserving role-changing cards and other triggers for advanced play only.

Somewhat less common are team games with more than two teams competing at once. Skirmish games like *Star Wars: X-Wing* can allow for these types of modes, but there are even more unusual examples. *Cyclades* with the *Titans* expansion enables a 2v2v2 mode, and *Ticket to Ride: Asia* also supports 2v2v2 play.

Team modes are fairly common in otherwise non-team games, and some team modes are attempts to enable a 1v1 game to scale to a higher player count. The aforementioned *Axis & Allies* and *War of the Ring* have team modes, but players may simply choose to play using the 1v1 rules, and have teammates collaborate in decision-making instead of using the formal rules for team play.

Two other game genres feature partnerships. Card games, especially those in the trick-taking family, are one. The other partnership genre is dexterity games. *Flick 'em Up* has explicit partnership rules, and many flicking games like *PitchCar* and *Caveman Curling* are amenable to alternating play.

Another very popular game structure is One vs. All. This structure is especially suitable for hidden-movement hunting games, in which one player attempts to escape from a group of hunters, like *Scotland Yard, Specter Ops,* and *Hunt for the Ring*. It's also common in overlord-style games where one player controls the "bad guys" and the other players each control an individual hero. *Conan, Star Wars: Imperial Assault,* and *Level 7 [Omega Protocol]* all feature this style of play. Fantasy Flight Games has converted many of its overlord games into cooperative games by introducing an app to control the overlord player.

What distinguishes One vs. All most sharply from other team games is the asymmetric nature of the factions. In hunting games, each player typically controls only one character, but the characters tend to have very distinct abilities, and the victory conditions for the two sides are different too. In overlord games, the overlord usually controls a whole host of minions that they can deploy, whereas the other players control only one character. These games can be difficult to teach and learn because players need to learn how both factions work in order to play the game effectively. While the genre remains very popular, that challenge continues to bedevil designers and players.

Sample Games

Axis & Allies (Harris, Jr., 1981)
Battlestar Galactica: The Board Game (Konieczka, 2008)
Captain Sonar (Fraga and Lemonier, 2016)
Caveman Curling (Quodbach, 2010)
Celebrity (Unknown)
Codenames (Chvátil, 2015)
Conan (Henry, Bauza, Bernard, Cathala, Croc, Maublanc, and Pouchain, 2016)
Descent: Journeys in the Dark (Second Edition) (Clark, Konieczka, Sadler, and Wilson, 2012)
Diplomacy (Calhamer, 1959)
Dune (Eberle, Kittredge, and Olatka, 1979)
Eclipse (Tahkokallio, 2011)
Flick 'em Up (Beaujannot and Monpertuis, 2015)
Hunt for the Ring (Maggi, Mari, and Nepitello, 2017)
Level 7 [Omega Protocol] (Schoonover, 2013)
Mansions of Madness: Second Edition (Valens, 2016)
PitchCar (du Poël, 1995)
Risk (Lamorisse and Levin, 1959)
Scotland Yard (Burggraf, Garrels, Hoermann, Ifland, Scheerer, and Schlegel, 1983)
Space Cadets: Dice Duel (Engelstein and Engelstein, 2013)
Specter Ops (Matsuuchi, 2015)
Star Wars: Imperial Assault (Kemppainen, Konieczka, and Ying, 2014)
Taboo (Hersch, 1989)
War of the Ring (Second Edition) (Di Meglio, Maggi, and Nepitello, 2012)

STR-04   Solo Games
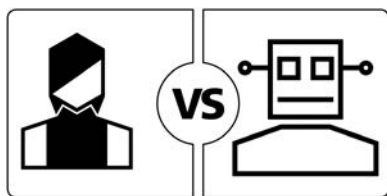
Description

A solo game is a game or game mode intended for play by a single player.

Discussion

Solo games can stretch the definition of what a game is, but solo games have been around for some time. Patience or Solitaire card games, war games, interactive fiction (e.g., Choose Your Own Adventure® books), crossword puzzles, paper-and-pencil games, word searches and many more single-player, game-like pursuits are very popular and have been for years. What is new is the explosion of demand, and supply, for solo board games, whether as standalone games or as game modes in multiplayer games. Rather than quibbling over the definition, we choose to embrace the variety and possibilities of solo gaming.

Solo games are closely related to cooperative games in the sense that the player plays against the game system itself, rather than a sentient opponent. Solo games can be considered as a special case of co-op games in which there is only one player—and thus, no alpha player problem. While most co-ops can be, and are, played solo, communications-based co-op games like *The Mind* typically can't be played solo at all. Cooperative Limited Card Games (LCGs—a genre, i.e., a blend of collectible card games and deck-building games) are very popular among solo players, and the dungeon-crawl-style Rogue-like game seems especially amenable to solo play. Players can usually brew their own unofficial solo game from these games, or from many non-communication-based co-ops, by playing more than one position in a co-op game, for example.

Modern solo design pushes beyond that basic approach to solo play. We can classify a few kinds of solo games: goal-based, record-based, and AI-based. In goal-based games, players try to achieve some goal, usually a Victory Point (VP) total, within a certain number of turns, or a certain amount of time.

This type of design is most similar to multiplayer cooperative games. These games might have an AI opponent of sorts, but typically the opponent is an asymmetric villain of some kind, or even an entirely abstract process, like a spreading fire in *Flash Point: Fire Rescue*. The AI is not an automated version of a human player who competes as another human player might.

Record-based games are those whose goal is to beat your previous high score. While this may seem like a mundane and dull victory condition, some games have developed large solitaire followings, complete with ladders and statistics that transform the game from a solo game to a community-based meta-competition. *Ganz schön clever* is one example of this type of game and community competition. Some goal-based games can also work as record-based games, as long as some scoring metric can be captured that adequately measures game performance.

AI-based games attempt to recreate the multiplayer experience by introducing an automated player or players. Typically, this means some basic algorithm governs the moves of the AI player. These systems can be challenging to design, and usually depend on dice, cards or other randomizers to create uncertainty about the AI player's choices. However, other approaches to AI opponents are also possible, as shown by Morten Monrad Pederson's Automa system, which powers solo modes in games as varied as *Scythe, Anachrony, Baseball Highlights 2045,* and *Between Two Cities.*

Pederson's Automa system is more a philosophy and approach than an official system, and many designers have used its principles to create Automas. The key principles are that the solo game should feel as much as possible like the multiplayer game, and that AIs should be representational, rather than procedural. The AI doesn't observe the rules and doesn't play the game as a player might. Rather, the AI is a series of outputs that are applied to the game state that mimic the outputs that result from a human player's choices—a kind of Potemkin player. In Pederson's words, the AI is only the shell of a human player, and while the humans in a game of *Viticulture* have vineyards and grow grapes, the Automa players do not; they just give the impression that they do. In practice, Automas will claim action spaces, draft cards, block routes, and otherwise interfere with human players, but they will not collect resources, build buildings, or score victory points.

Solo games are enjoyed by a large, active, and growing community who continues to homebrew solo versions of multiplayer games, host contests and challenges, and enjoy an unexpected comradery despite the solitary nature of their pastime. Increasingly, including a solo mode is a desirable feature for published multiplayer games, and the success of a number of solo-only games,

like *Friday* and *Hostage Negotiator,* has established that there is a market even for the loneliest of player counts.

Sample Games

Ambush (Butterfield and Smith, 1983)
Anachrony (Amann, Peter, and Turczi, 2017)
Arkham Horror: The Card Game (French and Newman, 2016)
B-17: Queen of the Skies (Frank and Shelley, 1981)
Baseball Highlights: 2045 (Fitzgerald, 2015)
Between Two Cities (O'Malley, Pedersen, and Rosset, 2015)
Flash Point: Fire Rescue (Lanzig, 2011)
Friday (Friese, 2011)
Ganz schön clever (Warsch, 2018)
Hostage Negotiator (Porfirio, 2015)
Lord of the Rings: The Card Game (French, 2011)
Mage Knight Board Game (Chvátil, 2011)
One Deck Dungeon (Cieslik, 2016)
Onirim (Torbey, 2010)
Robinson Crusoe: Adventures on the Cursed Island (Trzewiczek, 2012)
Scythe (Stegmaier, 2016)
Terraforming Mars (Fryxelius, 2016)

STR-05   Semi-Cooperative Games
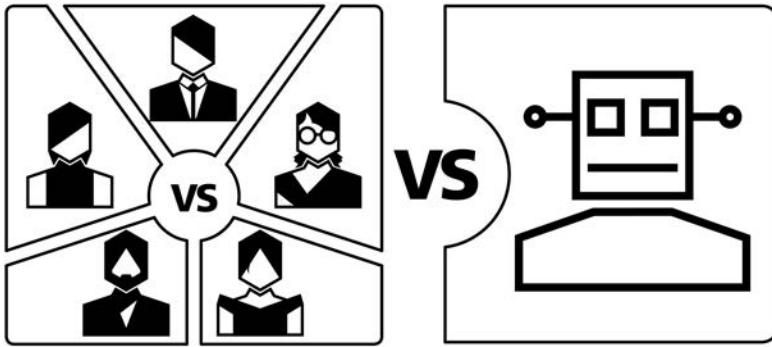
Description

A game which ends with either no winners or with the players winning as a group, but a single player being recognized as the individual winner as well.

Discussion

Semi-cooperative games are like cooperative games because players can all lose together to the game itself. However, if the players manage to overcome the game, one of the players will be crowned the individual victor, or a kind of most valuable player, based on some in-game achievement. A group's enjoyment of this style of game depends on all members having the same answer to the question of whether a group win, coupled with an individual loss, is in fact superior to a total group loss. If players are split on this question, those for whom an individual loss is as bad as a group loss will not seek optimal cooperative plays, and may even sabotage the group while trying to secure a winning individual position. Players who prefer to win as a group, even if they lose as individuals, will be incensed by this conduct, and unhappiness will follow for everyone.

There's a strong connection between semi-cooperative games and role-playing games (RPGs). RPGs typically feature a similar dynamic: all players want to follow the main plot narrative and defeat the big bad, but each player has individual motivations that may sometimes work at cross-purposes, and in any case, each player is motivated to secure the greatest in-game rewards in terms of wealth, experience points, glory, etc. These competing motivations can help weave a complex and gripping narrative. In tabletop

games, a semi-cooperative structure can create memorable moments of last-second betrayal and competitive jockeying for position.

Semi-cooperative games are fascinating as a design study because of how players engage with them. Many groups will play semi-cooperatives as co-ops, ignoring the individual win conditions, or treating them as a means for recognizing a great performance by some player, rather than as a win condition to be claimed. Others will embrace the notion of an individual win and engage in brinksmanship in almost total violation of the cooperative element of the game. Despite the broad range of possible play styles, each group typically has a very narrow idea of the "right way" to play the game. In other words, it's unlikely that the same group would play *Arkham Horror* as a total co-op one night, and then as a semi-co-op another night. Actually, you might be hard-pressed to find anyone who plays *Arkham Horror* with any care for the individual win condition. The game holds little attraction for players looking for that experience. Crafting a semi-co-op that is satisfying to play and that manages to incentivize both the individual and cooperative aspects of the game is like trying to land a jet plane in a phone booth.

Another route a designer can consider is introducing cooperative elements into a competitive game without creating a cooperative loss condition. Games like *Kingsburg* and *Survive: Escape from Atlantis* achieve this in different ways. In *Kingsburg,* all players must face a common foe at the end of each year. In *Survive,* players can share common resources like lifeboats to escape the ocean's dangers. These cooperative opportunities can enrich the game and create internal drama without confusing players as to their incentives, or causing distress over what type of game players they thought they sat down to.

Sample Games

Archipelago (Boelinger, 2012)
Arkham Horror (Krank, Launius, Petersen, and Willis, 1987)
Castle Panic (De Witt, 2009)
CO$_2$ (Lacerda, 2012)
Defenders of the Realm (Launius, 2010)
Kingsburg (Chiarvesio and Iennaco, 2007)
Legendary Encounters family of deck-building games (Cichoski and Mandel, 2014)
The Omega Virus (Gray, 1992)
Republic of Rome (Berthold, Greenwood, and Haines, 1990)
Survive: Escape From Atlantis (Courtland-Smith, 1982)

STR-06   Single Loser Games
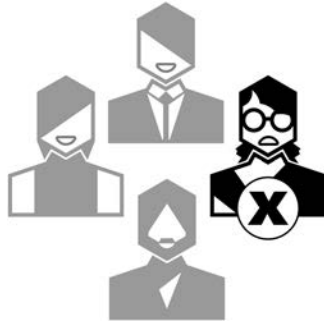
Description

A game with three or more players which ends with only one loser.

Discussion

Games with one loser flip the script by incentivizing players not to perform better than everyone else, but better than at least one other person. Like the old saw about not needing to outrun a ravenous bear, these games emphasize impeding other players more than advancing yourself. *Old Maid* is a well-known classic card with this structure. *Alcatraz: The Scapegoat* is a modern game in which players are escaping prison, but one of them, the scapegoat, will remain behind and lose.

Stacking games often feature a single-loser structure, because many of them end when a player knocks over the shared structure. *Jenga* and *Rhino Hero* are examples of this dynamic, though *Rhino Hero* does offer some rules for determining who the winner is among the surviving players. In practice though, groups often ignore this final scoring, or even scoring of any kind.

Single-loser structures are not very common in modern games, perhaps because they encourage sharply confrontational "take-that" play in which players can directly impede or harm one another. These structures can also be susceptible to a bash-the-loser pattern, in which the player who falls behind becomes the most attractive target to all other players, and has no chance to recover their position. This structure represents an innovation horizon for designers to explore.

Sample Games

Alcatraz: The Scapegoat (Cywicki, Cywicki, and Hanusz, 2011)
Aye, Dark Overlord (Bonifacio, Crosa, Enrico, Ferlito, and Uren, 2005)
Cockroach Poker (Zeimet, 2004)
Jenga (Scott, 1983)
Pairs (Ernest, Glumpler, and Peterson, 2014)
Rhino Hero (Frisco and Strumph, 2011)

STR-07   Traitor Games
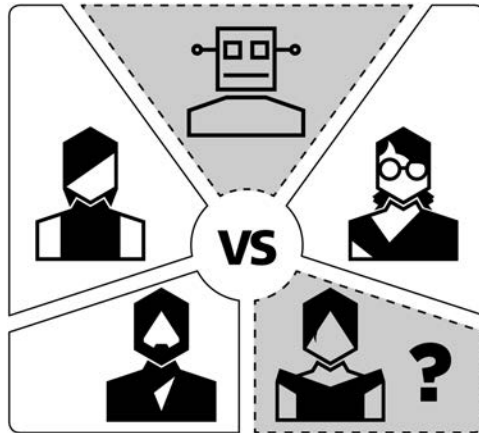
Description

A traitor game can be seen as a kind of team game, or as a cooperative game with a betrayal mechanism. The traitors typically win by triggering a failure condition for the players. For our purposes, a traitor game is characterized by traitors that begin the game with hidden identities.

Discussion

Traitor games sit at the overlap in the Venn diagram of social deduction games, team games, and cooperative games. The cooperative game engine sets the overall parameters for how players interact in the game, and those choices provide information that players can use and manipulate to deduce, accuse, and mislead. The team element provides coordination options for both sides, both out loud and in secret. These designs must add a layer of obfuscation in order to preserve uncertainty and mystery. Thus, in *Dead of Winter* the cards contributed by players to meeting the current crisis are shuffled prior to being revealed, so as to hide which player contributed which card.

In designing traitor games, it's important to consider how the game plays at different stages of knowing the traitor's identity. The tension and suspense of not knowing who is on which side is great fuel for the beginning of the game, but once the traitor has been sussed out, is the game still fun? Does the traitor still have meaningful and interesting choices? Is catching the traitor a victory

condition itself? *Betrayal at House on the Hill* is a traitor game with many story modules, each with its own mechanisms, that designers can treat it as a case study on this exact issue.

Another challenge facing traitor games is learnability. Like in team or One vs. All games, players have to learn how all the sides work to play properly. In traitor games with hidden identities, players can't readily ask questions or consult the rules without giving away their loyalties. Good player aids and reference material need to be areas of focus.

Sample Games

Battlestar Galactica: The Board Game (Konieczka, 2008)
Betrayal at House on the Hill (Daviau, Glassco, McQuilian, Selinker, and Woodruff, 2004)
Dead of Winter: A Crossroads Game (Gilmour and Vega, 2014)
Saboteur (Moyersoen, 2004)
Shadows over Camelot (Cathala and Laget, 2005)
Werewolf (Davidoff and Plotkin, 1986)

STR-08   Scenario/Mission/Campaign Games
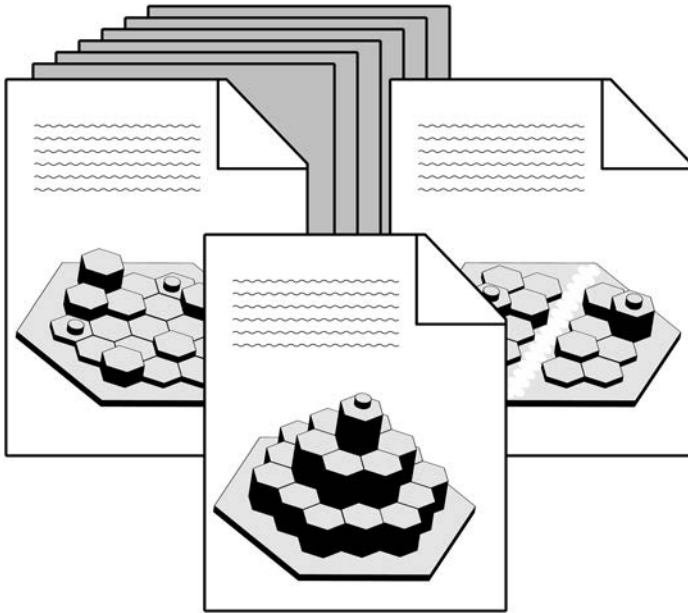
Description

This is a game system that can be applied to a variety of different maps, starting resources and positions, and even different win and loss conditions. These variable conditions can be assembled into a broader narrative or campaign, or they can be entirely disconnected from one another.

Discussion

The roots of scenario-based games are in storytelling, history, wargames and RPGs. The idea is that a rich experience can be woven out of multiple episodes, planned out to be experienced sequentially.

In wargames like *Advanced Squad Leader,* the same core system, together with substantial supplements, enables players to model an enormous variety of possible conflicts. As players gain mastery, they can attempt more challenging and complex scenarios. At the other end of the spectrum, a war-themed game like *Memoir '44* gives players the opportunity to play the many battles and confrontations that made up the D-Day invasion with an intuitive ruleset that can be taught in ten minutes.

Scenario structures are popular in dungeon crawler games. Swap in a new dungeon map, a new boss monster, maybe some new mission types, and players can enjoy new challenges without learning new rules. Scenarios can also be completely detached from any narrative, and simply allow players to face off against one another in a skirmish mode that provides some basic rules for force construction. Scenarios are also prevalent in cooperative settings, both for offering different levels of difficulty and for creating variety.

Recently, there has been an explosion in the types of games offering a scenario or campaign structure. *Catan* expansions going back as far as *Seafarers of Catan* have offered scenario play, but hits like *The 7th Continent, Mechs vs. Minions, Near and Far,* and card-based dungeon crawlers like *Pathfinder Adventure Card Game* and *Gloomhaven* have rocketed in popularity. It's also impossible not to mention *T.I.M.E Stories* and the various escape room game series like *Exit: The Game, Unlock!,* and *Deckscape.* Though each box is a self-contained experience, the play system is largely similar from box to box, and outside of the packaging and business model, these games are scenario-based in structure. One might even consider *Age of Steam* maps, *Power Grid* expansions, *Ticket to Ride* standalone variants from Europe to New York, *Pandemic: Iberia* and *Cthullhu,* and the *Mystery Rummy* series as follow-on scenarios, sold separately.

Sample Games

The 7th Continent (Roudy and Sautter, 2017)
Advanced Squad Leader (Greenwood, 1985)
Age of Steam (Wallace, 2002)
Dead of Winter: A Crossroads Game (Gilmour and Vega, 2014)
Deckscape (Chiachierra and Sorrentino, 2017)
Exit: The Game (Brand and Brand, 2016)
Mechs vs. Minions (Cantrell, Ernst, Librande, Saraswat, and Tiras, 2016)
Memoir '44 (Borg, 2004)
Near and Far (Laukat, 2017)
Pandemic game system (Leacock, 2008)
Pathfinder Adventure Card Game (Selinker, Brown, O'Connor, Peterson, and Weidling, 2013)
T.I.M.E Stories (Chassenet and Rozoy, 2015)
Ticket To Ride (Moon, 2004)
Unlock! series (Various, 2017)

STR-09 Score-and-Reset Games
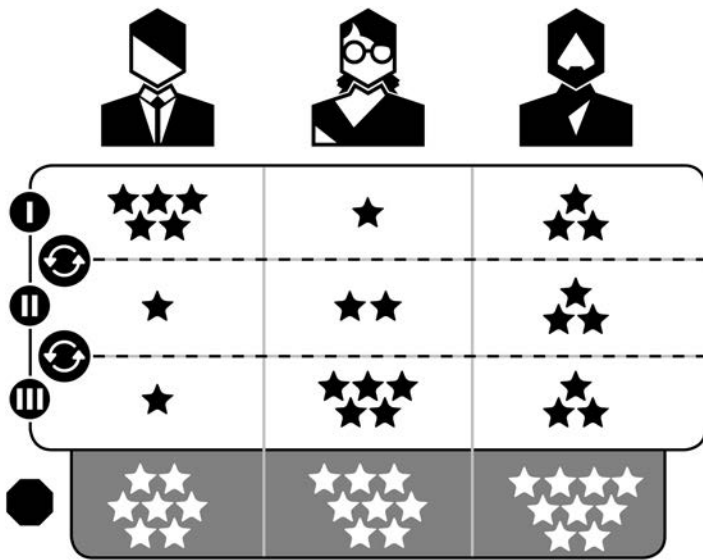
Description

This is a game in which players play until reaching a stopping condition, then record scores, reset the game, and play one or more additional rounds. The game concludes after some number of rounds, and the cumulative score is calculated to determine a winner.

Discussion

Score-and-reset is a very common game structure that is well represented among classic games from *Bridge* to *Backgammon,* and in modern games like *Red7, Ravenous River,* and *Incan Gold.*

 Card games are especially amenable to this structure, which matches well with playing out a hand of cards, shuffling and redealing. Games with a strong turn-order advantage can take advantage of a score-and-reset structure by having players take turns in the lead position, and using cumulative scoring to measure who played best over a series of rounds.

 Stacking games like *Rhino Hero* use score-and-reset because once the shared structure is toppled, there's a need to collect up the cards and pieces anyway, and this represents a natural end point. Whether players do in fact

record wins and losses or points is to some extent a matter of the dynamics of the game group itself. By contrast, dexterity games like *KLASK* and *BONK* reset after each goal, but scoring is rigorously tracked.

Score-and-reset structures can be somewhat informal. Players might play a series of games of *Hive* and declare a victor after one player reaches some total number of victories. There's not a sharp line between score-and-reset and round structure in general. *Amun-Re* features two ages, in which gameplay is identical, but the board itself does not fully reset. Pyramids built in the first age persist in the second age, and influence valuation of territories. In *Blue Lagoon,* the board is reset between the first and second half of the game, with the exception of the huts players lay out in the first half. However, the rules of placement change profoundly too—where players were free to lay explorers on any sea space in the first half, in the second half, they must begin laying explorers adjacent to their huts.

Sample Games

Amun-Re (Knizia, 2003)
Blue Lagoon (Knizia, 2018)
BONK (Harvey, 2017)
Hive (Yianni, 2001)
Incan Gold (Faidutti and Moon, 2005)
KLASK (Bertelsen, 2014)
Ravenous River (Shalev, 2016)
Red7 (Chudyk and Cieslik, 2014)
Rhino Hero (Frisco and Strumph, 2011)

STR-10   Legacy Games
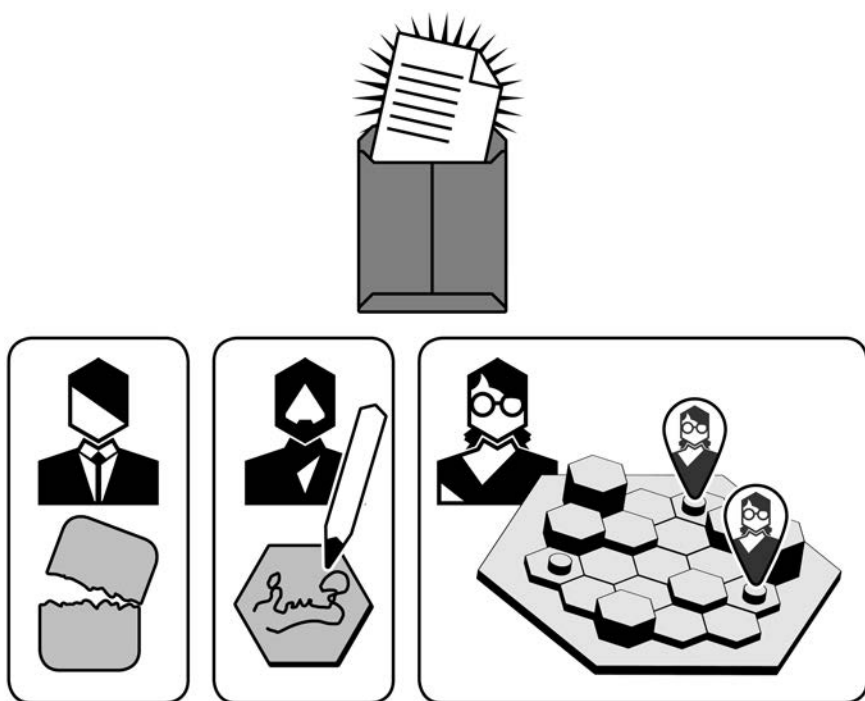
Description

A legacy game is a multisession game in which permanent and irreversible changes to the game state carry over from session to session.

Discussion

The first legacy game, Rob Daviau's *Risk Legacy*, came from the unlikeliest of places: Hasbro. Daviau, by his telling, half-shepherded, half-snuck the audacious design past the gatekeepers at the company, and emerged with a genre-defining hit. Famously, the game was sealed with a sticker that had to be broken to open the box, and which warned ominously, "What is Done Cannot Be Undone." This irreversible permanent change is what legacy games are all about.

As of this writing, there are still relatively few legacy games on the market. They are difficult to playtest, require generating quite a lot of content, and

are tricky to produce and price properly. Curmudgeons will rightly point out that RPGs and campaign games are essentially legacy games, except that you don't have to destroy your game as you play. Yet that permanent destruction, the tearing of a card or writing on a board generates a visceral response that those other games don't. Breaking this taboo and permanently altering a game can be a stressful and cathartic experience at the same time.

Legacy games aren't simply about destroying components and defacing boards. Another element common to these games is unlocks: gated content that can only be opened and accessed after some condition is met. We'll refrain from specific examples, so as not to spoil these experiences for the uninitiated! Unlocks differ fundamentally from gated content in non-legacy games (see "Gating and Unlocking" in Chapter 3) in that unlocks usually occur at game-end, their impacts will only be felt in the next session, and these unlocks are typically not simply buffs and de-buffs to existing statistics, but rather, entire new mechanisms, characters, factions, maps, etc. These unlocks can also radically change the narrative or move the camera and offer players new perspective and surprises.

Like campaign games, legacy games require a substantial commitment to complete, and they typically call for the same group to come together ten or more times. *Pandemic Legacy* can theoretically take 24 sessions to complete! Publishers, and thus designers, can feel trapped between offering a novel and essentially unrepeatable experience on the one hand, while still providing sufficient re-playability to players, despite the consumable nature of the game. Most legacy games do allow players to keep playing the game even after the campaign is concluded, but anecdotally, it seems that few players do so.

It appears, from this early vantage point on this emerging trend, that the market is expanding to allow for a broader range of possible games, such that at the right price point, even a single-play game like the *Exit* series can be a hit. Games like the *Harry Potter: Hogwarts Battle* deck-building game have used unlocks, but not destructibility, and are fully resettable. *Gloomhaven* takes a similar approach with reusable stickers to provide changes that are campaign-permanent, but otherwise reversible. *Fabled Fruit* is even more easily reset, requiring nothing more than reordering a deck of cards. However, it is difficult to distinguish it structurally from, say, a deck-building game in which any given play session may include a completely different subset of cards.

Legacy games are a still-emerging category and definition. Elements we've identified may not exist in every game, and new elements may yet emerge, especially as legacy games and digital apps converge. Stay tuned for more changes in this exciting new genre.

Sample Games

Betrayal Legacy (Daviau, Cohen, Honeycutt, Miller, Neff, and Veen, 2018)
Charterstone (Stegmaier, 2017)
Fabled Fruit (Friese, 2016)
Gloomhaven (Childres, 2017)
Harry Potter: Hogwarts Battle (Forrest-Pruzan Creative, Mandell and Wolf, 2016)
Legacy of Dragonholt (Valens, Clark, Flanders, and Mitsoda, 2017)
Pandemic Legacy: Season 1 (Daviau and Leacock, 2015)
Risk Legacy (Daviau and Dupuis, 2011)
Seafall (Daviau and Honeycutt, 2016)

2

Turn Order and Structure

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One of the elements that separates "games" from "play" is the introduction of *structure*. This takes many forms, including restrictions on how players perform activities and when they may perform them. Out of this arises the concept of a "turn"—an order or structure within which players take their actions.

The concept of taking turns is one of the first game-based concepts taught to young children. Many simple games, like *Candyland*, exist for the purpose of teaching how to wait for your turn, among other early building blocks of how to play games.

The turn structure of a game can set the tone for the entire experience, whether it is playful, strategic, or intense. Selecting the appropriate turn structure for the game is an important part of the design process.

This section includes a wide variety of these structures, including some that, while appearing unstructured, like real-time games, actually contain their own internal structure, logic, and design challenges.

Terminology

For this book we have adopted the following commonly used terminology when describing turn structure:

A **Turn** is typically one player taking a series of **Actions** or **Steps**, although sometimes other players may interrupt or otherwise participate.

A **Round** is composed of multiple Turns. This can be a fixed number of turns, or variable depending on player actions or random events.
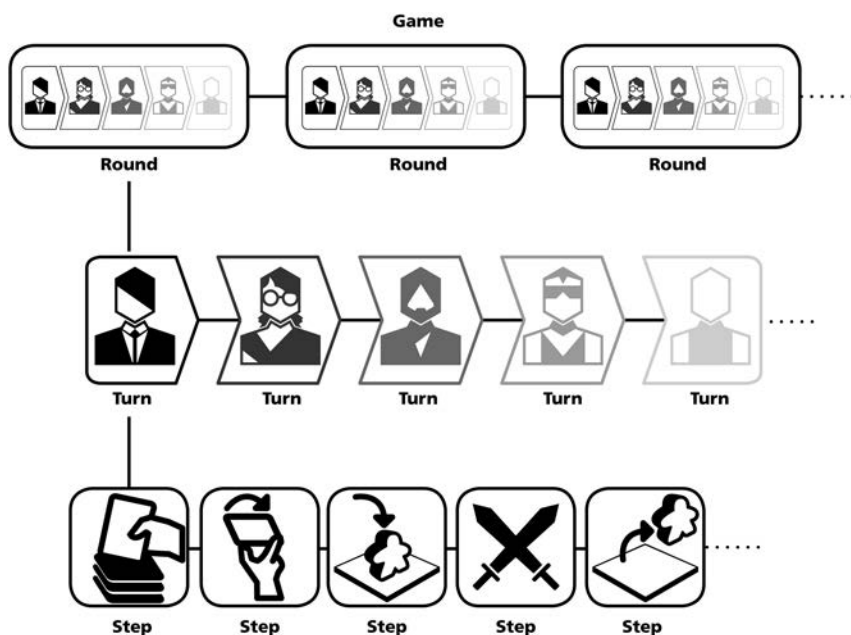
For example, *Agricola* consists of 14 Rounds. In each Round there is a Start Player, who takes the first Turn. During that Turn, they perform two Steps: Placing a worker, and performing the Actions designated by the space where the worker is placed. Players continue to take Turns in clockwise order until all workers have been placed. This concludes the Round.

There may be activities that take place at the beginning or end of a Round. For example, in *Agricola* you may need to feed your workers, or new Actions may be added to the available options.

Many games also introduce the concept of a **Phase**. Phases can be inserted at different places in the hierarchy depending on the needs of the designer. For example, a Round can consist of several Phases, and each Phase can have

a series of Turns. Or a series of Rounds may make up a Phase. The section on Interleaved vs. Sequential Structures discusses this in more detail.

The key distinguishing feature of Phases vs. Rounds or Turns is that there are usually multiple Phases, and each is named with a different and specific purpose. For example, there may be a "Feeding Phase" and a "Scoring Phase," and those can be radically different from each other. In contrast, Rounds and Turns are rarely distinguished in this way. They are identical in their basic structure. This is not to say that each Turn, for example, always consists of exactly the same Steps. Many games give players a choice of actions to perform. But a turn performed by one player is typically very similar in structure, if not identical, to another player's turn.

Some games also have levels above Rounds. These have a variety of names, from the generic Stage in *Die Speicherstadt* to the more thematic Age in *Through the Ages*.

Obviously, all of this terminology is not written in stone, and there will be esoteric structures that may require different names. However, anything that is outside what players are expecting, or inverting this customary order, will add cognitive load to the players, both in learning and playing. You can build a car that puts the windshield wiper controls underneath the radio instead of on a steering wheel stalk, or make a new icon to represent the defrosters, but new drivers will find it more challenging to drive. Eventually they will adapt, but the best approach is to keep to conventions unless there is a strong reason not to do so.

TRN-01 Fixed Turn Order
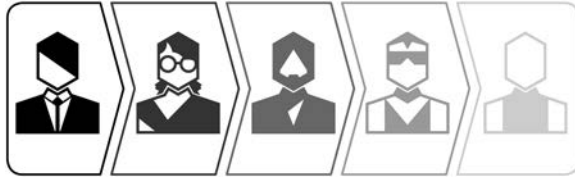
Description

Turn order is set at the start of the game and never varies. Each player takes a turn in the same sequence until the end of the game.

Discussion

A Fixed Turn Order is the most basic turn order, one that we are introduced to from the first games we play at a young age. Typically, play proceeds from a starting player clockwise around the table; however, Asian games often proceed counter-clockwise. In this book we will assume that games proceed clockwise (Progressive or Become First Player Action, for example). We recommend that the direction match the cultural norm to reduce the cognitive load on players.

Fixed Turn Order will often result in an imbalance favoring one of the player positions (typically the first player, but sometimes the last). To compensate, the designer may give a bonus to the other players. This can be extra or better resources, as in *Century: Spice Road*, bonus victory points, as in *Go*, or other advantages.

Another concern is ensuring players will have an equal number of turns. A common means for addressing this is using a token or indication of which player went first. When the game-ending condition is triggered, the round continues, the marker serving as a reminder of which players should still take a turn so that all players will have the same number of turns. *Century: Spice Road* uses this system, for example.

These systems may introduce additional complexity and design considerations, however. For example, some players may have their final turn before they know that the game is ending, while others may have theirs after, and be able to optimize their play. Let's say there are five players: A through E, with A being the first player. If player C triggers the end of the game,

D and E will get one final turn, then the game will end. This may give D and E an advantage over A and B, as they definitely know this is their final turn and can execute accordingly.

Through the Ages uses a Fixed Turn structure, and keeps track of the first player. However, to help counteract the issue that some but not all players know what their last turn is, it sometimes extends an extra round, depending on when the end is triggered. If game-end is triggered on the first player's turn, the current round would be the final round. If game-end is triggered on any other player's turn, the game goes on for another full round. This helps mitigate the situation, but it does add additional complexity to the rules.

Sample Games

Candyland (Abbot, 1949)
Century: Spice Road (Matsuuchi, 2017)
The Expanse Board Game (Engelstein, 2017)
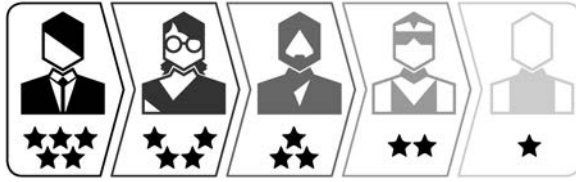*Go* (Unknown, 2200 BCE)
Monopoly (Darrow and Magie, 1933)
Parcheesi (Unknown, 400)
Snakes & Ladders (Unknown, ~200 BCE)
Splendor (André, 2014)
Through the Ages: A Story of Civilization (Chvátil, 2006)

TRN-02   Stat Turn Order

Description

The turn order within each Round is set by some statistic relating to the players' resources or position in the game.

Discussion

This Stat Turn Order mechanism gives the designer an additional tool to work with, particularly to implement a Catch the Leader mechanism (VIC-18). Frequently the resource that is used as the basis for turn order is Victory Points (VIC-01), where the player in last place goes first in the turn order, or possibly last. However, it can be other resources or board states. In *Civilization*, for example, it is based on the number of population tokens a player has on the board.

Turn order may also be variable for different phases of the game, based on different statistics. Both *Power Grid* and *Civilization* use this method. *Power Grid* always uses the number of connected cities as the ranking metric, but in some phases the player with the most connected cities goes first, and in others they go last. During the auction for power plants, the player in the lead must select and bid on the first power plant, which is disadvantageous. When purchasing resources and building power lines, the player in the lead goes last, resulting in more expensive resources or possibly getting blocked out of places to build. In *Civilization*, some phases are sequenced by Census (population tokens), while others are based on the victory track, either forward or reverse. This gives the designer fine-grained control over balance and the relative importance of different aspects. It also allows players to manipulate turn order, and gives the designer a tool to implement a Catch the Leader mechanism.

A word of caution is in order if Victory Points are used as the turn order (as in *Power Grid*), but many Victory Points are awarded at the end of the game,

or are otherwise not tallied on the Victory Point (VP) track immediately (VIC-06). Those "off-the-book" VPs have the added benefit of not hurting a player's turn order positioning. If players who are ahead on the score track during the game are penalized by turn order, it will give increased weight to strategies around end-game points, which the designer needs to consider for balance.

When the advantages of turn order are extreme, manipulating turn order may become a dominant feature of game play, which may or may not match the designer's intent. For example, in *Rise and Decline of the Third Reich*, a simulation of the European theater of World War II, turn order is determined by the production output of the sides (called Basic Resource Points, or BRPs). Typically, it is clear which side has more BRPs, and the turn order stays fixed. However, at critical points the lead may change, resulting in a double turn, as the player that moved last in one turn moves first in the next. Players have some control over BRPs, as a portion of those not spent carry over to the next turn, and conquests, strategic warfare, and other effects may impact it, so paying close attention to this stat is vital.

This is clearly part of the design intent. In the early stages of the game, Germany will typically move first, but as the United States enters the war and gains in economic strength there will inevitably be a transition resulting in Allied double move, which can strongly shift momentum in their favor. The Axis player tries to blunt this by controlling the timing of when this double move occurs, perhaps triggering it earlier than the Allied player wants, and when they are not set up to take advantage of it.
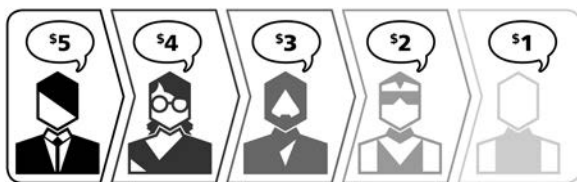
Sample Games

Civilization (Tresham, 1980)
Power Grid (Friese, 2004)
Rise and Decline of the Third Reich (Greenwood and Prados, 1974)

TRN-03   Bid Turn Order

Description

Players bid for turn order. A variety of auction mechanisms may be used (see "Auctions" in Chapter 8 for more details).

Discussion

Adding an auction for turn order, or Bid Turn Order, helps improve balance by allowing the players to decide the relative merits of different turn orders at different times and situations. However, there are several drawbacks to this method. First, it will slow the game down. Auctions in general can add a lot of time to the game and can feel tacked-on when the auction is not integrated into the core game mechanism. This is normally the case with auctioning off turn order, which is usually a prelude to the main gameplay.

    Age of Steam has a traditional Turn Order Until Pass auction (AUC-03). While the auction can be long, turn order in this game is very important, and the rules of the bid have additional tactical considerations, since players who drop out early get all or some of their bids back. In a tight economic game like *Age of Steam*, the bidding is extremely tense and important, and the experience more than makes up for the game length.

    In *A Game of Thrones*, players bid for turn order via the Throne track. In addition to being first player, the highest bidder on the Throne track also gains the ability to break any ties that occur. Giving an extra benefit to the auction makes it more interesting to the players, and raises the stakes of the bidding.

    Another game that uses this mechanism is *El Grande*, where the playing of Power Cards determines the turn order. Each player has Power Cards numbered 1–20, and selects one (selection is made based on the turn order of the prior turn). Each player may only play each Power Card once per game, and they may not play the same Power Card as one that another player has played during that round. These rules speed the auction for turn order. In an

example of elegant design, the Power Cards determine not just turn order, but the number of pieces ("caballeros") that are made available to the player for the Area Majority competition (ARC-02) featured in the game. Power cards are designed to offer better turn order and fewer caballeros, or vice versa. Timing their play is a critical part of *El Grande* and makes the turn-order auction step more engaging.

Auctions do suffer from another weakness, though. Auctions rely on players understanding the value of what they are bidding on. When bidding for resources or something tangible, it is easier for new players to judge relative worth. However, turn order is a much more nebulous concept for new players, and determining its value can be very tricky. This can lead to players over- or under-paying in the auction, which can lead to balance issues and lessened enjoyment. Therefore, if using a bid for turn order, it is recommended that designers give players guidelines for typical early game bids to help them bid appropriately.

Bid Order turn systems typically require a physical element to track turn order—a track, tokens, cards, something to indicate the sequence. Because turn order does not go "around the table," this system can result in delays as players get confused, or need to check a secondary track, to determine whose turn it is.
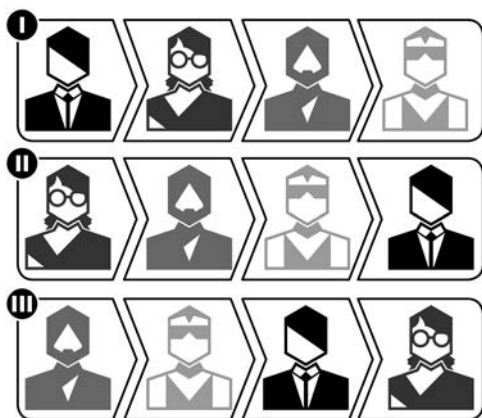
Sample Games

Age of Steam (Wallace, 2002)
El Grande (Kramer and Ulrich, 1995)
A Game of Thrones (Petersen and Wilson, 2003)

TRN-04   Progressive Turn Order

Description

One player has the First Player token. At the end of the round, the token passes to the player to the left who becomes the new First Player for that round. During the round, players take turns clockwise around the table.

Discussion

There are several advantages to the Progressive Turn Order system over the Fixed Turn Order (TRN-01) structure. First, it naturally rotates the first player marker through the players in a predictable way. This enables planning on the part of the players, plus it introduces a timing element. If you are going second, you know that you will be going first the next round and can plan accordingly.

Similarly, being first in a round is immediately followed by being last in the next round. This gives a nice rhythm to the game, as over a series of rounds you move closer and closer to going first, and then slip to last place. It's a gradual buildup, followed by a sharp drop.

The above assumes, of course, that going first is the best position, and going last the worst. In some games the opposite is true, like *Texas Hold'Em* Poker. In this game the first position is typically considered the worst, while the last, "the button," is the best, as seeing what other players do before you make your decision gives more information to work with. So in *Texas Hold'Em* Poker, once the player is in the best position, the button, they gradually move closer and closer to the worst position, the small blind. Then the player jumps from being in the worst position to the best.

Progressive games can leave a large gap between player turns. For example, in a five-player game when a player moves first, the next round he or she will move fifth. That means that it will be nine turns until the player gets to go again (eight opponent turns). Depending on the game, this can lead to serious downtime. For this reason, Progressive is most effective in games with short turns, or where players take actions during other player turns. The latter is done in *Puerto Rico*, where the other players get to perform a less powerful version of the action selected by the main player (ACT-08).

Typically, games that use Progressive Turn structure are played to the end of the round in which the end game condition is triggered. Therefore, the issue with players having an unequal number of turns does not arise as it does in Fixed Turn Order games. Sometimes a mechanism is included to ensure that each player has the same number of opportunities to go first (often by setting the number of rounds equal to the number of players, or a multiple of that number).

A less-used variant on Progressive Turn structure is Regressive, where the First Player token passes counter-clockwise, while turns are taken clockwise. Much of the discussion in Progressive applies here, in terms of psychology and gaps between turns. However, there is one important difference: in a Regressive structure, the player who goes last in one round will go first in the next. Players having two turns in a row can be extremely powerful, particularly when a player knows it is happening and can plan accordingly. The game needs to be designed and structured to either take advantage of that or blunt it in some fashion. For example, in *Dead of Winter*, a semi-cooperative potential hidden traitor game (STR-05), the hidden traitors would do well to reveal themselves to be the traitors in the round in which they go last, as they will have two successive turns in which to wreak havoc.

Regressive is unintuitive to players, because so many games go clockwise. Having a turn which moves clockwise, but a token which moves counter-clockwise, is an additional cognitive burden that should only be imposed for some specific design reason.

Sample Games

Progressive:
The Little Prince: Make Me a Planet (Bauza and Cathala, 2013)
Puerto Rico (Seyfarth, 2002)
Quadropolis (Gandon, 2016)
Terraforming Mars (Fryxelius, 2016)
Texas Hold'Em (Unknown)
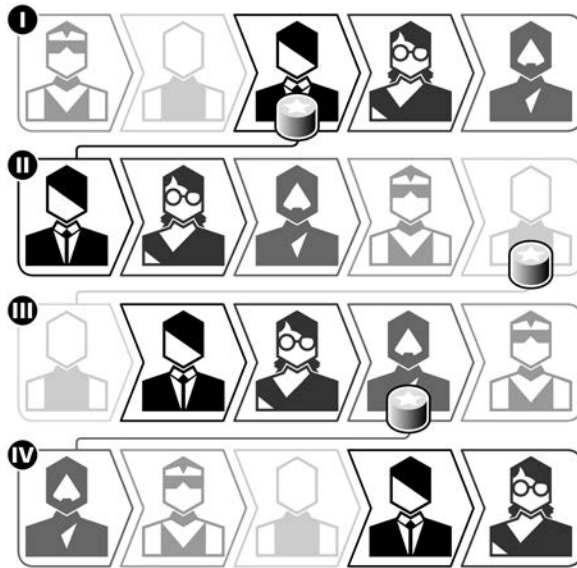
Regressive:

Dead of Winter: A Crossroads Game (Gilmour and Vega, 2014)

Kepler (Bariot and Montiage, 2012)

Viticulture (Stegmaier and Stone, 2013)

Walk The Plank! (Steely and Tinney, 2013)

TRN-05   Claim Turn Order

Description

In each round there is a First Player, and turns are taken clockwise from the first player. There is an action that may be taken to claim a place in the turn order (typically, but not always, first) for the next round, with play proceeding clockwise from the First Player. If no one takes the action, turn order remains unchanged.

Discussion

Similar to Stat Turn Order (TRN-02), Claim Turn Order Action gives more control to the players over the turn order, as they need to do something to seize control over the first player marker.

Caution and finesse need to be employed by the designer when using this system, as there are a number of pitfalls. This technique is often used in Worker Placement (Chapter 9) or Action Drafting (ACT-02) games, and players will need to use one of their workers or actions to go first next time. This means that they are sacrificing something to gain that advantage. Balancing the cost can be tricky as the value of going first can be variable from situation to

situation, and player to player. The value of simply going first may not be that great, so players may avoid using an action to be first player. In this case, the same player gets to remain first player without losing an action. They simply remains first player by default.

Designers can sweeten the value of claiming turn order by including other resources or abilities with it. For example, in *Agricola*, the player who chooses the First Player action may also play a Minor Improvement.

More importantly, the player to the left of the player who chooses to go first gets a great boon. They will get to play second, which, while not as good as going first, was obtained with absolutely no effort on their part. *Agricola* suffers quite a bit from this issue, as it is of great benefit to be to the left of the player who chose to go first, and frustrating to be the player to the right, who will now go last, through no fault or action of their own.

First Class: All Aboard the Orient Express deals with this issue by giving bonuses to all positions when the First Player token is chosen as an action. In a four-player game, the player who chose to go first gains two coins, the third player may take a Train Card, and the fourth player may either take or upgrade a Train Card. The player who will now be going second receives no bonus—being able to go second in the round while not giving anything up is deemed sufficient compensation. The *First Class* system gives the designer a lot of flexibility in balancing the different player positions.

Another pitfall to avoid is scripted play—obviously-best moves by players. In earlier editions of the game *Twilight Imperium*, players chose an Action card on their turn to perform. One of them gave a Victory Point to the player choosing it, which was very powerful, and another let a player become First Player. Because the free Victory Point card was so strong, play almost always followed a scripted pattern. The first player to go would take the free Victory Point card, and the second player would take the card to become First Player, thus ensuring they would get the free Victory Point next turn.

Turn order ended up simply moving around the table, devolving into a Progressive turn structure. However, the presentation of turn order as a choice made it seem as if the game had more flexibility than it actually did. Having forcing moves for the first two players made for a much less interesting play experience. A similar issue arises in *Stone Age*, where expanding fields and gaining workers are invariably the first two actions chosen in each round.

Sometimes the action that determines turn order is tightly integrated into play. *High Society* has players bidding on objects, and the winner of an auction begins the bidding for the next auction. Trick taking games, where the winner of a trick takes the lead is a similar example, which will be explored in more

detail in Chapter 13. In both of these examples, play proceeds clockwise from the new start player.

A variant of this mechanism is seen in *Age of Empires III: The Age of Discovery* and other games. In these, players take an action to secure their place in the turn order, but more than one player can do this. The first player to do so becomes the first player in the next round, the second player becomes second, and so on. Players who do not take this action are moved to the back of the turn order.

This has similar issues to both the classic version of this mechanism and the Pass Order mechanism (TRN-06). Players must give up the opportunity for an action to improve their place in the turn order, and players that are currently early in the order have less incentive to spend an action there. Also, players that are early in the turn order have a better opportunity to keep it because they will have a first chance of using later round actions to maintain their turn position.

However, it does mitigate some of the issues of the base version of this mechanism, as it puts more control into the hands of the players, albeit in an inequitable way.

Sample Games

Age of Empires III: The Age of Discovery (Drover, 2007)
Agricola (Rosenberg, 2007)
Bridge (Vanderbilt, 1908)
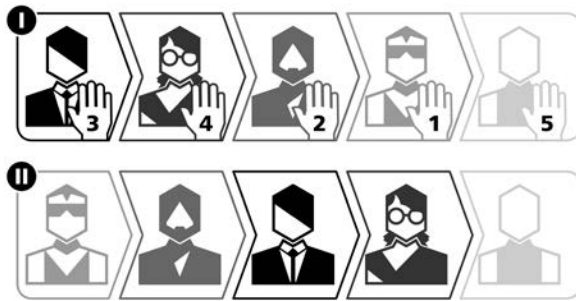*First Class: All Aboard the Orient Express* (Ohley, 2016)
Hearts (Unknown, 1850)
High Society (Knizia, 1995)
Stone Age (Brunnhofer, 2008)
Twilight Imperium (Petersen, 1997)

TRN-06   Pass Order

Description

On their turn, players may either take an action or pass. The first player who passes becomes the new first player for the next round. The second player who passes becomes the second player for the next round, and so on. Reversing pass order and turn order is also possible when going later in turn order is more advantageous.

Discussion

Pass Order attempts to address the issues created by more static turn-order mechanisms, or those which order all players based on the actions of a single player. With Pass Order, players are presented with a choice: take additional actions this turn, or be earlier in the turn order for the entire next round. Players have to estimate whether continuing to take actions in the current round is worth more than having an earlier choice on actions in the following round.

A good place for this mechanism is in a game that features some type of drafting (CAR-06). In *Caylus*, players place workers on buildings ("Worker Placement," Chapter 9) to receive certain benefits. Each building can be occupied by only one player each round, so players are drafting from a limited pool of possible actions. Going earlier in turn order ensures players can select the buildings they desire most. But taking additional actions later in the turn order can yield additional benefits.

Games in which players are very likely to take an equal number of actions in a round are a poor fit for this mechanism. For example, if players only have three actions in a turn, most likely they will all be passing after the same

number of turns. If players take six or more actions in a round, the cost of losing later actions in the round is much reduced.

An important consideration with Action/Passing is the fate of the last player who has not passed. This is an issue that affects any game in which players end their round by choosing to pass. For example, in *The Networks*, players receive more money or victory points for passing early, rather than turn order position. Nevertheless, because *The Networks* is a Rochester draft (see "CAR-06, Drafting" in Chapter 13), there are relatively few limits on the ability of the last player still active to sweep up whatever cards remain on the board. This can be quite powerful! Other games, like *Francis Drake*, limit the ability of the last player to gain too much advantage by requiring expending a limited pool of workers to activate the remaining buildings. *Caylus* addresses this issue in a different way, by making it increasingly expensive to place workers as more players pass. Finally, in *Sentient*, players who pass first go last, which actually provides them with the advantage of sweeping the board.

Designers using this structure should be careful to align the turn order reward (first or last) with the game. The mechanism works best when turn order preference is strong, when players act many times over the course of a single round, and when there is some hard limit on the total number of actions a player can take. Rewards other than turn order advantage can be employed as an alternative or in addition.

Two final notes of caution. First, designers must provide some physical affordances for tracking who has passed and in what order. Ideally, these are combined so that when a player passes, they move some indicator to show that they have passed, and when they will play in a future turn. Secondly, designers should also pay attention to the amount of downtime experienced by the first player to pass.

Sample Games

Caylus (Attia, 2005)
Francis Drake (Hawes, 2013)
The Networks (Hova, 2016)
Sentient (Kevern, 2017)

TRN-07   Real-Time

Description

There are no turns. Players play as quickly as possible, subject to certain constraints, until the game or phase is completed.

Discussion

Real-Time Games bring a lot of excitement to the table, as players frantically work to completely execute their actions. However, they also bring a lot of challenges for the designer.

First, Real-Time Games need to be very simple. Anything that causes confusion requires the players to stop the action, resolve the issue, and then continue, or just carry on with a confused player who stops enjoying the experience, or possibly violates the rules unwittingly. This can place very real constraints on what can and can't be done from a design standpoint.

The designer also needs to address timing issues, if players are conflicting in actions they wish to perform. There are several ways to deal with this:

- Players play cards onto stacks. Sequence in the stack indicates order.
- The player who touches a token first is allowed to manipulate it.
- Players do not interact during the real-time portion, but only after it is completed and things can be resolved at leisure.

The level of intensity and focus required from players in a Real-Time Game means that the game's length needs to be short. Twenty minutes is a reasonable maximum duration for a completely uninterrupted Real-Time Game.

Another consideration is dealing with mistakes and cheating. Some games, like *Pit Crew* and *Space Alert* have specific rules for dealing with mistakes that give a penalty to the players or cancel the attempted action.

As players are absorbed in their own actions, cheating can also be an issue. In cooperative games like *Space Alert*, cheating is a different consideration. However, for competitive games, the designer may need to incorporate design techniques such as making sure that everything is in the open, that text on cards is large enough to be understood across the table rapidly, and that there is as little manipulation of components as possible (e.g., once a card or die is placed in a spot, it cannot be moved from that spot).

However, there have been several successful games that have not protected against mistakes and cheating, and it does not appear to have impacted their success. In *Captain Sonar* (more correctly classified as using a Punctuated Real-Time mechanism, TRN-08), each team writes and erases on laminated control panels behind a screen. It would be quite simple for a team to cheat behind the screen or make undetected mistakes. In practice, however, the social contract seems to hold and players are not concerned about this. This may open up more complex design opportunities for Real-Time Games, as long as the game is marketed toward an audience that accepts this stance regarding potential cheating.

Because of nonstop nature of Real-Time Games, they are often structured with two phases: Action and Resolution. Action is when the real-time action occurs. After a condition is met, typically a timer expiring, but possibly when a task is completed, or when a hand or deck of cards is exhausted, there is a Resolution phase. In this phase, results of the action phase are determined, without any time pressure. This two-mode approach allows for complex mechanisms that might otherwise not be possible.

There are typically two types of endings to a real-time phase. In the first, whenever the end-phase condition is met, the phase ends immediately. Players are informed that it is over, and that is that. *Spit* (aka *Speed* or *Blitz*) and *Pick-A-Polar Bear* are both triggered when one player reaches a particular game state (all cards gone from their deck in *Spit*, and no more legal options to take a card in *Polar Bear*). At that time, the phase instantly completes.

Some games use the phase-end trigger to set up "bonus time" for the other players, informing them that they have a set amount of additional time before the phase ends. For example, in *Show & Tile*, the first player to complete their artwork flips a sand timer. When that timer runs out, the artwork phase is over, and players proceed to the guessing phase. Other games flip this dynamic around, and give players who finish early an additional bonus task that must

be completed by the time all players finish the core task. In *Pit Crew*, when a team finishes the real-time task of repairing its car and getting it out on the track, the team switches to rolling a die to move the car, rolling over and over. Meanwhile, the other teams continue to repair their car, and start rolling their own die if other teams are still working. The last team to finish does not roll its die, but stops all other teams from rolling. This puts added pressure and tension on the teams who are still working on their repairs while others move around the track, and adds some narrative arc to the activity.

Sample Games

Brawl (Ernest, 1999)
Escape: The Curse of the Temple (Ostby, 2012)
Falling (Ernest, 1998)
Light Speed (Ernest and Jolly, 2003)
Pick-A-Polar Bear (Landsvogt, 2013)
Pit Crew (Engelstein, 2017)
Show & Tile (Loomis and Shalev, 2018)
Space Alert (Chvátil, 2008)
Spit (Unknown)

TRN-08 Punctuated Real-Time
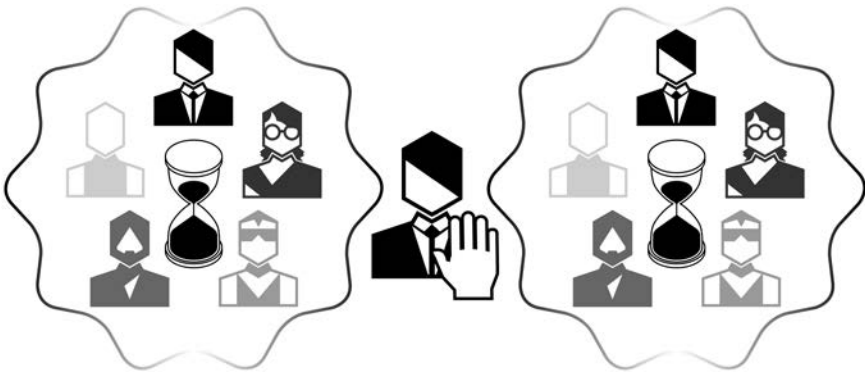
Description

There are no turns. Players play as quickly as possible, subject to certain constraints, until the game or phase is completed. Play is also interrupted by specific player actions, which are resolved before resuming the real-time action.

Discussion

Punctuated Real-Time is a variation on real-time (TRN-07), and the difference is subtle. Whereas in a real-time game the action stops when some condition is met—a timer going off, or a deck exhausting—in a Punctuated Real-Time Game, the action may be stopped at any time, at the discretion of a player, or upon taking a valid stopping action.

In *Space Cadets: Dice Duel* and *Captain Sonar*, players stop the action by shouting something ("Fire Torpedoes" or "Launch Mine"), and all players stop what they are doing to resolve the action.

To a certain extent, this mechanism is also present in the early twentieth century game *Pit*, as players end the real-time trading portion by hitting a bell, after which the round is evaluated. Also dating back over a hundred years, baseball and American football are also exemplars of Punctuated Real-Time, where teams can plan, organize, substitute, and catch their breath prior to initiating the next pitch or play.

Punctuated Real-Time adds an additional layer of tension to what is already the tense mechanism of real-time. Players do not necessarily see the stoppage

of play coming. In *Pit*, you don't know how close the other players are to winning the round. It also gives more flexibility to the designer on a number of levels. First, it allows for the inclusion of more complex mechanisms, as they can be resolved during the "stoppage time." Firing a torpedo in *Captain Sonar* falls into this category, as the resolution can include complexity that would normally be beyond what is reasonable in a Real-Time Game.

Second, Punctuated Real-Time allows the game to be longer, as the stoppage time gives players an opportunity to catch their breath, or even get a snack or go to the restroom. In a fully Real-Time Game such as *Escape: The Curse of the Temple*, action that continues more than 10–20 minutes or so risks exhausting and overwhelming the player. Punctuated Real-Time gives the designer a tool to created nonscheduled breaks to give the players a breather, allowing for a longer, more complex and textured overall experience.

Sample Games

Captain Sonar (Fraga and Lemonier, 2016)
Escape: The Curse of the Temple (Ostby, 2012)
Merchants of Amsterdam (Knizia, 2000)
Pit (Cayce, Gavitt, and Parker, 1903)
Space Cadets: Dice Duel (Engelstein and Engelstein, 2013)

TRN-09 Simultaneous Action Selection
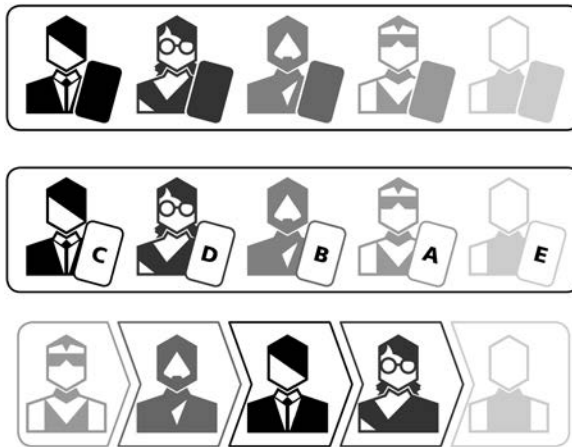
Description

Players plan their turn simultaneously and secretly. Then, they reveal their plans at the same time.

Discussion

A Simultaneous Action Selection Game has players selecting actions at the same time, but actions are generally resolved in turn order. The action-selection mechanism will usually include a sub-system for determining the order by which the action resolution phase will be played. For example, in *Libertalia*, players choose a role card from their hand, and play it face down. Then, all cards are revealed simultaneously, and the lowest-numbered card revealed is resolved first. Each player in *Libertalia* has the same role cards in their hands, so duplicate plays occur frequently. To resolve these ties, each card also shows a unique priority number. *Robo Rally*, a classic in the genre, uses a similar priority number mechanism to sequence the players once cards are revealed.

Priority numbers are not necessarily required for Simultaneous Action Selection. *Race for the Galaxy* has players simultaneously select which roles they would like to execute, but then the roles are always performed in a specific order. See the Role Order mechanism for more details

Typically, cards are used to implement this mechanism, although other game objects, such as tiles or dice, can also be used. In *Incan Gold*, each turn

players simultaneously decide whether they are going to remain in the cave or return to camp. In the original version (called *Diamant*) players indicated this choice by secretly holding their wooden adventurer figure in their hand or having an empty fist. Later versions replaced this with placing a "Stay" or "Go" card face down. In the *A Game of Thrones* board game, actions are planned using order tokens that are placed face down, and then revealed by flipping them all face up.

This mechanism gives players the opportunity to try to anticipate what their opponents will do, and plan accordingly. The general term for mechanisms which have players trying to guess what their opponents will do is called "Yomi," a Japanese word. We discuss Yomi in more detail in UNC-01.

Simultaneous Action Selection can also speed up games and reduce downtime, as players are acting simultaneously. However, if the planning is extensive, as in *Diplomacy* and *A Game of Thrones*, it can give room for Negotiation (ECO-18) and increased strategy, which adds length.

Sample Games

Diplomacy (Calhamer, 1959)
A Game of Thrones (Petersen and Wilson, 2003)
Incan Gold (Faidutti and Moon, 2005)
Libertalia (Mori, 2012)
Robo Rally (Garfield, 1994)

TRN-10 Role Order

Description

Players secretly and simultaneously select an action, role, or priority. Then they are revealed, and the actions/roles revealed determine the order in which players act.

Discussion

Role Order is a subset of Simultaneous Action Selection (TRN-09). There are several ways to implement this mechanism. *Citadels*, for example, has players draft roles (like Thief or Assassin). There is one card for each role in a deck. Some of the roles are removed without any of the players knowing their identity. The first player then looks at the remaining roles, chooses one, and passes the remaining cards to the left.

After each player has selected a role, the first player calls out the roles from first to last, according to their number. Thief, for example, is number two. If a player has that role, he or she reveals it and takes that action.

Race for the Galaxy has a different approach. Each player simultaneously selects which of the roles (like Explore or Settle) they wish to play. Then all players reveal their choice. The roles are resolved in a defined order (e.g., Explore is always first). For each role that is chosen by at least one player, all players get to perform it, but the player(s) who chose it get a bonus via a

more powerful version of the action. More on this in the Follow mechanism (ACT-08).

If no one selects a role, it is skipped, so if players really want a specific role to occur, they can select it, or gamble that, based on the situation, other players are likely to select it, affording them the opportunity to choose something else. This introduces an element of Yomi (UNC-01), as players attempt to outguess each other.

In both of these games, players are not guaranteed that certain roles will occur. This is typical of implementations of this mechanism, as a result of the hidden role selection—if all the roles were in play, players could readily deduce which roles were taken before them.

Using Role Order allows *Citadels* to introduce an interesting twist. The player who chooses the Assassin role names another role that will have to lose a turn. Note that it is the role that is targeted, not the player. Players losing their turn is an anti-pattern (TRN-16) that usually results in negative feelings as it gets in the way of doing the activity they sat down to play. However, in *Citadels*, the role is targeted, not a specific player. While the Assassin players may have an idea of who may be more likely to choose a role, they are not sure. Additionally, the role the Assassin names may not even have been selected that turn, rendering the ability moot.

Role Order allows the designers to control the order in which operations occur, while giving players a choice about which of those will happen. It also introduces a well-defined turn order that doesn't suffer from needing to have a mechanism to shift the first player. It happens naturally.

Sample Games

Citadels (Faidutti, 2000)
Race for The Galaxy (Lehmann, 2007)

TRN-11   Random Turn Order
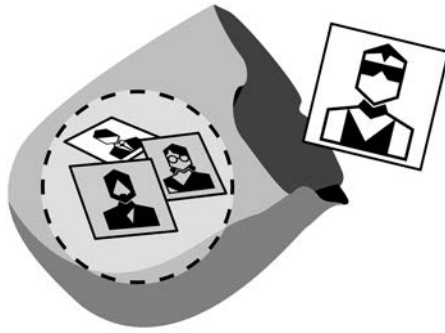
Description

Representatives of play pieces or players are randomized, and one is drawn at a time. That player or play piece takes its turn, then a new random draw is made.

Discussion

Random Turn Order can introduce a lot of excitement and tension to a game, as players anxiously await which token will be revealed next. However, it also reduces the ability of the players to plan effectively, which makes it most effective in lighter games. Games are more tactical, as players need to react to the situation as it develops, because they can't predict when their turn will come.

There are ways to increase the ability for strategic planning when using a Random Turn Order. *Pillars of the Earth* is a Worker Placement game (Chapter 9), where workers are pulled from a bag. As with most Worker Placement games, going early is an advantage, as more and better options are available. When a player's piece is pulled, if that player wishes to place it, they need to pay a cost. This cost starts high, and gradually drops throughout the turn. If a player does not want to (or cannot) pay the cost, the worker is placed to the side, and is used to select an action at the very end of the turn. This presents players with an interesting strategic option of trying to judge the value of going early. The higher price of going early counteracts the luck of being drawn early.

In *Warrior Knights*, actions are represented by cards. Each player selects two cards from their personal deck that they wish to use that turn. The selections

from all the players are shuffled together and then they are drawn one at a time, and the player whose card is chosen performs the corresponding action.

The inability to create a perfect plan has made this a popular mechanism in war games. Rather than one player moving all pieces, and then the next player moving all of theirs, a random draw for who gets to activate next helps simulate battlefield uncertainty, while also reducing downtime for the players. *Firepower* implements this type of chit-pull system.

Random Turn Order also gives the war game designer flexibility in modeling superior and inferior units. For example, in the game *A Victory Lost: Crisis in Ukraine 1942-1943*, Activation Chits for units are placed into a cup. But veteran units receive multiple chits, while new recruits may receive only one, modeling in a natural way the increased effectiveness of the veterans. This is a kind of Deck Building system (CAR-05).

Another technique is to include wild card or category tokens, which give the player a choice of which unit to activate when they are pulled, as long as they correspond to the matching category. This also increases tactical flexibility and reduces the luck factor. *Battle Masters* is an example of a game that uses this approach.

Sample Games

Battle Masters (Baker, 1992)
Firepower (Taylor, 1984)
Pillars of the Earth (Rieneck and Stadler, 2006)
A Victory Lost: Crisis in Ukraine 1942–1943 (Nakamura, 2006)
Warrior Knights (Carver, Clequin, Faidutti, and Konieczka, 2006)

TRN-12   Action Timer

Description

Players place owned timers on action spaces and pieces and take an action. When the timer runs out, it may be moved to another location to take that action. There are no turns; players may move their own timers any time after they have expired.

Discussion

This Action Timer mechanism is typically implemented with sand timers. Timers allow for a real-time feel (TRN-07), while mitigating their frantic nature. It allows the game to flow naturally, while giving players some structure and breathing room to plan their next actions. As such, they can be used for longer periods of times than would be desirable in a traditional real-time game.

Sand timers can be placed onto fixed spaces on the board to indicate what actions the players are allowed to take, or onto specific pieces that move around. In *Time 'n' Space* (a remake of the classic *Space Dealer*), sand timers may be placed into a player's base for research and other actions, or directly onto a spaceship to allow it to move. Similarly, in *War Time*, the sand timers are placed directly on the units, which allows them to move or attack.

Typically, the action is taken when the timer is placed. This allows the player to place the timer, then actually do the action (take cubes, gain a research card, perform an attack, move a unit, etc.) while the sands are running. This reduces overall downtime for the players. If you wait for the timer to end before doing the action, players will typically quickly move the timer to a new action to get it going, then go back and execute the original action, which can add some confusion.

In spite of this mechanism being real-time, it can have a fair amount of downtime for the players and feels sluggish at points as players are watching the grains to get ready to do their next action. To help mitigate this, players

usually have multiple sand timers to use, to allow for action combos, and move things along.

Some games also give players timers of varying durations. In *Wartime: The Battle of Valyance Vale*, players have 30, 60, and 90 second timers, and each can be used for any unit. Deciding which to use adds an additional tactical layer, and also helps give the player more to do while waiting for other timers to run out.

TAMSK is an abstract game that takes a unique approach to using sand timers. The pieces are sand timers, and when they make a move the timers are flipped. A key element is that if a timer runs out of sand, it is locked into place. This gives players tactical options of how to use the timers, and how much time they have to think about decisions. A piece that is moved again shortly after being moved will only have a little time remaining in the timer.

There are a number of physical issues that need to be dealt with in these games. First, when players interact with each other, there can be contention about which timer finished first, and so which player might be able to take an action space or launch an attack first. This can be difficult to adjudicate in the midst of the game, as timers will continue to run.

Also, while a real-time can be stopped by mutual agreement of the players, this is harder with a sand timer game. The sand timers need to all be tipped over, which can take some time and also change the way the sand is distributed while they lie on their sides—to say nothing of their chances of rolling off the table!

Finally, there are manufacturing variations with sand timers that can lead to a timing difference of many seconds. A 30-second timer may actually take as long as 40 seconds to run. Indeed, the same sand timer may run faster or slower depending on the irregularity of the grains in it and how they happen to fall. Many timers have different run times depending on which side is up. These variations need to either simply be accepted, or some type of manufacturing screening process needs to be implemented, which will add cost to production.

In spite of these issues, sand timer games have a unique feel that deserves further exploration by designers. Apps and other digital-analog hybrids hold some promise here as well.

Sample Games

Space Dealer (Stapelfeldt, 2006)
TAMSK (Burm, 1998)
Time 'n' Space (Stapelfeldt, 2013)
Wartime: The Battle of Valyance Vale (Guild, Lackey, Parks, and Tempkin, 2017)
Wok Star (Fowers, 2010)

TRN-13   Time Track

Description

There is a linear "Time Track" with many spaces. Each player has a marker on the track, which indicates where they are "in time." Markers farther on the track are further forward in time.

The player with the marker lowest on the track (furthest "back in time") takes the next action. Each action has a cost in time, and the player's marker is advanced a number of spaces according to that cost. Then, the next lowest marker on the track takes an action. It is possible that the same player takes multiple turns in a row.

Discussion

Time Tracks have a number of inherent advantages:

- Clarity: It is obvious who goes next, even though turn order jumps around a lot.
- Player Control: Players have some choice over who goes next, allowing for additional tactical play.
- Balance: The designer can include powerful actions, but can give them a long time duration to compensate.

However, there are, of course, downsides to this technique. It can lead to players being out of the action for some time if they have taken long-duration options. Admittedly, they have chosen to do this, but an option available to players should not result in them having a less enjoyable experience.

To prevent this situation, designers typically do not include very long duration activities. However, this compression of durations into a narrower range works against the benefits and promise of this system, as players usually

are quite close together on the Time Track. *The Dragon & Flagon*, for example, has actions that range from 1 to 4 Time. Most of the actions in *Thebes* are in a similar range, although players can opt to dig for artifacts for up to 12 Time, which will give their opponents the opportunity to perform many actions before their turn comes around again.

Because of this tight duration grouping, players frequently will share a space on the Time Track. These ties are usually resolved by having the player on top of the stack (the last piece to arrive there) move first. However, this "Last-in-First-out," or LIFO, system will give players guaranteed double moves in some situations. Depending on the game, this may not be an issue, and may even be desirable. But for some, it may be too powerful and some mediation needs to happen. In *The Dragon and Flagon*, for example, Turn Order is randomly determined when multiple players share the same space.

Another alternative is to only allow one piece per space on the Time Track, forcing players who would otherwise occupy a space to move one or more spaces further forward until they find an empty space. This can add an extra layer of decision making, as the actual cost of certain actions may vary based on the positioning of the opponent. *Glen More* and *Kraftwagen* use this system. When the game offers only a limited amount of time, or creates triggers based on specific spaces on the track, the particulars of how ties are handled and whether players skip spaces become especially important.

High Rise combines a Time Track with an Action Selection mechanism. Each space on the Time Track has an associated action. When players move to the space, they execute the Action. The player furthest back on the track moves first, and two players may not occupy the same space, giving players the choice of moving far forward to guarantee a needed action, but potentially giving their opponents multiple turns.

Sample Games

AuZtralia (Wallace, 2018)
The Dragon & Flagon (Engelstein, Engelstein, and Engelstein, 2016)
Glen More (Cramer, 2010)
High Rise (Hova, 2019)
Thebes (Prinz, 2007)
Tokaido (Bauza, 2012)

TRN-14 Passed Action Token
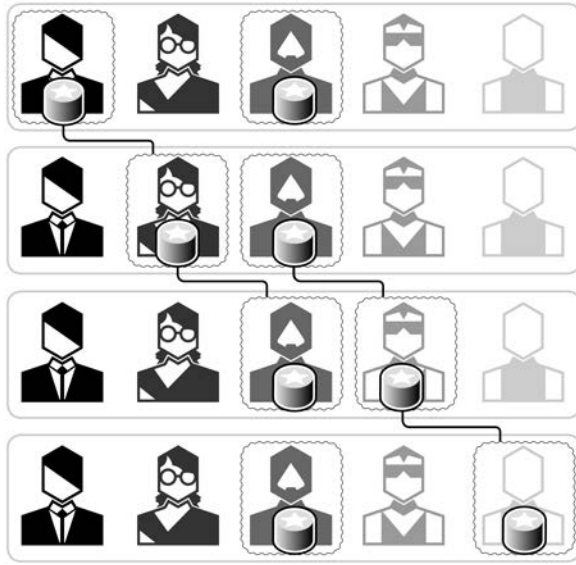
Description

Players possess one or more Action Tokens. Those who have an Action Token may take a turn, then they pass the token clockwise, allowing the next player to perform an action. Actions are performed in real time; there is no pausing and structure within the turn.

Typically, to prevent stalling and to keep the game moving, in games with multiple Action Tokens, if both tokens are held by the same player, then they suffer a penalty.

Discussion

This mechanism is a cross between a real-time-based and a turn-based game. Similar to the Action Timer mechanism (TRN-12), it allows players to play at their own pace, and asynchronously, but gives some structure.

However, in the Action Timer mechanism, the players are basically independent of each other, and can operate simultaneously. Here, players are linked more closely, in that your turn can only start when the player before you in turn order finishes his or her turn. This helps solve the dilemma of players breaking rules (either inadvertently or deliberately) that is present in

other real-time mechanisms by having some players be inactive and able to watch what other players are doing and interrupt if necessary. This allows for more complex mechanisms within the game itself as opposed to traditional real-time games.

For the most part, in order for this mechanism to work, there needs to be multiple Action Tokens being passed around the circle at the same time. The exception is if the round itself is timed in some fashion and having possession of the Action Token causes a player to lose. *Hot Potato* and *Catch Phrase!* are examples of this, where the player holding the item when time runs out loses.

When using multiple Action Tokens, a key design element is what happens if multiple tokens end up with the same player. In *Camelot*, if another token would be passed to a player who already has one, it instead skips that player and goes to the person to his or her left. This is equivalent to losing a turn, as other players will get to act a second time before the affected player. While we recommend against players losing a turn and classify it as an anti-pattern (TRN-16), in this case the opportunity to avoid losing a turn lies with the player, and is not luck-based. Therefore, it is an understandable and satisfying solution to use in this case. It forces players to move at a reasonable pace, at least comparable in speed to the other players.

Yet, it does not mean that fast players will always win, depending on the design of the game. If a reasonably thought out single move will beat a hasty double move, then the system will be fine, as just doing something as quickly as possible will not be rewarded. The players will need to balance "optimal" and "good enough."

An alternative system is seen in *Diner*. In this game, if a second Action Token ends up with the same player, it just sits there until he or she completes his or her move, and pass the first token to the next player. There is no "lapping" as there is in *Camelot*. This can lead to slower and more conservative play, but in this game it is helped by forcing players to compete to take shared cards in a central tableau, so playing slowly in general will allow the other players to grab more desirable cards.

It is also possible to use this as an overlay or subset of another structure. *Space Cadets* uses a real-time turn structure, but in certain situations an Action Token (a small deck of cards in this case) is passed around to allow players to perform a special action beyond what they can normally do.

Eclipse uses two Action Tokens in a variant mode that can accommodate as many as 9 players. The only distinction between the tokens is that one

provides priority over the other for acquiring new technologies. The system is surprisingly effective at speeding along what would otherwise be an unplayable behemoth of a game.

Sample Games

Camelot (Jolly, 2005)
Catch Phrase! (Uncredited, 1994)
Diner (O'Malley, 2014)
Eclipse (rule variant) (Tahkokallio, 2011)
Hot Potato (Unknown, 1800's)
Space Cadets (Engelstein, Engelstein, and Engelstein, 2012)

TRN-15   Interleaved vs. Sequential Phases
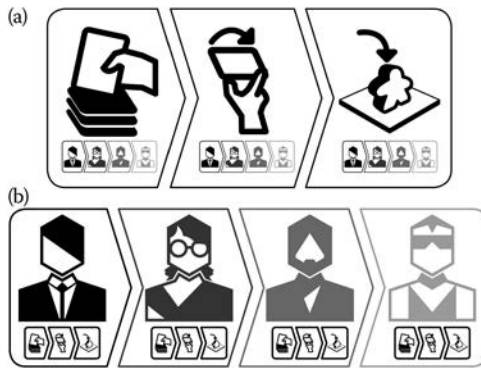
Description

This describes two different meta-turn structures. In an Interleaved Phase structure (a), all players perform the first phase, then all perform the second phase, etc. In a Sequential Phase structure (b), each player performs all phases before moving on to the next player, who then performs all phases, etc.

Discussion

Interleaved structures in general are preferred in modern design, as they reduce downtime between player actions. War games in the 70s and 80s were notorious for their "I Go, You Go" structures, where one player would take a turn that could last for a very long time, with the other player wandering off to do some other activity. In the 80s and 90s this started to shift, with designers moving to Interleaved turn structures to keep players more engaged throughout.

However, there are plenty of games that stick to a Sequential turn structure for a variety of reasons. *The Russian Campaign*, a simulation of the German invasion of Russia during World War II, uses a strictly Sequential turn structure. Each player performs all of these steps before the turn passes to the next player:

- Receive Reinforcements and Replacements
- Move All Units
- Combat
- Breakthrough Movement
- Breakthrough Combat

The Sequential structure of *The Russian Campaign* is integral to the strategy and experience of the game. Allowing one player to move and attack twice before the opponent gets to do anything gives the game epic swings and devastating breakthroughs and does a particularly good job of capturing the early and late phases of the war, which featured large-scale encirclements and desperate breakouts.

In contrast, *Power Grid* uses an Interleaved turn structure. There are three main Phases in each Round:

- Buy Power Plants
- Buy Raw Materials
- Build Power Lines

In turn, all players perform Buy Power Plants, then in turn all players perform Raw Materials, etc. There is little time between a player taking their next action.

Any turn structure can be used inside the meta-structures of Sequential and Interleaved. For example, *Power Grid* uses a Stat Order structure (TRN-02).

These structures aren't mutually exclusive: some parts of a game may be interleaved, and some may be sequential, and different Turn Order structures may be used for each. For example, Simultaneous Turn structure is frequently appropriate during upkeep or planning phases even though movement may be sequential. As always, these different mechanisms are tools, and each has its place and circumstance.

Sample Games

Sequential:
The Russian Campaign (Edwards, 1974)
Through the Ages: A Story of Civilization (Chvátil, 2006)

Interleaved:
Orleans (Stockhausen, 2014)
Power Grid (Friese, 2004)

TRN-16   Lose a Turn
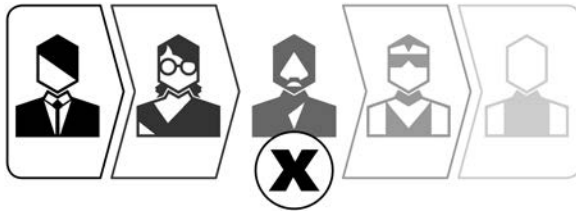
Description

This is a meta-mechanism that can be applied to a variety of turn structures. A player who "Loses a Turn" must skip their next opportunity for a turn, and will go to the next round, or the next time their turn arises.

Discussion

Losing a Turn was common in Roll and Move games of the nineteenth and twentieth centuries (MOV-02). In current game design philosophy, it is considered an anti-pattern to be avoided, as it was frequently used as a possible outcome of landing on a particular space or drawing a card—which were, themselves, random. Losing a Turn keeps the player from enjoying and participating in the game, and can be very frustrating if one player is disproportionately affected. Mostly though, it frustrates the intent of the player as a person seeking to engage in an activity. Players want to play a game, and losing your turn means not playing a game. Like the ads on the radio that interrupt the music, if it happens too often, players will "change stations" and play something else.

There are other mechanisms where players are allowed to take a turn, but may end up not doing anything, which can be equally an issue, that are functionally (and psychologically) generally equivalent to Lose a Turn. An example may be having to win a Roll and Move game by "exact count," such as *Trouble* or *Snakes & Ladders*. In these games, players may only win by advancing to the final space by getting exactly what they need, and can result in many turns of fruitlessly rolling a die and spinning a spinner. While the players are still getting a turn, and there is some excitement in seeing if the player will win, it still can become frustrating if it lasts many turns.

Similarly, games like *Sorry!* require certain values to leave "Home" and, in essence, start the game. Again, this can result in many consecutive turns of inactivity, which leads to frustration and boredom. *Monopoly* can send players to Jail, where they will need to roll doubles to escape. *Monopoly* has some remediation to this "Lose a Turn" effect, as players may choose to pay to get out of Jail, or, in later stages of the game, may prefer (and hope) to remain in Jail to avoid the possibility of paying high rents.

There are other effects that are similar to losing a turn. In a Worker Placement game (Chapter 9), losing a worker for a round is equivalent to losing a turn. In an Action Retrieval system (ACT-03), the turn that the Actions are retrieved can feel like a lost turn to players. In a card game where you are trying to discard all your cards by playing one per turn (like *UNO*), having to draw cards is similar to "Losing a Turn" in terms of tempo, although it does not impinge on the player's participation in the game. Similarly, when some players gain extra turns, this is equivalent to the others losing a turn. However, due to psychological framing effects, these more modern takes do not feel as bad. Thus, giving extra turns to other players or removing resources can be a better solution for including "Lose a Turn" effects.

If the reason that a turn is lost is in control of the player, then this anti-pattern is mediated. If players choose to take a risky course or over-spend a resource that leaves them unable to take a turn, that can be an effective design, as it is resulting from player action, and is not perceived the same psychologically by players. As an example, in the Passed Action Token game, *Camelot* (TRN-14), players who play too slowly may miss a turn if the other Action Token catches up to them. Instead of making a game slow and frustrating, this adds excitement, as players can see the Action Token getting closer, and players have the ability to play faster to avoid losing a turn.

Sample Games

Camelot (Jolly, 2005)
Monopoly (Darrow and Magie, 1933)
Snakes & Ladders (Unknown, ~200 BCE)
Sorry! (Haskell, Jr. and Storey, 1929)
Trouble (Kohner, Kohner, and Kroll, 1965)
UNO (Robbins, 1971)

TRN-17   Interrupts
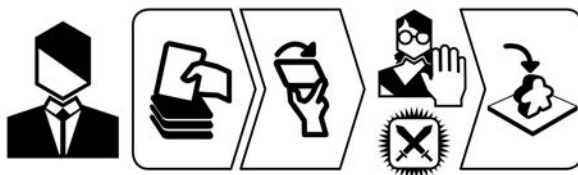
Description

This is a meta-mechanism for Turn Order. Players may take an action that interrupts the normal turn flow.

Discussion

This mechanism can be used with almost any of the turn structures discussed. The ability to interrupt an opponent during their turn can be an important part of the design. The interruption can be a standard ability that players have and can be based on cards in their hands or other special tokens.

Squad Leader is an example of the "standard ability" style. During the Movement Phase, one player moves their pieces or stacks one-by-one, one space at a time. The other player (the "defender" for that turn) may, at any time, interrupt movement to take a Defensive Fire opportunity at the moving units. This is an option that is always available to units; no special ability is required.

Magic: The Gathering, in contrast, features some cards that are labelled as Instants. These cards can be played in response to the opponent taking an action. Other games frequently will call these cards Reactions. If you don't have a Reaction card, you will not be able to take a Reaction.

Incorporating Interrupts into the design has a number of positive features. First, it keeps players engaged. If you can interrupt what your opponent is doing, you can look for the perfect opportunity to strike, and it encourages players to pay attention to what's going on. This reduces downtime, or perceived downtime. Before *Squad Leader*, war games mostly had a strict "I Go, You Go" structure, which made it appealing for players to mentally check out when it was not their turn.

In *Squad Leader*, even if defenders never take a Defensive Fire shot, they feel like it was their turn as well, in a way because they were always evaluating the option. Similarly, in games where you can play Reaction cards, players need to monitor the action continuously.

Interrupts add uncertainty and chaos to the game and undermine the ability of players to create a perfect plan. You cannot be certain that the squad will make it across the street, or that the monster will successfully attack. This can be positive or negative depending on the goal of the design.

It also gives a leg up to players who are more familiar with the game than new players. Understanding the range of possible opponent responses gives experienced players an advantage when formulating their plans. Even if they can't be perfect, they can plan contingencies for possible opponent responses.

Because of their asynchronous nature, Interrupts require rules and conventions around their play, to give players the opportunity to react, and also to adjudicate if multiple players want to react at the same time.

In *Squad Leader*, for example, there is a specific rule that a player moving a stack of units must pause briefly after each space is entered to give an opponent the opportunity to announce Defensive Fire. This requires cooperation of the players to keep these pauses long enough for players to decide, but short enough not to unduly lengthen the game. Conventions may be developed, such as a player being allowed to request a few extra seconds to make a decision.

Similarly, when playing reaction cards, there needs to be an opportunity for players to play them.

Some designs allow Interrupts to themselves be interrupted. Obviously, the system needs to prevent infinite Interrupts, typically by playing a card to execute them. There also needs to be a system to handle these multiples.

Magic: The Gathering uses a LIFO system, using an Instant stack. If a player wants to play an Instant in response to another Instant, it is played on top of the earlier card. When all Instants have been played into this stack, they are resolved from the top down. So the first card to be played will be the last to be resolved.

Some games will actually allow the Interrupt to change the turn order. For example, in *Mille Bornes*, a player may respond to a Hazard card being played on them by playing the matching Safety. If they do, the interrupting player immediately becomes the active player, and takes a normal turn. The players between the old active player and interrupting player are skipped, losing their turn (TRN-16).

Sample Games

Magic: The Gathering (Garfield, 1993)
Mille Bornes (Dujardin, 1954)
Squad Leader (Hill, 1977)

3

Actions

❧

When watching a movie, or seeing a play, the story progresses independent of the viewer. Games, however, require action by the player to move things forward. These actions may be based purely on luck, rely solely on the player's skill, or lie somewhere in between. But a fundamental differentiator of games from many other activities is that the players must *act*.

While later chapters will discuss what those specific actions might be, this one describes different ways that the players are permitted by the designer to take actions, and the way that those flow. Thus, the mechanisms discussed here should be viewed in conjunction with the Turn Structures of Chapter 2.

An *Action* is an atomic step or series of steps that a player chooses to perform. For example, moving a piece, picking up a cube, selling a share of stock, or initiating combat may all be Actions. An Action may also be compound, allowing a player to both pick up a cube and sell a share of stock, depending on the structure and metaphor of the game.

The selection and integration of Actions into the game can give play a specific feel. These Action systems control the complexity of the game, in terms of the number of Actions a player may perform consecutively and how they interrelate, the interaction between players, and other features. Manipulation of the Action system, like in a Rondel (ACT-10, Rondel Games) or Action Queue (ACT-06, can become the focus of the game itself and a key mechanism. Or it can simply provide a framework that fades into the background.

If a game is not interactive enough or is overwhelming players with too many choices, the root of the problem is frequently in the way Actions are made available to the players. Looking closer at that part of the design may pay dividends.

ACT-01   Action Points
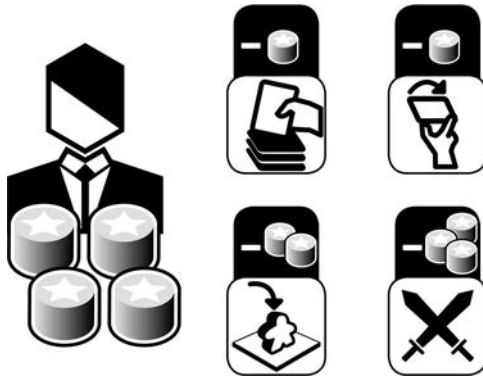
Description

A player receives a number of Action Points on their turn. They may spend them on a variety of Actions.

Discussion

This is a very general mechanism that is isomorphic to a variety of game structures. However, some generalities can be discussed.

A common implementation of this mechanism is that a player receives a fixed number of Action Points on their turn, and can spend them on any combination of Actions, each of which spends one of those points. *Pandemic*, for example, gives a player four Action Points each turn, which can be spent by on several Actions like moving to another city or removing a disease cube.

Tikal takes a similar approach, but Actions may cost more than one Action Point. Each player gets 10 Action Points for the turn, and the cost of Actions ranges from 1 to 4. This can dramatically increase the decision space for players, so the designer needs to be cognizant of the additional weight this will add to the game.

A game may have multiple currencies of Action Points. *Through the Ages: A Story of Civilization* has two types of Action Points: Civil and Military. Each may only be spent on specific types of Actions.

Variations of this mechanism may also limit players to only performing an Action one time per turn. Some allow players to leave some Action Points

unused to be carried over to the next turn, and others require that all be spent or lost.

Many games use this mechanism without explicitly awarding Action Points to the players. For example, the game may simply tell players that they may do two out of three possible Actions, or even one. In *Feudum*, each player simultaneously selects four out of eleven Action cards available in a personal pool to use each turn. This makes it obvious whether an Action can be performed multiple times, or just once, depending on many copies of the same Action card are in the deck.

A variant of an Action Point system is found in *Starship Samurai*. Here, players select the Action they wish to perform from a limited menu. They must also use one of their order counters, which are numbered from 1 to 4. The number determines the number of times the Action may be executed. For example, if players choose the Move Action and use their "3" token, they get to move 3 units.

Action Point systems give the players a lot of flexibility in how they approach their turn. The pace of the game can be controlled by the designer by changing the number of Action Points available each turn. Small values will lead to quicker turns. Larger values will lengthen turns, but also open up more space for combos.

Sample Games

Android Netrunner (Garfield and Litzsinger, 2012)
Feudum (Swanson, 2018)
Forbidden Island (Leacock, 2010)
Kemet (Bariot and Montiage, 2012)
Pandemic (Leacock, 2008)
Starship Samurai (Vega, 2018)
Through the Ages: A Story of Civilization (Chvátil, 2006)
Tikal (Kiesling and Kramer, 1999)

ACT-02   Action Drafting
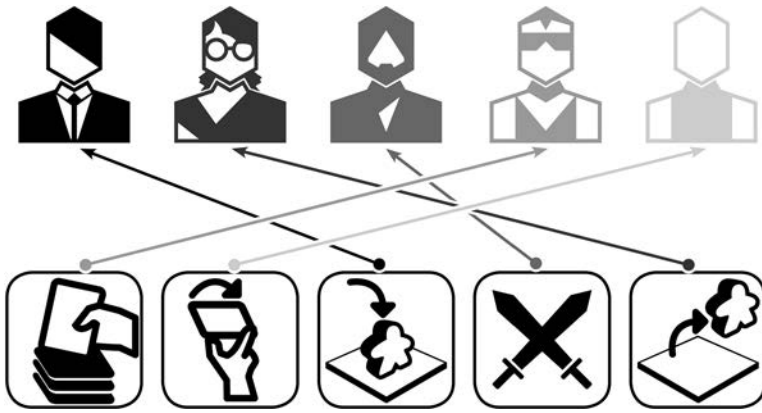
Description

Players select from an assortment of Actions in a shared pool. The available Actions are limited in quantity, and once a player has chosen an Action it may not be chosen again.

Discussion

This mechanism creates player interaction within the Action selection itself. While many games have Actions, typically if an Action is chosen by one player, that does not deny it to another. Action Drafting creates a marketplace for Actions, with players competing to select them.

Action Drafting is a very common mechanism that goes by a variety of names, such as Role Selection or Worker Placement. In a Worker Placement mechanism, players place pawns ("workers") onto Action spaces on a board, performing that Action and denying it to their opponents. Because of the variety and importance of Worker Placement, we have dedicated Chapter 9 to exploring its considerations and variations. The issues discussed there, such as the strength of the first player advantage, apply to most of the mechanisms discussed here as well.

Citadels is an example of a Role Selection implementation of Action Drafting. In *Citadels*, the start player takes all the role cards (which show their associated actions), selects an Action card, and then passes the remaining cards to the player to the left. Because the card chosen is secret, this system generates information asymmetry (UNC-05). *Puerto Rico* and *Race for the Galaxy* are similar examples of Role Selection, as in a round each player selects (drafts) a role and gets to perform

associated actions. *Puerto Rico* allows players to perform a less powerful version of the action drafted by the player (see "Follow, ACT-08" in this chapter), while *Race for the Galaxy* also has Follow but allows players to select the same role.

Another frequent implementation of this system uses a Dice Pool. At the start of the Action Selection phase, a number of dice are rolled, and each number corresponds to a specific action. In *La Granja*, for example, all the 4s rolled are placed into the "Take 4 Coins" action space. Once all dice are placed in their boxes, the players take turns selecting a die, and performing the associated action. In a separate twist, there is an extra die left over after all players have selected two action dice, and every player gets to perform that final action.

An Action Drafting system based on a dice pool works against perfect plans, as players need to adapt to whatever is available. In addition, it forces players to consider not just their own plans, but also what their opponents may need. Players may consider taking a sub-optimal choice in order to deprive it from their opponents (so-called "hate drafting").

Another variant is found in *Dungeon Lords.* In this game, players secretly select three out of six possible Action cards, placing them secretly face down in front of them in order. Each player then reveals their first card, and places tokens on the selected spaces (with ties in order being broken by a Start Player token). The players who place earlier on each Action space can perform more powerful versions of the Actions.

In *War of the Ring*, each player has their own dice pool, and players alternate selecting one of their dice. These systems are not really drafting, in that players are not denying their opponent an Action. However, it does restrict the range of possible Actions, gives players flexibility, and an understanding of the possible Actions available to their opponent.

Sample Games

7 Wonders (Bauza, 2010)
Agricola (Rosenberg, 2007)
Citadels (Faidutti, 2000)
Coimbra (Brasini and Gigli, 2018)
Dungeon Lords (Chvátil, 2008)
La Granja (Keller and Odendahl, 2014)
Puerto Rico (Seyfarth, 2002)
Race for the Galaxy (Lehmann, 2007)
War of the Ring (Di Meglio, Maggi, and Nepitello, 2004)
Yspahan (Pauchon, 2006)

ACT-03   Action Retrieval
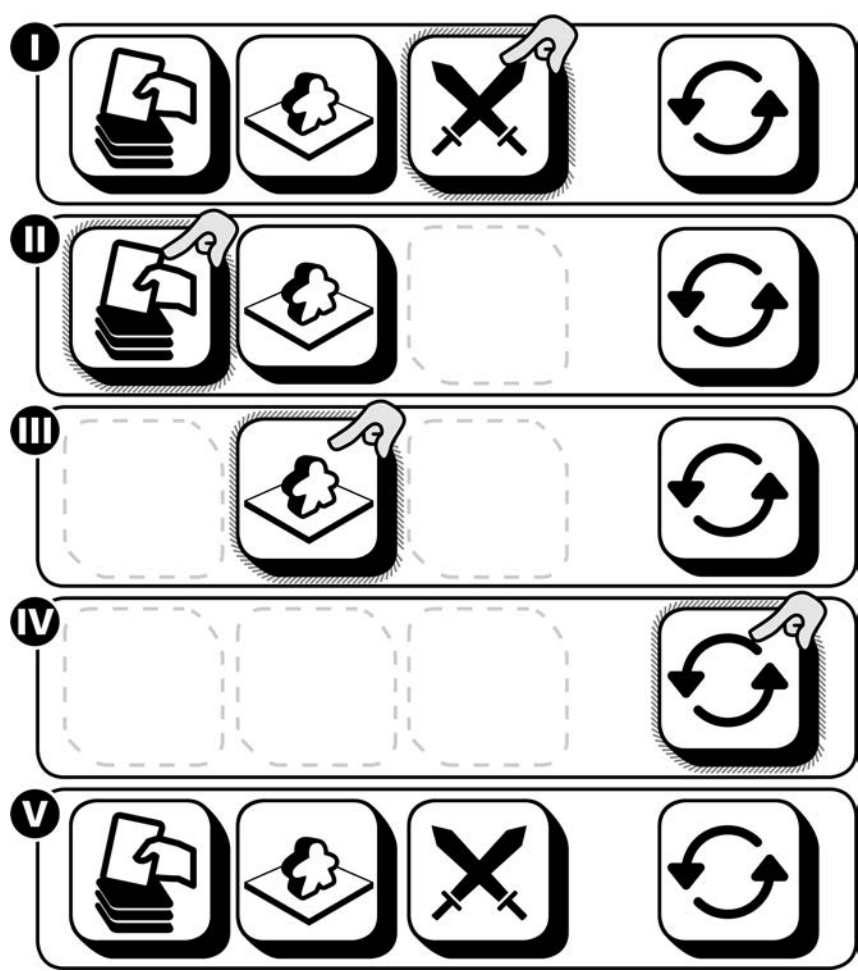
Description

Each player has a set of Actions available to them, embodied in cards, tokens, or some other affordance. Once performed, they are spent and may not be performed again until retrieved. Action Retrieval typically is itself an Action, or may take an entire turn.

Discussion

This mechanism focuses on efficiency. Because retrieving the used cards takes an Action, players that retrieve more frequently will be at a disadvantage, as they will conduct fewer Actions that advance their cause.

The Actions usually span a gamut of discrete options that affect different aspects of the game. For example, *Assault of the Giants* has the actions: Move, Attack, Recruit, Make Alliance, and Leader. Once players use Move, they cannot play it again until they take a Retrieve turn, which restores all action cards used since the last Retrieve. This stops players from selecting a specific Action like Recruiting over and over again, and forces them to adopt balanced strategies, and plan several turns ahead. Therefore, a game that adopts this mechanism has a much more strategic feel. It also allows for additional tactical play, as opponents will know, for example, that you do not have a Move action available, and will not be able to respond to opponents moving to different areas.

Many games introduce additional wrinkles to reward planning and sequencing. *Assault of the Giants*, for example, makes Actions more powerful the more Actions were previously played. For example, if the Move card is played as the first card after a Retrieve, only one unit can move. But if Recruit and Attack have been played before Move, then three units may move.

Another variation is a mix of one-time and recoverable cards. *Gloomhaven* has some action cards that can only be used one time during a scenario. Others may be recovered by having a character Rest.

Sample Games

Assault of the Giants (Parks, 2017)
Century: Spice Road (Matsuuchi, 2017)
Gloomhaven (Childres, 2017)
Spirit Island (Reuss, 2017)

ACT-04   Action/Event
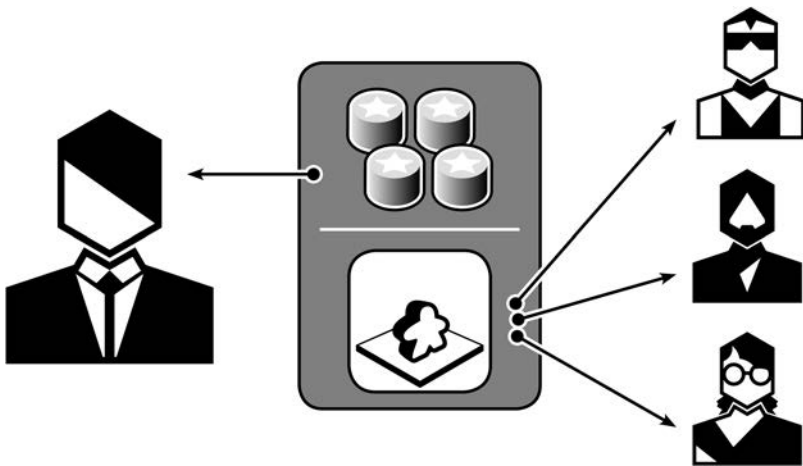
Description

On their turn, the player plays a card that shows Action Points and an Event. They must choose to either use the Action Points or perform the Event. If They choose to use Action Points, typically the Event may be performed by another player.

Discussion

This mechanism builds on a basic Action Point system, and allows designers to integrate a lot of flavor and special actions to a system to emphasize theme. It was pioneered in historical simulations as a way of introducing historical events without unduly adding rules overhead. For example, *Twilight Struggle*, a simulation of the Cold War, has a card that can either be used for 3 Action Points or the Warsaw Pact event. If the Action Points are chosen, there is a standard list of Actions on which they can be spent (ACT-01).

Many games incorporate an Event Deck (ACT-17), which is another way to include special effects and deeper theming. However, the Action/Event system gives players another layer of choice, rather than simply imposing global effects.

Often, games using this system add another layer of player decision-making by having some or all events only eligible for specific players. For example, in

We The People, a simulation of the American Revolution, certain events may only be performed by the Colonists, and others by Great Britain. If a player is not eligible for the event on a card, they must use the Action Points. Similarly, some events are dependent on specific locations, control of particular areas, the presence of certain characters, etc. In *Empires of the Void II*, for example, events can be tied to specific planets, and if those planets are not in play or the player is unable to execute some condition related to that planet, the player may only use the card for its point value, rather than the event. In *World War II: Barbarossa to Berlin* there are prerequisite events that must be triggered before other events may be used.

Twilight Struggle takes this even further, letting the opponent use an Event if the card is played for the Action Points. For example, the Warsaw Pact event can only be used by the USSR player. If the USA player plays the card, he or she must use the 3 Action Points, and the USSR will perform the Event. This makes choosing and sequencing card play very important.

Twilight Struggle and *We the People* are two-player games. This system is extended to multiplayer in *The Expanse Board Game*, which supports up to four players, each of whom represents a faction. Between two and four factions are eligible for each event, and if a player uses the Action Points, the other players are given the option to perform it, in a priority order.

Sample Games

1960: The Making of the President (Leonhard and Matthews, 2007)
Empires of the Void II (Laukat, 2018)
The Expanse Board Game (Engelstein, 2017)
Hannibal: Rome vs Carthage (Simonitch, 1996)
Twilight Struggle (Gupta and Matthews, 2005)
We The People (Herman, 1993)
World War II: Barbarossa to Berlin (Raicer, 2002)

ACT-05   Command Cards

Description

Players have a hand of cards that allows them to activate and perform actions with a subset of their units.

Discussion

Players have a hand of cards that represent different geographic regions or unit types and must play one each turn. When a geographic region card is played, units that are located in the region(s) indicated on the card may take Actions. If a Unit Type card is played, only units of that type may take Actions.

For example, in *Memoir '44* the cards may represent left flank, right flank, center, or unit combinations, for example, all Tank units. Players have an indication of their future range of actions based on the cards in their hands, which allows for a level of planning. Hand size limits help define the information horizon and amount of look-ahead players can engage in.

In a traditional war game, players can take actions with all of their units each turn. Command Card systems limit this to a subset of units, which reduces the length of turns, and simplifies decision-making, giving the game a lighter feel.

Some games, like *Risk: Star Wars Edition,* give players a range of one to three possible activation choices, building in greater flexibility and planning.

In the extreme limit, with one unit at a time being activated, this mechanism reduces to a Chit Draw system (TRN-11).

Sample Games

Battle Cry (Borg, 2000)
BattleLore (Borg, 2006)
C&C Ancients, Napoleonics, etc. (Borg, 2006–2018)
Combat Commander: Europe (Jensen, 2006)
Memoir '44 (Borg, 2004)
Risk: Star Wars Edition (D'Aloisio, Rucker, and Van Ness, 2015)

ACT-06   Action Queue
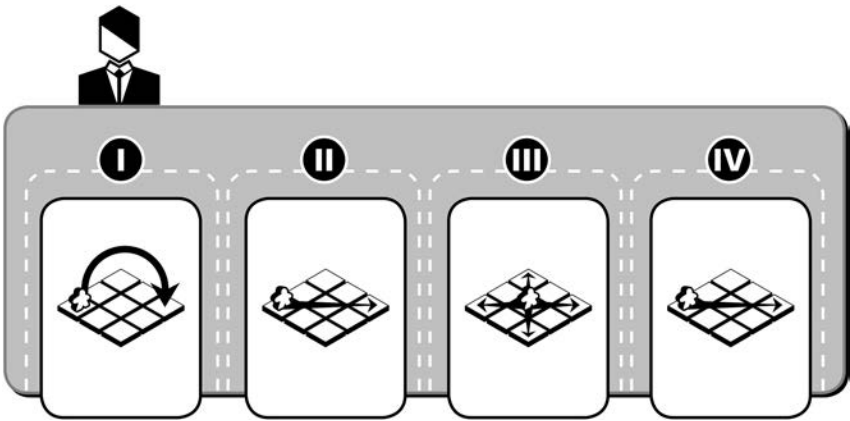
Description

Players create Action Queues and perform them in sequence.

Discussion

While this mechanism has many different implementations, at its core, the idea is that players must plan their actions and commit to a specific sequence of execution. For example, players may have to plot the movement of a robot by placing three Action cards in sequence that may, for example, cause the robot to move forward two spaces, then turn left, then move one more space. The types of actions, the way they are revealed and resolved, and other specifics have several variations.

Action Queues emphasize planning, but can also introduce chaos, as players commit to a course of action several steps or turns in advance, keep them hidden from the other players, and have limited opportunity to change the plan. This introduces Yomi (UNC-01), as players try to guess what other players will do and what the board state may look like in the future.

Actions are typically represented by cards, as they can contain a lot of information about the preconditions and resolution. Tiles can also be used but need to be simpler. Queues can either be *Rolling,* where the Action at the head of the queue is revealed and performed as a new Action is added to the

end, or *Batch*, where a set number of cards are added to the queue at one time, and then all are resolved in order.

One of the earliest uses of a Rolling Queue is the 1965 game *Nuclear War*. In this game, each player has a queue of two cards in front of them. On their turn, they add a card to the end of the queue, and then turn up and execute the card at the queue head. In *Nuclear War* the players start at peace and may perform certain peace actions, but when someone launches a missile, only war actions may be taken. The delayed Action Queue gives the game tremendous tension, as players need to decide if they can continue to perform peace actions or want to be the first to declare war.

RoboRally uses a Batch Queue. The players fully plan an entire series of actions and then resolve them using an Interleaved turn structure, with each player revealing and performing the action in the first slot, then each player doing the second action, etc. *Swashbuckler*, instead of cards, has players record their actions in blocks of six time steps on a record sheet. Players then resolve each time step in a similar way.

Robo Rally only allows for the players to queue Movement actions, with others (like shooting) being done on-the-fly as the opportunity permits. In contrast, *Swashbuckler* allows players a full suite of movement, combat, and other actions.

Twin Tin Bots uses a Batch Queue approach, but the entire queue does not get replaced at once. Players may only replace one Action in the queue each turn. The others remain and are performed. This obviously adds more complexity to the programming step as players need to play further ahead about how they may change of their queues. *Mechs vs. Minions* is a similar example of this system.

When queues get longer, and particularly when movement and rotation actions are included in the available actions, this mechanism may require good spatial relations in the players, as they need to visualize where they will be as they progress through the queue. This can give games a heavier feel, while at the same time increasing the chaotic feel. This combination may not be well received by some players, although some games, like *Robo Rally* and *Space Alert,* rely on this for their experience.

Other games, like *Colt Express*, address this challenge by limiting the overall movement space. In *Colt Express* players can move to the head or rear of a short train of cars, or between the inside and the top of those cars. Each player can move to one of three spaces per turn, and the whole board is about ten spaces (depending on player count), increasing the likelihood of player collisions and interactions.

Root has a unique take on the Action Queue, as one of the factions must add a new Action to the queue each turn (in any position) and perform all the Actions in sequence. If an Action cannot be executed, the player loses victory points, and all Action cards are discarded. Another variation is in *Valparaiso*. Players simultaneously plan their actions in a queue, and then execute them in order. However, as the turn unfolds they may pay gold to perform an action in their queue sooner than planned.

Sample Games

Rolling Queue:
The Dragon & Flagon (Engelstein, Engelstein, and Engelstein, 2016)
Killer Bunnies and the Quest for the Magic Carrot (Bellinger, 2002)
Nuclear War (Malewicki, 1965)

Batch Queue:
Colt Express (Raimbault, 2014)
Gunslinger (Hamblen, 1982)
Mechs vs. Minions (Cantrell, Ernst, Librande, Saraswat, and Tiras, 2016)
Robo Rally (Garfield, 1994)
Root (Wehrle, 2018)
Space Alert (Chvátil, 2008)
Swashbuckler (O'Neill and Taylor, 1980)
Twin Tin Bots (Keyaerts, 2013)
Valparaiso (Malz and Malz, 2018)

ACT-07   Shared Action Queue
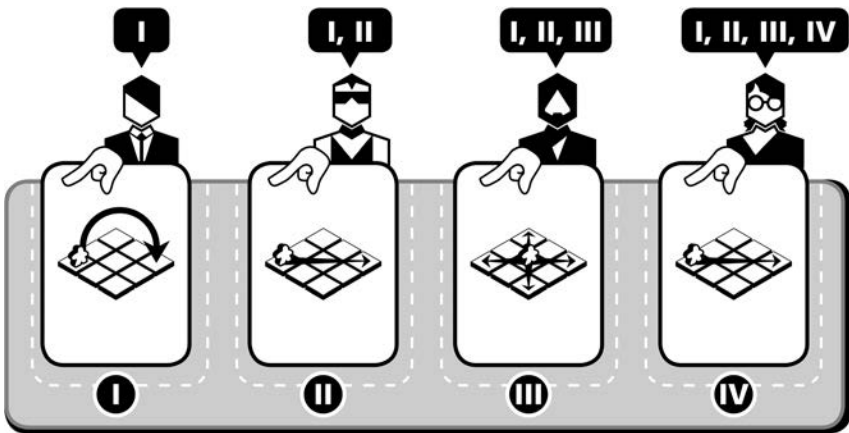
Description

All players add Actions to a central Action Queue. Actions in the Queue are performed by all players.

Discussion

This is a variation on the standard Action Queue mechanism. Here, on their turn a player adds one or more Actions to the end of a queue shared by all players, and then executes the full queue from start to finish. This system increases interactivity, as players are planning actions not just for themselves, but also for their opponents. It gives a different flavor of strategic options, as players attempt to plan actions that will benefit them more than their opponents. Sequencing may also play a role, as the action queue may not set up certain players to perform actions as they may be out of position for an earlier action, a deficiency that cascades throughout the queue.

The two-player game *Major General: Duel of Time* takes this a step further by including two actions on each card played, one for each player. It is also unique in that actions may be placed anywhere in the queue, not just at the end. After playing an action, the player executes actions from the end of the queue closest to them. On their opponent's turn, they will resolve the actions in the opposite order, and using the other actions on the cards.

Each turn in *Mottainai* a player plays a card in front of them that allows the taking of a particular action. However, before performing it the player first performs the actions in front of each opponent, going clockwise and ending with themselves. This is similar to Follow (ACT-08), except that the opponent's chosen actions are executed on your turn, not on the opponent's turn.

A variation on a Shared Action Queue is used in *Kraftwagen,* which has a queue of action tokens, trailed by a queue of player markers. The person at the end of the queue may move to any position to take and execute an Action. However, the further ahead the person moves, the longer it will be until they are once again at the end, and in position to take a new action. *Kraftwagen* blends a Shared Action Queue with a Time Track (TRN-13).

Sample Games

Impulse (Chudyk, 2013)
Kraftwagen (Cramer, 2015)
Major General: Duel of Time (Liu, Moorman, Yeong, and Zhao, 2017)
Mottainai (Chudyk, 2015)

ACT-08 Follow
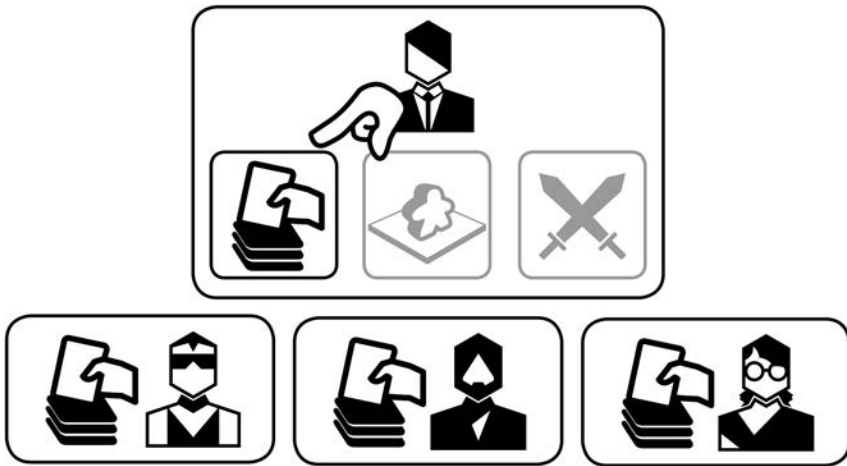
Description

One player selects an Action. Other players may then perform that Action, or a modified version of it. This is closely related to Action Drafting (ACT-02) and Role Selection (TRN-10), and is often implemented alongside those systems.

Discussion

Follow mechanisms are a form of Action Selection that have a high degree of player involvement. *Puerto Rico* is a good example. On their turn, a player selects one of the available roles, and executes the action associated with it. Then, in turn, each player gets to execute the role. The player who selected the role also gets a bonus to their action. For example, the player who selects Builder gets a discount on the cost of construction and performs the action first. The other players then each perform the Builder action, paying the normal cost.

This mechanism forces players to consider not just what they want to do, but what will be good for their opponents. Does someone really need to build? Perhaps picking Builder is not the best choice. Can someone only build if they get the discount? Then selecting Builder, even if it helps other players too, may

be the best option. Players need to look holistically at everyone's position, not just their own.

A variation on this mechanism can be found in *Glory to Rome* and *SPQF*. In these games, Actions are taken by playing a card from the hand, which are in certain suits. Other players may echo the action if they play one or more cards matching the suit. In this way, the players that are echoing may end up performing more powerful versions of the actions by discarding several cards. It also means that if players cannot match the action, they may not echo it. Since players' hands are hidden in these games, this makes determining the best option somewhat of a guessing game. But careful attention will show what may be useful to other players, and what cards they may have collected.

Follow systems of this sort introduce a cost to the follow action. In *Eminent Domain,* players may Follow by discarding cards of the same suit, which further power the action. Because the game is a deck-builder, the cards spent from hand are only an opportunity cost, as they will eventually be shuffled back into the player's deck. In *Tiny Epic Galaxies,* players must spend a Culture resource to follow, which is a more concrete cost.

In *Mottainai*, players, on their turn, may perform the actions that the other players played on their prior turn. Unlike other Follow mechanism implementations, this one calls for a batch execution of the sequence of actions, rather than an Interleaved system.

Generally, Follow systems are excellent at keeping players engaged on every turn, since players act, or have potential to act, on every turn. However, they may also slow down play, since players have to decide on every single turn whether they wish to Follow and how. Designers are encouraged to include some physical token to keep track of who the active player is, too, since the interleaving of player actions inside each active player's turn can lead to turn-order confusion.

Sample Games

Ceylon (Zinsli and Zinsli, 2018)
Eminent Domain (Jaffee, 2011)
Glory to Rome (Chudyk, 2005)
Mottainai (Chudyk, 2015)
Puerto Rico (Seyfarth, 2002)
SPQF (Rodiek, 2018)
Tiny Epic Galaxies (Almes, 2015)

ACT-09   Order Counters
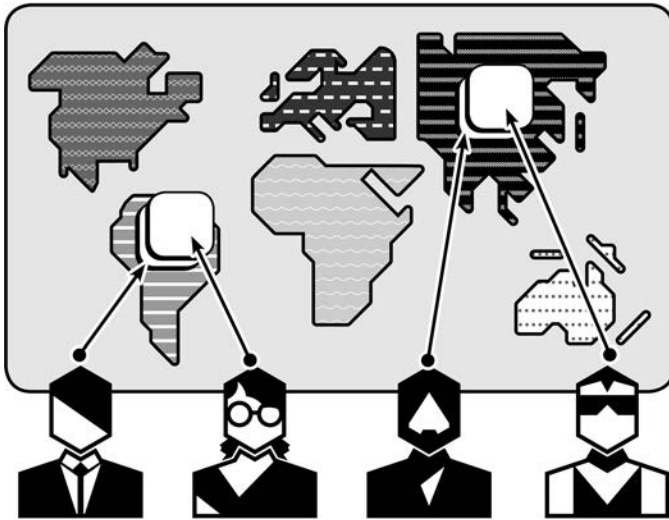
Description

Players place Order Tokens into regions, indicating what they want to do in that particular region of the board. After all tokens are placed, they are executed in sequence.

Discussion

This mechanism combines an Interleaved Turn Structure (TRN-15) with an Action Queue. Players are in essence creating multiple Interleaved Action Queues during a planning step, and then resolving them. The tokens are typically placed face down, so opponents know where you are planning to do actions, but not which, and if more than one order may be given, tokens are placed in a stack to indicate their sequence.

Because players alternate placing orders into different areas, they must balance a variety of factors. Which actions do they wish to do early? Will committing to a region alert an opponent to your intentions to operate there? What action are the opponents planning?

The resolution of the Order Token stacks can be performed in several ways. First, they may either be resolved from the top down, so that tokens that were placed last are resolved first (LIFO: Last-In-First-Out), or the token

stack may be flipped over, so that the earliest tokens are resolved first (FIFO: First-In-First-Out). Some games (like *A Game of Thrones: The Board Game),* don't consider the placement order of the tokens, and simply turn them all over and resolve them in a specific Action order.

Resolution order has great impact on the strategy and feel for placement. LIFO gives the game a "chicken" feel, as players want to be the last into a region with key actions so that they are executed first, but it also increases cognitive load, as players need to remember the reverse order of tokens in the stack and modify their plans as they go. With a FIFO structure, players can gradually just build up their plans in their minds as they proceed, which is less cognitively taxing.

Either way, this is a moderately complex mechanism which is best reserved for heavier strategy games.

Sample Games

Forbidden Stars (Bailey, Kniffen, and Konieczka, 2015)
Francis Drake (Hawes, 2013)
A Game of Thrones (Petersen and Wilson, 2003)
Starcraft: The Board Game (Konieczka and Petersen, 2007)

ACT-10   Rondel
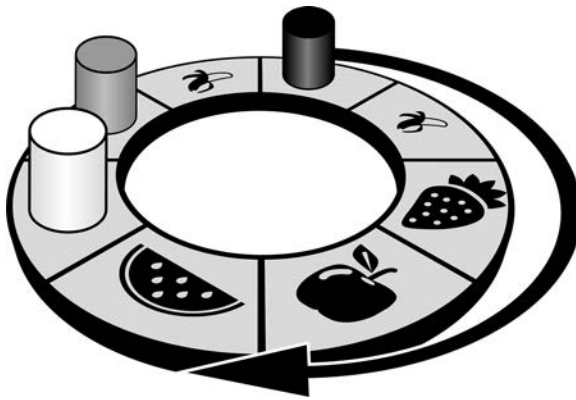
Description

The available Actions are represented as pie wedges in a circle. Each player has one or more tokens on Rondel's wedges. On their turn, they may move their token around the Rondel and perform the Action indicated by the wedge where they stop. It is typically more costly to move further around the Rondel.

Discussion

This mechanism is related to a basic Action Point system (ACT-01), as the Rondel represents a menu of available actions. However, the cost of the actions varies for each turn, as to move more than one space typically incurs some cost (money or some other currency). If a player wishes to move one space at a time, they incur little cost, but may not be most efficiently performing the actions.

Rondel systems emphasize trade-offs, planning, and efficiency, as players need to balance taking the action that they want to do now, and paying a cost, with waiting and paying no or a reduced cost.

There are several variations on this mechanic. In *Finca*, players have several tokens on the Rondel, and may choose one of them to move. The distance that it may move is based on the number of tokens in the starting wedge, and the power of the action is determined by the number of tokens in the ending wedge. This makes for a highly interactive yet relatively simple system, and also begins to blur with a Mancala mechanism (MOV-12).

Sample Games

Antike (Gerdts, 2005)
Concordia (Gerdts, 2013)
Finca (Sentker and zur Linde, 2009)
Imperial (Gerdts, 2006)
Navegador (Gerdts, 2010)

ACT-11   Action Selection Restrictions

Description

Players are restricted from which actions they may choose.

Discussion

There are a wide variety of mechanisms that have been used to force players to choose less than optimal actions, or even ones that are detrimental. Some of the more popular mechanisms have been included in their own section: Action Drafting, Action Retrieval, Rondels, and Command Cards are all examples. However, there are a wide variety of approaches to this that have been used in only one game. Several of these are collected in this section.

In *Kemet*, the possible actions are laid out in a pyramid. Players must select at least one option from each pyramid level. In *Goa*, action tiles are laid out on a grid. The start player places a marker on the grid, taking that tile. Each player in turn then places their marker adjacent to the previous one played, onto another tile, either orthogonally or diagonally. Players need to consider how they may be helping their opponent by placing next to a tile they need.

In *Noria,* players place action tokens on concentric wheels. Only tokens in certain portions of the wheels may be used, and the wheels rotate at different speeds. *Tzolk'in: The Mayan Calendar* also uses rotating gears, and the longer workers remain on the gears the more powerful actions they can perform. In *Calimala,* players place discs between two actions on a grid, and can perform both connected actions.

Manitoba has a tower of discs of different colors, and the active player selects part of the stack which controls what map regions and tracks may be used for actions.

In *Keyforge: Call of the Archons,* each turn a player picks what "house" they will use, and only cards (actions) that belong to that house may be used. Looking for novel ways to limit the actions that players can take is a constant source of innovation in game design.

Warpgate gives players a hand of Action cards, each of which has two possible Actions that can be performed. When playing a card, the player may select which half to use. It has the additional twist that cards become more powerful the later they are played in the round.

Sample Games

Calimala (Lopiano, 2017)
Forum Trajanum (Feld, 2018)
Goa (Dorn, 2004)
Kemet (Bariot and Montiage, 2012)
Keyforge: Call of the Archons (Garfield, 2018)
Manitoba (Conzadori and Pranzo, 2018)
Noria (Wagner, 2017)
Tzolk'in: The Mayan Calendar (Luciani and Tascini, 2012)
Warpgate (Nichipurov, 2018)

ACT-12   Variable Player Powers
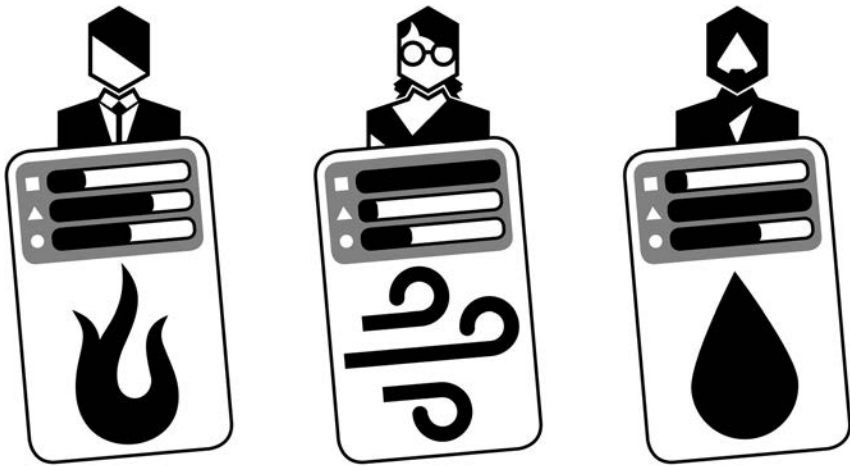
Description

Each player has special Actions that only he or she can perform, or that modify standard actions.

Discussion

This is a meta-mechanic that can modify Action and other systems, like Resolution. We are placing it here, as it can typically give players additional actions that they can perform or it modifies standard actions or procedures.

Typically, each player has a unique player power that sets them apart from the other players. This is an excellent way to include asymmetry, as well as emphasize theme, as in *Dune*, where the factions are highly differentiated through different actions and abilities and are quite evocative of the source material. For example, the Fremen faction, who reside on the planet, can build units anywhere, and are better able to deal with the hazards on the planet. The Guild faction, which controls all space travel, gains money each time a non-Fremen player moves forces to the planet surface.

Variable Player Powers also improve replayability, as players will want to return to the game to try out different factions and see how they play, and in some cases this will feel like a completely different game.

These unique powers also increase complexity and cognitive load on the players, however. In addition to the standard rules, the special exceptions for

each player need to be taught. The most successful of games where Player Powers are at the forefront are based on very simple frameworks. *Cosmic Encounter* is all about the player powers, and they can radically change the way players play the game. The simple structure of *Cosmic Encounter* is an excellent example. Combat is resolved by each player playing a number card, and adding the number of tokens they have in the battle. Highest number wins. That simple framework allows the designers to take the special powers in a dizzying array of different directions. The designer has reserved most of the design space in this mechanism for the interactions of the unique player powers.

Another feature of player powers is that they may make a particular strategy optimal for that player. For example, a faction may be very good at fighting, which will encourage a military strategy. This can be positive, as it gives players an identity and immediate strategic direction for new players. But it also limits players' strategic choices, and they can feel as if there is one "correct" way to play for a faction.

There are several options for conveying the details of a Variable Player Power to the players. One is to state the rules explicitly through a player mat or shield, as in *Cosmic Encounter* or *Spirit Island*, where they are all clearly presented to the player at the start of the game through a player mat or limited number of cards. Alternately, they can be spread out amongst a large number of components, typically a deck of cards, such as in *Sentinels of the Multiverse*. The advantage of the latter is that it makes it simpler to teach, as the base rules are the same for all, and the differences only need to be taught when they arise. It also gives the players a sense of discovery, as they see cards and abilities they did not know existed.

On the negative side, this can make it difficult for new players to take full advantage of a specific character, and so may lead to an unsatisfactory initial play with a specific faction or character.

Sample Games

Cosmic Encounter (Eberle, Kittredge, Norton, and Olatka, 1977)
Dune (Eberle, Kittredge, and Olatka, 1979)
Pandemic (Leacock, 2008)
Root (Wehrle, 2018)
Sentinels of the Multiverse (Badell, Bender, and Rebottaro, 2011)
Sidereal Confluence: Trading and Negotiation in the Elysian Quadrant (Deichmann, 2017)
Spirit Island (Reuss, 2017)

ACT-13 Once-Per-Game Abilities
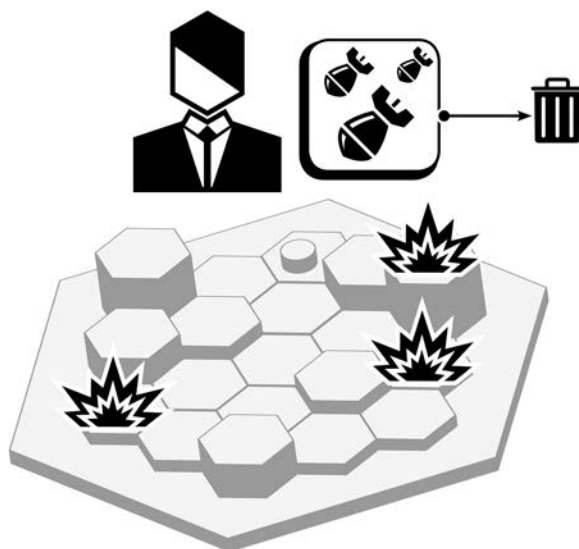
Description

Players have a special ability that they can use one time per game.

Discussion

While there are exceptions, Once-Per-Game Abilities are usually different for each player or character. Because they can only be performed once, the designer has great latitude to make them very powerful.

These two characteristics combine to make this mechanism potentially be player- or character-defining. The threat of using the ability, the decision of when to actually use it, and identifying the correct moment can dominate the play of the game as players maneuver for advantage, and can elevate the strategy and tactics. It also adds another dimension of consideration for players—timing—that is not present with always-on special abilities. In *Warmachine/Hordes*, each side has one Warcaster who has an extremely powerful single-use ability called a Feat. When and how to use the Feat is a critical part of the game. As such, when characters have wildly varying special abilities as in *Warmachine/Hordes*, it is important that players understand exactly what their opponents are capable of doing. This rewards veteran

players and puts a burden on new players to understand the full extent of the special Action.

Some games give players a set of special action tokens at the start of the game, which are usable one time during the game. These may be the same for each player, like *Finca*. Often, if tokens are not used, they give bonus Victory Points to the player at the end of the game.

Sample Games

Battles of Westeros (Kouba, 2010)
Battlestar Galactica: The Board Game (Konieczka, 2008)
Drakon (Jolly, 2001)
Finca (Sentker and zur Linde, 2009)
Warmachine/Hordes (McVey, Snoddy, and Wilson, 2003)

ACT-14   Advantage Token
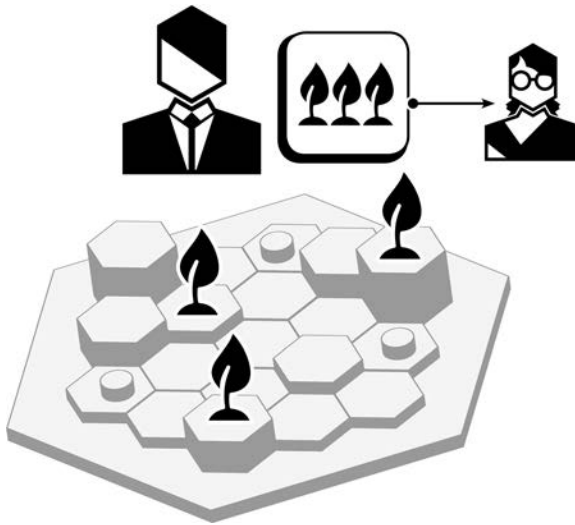
Description

One player has a token that permits them to do a special Action, or modify an Action. Once used, the token passes to another player.

Discussion

This is a meta-mechanism of Action Selection, as it determines what Actions may be available to a player. Originally introduced in the 1981 game *Storm Over Arnhem* as the "Tactical Advantage" token, it represents the ebb and flow of a conflict. In *Storm*, the controlling player could use it to re-resolve a combat, or to force a turn to continue when it would otherwise end. After being used in this way, it is passed to the other player, who receives the same options.

    This introduces another consideration for the player, as the value of using the Tactical Advantage must be weighed against its loss and the possible use of it by the opponent. Similar to Once-Per-Game Actions (ACT-13), a timing dimension is added to the decision-making. Normally, Variable Player Powers (ACT-12) are always on, so if you can use them, you should. But that is not the case with this mechanism.

Twilight Struggle uses this mechanism more thematically than *Storm Over Arnhem*, in the guise of *The China Card*, an actual card that is passed between players when it is used. It is a powerful card that is even more powerful when used to perform actions in Asia, but after use it is given to the opponent. Again, consideration must be given to timing, and whether to use the card or simply hold on to it and deny its use to the opponent.

Advantage Tokens can also be used to give ongoing benefits to the owning player that do not require surrender. In *Storm*, for example, the player controlling the token gets to go first in a turn, and decides the order of resolution of conflict situations.

Many games use this system less overtly for tie-breaking. In a Sealed Bid Auction for example (AUC-04), ties may be broken by a Priority Token. Then, the token is given to the player who lost the tie-breaker. This is different than the standard sense of this mechanism, as the transfer is not typically controlled by the player. It simply designates who wins a tie, and its transfer is never a choice. In another variant of this mechanism, the *A Game of Thrones* board game features an Iron Throne token that is awarded to the winner of the turn-order auction. The holder of the Throne determines how all non-combat ties among all players are to be decided. The recurring turn-order auction is the means by which possession of the token moves around, rather than by its use.

The Advantage Token mechanism gives the designer an opportunity to give the players more control over certain random aspects of the game, such as combat resolution in *Storm Over Arnhem* or card draw in *Twilight Struggle*. As such, it can make a game feel more strategic, without a lot of rules overhead.

Sample Games

Breakout: Normandy (Greenwood and Stahler, 1992)
The Fog of War (Engelstein, 2016)
A Game of Thrones (Petersen and Wilson, 2003)
Storm Over Arnhem (Allen, 1981)
Twilight Struggle (Gupta and Matthews, 2005)

ACT-15   Gating and Unlocking
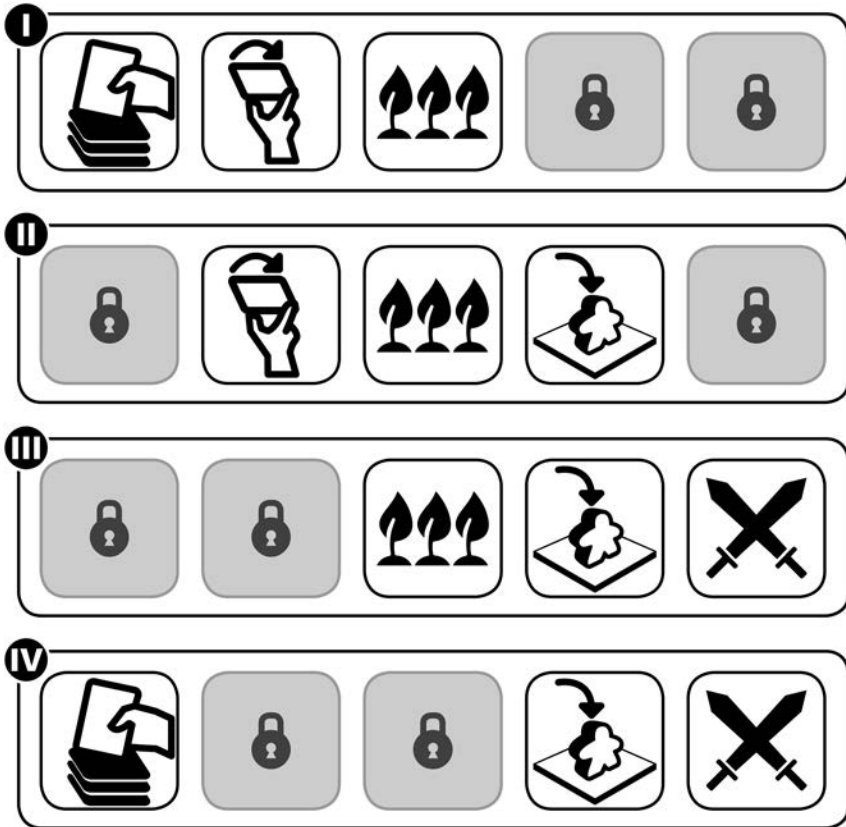
Description

At certain points in the game, different actions are made available to the players. Actions may become available by a variety of means, including reaching a certain turn or game stage. Depleting a shared pool or bringing some track past a threshold level through the cumulative effects of the actions of all the players is another common approach to triggering unlocks.

Discussion

This is a meta-mechanism of Action Selection, as it affects the availability of Actions, rather than how they are selected. It may be used with any of the Action Selection mechanism.

These new Actions can introduce new resources, give better or more efficient options than the older spaces, and introduce completely new mechanics. *Agricola* does all three of these. After each round, a new Action card is added to the game board. Some of these introduce new resources, such as Cattle or Boar, some give more of a resource per space, and others introduce a completely new Action, such as Family Growth.

Adding more actions as the game progresses can be used by the designer to control complexity. Early in the game, actions can be simple and limited, giving the players a chance to understand the system without being overwhelmed. As the game progresses, more complex actions and combos can be introduced. Good candidates for this may be actions that are difficult or impossible to perform early in the game anyway or are tactically improper. This helps give players a positive first experience.

In addition to controlling complexity, adding actions also gives a sense of forward momentum and narrative arc. New options are introduced to the players, giving the game a progressively more advanced feel as it goes. Adding spaces that give more resources, or allow earlier actions to be performed more efficiently, adds a sense of acceleration.

The *18xx* series of railroad games, such as *1830*, has a strong gating system that is a critical part of player strategy. Trains must be bought in order of power. As certain train levels are exhausted, a variety of game effects are triggered. Upgraded and more powerful track tiles become available, and certain older trains disappear. Understanding and predicting the timing of these transitions is a critical skill in *18xx* games and is one of the reasons they are unforgiving for new players, as these transitions accelerate as the game progresses, so timing can be tricky.

Similarly, *Through the Ages: A Story of Civilization* has the players progress through a variety of Age decks, with upgraded technologies, abilities, and leaders. As each deck is exhausted, players need to discard cards from older ages and reduce their population. Like *1830,* the timing and anticipation of these transitions becomes a skill for players to master. *SpaceCorp* also has three Ages (called Eras), but the transition is more extreme as each is played on a completely separate board, with only some advantages carrying over from one to the next.

Sample Games

1830 (Tresham, 1986)
Agricola (Rosenberg, 2007)
The Expanse Board Game (Engelstein, 2017)
Lords of Waterdeep (Lee and Thompson, 2012)
Mechs vs. Minions (Cantrell, Ernst, Librande, Saraswat, and Tiras, 2016)
SpaceCorp (Butterfield, 2018)
Through the Ages: A Story of Civilization (Chvátil, 2006)

ACT-16   Tech Trees/Tech Tracks/Track Bonuses
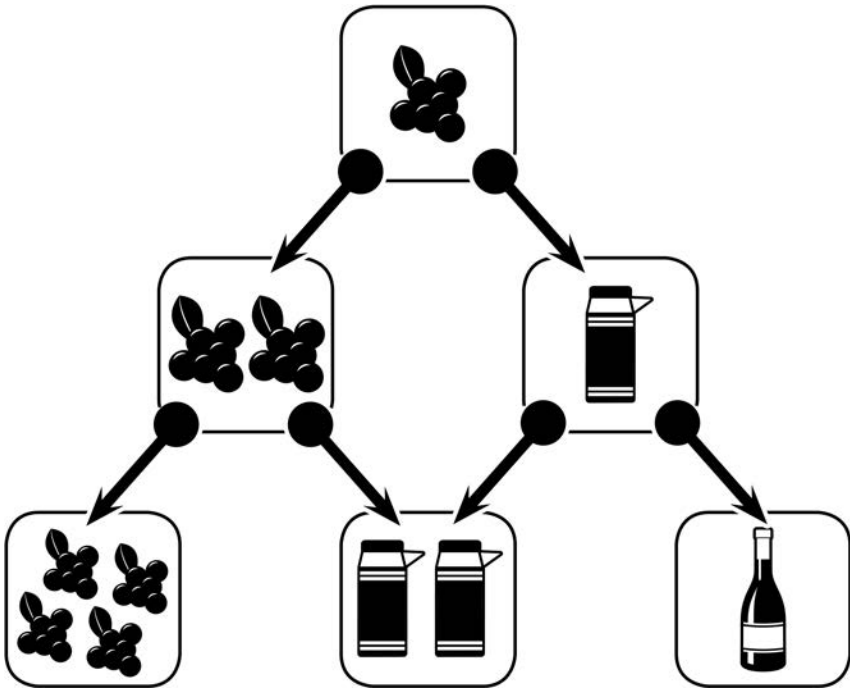
Description

During the course of the game, new Actions become available to specific players, or existing Actions are improved.

Discussion

This is similar in many ways to the meta-mechanism of Gating and Unlocking (ACT-15). New actions and abilities are introduced as the game progresses.

   The differences in this mechanism are subtle but important. First, these new and upgraded Actions are typically only available to a single player. It is possible that multiple players can earn the same additional Action, but it needs to happen individually.

   Some games allow other players to take advantage of another's personal Actions, either by paying the owning player some fee, obtaining the ability

by force or trade, or by having the owner's monopoly on them expire after a number of turns, making them available to all.

These upgrades frequently do not make entirely new Actions available to a player. Instead, they make specific Actions more efficient or powerful.

Whereas Gated upgrades typically are triggered on a timed or global schedule (as in *Agricola's* one new Action space per turn system), in a Tech system players need to accumulate and spend some resource in order to gain them. This can be a general currency, such as money, as in *Civilization*, or a specialized "research" currency as in *Eclipse* or *Through the Ages: A Story of Civilization*. There are games where techs are given out freely, although these still have an opportunity cost as players must forgo other choices.

Technologies do not have to be themed as research to use the mechanism. In many games, hiring people, or building certain structures unlocks new or advanced abilities. *Puerto Rico* is one of many examples of this. Growing, evolving, building, and training are other common metaphors for research.

Upgrades may have prerequisites that need to be satisfied, or may be easier to obtain if you have an earlier tech. This results in a Tech Tree. For example, in *Stellar Conquest*, if you have researched Industrial Technology, it is less costly to then obtain Robotic Industry.

Tech Trees may also be expressed as Tracks. As players advance their marker along one or more tracks, they may pass certain spaces, which gives improved actions or abilities. *Orleans* and *Russian Railroads* both utilize this mechanism. There may also be physical markers placed along these tracks, so that the first player to reach those spaces gains those markers and a special bonus. Other players will still receive bonuses printed on the track.

Tech Trees may be disguised thematically. In *Titan*, players recruit creatures into legions. The creatures that may be recruited into a legion depend on its current composition. Three Ogres may recruit a Troll, and three Trolls may recruit a Colossus. These creatures are more and more powerful, and some have special abilities like flying.

This type of system gives the designer fine-grained control over Actions available to players, and gives a path to offer different strategic options, as players can choose which Actions and Abilities to invest in. Having a limited number of these Techs also forces player interaction and competition.

Sample Games

Agricola (Rosenberg, 2007)
Civilization (Tresham, 1980)
Clash of Cultures (Marcussen, 2012)
Eclipse (Tahkokallio, 2011)
Kemet (Bariot and Montiage, 2012)
Orleans (Stockhausen, 2014)
Puerto Rico (Seyfarth, 2002)
Russian Railroads (Ohley and Orgler, 2013)
Stellar Conquest (Thompson, 1975)
Through the Ages: A Story of Civilization (Chvátil, 2006)
Titan (McAllister and Trampier, 1980)
Twilight Imperium (Petersen, 1997)

ACT-17   Events
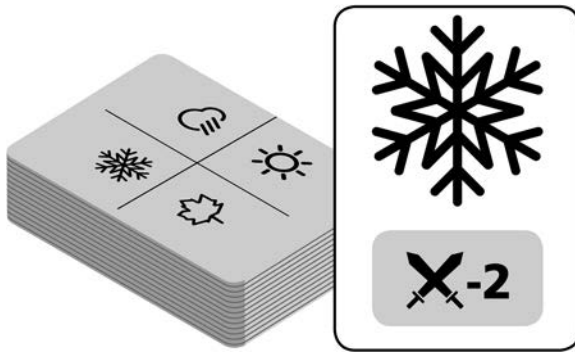
Description

Actions occur outside the control of players that cause an immediate effect, change the state of the game, or impact subsequent actions.

Discussion

Events can add variety and theme to a game. Many gamers' first exposure to events comes through *Monopoly*, in the form of Chance and Community Chest cards. These may immediately affect one or more players. This type of event is also found in *Empire Builder*, a railroad building game where cards may cause derailments, or floods wipe out tracks crossing rivers.

However, their usefulness is multiplied by affecting the overall game state for an extended period of time. Other events in *Empire Builder* may cause blizzards, which affect train movement near mountains, or storms that affect certain regions. This forces players to reevaluate their plans to try to avoid or take advantage of the changed circumstances. Sometimes this can be interesting for the players, but if it is too random and negative it can feel punishing.

Events can also affect the global game state. In *Evo,* the overall temperature is of critical importance to which dinosaurs will be able to survive. Each turn, a die is rolled to determine how the temperature changes. The new environment is in effect globally and affects all players. Similarly, in night missions in earlier editions of *Warhammer 40,000* dice are rolled each turn to determine how far units can see.

Core Worlds: Galactic Orders delays the implementation of Events. Each round an Event is drawn, and all players can see what it is. However, it does not go into effect until the end of the round. This gives all players an opportunity to adjust to take advantage. Events in *Robinson Crusoe: Adventures on the Cursed Island* have an immediate effect and may further impact play unless the players address them in some way over several turns.

Terra Mystica gives players broader visibility to an Event of a sort—random scoring tiles. At the start of the game, tiles are placed that show what will give bonus points for each round. Players can see what is coming up and plan their strategy accordingly.

A delayed Event mechanism is used in *Through the Ages: A Story of Civilization.* In this game, players play Event cards into a stack that may, for example, give a bonus to the player with the strongest military. While the player who added that card to the stack knows it will be drawn in the future, the way that the events are played from stacks makes it very uncertain how many turns it will be before it is drawn. While a player may have had the strongest military when he or she played the event into the stack, he or she may not by the time it is actually drawn.

Sample Games

Core Worlds: Galactic Orders (Parks, 2012)
Empire Builder (Bromley and Fawcett, 1982)
Evo (Keyaerts, 2001)
Monopoly (Darrow and Magie, 1933)
Robinson Crusoe: Adventures on the Cursed Island (Trewiczec, 2012)
Terra Mystica (Drögemüller and Ostertag, 2012)
Through the Ages: A Story of Civilization (Chvátil, 2006)
Warhammer 40,000 (Chambers, Johnson, Priestly, and Thorpe, 1993)

ACT-18   Narrative Choice
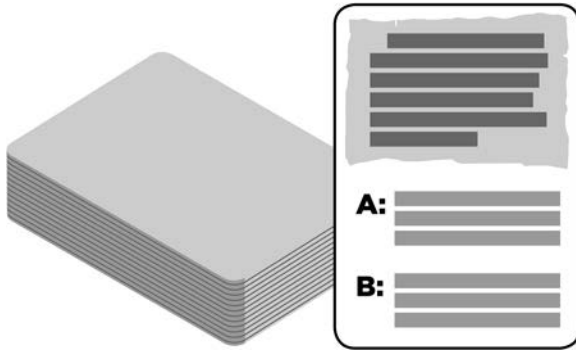
Description

Multiple action options are presented to the players via a narrative format.

Discussion

With the rise of *Dungeons & Dragons* in the 1970s, game designers looked for new ways to incorporate storytelling into game design. One of the earliest to do this was the late-1970s *Choose Your Own Adventure* book series, which began with *The Cave of Time.* In this series, at the end of short chapters, the reader would be presented with a series of choices, which would lead to other pages, and ultimately a good or bad conclusion.

This system has been adopted as part of more traditional tabletop games, with an early example being *Tales of the Arabian Nights.* In this game, after moving to a space, players are directed to read a numbered paragraph in a large book to reveal what adventure the character is experiencing. These vignettes offer choices of actions for the players, for example, "Bribe the Guard" or "Fight Your Way In." These lead to other numbered paragraphs, which give the result, and their impact on the game state.

Frequently, these systems use Stat Checks (RES-02) to determine the outcome. For example, if you choose to "Fight Your Way In," you may need to make a check against Strength or some other ability. Then, the paragraph will tell you to proceed to different paragraphs depending on the outcome. Sometimes, not all the actions will be available to you, unless you previously found some item, or built up some stat to a sufficient level.

The strength of this mechanism is in the ability to bring more structured narrative and flavor to the game, without the players needing to create narrative from abstract game elements. However, the weakness of Narrative Choice systems is that the adventures they present can be disconnected from the main course of the game, and thus can lack context. *Arabian Nights* ties the adventure to the player through the use of different environments (sea, desert, etc.), and player status (married, despondent, cursed) that impact the adventures. But the adventures themselves do not combine into a single coherent narrative.

Dead of Winter: A Crossroads Game attempts to deal with this contextual issue by the Crossroads mechanism. The player to the right of the active player draws a Crossroads card that applies to that turn. It begins with an action trigger, such as entering a certain location, which is not revealed to the phasing player. If the player takes the trigger action, the Crossroads card holder interrupts the action, and presents the mini-adventure to the player. This means that the game designer can write an adventure knowing, for example, that it will specifically take place at a certain location. This mechanism has two different implementations that are worth noting. In the tabletop version, the Crossroads cards were written so that players were told what the outcome of each choice would be prior to making the choice. In the digital implementation, the outcome of each choice is hidden from the players. This is another example of input vs. output randomness, but in the context of making a meaningful narrative choice, hiding the mechanical, in-game outcomes creates a more character-driven experience.

Games like *Ambush!* and *Action Castle* maintain narrative cohesion at the expense of replayability. In these games, players are presented with specific triggers or situations. For example, in *Ambush!*, moving into a specific space during a certain stage of the mission will always trigger the same paragraph to be read. *Action Castle* emulates computer adventure games, and has players interact with the game via short phrases (like "take sword"), but the same phrases will always work in the same situation.

Other games strive to maintain cohesion by locking narrative choices so they only appear at specified times. In *Near and Far,* some of the narrative passages are tied to the game's campaign mode, to preserve a more cohesive story. *Risk Legacy* uses a gating mechanism (see "ACT-15" in this chapter) to ensure that specific story beats are only revealed once players have progressed the campaign sufficiently to make the story fit.

Legacy of Dragonholt, a role-playing-style game (RPG), is built nearly entirely on the Narrative Choice mechanism. A tracker sheet for both the

characters and the scenario allows for lots of stat-checking to determine progress. Scenarios often come with a map of areas to visit. Each area, when visited, will have different options open to the players based on a few factors. If you come to a store at night, the store will be closed. If you go to market on market day, there will be lots to explore. In addition to tracking time of day and day of the week, players also track when they complete specific story points, as instructed by the game book. These story points create a kind of memory for the system, so options presented to players may depend on their having marked a specific story point. If, for example, the innkeeper goes missing, the game will instruct players to mark, say, story point B7. Later options might direct players to read different texts if point B7 is marked, to ensure that there is story continuity and that the innkeeper who went missing isn't behind the bar the next morning. *Legacy of Dragonholt* shares more in common with pencil-and-paper interactive fiction books than with traditional tabletop board games, but it is an excellent example of how flexible the Narrative Choice mechanism can be.

Sample Games

Above and Below (Laukat, 2015)
Action Castle (Soren, 2009)
Ambush! (Butterfield and Smith, 1983)
The Cave of Time (Packard, 1979)
Choose Your Own Adventure: House of Danger (Uncredited, 2018)
Dead of Winter: A Crossroads Game (Gilmour and Vega, 2014)
Dungeons & Dragons (Arneson and Gygax, 1977)
Legacy of Dragonholt (Valens, Clark, Flanders, Mitsoda, and Spyridis, 2017)
Near and Far (Laukat, 2017)
Risk Legacy (Daviau and Dupuis, 2011)
Tales of the Arabian Nights (Freeman, Goldberg, Kaufman, Maroney, and Rolston, 1985)

4

Resolution

~

In Chapter 3, we discussed Actions and the different ways that players can choose or plan Actions. Sometimes, the outcome of an Action is specific and definite. No chance is involved. For example, in *Chess*, if you take the Action of moving your Knight forward, it will happen exactly as you plan.

However, some Actions have uncertain outcomes. Some are related to performative uncertainty, as in a dexterity game, where you may not succeed in performing your planned action. Others relate to chance interfering with your plans, which we call Output Randomness (see Chapter 6). For example, in *Risk*, you may declare an attack on Kamchatka (the Action), but the result of that Action is not known when it is declared. You may win without losing a single army, lose all your armies, or some result in between.

Because Output Randomness is most often associated with conflict, many of the examples here are from war or battle games. However, there are plenty of Actions that require some form of resolution, such as trying to sell at a market, finding a hidden object, upgrading a technology, or approving a budget in a political-economic game. This chapter discusses different ways of determining the outcomes of Actions.

RES-01   High Number

Description

Each player is represented by a numeric "strength," and the higher strength wins the conflict.

Discussion

This is a basic and common way of resolving conflicts. The base strength can be represented by a fixed value for the piece, as in *Magic: The Gathering*, or by the position on the board, as in *Cosmic Encounter*, where each defending token adds 1 to the total defender strength. Sometimes, strengths may be determined randomly. In *War*, players flip cards to compare strengths. Many games include a "roll-off" mechanism, where each player rolls a die, and the high roll wins the contest.

Frequently, base strength can be modified by some factor. In *Magic: The Gathering*, there are a variety of cards that impact the Power and Toughness of creatures (comparable to an Attack and Defense strength). In *Cosmic Encounter*, each player secretly plays a number card which is added to the number of tokens on their side, including allies.

Modifiers need to be carefully considered by the designer. Their inclusion increases the complexity of the resolution, particularly if they come from multiple sources. For example, a game may grant the defenders a +2 modifier because they are defending in the mountains, and a −1 modifier because they are infantry defending against artillery. While the math seems simple, having a long list of modifiers for the players to apply can be burdensome. It is better to have these factored into intrinsic strengths, or through card play or dice pools whose outcomes model the probabilities desired.

The dungeon-crawler *Descent: Journeys in the Dark* uses a High Number mechanism combined with a Dice Pool. The characters, weapons, and situation add or remove dice from the attacker's and defender's pools. They

then each roll their dice, and count hits (for the attacker) or shields (for the defender). The higher number prevails. If the hits exceed the shields, the defender takes damage based on the difference.

This attrition-style mechanism, where damage is caused based on the delta between the final strengths, is common. A less common alternative is Winner Takes All, where the losing side is completely eliminated at no cost to the winner. The game *4000 AD* implements this mechanism, which can lead to tension and wide swings, as a 10-strength fleet will completely eliminate both a 1- and 9-strength fleet at no loss to itself. The lack of realism can impact theme and immersion.

An Ordered High Number system is used in the *Risk* series of games. In these games, Attacker and Defender typically roll multiple dice. The highest roll of the Attacker is compared to the highest of the Defender, second-highest Attacker roll to second-highest Defender roll, etc. Because of the simultaneous ordering of the rolls from highest to lowest, this system has lower variance than just making N independent rolls. It also offers a much simpler way to give an advantage to the player with greater numbers without resorting to modifiers. If a player has a 3:1 numerical advantage, they simply roll three dice versus the opponent's one, which is much simpler than gaining modifiers to the die roll.

An interesting twist on this system is to switch whether the high or low number is the winner within the same game. For example, in *Battleball*, a simulation of futuristic football, players are represented by different size dice—six-sided, eight-sided, twelve-sided, or twenty-sided. When moving, rolling higher is better. High rolls allow a player to move farther. The D20 wide receivers are great at dashing down the field. The D6 linesmen are much less mobile. But when trying to tackle, both players roll their die against each other, but now the low number wins. So, linesmen will usually tackle wide receivers. However, this system leaves open the possibility for surprises in both running and tackling.

In numeric comparison systems, some means to deal with ties needs to be included. In combat simulations, these ties typically are awarded to the defender; however, any tie-breaking mechanism can be used.

High Number and Stat Check mechanisms can be combined for a more nuanced mechanism. See the Stat Check section for more details.

Sample Games

4000 AD (Doherty, 1972)
Battleball (Baker, 2003)

Cosmic Encounter (Eberle, Kittredge, Norton, and Olatka, 1977)
Descent: Journeys in the Dark (Wilson, 2005)
Magic: The Gathering (Garfield, 1993)
Risk (Lamorisse and Levin, 1959)
War (Unknown)

RES-02   Stat Check
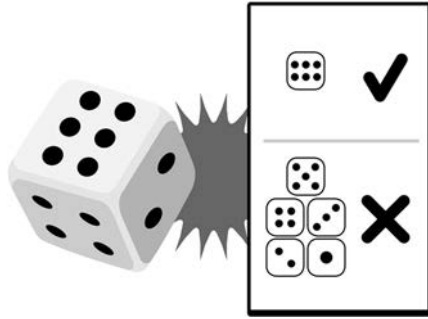
Description

There is a target number required to succeed at some test. A random number is generated (by card draw, die roll, etc.), which is compared to the target. If it meets or exceeds the target, the action succeeds.

Discussion

This mechanism goes by a variety of names, including Task Check, Skill Check, and others. It is commonly used in role-playing games (RPGs), such as *Dungeons & Dragons*, where a player makes a roll against a stat or target number. Typically, if it is lower than the target, the action succeeds.

Stat Check is frequently used in battle games, like *Axis & Allies*, where each type of unit has a target number that it is trying to meet or exceed to score a hit. *Warhammer* uses a similar system with six-sided dice, and rates units as, for example, 2+, 3+, or 4+, if it needs to roll a 2 or higher, 3 or higher, or 4 or higher. The group of minis (or single mini) is then rated for how many dice it gets to roll. One attack may be rolling 8 dice for a 4+, and another might be 5 dice for a 3+. Target numbers may be modified based on characteristics of the defender, such as terrain, or special armor, but the rolls are typically not opposed by the defender, as in the High Number Mechanism. The defender may get to respond, but as a separate check. For example, in *Warhammer*, defending figures may be able to cancel hits by making a Saving Roll of 3+. Performing a series of Stat Checks lengthens

the game, but also increases tension and can simplify the rules as modifiers and other effects are localized.

Some games keep the target number the same but differentiate units by the type of dice rolled. For example, in the 1986 *Fortress America*, the target number is always a "5" or greater. But some units roll a six-sided die, some an eight-sided die, and others a ten-sided die. This makes it easier for the player to perform combat, as there is only one target number to remember.

In the 2012 reprint, this was simplified further by simply having "hit" or "miss" symbols on the relevant dice, so only two sides of the six-sided die have the Hit symbol, but four sides of the eight-sided die do. While this system was a visual improvement, it was more opaque as to the strengths of the dice. Players would have to examine all sides of the dice and memorize their odds, which was fiddlier than with the target number system.

Some games combine a Stat Check with a High Score system. One example is the miniatures game *Infinity*. The *Infinity* mechanism has each player trying to roll below their stat using a 20-sided die, but higher than their opponent. For example, let's say two units are shooting at each other, and one has a skill of 17, and the other a skill of 12. First, a player is only eligible to hit if they roll less than or equal to their target. If only one player succeeds on the Stat Check, that player hits their opponent. If both miss, then there is no effect. If both hit, then the player with the higher roll (but still below the target) succeeds and the other fails. Combining systems like this gives a compact and fluid method for a variety of results.

Stat Checks can incorporate modifiers. The same considerations that are discussed in High Number apply here.

Sample Games

Axis & Allies (Harris, Jr., 1981)
Dungeons & Dragons (Arneson and Gygax, 1977)
Europe Engulfed (Evans and Young, 2003)
Fortress America (Uncredited, 1986)
Infinity (Rodriguez, 2005)
Nexus Ops (Cantino and Kimball, 2005)
Titan (McAllister and Trampier, 1980)
Warhammer Age of Sigmar (Uncredited, 2015)

RES-03   Critical Hits and Failures
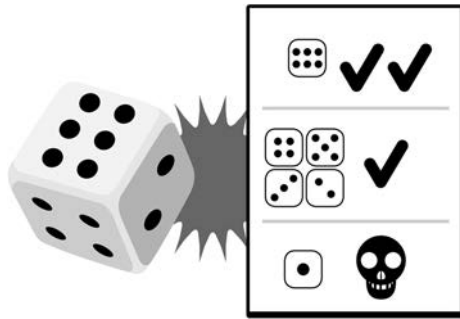
Description

Dice are rolled, and those exceeding a target number generate a success. Certain rolls (typically the highest and/or lowest on the die) generate additional success or extreme failure.

Discussion

Critical Hits (and Critical Failures) add variance to a resolution system, in essence lengthening the "tail" of the result distribution. They also add excitement by creating jackpot effects, similar to a slot machine. You have a pretty good idea of what the result range may be, but Critical Hits and Failures, depending on implementation, can give bonuses that make success possible where it normally might not be, or add tension to an overwhelming attack.

In its standard implementation, Critical Hits double the damage of an attack, or improve the result in other ways. However, there are several novel uses of Critical results.

Uncharted Seas and *Dystopian Wars*, miniatures games from Spartan Games, have an "exploding dice" critical system. In this system, players roll a number of six-sided dice, and get a success on a 4 or higher. On a roll of a 6, however, the player gets two successes, and also gets to reroll those dice. Additional 6s on the rerolls will yield additional double-successes and more rerolls. In this system, it is theoretically possible to get any number of hits on any attack, which can make for dramatic moments as dice are rolled and rerolled, and successes accumulate.

Warmachine/Hordes allows for a critical hit any time at least two dice in an attack show the same result. Normally an attack is made with two dice, but this number may be increased or decreased, naturally changing the frequency of critical hits or removing their possibility (as in the case of a one-die attack) without any additional rules overhead.

Advanced Squad Leader generates extra effects (both positive and negative) on rolls of 2 or 12 on two six-sided dice. A 2 causes a Heat of Battle effect, which may cause a hero to emerge, a unit to upgrade, or the squad to go berserk and charge the enemy; a 12 may cause weapons to break or other negative results, resolved by rolling on a separate chart (RES-04). These add a lot of variety to combat results and force players to adapt to changing circumstances.

Several games convert special symbols or excess successes (if rolling against a target) into a type of currency that can be spent on various beneficial effects. Sometimes called Surges, these can also give a lot of tools to the player to use tactically, beyond simply resolving the combat. The miniatures game *Malifaux* adapts this by using a card flipping system to generate random combat strengths, but allowing special abilities to trigger if the correct suit flips.

Sample Games

Advanced Squad Leader (Greenwood, 1985)
Dungeons & Dragons (Arneson and Gygax, 1977)
Dystopian Wars (Fawcett, Flack, Glover, Padfield, Sammarco, and Sinclair, 2010)
Malifaux (Caroland, Johns, and Weber, 2009)
Uncharted Seas (Fawcett and Sims, 2008)
Warmachine/Hordes (McVey, Snoddy, and Wilson, 2003)

RES-04   Ratio/Combat Results Table

Description

The Attacker and Defender each total their strength. This is then expressed as a ratio and is used to index into a Combat Results Table (CRT). A dice roll then determines the result of the conflict.

Discussion

Pioneered in the earliest war games, the CRT has become a staple of the genre. CRTs are typically indexed by calculating the ratio of the attacker's strength to the defender's. For example, if the attacker has a strength of 8, and the defender a strength of 4, the 2:1 column would be used, as 8 is two times 4. Typically, these are rounded down in favor of the defender, so a 9–4 attack would also be resolved on the 2:1 column.

Once the correct column is determined, a die is rolled to determine the final result. In war games, this is typically some combination of force eliminations, damage, or retreats.

The use of the CRT gives the designer a lot of control over potential results. It is possible to have a tightly grouped range of outcomes from 1 to 6, or a wild variation. In addition, the designer has many hooks to apply other effects. For example, the attacker or defender strength can be modified, the final die roll can be modified, or the column used can be shifted left or right. This flexibility has led to its continued popularity in the wargaming community.

Designs have taken the CRT in a wide variety of directions. *Squad Leader* eschews strength ratios, and simply has the column chosen by the firepower of the attacker. It also includes a mechanism called Cowering, where if doubles are rolled (two dice are rolled in *Squad Leader*), the column used is shifted one to the left, to a weaker column. Elite troops are typically immune to Cowering. This is a good example of the opportunities CRTs offer to differentiate and apply various effects.

Some games have the column selected by a differential between Attacker and Defender rather than a ratio. This has the benefit of simplicity, as division can be confusing when the strengths get large. Differentials are less realistic, however, as they will treat a 10–8 attack the same as a 3–1 attack. However, if the values are bounded within a reasonable range, differential CRTs can give a lighter feel.

Some games use charts with various conditions as the columns to resolve Actions and random events. *Down with the King* has charts that players roll on to determine the result. For example, there are separate charts for Gambling, Seducing, and Carousing. The solitaire game *B-17: Queen of the Skies* includes charts for damage from German fighters, bombing accuracy, and the result of crew member injuries.

While charts can encapsulate a large amount of information and give a lot of flexibility to the designer, they can be intimidating to players and tedious to use, and are considered old-fashioned. However, in the right situations, they can be quite useful.

Sample Games

B-17: Queen of the Skies (Frank and Shelley, 1981)
Down with the King (Rahman and Rahman, 1981)
France 1944: The Allied Crusade in Europe (Herman, 1986)
Gettysburg (Roberts, 1958)
Squad Leader (Hill, 1977)

RES-05 Die Icons
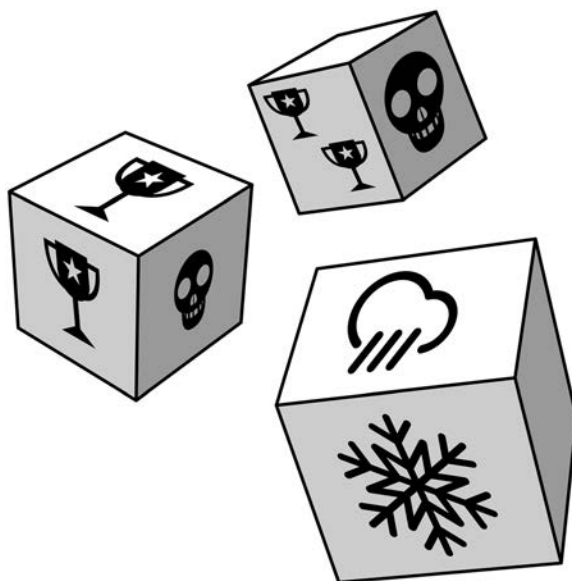
Description

The player rolls a number of dice. Any die showing the target icon is a success.

Discussion

This mechanism is typically a subset of High Number (RES-01) or Stat Check (RES-02), as the number of successes ultimately reduces to one of these. However, we are listing this as a separate mechanism due to some subtleties in the implementation and player interaction.

The use of Die Icons has several advantages over traditional dice with numbers on the sides. First, using an icon makes it simpler for players to interpret the result, if they are properly chosen. Counting icons is inherently simpler from a cognitive perspective than adding numbers or checking to see if numbers on dice exceed certain values. This ease increases as the number of dice rolled increases and is particularly true if the target value may vary depending on the game situation. In this case, icons are easier to parse at a glance, especially if they are thematic.

For example, contrast *Warhammer* with *Memoir '44*. In *Warhammer*, a player may roll four dice for an attack, looking for a 5 or higher for a success (a 5+, in the parlance). After rolling, the player needs to look at the dice, remembering the target number. *Memoir '44*, like *Warhammer*, bases the number of dice rolled on the nature of the attacking unit. The icon that counts as a hit is based on what is being targeted. When attacking an Infantry, each Infantry symbol counts as a hit. When attacking Armor, each Armor symbol counts as a hit. In addition, the grenade icon always counts as an additional hit. Since there are two infantry icons, one armor icon, and one grenade icon on a die, an attack on infantry is equivalent to a 4+, and an attack on armor a 5+. But the player does not need to have a chart of those numbers or track them in any way. It is intuitively obvious to look for the icons of what you are attacking, and just count them up. Advanced players can understand the symbol distribution, but it is not necessary. The die does the heavy lifting.

The distribution of icons also gives the designer fine-grained control over possible combat outcomes and allows for multiple effects to be determined. The *Memoir '44* dice also include a Retreat icon, which applies in conjunction with the removal effects, allowing for a wide variety of outcomes.

A disadvantage of icons is that it is very difficult to deal with modifiers, or other ways to modify attacks based on, for example, terrain, or different quality forces.

Some games, like *Descent*, deal with this by having dice of different qualities, relating to the power and skill of the character, weapon, armor, or other equipment. The dice can be segregated into types like attack, defense, knockback, special, and others, again allowing the designer fine-grained control over possible outcomes while making it simple for the player to interpret. They just need to see what color dice need to be rolled, and then read off the icons to see the results.

Eclipse is a hybrid of this system, with three colors of dice representing different powers—yellow (the weakest), orange, and red. However, *Eclipse* does not use icons on the dice. Standard numeric pips are used, but with non-standard distributions to model the varying power levels.

At the extreme end, *Dragon Dice* has custom dice for every single unit in the game. The same effect can be represented by different icons for different units. For example, Move icons may be boot prints for one creature and hoof prints for another. Although it increases thematic immersion, having so many icons can make it difficult for players to quickly parse results. It can also create production challenges, and indeed, *Quarriors!*, the game that launched the

concept of collectible dice games, struggled to find a publisher because of the manufacturing challenge the game presented.

While they are most commonly used on dice, icons can be placed on cards to be flipped for resolution as well. Similar considerations apply, except that it is rare to have draws from multiple different decks the same way games like *Descent: Journeys in the Dark* have players roll different dice.

Sample Games

Command & Colors (Borg, 2006)
Descent: Journeys in the Dark (Wilson, 2005)
Dragon Dice (Smith, 1995)
Eclipse (Tahkokallio, 2011)
Memoir '44 (Borg, 2004)
Quarriors! (Elliott and Lang, 2011)

RES-06   Card Play
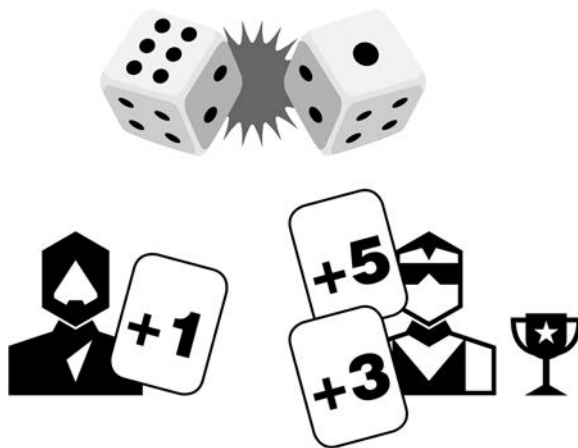
Description

Each player simultaneously or sequentially plays one or more cards. These modify the base outcome of a conflict and allow various special abilities to apply.

Discussion

This resolution system places more control in the hands of the players. In its simplest form, the player plays a number card to be added to the base results, as in *Cosmic Encounter.* However, this can be taken in a wide variety of directions to make combat more tactical.

Kemet resolves conflict by giving players a strength based on the units in the battle. The players then each select a single Combat Card that modifies the outcome. It has three values: strength bonus, shield value, and damage caused. The strength bonus is added to the unit strength to determine the victory, while the shield value and damage bonuses determine how many opposing units are killed. Units are only removed based on those values, not winning or losing the battle. Players may know they are most likely to lose, and choose a Combat Card with little strength bonus, but high damage value, so they destroy as many units as possible, possibly setting up for a counter-attack, or even a Pyrrhic victory, should they succeed in eliminating all the attacking forces. This type of counter-play leads to a lot of Yomi (UNC-01), as players try to outguess their opponent's intent.

Kemet also has players exhaust Combat Cards that they use, plus one additional card, in each battle. When all cards are exhausted, they are recovered, similar to an Action Retrieval system (ACT-03). This gives players more decisions to make and gives savvy players the opportunity to track which Combat Cards may still be in play for their opponents.

A variety of other games allow players to play cards that modify the battle in more extreme ways. *Starship Samurai* allows each player to include one battle card, the effects of which may range from a simple strength addition, to the ability to redeploy units into or out of the battle, changing the situation drastically. *Magic: The Gathering* and other collectible card games (CCGs) use card-based Interrupts (TRN-17) to allow for a wide variety of different effects.

Card systems can get quite complex. *We the People* has players draw a hand of tactics cards to resolve battles, the size of which is based on a variety of factors, including strength. Players then alternate playing or matching an opponent play. The first player who is not able to match the opponent loses the battle, so the player with more cards will typically win, but not always, and seizing the ability to lead the card play becomes a critical tactic. In *Starcraft: The Board Game*, players have a small hand of cards that have abilities that trigger based on the units involved in the battle. As in *We the People*, players alternate card play to gain an advantage. *Starcraft* allows players to purchase upgraded tech cards to shuffle into their combat decks, but there is no guarantee they will be available, leading to opportunities for bluffing (UNC-01).

The disadvantage of the more sophisticated card-based systems is that they slow down play quite a bit as battles are resolved. In a two-player game, this may not be an issue, but it is a consideration with higher player counts. Nonetheless, these systems can offer enormous design opportunities, and the ability to model a wide range of thematic moments and stratagems, as a play of *War of the Ring* will demonstrate.

Sample Games

Cosmic Encounter (Eberle, Kittredge, Norton, and Olatka, 1977)
Hannibal (Bauza, 2010)
Kemet (Bariot and Montiage, 2012)
Magic: The Gathering (Garfield, 1993)
Starcraft: The Board Game (Konieczka and Petersen, 2007)
Starship Samurai (Vega, 2018)
War of the Ring (Di Meglio, Maggi, and Nepitello, 2004)
We the People (Herman, 1993)

RES-07   Rock, Paper, Scissors
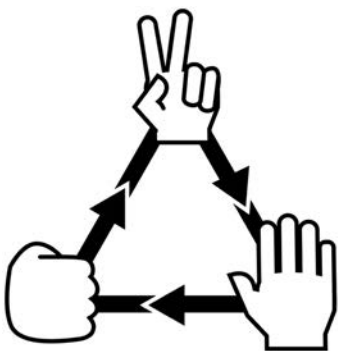
Description

There are three possible options, and they are cyclically superior (A beats B, B beats C, and C beats A).

Discussion

Rock, Paper, Scissors (RPS) is one of the core resolution mechanisms. Unlike High Number or Stat Check, it is *intransitive.* A *transitive* relationship means that if A beats B and B beats C, then A beats C. For example, simply comparing strengths leads to a transitive relationship.

Adding intransitive elements to conflict resolution leads to interesting and novel decisions for the players. For example, many Napoleonic wargames treat the relationship between infantry, cavalry, and artillery as intransitive. Infantry beats cavalry (defending in a square), cavalry beats artillery, and artillery beats infantry. Note that "beats" in this context means "has an advantage over." It does not typically mean wins 100% of the time. *Age of Mythology: The Board Game* is an example of this type of system.

There are a variety of ways to implement an RPS-based resolution system. Some games, like *Secret Labyrinth* and *Darkover*, have players secretly select one of three options (literally, RPS in the case of *Secret Labyrinth*), reveal, and compare. Others will give bonuses or penalties to players based on their choices, such as a modifier in a High Number system (RES-01), varying the number of dice to be rolled, or changing or adding target icons.

One system that is infrequently used is Intransitive Dice. In this implementation, there are three different dice with varying values on the faces. These are mathematically designed so that, on average, die A will roll higher than die B, die B higher than die C, and die C higher than die A. Typically the advantage is around 55–45, so it can be difficult to engineer a dominant advantage, but over the course of many rolls the player that gets the best matchups will come out ahead.

The RPS mechanism can also arise indirectly from the interaction of player choices. For example, in *Hoity Toity*, players who go to the Auction House may choose to play a Cash card, to buy an artifact; a Thief, to steal a Cash card; or a Detective, to catch a Thief. Similarly, in *Nobody But Us Chickens*, players can play a Chicken for points, a Fox to catch a Chicken, or a Dog to catch a Fox. If there are more than three players, the interactions and choices can get complex for players to decide, while being easy to resolve.

Hoity Toity has the additional wrinkle that if multiple players select Thief, they cancel out, which has shades of the Prisoner's Dilemma (RES-08) and Sealed Bid with Cancellation (AUC-05).

Many games extend a hierarchical system by including a wrap-around with the weakest piece defeating the strongest. For example, in *Stratego*, the Marshall is the strongest piece, but it can be defeated by the Spy, the weakest. Similarly, in *Frank's Zoo* the Elephant is the strongest card, but it is defeated by the Mouse. This adds a beneficial layer of uncertainty to these games. *Stratego* without the possibility of losing your Marshall would be a much poorer game.

Sample Games

Age of Mythology: The Board Game (Drover, 2003)
Darkover (Eberle, Kittredge, and Olatka, 1979)
Frank's Zoo (Matthäus and Nestel, 1999)
Hoity Toity (Teuber, 1991)
Nobody But Us Chickens (Nunn, 2003)
Secret Labyrinth (Kobbert, 1998)
Stratego (Mogendorff, 1946)
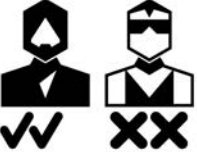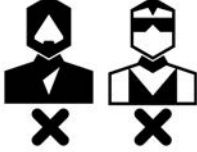
RES-08   Prisoner's Dilemma

Description

Each player has a choice between Cooperating or Defecting. Total payoff is maximized if both players Cooperate, but if one Defects and the other Cooperates, the Defector will score more individual points.

Discussion

The Prisoner's Dilemma (PD) is one of the core Resolution mechanisms. Players choose to either cooperate with each other, or defect. A typical payoff chart is shown in the diagram above. Since the payoffs if both defect or both cooperate are equivalent for both players, this system only works if there are more than two players, even if only two are involved in the PD. If there are only two players, neither gains ground if they select the same option, so picking Defect is always the correct strategy.

As indicated by the traditional choice names of Cooperate and Defect, the PD brings elements of trust to the forefront, and strong elements of Yomi

(UNC-01). This can lead to emotional investment by the players, or reaction to being betrayed, particularly in longer games where the outcome can have a significant impact on player position.

An example of this is *Diplomacy*, a 6–8 hour game of conquest in Europe. The players representing Austria and Italy start with two key spaces and armies, Venice and Trieste, adjacent to each other at the start of the game, the only such situation among the seven players. In *Diplomacy*, players write down orders and reveal them simultaneously (TRN-09, for more on Simultaneous Action Selection). After the initial negotiation phase, Italy and Austria need to decide if they will move away from their common border (Cooperate) or invade (Defect). If both Cooperate, it can set them up for a reasonable start and good long-term relationship. If both Defect, no one loses a home supply center, but it will sow distrust and put them behind the other players as their forces will not have moved. And if one Cooperates and the other Defects, a home supply center will be lost, putting one player at a significant disadvantage.

While *Diplomacy* frequently creates high emotional moments like this, the Prisoner's Dilemma does not always need to involve such high stakes. For example, in *Hoity Toity*, players in the Auction House may choose to purchase an item, play a Thief card to steal money, or a Detective card to catch a thief. While this is fundamentally an RPS mechanic (RES-07), if multiple players choose Thief, they cancel out and no thieves gain any benefit. This adds elements of a PD, but in a lighter way as there is no negotiation in *Hoity Toity*, and for players the stakes are much lower.

Another example of this is *Incan Gold*, where each turn players need to decide simultaneously if they are continuing to explore an abandoned temple in search of treasure or will return home. Sometimes earlier treasure and artifacts may be left behind players, to be scooped up by players who leave the cave. In particular, artifacts create a PD, as they are only gained if a single player chooses to leave the temple. If multiple players leave the cave on the same turn, none gain the artifacts. This implementation also tends to be light as there are potential benefits for both staying and leaving, and no negotiation prior to selection.

Cosmic Encounter introduces the PD through Negotiation cards. Conflict is resolved by both attacker and defender selecting a Number card from their hand. The player with the highest Number card plus Force strength wins the battle. Players also have the option to play a Negotiate card, if they have one, instead of a Number card. If both players Negotiate, they are allowed to negotiate a deal, which can be mutually beneficial. However, if only one

Negotiates, that player automatically loses, and the player and their allies lose all their involved forces. In an interesting twist, the player who chose a Negotiate card in this situation gains a small compensating benefit, but not Allies. Thus, inviting Allies to join you in a battle where you know you will play a Negotiate is its own form of Defection, building a secondary PD into the core mechanism.

Dead Last has two players dividing up four loot cards, and adds a third option to the classic PD. In addition to Share and Steal (Cooperate/Defect), players may also choose Grab One, which guarantees exactly one loot card, possibly leaving three for the opponent.

Sample Games

Cosmic Encounter (Eberle, Kittredge, Norton, and Olatka, 1977)
Dead Last (Grosso and Patton, 2016)
Diplomacy (Calhamer, 1959)
Fantasy Business (Boelinger, 2002)
Hoity Toity (Teuber, 1991)
Incan Gold (Faidutti and Moon, 2005)
Zombie in my Pocket (Lee, 2010)

RES-09   Alternate Removal
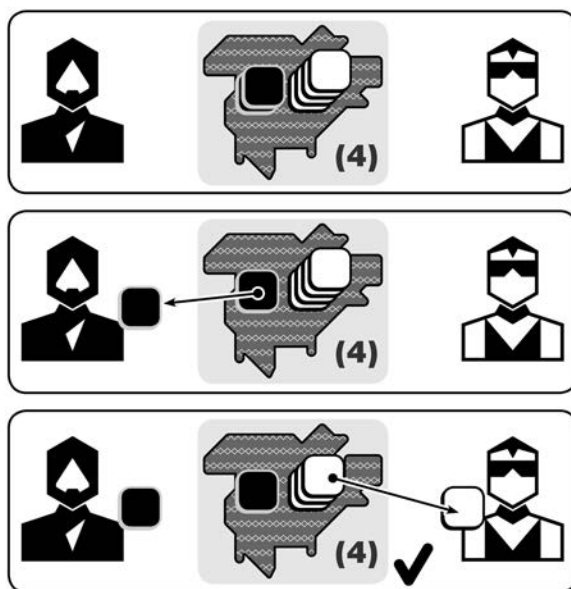
Description

The player with fewer units removes one. Then players alternate removing units until reaching a set number, one player is out of units, or some other stopping mechanism.

Discussion

The system of Alternate Removal was first introduced in the 1980 game *Civilization*. Conflict in *Civilization* only needs to be resolved if the total number of tokens in an area exceeds its carrying capacity (representing the fertility of the particular area), which ranges from 1 to 5. If the total quantity exceeds this, the Alternating Removal process is initiated. Tokens are removed, starting with the player with the fewest, until the total number of tokens no longer exceeds the carrying capacity.

If players have equal numbers of tokens, the tied players each remove a token at the same time.

This system has a variety of intriguing features. First, it is strictly deterministic. It is a determinative process with no hidden information. This

is rare among conflict resolution mechanisms. Second, coexistence in an area is allowed and common. Many games with conflict or battles for areas only permit a single player to ultimately occupy an area or control it in the case of Area Majority games (ARC-02). This gives more flexibility for players to negotiate and settle borders.

Finally, it gives the design hooks for special abilities later in the game. For example, if only one player in a Conflict has Metal Working, they are always the last to remove a token.

Inis uses a similar removal system, except that players have the option of removing a unit or discarding a card. In addition, players have the option, after taking a casualty, to withdraw from the battle rather than pursue the conflict. Notably, this doesn't trigger a retreat from the disputed territory.

Sample Games

Civilization (Tresham, 1980)
Inis (Martinez, 2016)

RES-10 Physical Action
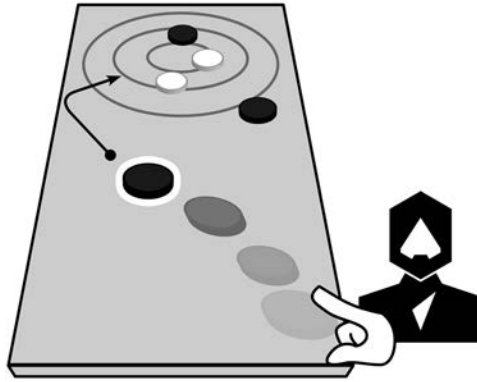
Description

A Physical Action needs to be performed by one or more players to determine the outcome of the action.

Discussion

The most common type of Physical Action used for this type of resolution is "flicking" a puck or disc towards a target zone. *Catacombs* uses flicking for almost all resolutions. Heroes are represented by discs and are flicked to move through the dungeon. When firing arrows or fireballs, smaller discs are placed on the board and flicked towards the enemy to resolve the attack. *Ascending Empires* and *Seal Team Flix* also have players flick on a map of the playing surface to resolve actions. *Space Cadets* has an abstract target board that determines whether the target is hit and the amount of damage.

Adding a physical element, like flicking, makes for an intuitive, tense, and exciting play experience by adding Performance Uncertainty (Chapter 6). It is somewhat skill-based, but also acts as a randomizer. However, its use does give a game a lighter feel, as it can give a "toy" feel, as players interact with the game pieces. In a highly strategic game, this can lead to a disconnect, as the strategy is undercut by what can feel like a highly variable resolution mechanism. It also can make players that are poor at performing the activity feel like they are at a disadvantage throughout the game, and it is not something that they can compensate for, leading to a negative experience.

While flicking is a popular implementation of a physical resolution mechanism, there are a wide variety of alternatives. *Flip Ships* has a form of flicking, with a ship being placed on a platform and flipped off of it. *Dungeon Fighter* has players bounce a die off the table surface to land on a target.

Wallenstein introduced the Cube Tower. This is a tower with internal ledges. Players resolve a conflict by taking a specific number of cubes of different colors (the attacking and defending cubes, for example), and throw them into the tower. The cubes that emerge at the bottom determine the outcome. Cubes that get stuck inside are left behind and may emerge in future conflicts. If a player knows he or she has many cubes stuck in the tower, he or she may be more inclined to initiate conflicts, for example.

Stacking is used in a variety of games, including *Junk Art*, *Animal Upon Animal*, and *Bausack.* Typically, in these games, the stacking is the core of the game. It does not tell the player the outcome of some other action, like a combat, but instead determines whether the player stays in the game or not or is eliminated. However, *Meeple Circus* is a stacking game in which players create their own stacks, attempting to include specific pieces in different configurations to qualify for both private and public goals (VIC-11).

Other games have objects being removed, like *Ker-Plunk* and *Don't Break the Ice.* There are also games that combine removal with stacking, including *Jenga* and *Villa Paletti*.

Finally, there are a variety of outlier physical mechanics, including throwing darts in *Dart Wars*, distinguishing items by feel in *Space Cadets*, egg-removal in *Gulo Gulo*, the pie launcher of *Pie Face*, finger gymnastics of *Climb!*, and popping balloons in *Kamasutra*. A comprehensive listing of these is far beyond the scope of this book.

Another variation on physical resolution is Speed Matching. Cards (typically) are flipped up, and players need to see if two match, and either slap the cards or grab a totem. Games that incorporate this type of system include *Jungle Speed* and *Scan*. The inclusion of a physical action can give players an opportunity to feint and induce a mistaken grab by other players, leading to a penalty in some games. *Jungle Speed* incorporates this tactic.

Introducing a physical action gives the designer a chance to add physical handicaps to mix up the challenges and make them harder. It also ups the "zaniness" factor, giving games a lighter feel. *Dungeon Fighter* has players act with their non-dominant hand, eyes closed, and various other physical challenges.

Sample Games

Animal Upon Animal (Miltenberger, 2005)
Ascending Empires (Cooper, 2011)
Bausack (Zoch, 1987)
Catacombs (Amos, Kelsey, and West, 2010)
Climb! (Michaud, 2008)
Dart Wars (Reymond, 2006)
Diskwars (Gelle, Hardy, Jolly, and Petersen, 1999)
Don't Break the Ice (Uncredited, 1965)
Dungeon Fighter (Buonfino, Silva, and Sorrentino, 2011)
Flick 'em Up (Beaujannot and Monpertuis, 2015)
Flip Ships (Klenko, 2017)
Gulo Gulo (Granau, Kramer, and Raggan, 2003)
Jenga (Scott, 1983)
Jungle Speed (Vuarchex and Yakovenko, 1997)
Junk Art (stacking) (Cormier and Lim, 2016)
Kamasutra (Faidutti, 2000)
Ker-Plunk (Goldfarb and Soriano, 1967)
Meeple Circus (Millet, 2017)
Pie Face (Uncredited, 1964)
Scan (Glass, 1970)
Seal Team Flix (Ruth and Thomas, 2018)
Space Cadets (Engelstein, Engelstein, and Engelstein, 2012)
Villa Paletti (Payne, 2001)
Wallenstein (Henn, 2002)

RES-11   Static Capture
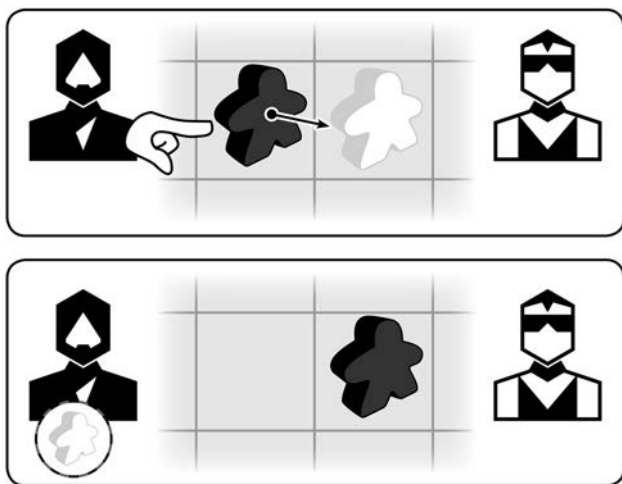
Description

Pieces are captured when another piece occupies or passes over their space.

Discussion

This is one of the oldest conflict resolution mechanisms, going back thousands of years.

Typically combined with a movement system, a token is affected in some way when another enters its space. For example, it may be captured (*Chess, Checkers*), sent back to start (*Parcheesi, Trouble, Sorry!, Backgammon*) or switch sides (*Shogi*).

In order to make capturing challenging and meaningful, the movement of pieces needs to be restricted in some fashion. *Chess* and *Shogi* allow pieces to move to defined squares, while the *Parcheesi* family of games uses a randomizer and the moved piece must, typically, move the full amount. More information about Movement schemes is in Chapter 10, but a few features are worth noting here.

In most cases, the moving piece will make the capture on its final space of movement. This is particularly true of games where movement is controlled by a randomizer, with pieces typically needing to land on an opposing piece by exact count to make a capture. There are exceptions, of course. *Sorry!*

has specific areas where a piece may slide through multiple spaces, sending all pieces encountered back to start, and in *Checkers* pieces make jumps to capture, and can string together multiple jumps as a single move.

Motion is not a requirement for this mechanism. *Through the Desert* allows players to claim Palm Trees for points by extending a chain of camels across the board. Camels do not move once placed, but players may only add to chains in certain ways. *Expedition* has a similar chain mechanism, as players attempt to "capture" certain cities on the board to earn points.

Tash Kalar: Arena of Legends has players placing pieces on the board, trying to achieve certain patterns. When those patterns are realized, enemy pieces may be captured.

While not truly Static Capture, there are games that feature pushing as a means to capture, including *Abalone*. In these games, there are typically restrictions on which pieces can move and be captured. In these games, pieces or groups of pieces may push other pieces, typically with the intention of pushing them off the board or into a dead space. Because of the physical nature of pushing, particularly chain pushing, the physical design of the board and pieces usually facilitates the mechanism. *Abalone* has a grooved board that makes it easy to push marbles in the six hexagonal directions.

Sample Games

Abalone (Lalet and Levi, 1987)
Backgammon (Unknown, 3000 BCE)
Checkers (Unknown)
Chess (Unknown, ~1200)
Expedition (Kramer, 1996)
Onitama (Sato, 2014)
Parcheesi (Unknown, 400)
Shogi (Unknown)
Sorry! (Haskell, Jr. and Storey, 1929)
Tash-Kalar: Arena of Legends (Chvátil, 2013)
Through The Desert (Knizia, 1998)
Trouble (Kohner, Kohner, and Kroll, 1965)

RES-12 Enclosure
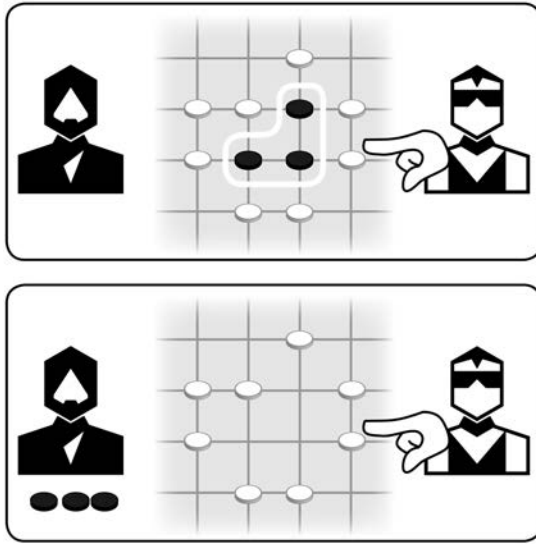
Description

Players are trying to surround pieces or key areas.

Discussion

Dating back thousands of years, *Go* is one of the most famous examples of this type of conflict resolution. If a group of connected stones has no empty spaces adjacent to it, it is captured. While the stones themselves are static, the evolution of groups gives *Go* a dynamic feel.

Reversi implements Enclosure by allowing players to flip tiles of the opposing color that are between two tiles of their own color.

The nature of Enclosure games makes certain regions of the board more or less desirable. In *Reversi* the corner and edge spaces are more valuable, as it is harder or impossible to surround pieces located there. Similarly in *Go*, players typically start near corners, where it is easier to enclose territory and make stones safe, and then extend down the sides and towards the middle.

Elements of Enclosure games can also be seen in games like *Samurai*, where the objective is to surround board elements with tiles. These are both Enclosure games and a type of Area Majority (ARC-02), where tiles can be

placed so that they are adjacent to multiple objectives, contributing strength towards both.

In general, good enclosure games are designed so that pieces are both trying to enclose and at risk of being enclosed themselves, or there are several possible ways they can be used for Enclosure.

Sample Games

Go (Unknown, 2200 BCE)
Reversi (Mollet and Waterman, 1883)
Samurai (Knizia, 1998)
Through the Desert (Knizia, 1998)

RES-13   Minimap
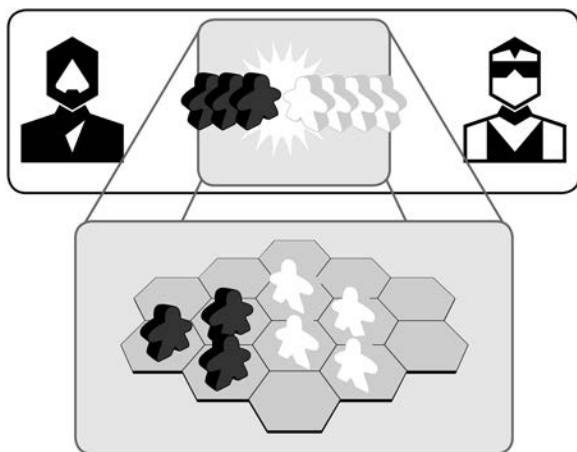
Description

When a conflict is initiated, pieces are moved to a separate board for resolution.

Discussion

This is a meta-mechanic, as it is a way of organizing conflict, and relies on one of the other methods discussed here to actually resolve individual attacks.

One of the earliest examples of the Minimap mechanism is the 1962 game *Bismarck*. In this naval game, players secretly move task forces around a search board. When they discover each other, task forces are moved to the Battle Board, where the conflict is actually resolved (through a Stat Check mechanism in *Bismarck's* case). It is like "zooming in" on the battle to get more tactical. Video games like *Master of Orion* and *Heroes of Might and Magic* implement a similar system.

The Battle Board was later extended in *Titan*, where players move groups of monsters (Legions) around a master board. When two opposing Legions meet in the same space, they are transferred to a battle board to actually fight the battle. *Titan* is notable in that it has a different battle board for each type of terrain, and the side the defender sets up on depends on the direction from which the attacker entered the space. This makes battles extremely variable and tactical.

A much simpler version of this mechanism is used in *Axis & Allies*, which uses a Battle Board not to give tactical options to the players, but as a player aid to help organize and keep track of the strength of units, what they need to roll to hit, and which units are still able to fire. This is more of a graphic design technique than a mechanism. A similar system is seen in many Force Commitment games (ARC-06).

A variation on this can be seen in *Buck Rogers: Battle for the 25th Century*, which has both a solar system map and separate maps for each planet, co-located on the board. Unlike *Titan*, which has many, many Jungle spaces, all of which resolve on the Jungle board, here the planet maps are very specific to the planets in the solar system, and act as a place for units on the planet to be located, and for ground battles to be resolved.

Sample Games

Axis & Allies (Harris, Jr., 1981)
Bismarck (Roberts and Shaw, 1962)
Buck Rogers: Battle for the 25th Century (Grubb, 1988)
Titan (McAllister and Trampier, 1980)

RES-14   Force Commitment
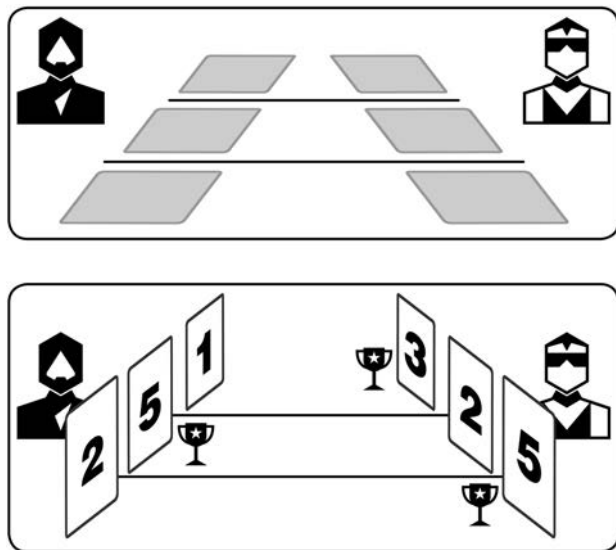
Description

The players select how many of their forces they will commit to the battle to different categories. The players then reveal their assignments, and resolve.

Discussion

This is a meta-mechanic that builds on other Resolution means. Typically, players will reveal their strengths in different categories, with the High Number gaining the benefit (RES-01). If the allocation portion of this mechanism is done secretly, it is a Sealed Bid Auction, so considerations noted in that section (AUC-05) apply here.

In one of the earlier implementers of this system, *Dune*, and its successor *Rex: Final Days of an Empire*, have players allocating to just two categories: in the battle or out of the battle. Units that a player commits to a battle will be lost. In addition, all units from the loser are eliminated. This system makes the players evaluate giving themselves a higher chance to win (by committing larger forces), versus preserving as much of their force as possible, by committing fewer forces.

Dune augments the mechanism by allowing the players to also commit leaders and bonus cards along with forces. This uncertainty is critical for this system to work, so that the player with the larger force cannot just bid one more than the size of the smaller.

A modified form of this system has the loser only losing part of its force, not the full force. This makes the decision of Force Commitment for the larger side more challenging, as it introduces more Yomi (UNC-01) by giving a broader possible strength range of the commitment of the smaller force.

Cry Havoc and *Rising Sun* give more options to players for Force allocation. In *Cry Havoc*, players may allocate forces to take control of the area being fought over, cause casualties, or take prisoners. Control and Prisoners are executed by the player with the most forces in that region, while Cause Casualties is executed by all players who have units there. Tactics cards can also be played to affect the battle in various ways.

Rising Sun has a similar system to *Cry Havoc*, except with slightly different assignment options (the ability to sacrifice your own units for victory points, for example). Also, while *Rising Sun* uses the same simultaneous secret assignment of forces, *Cry Havoc* has the Attacker allocate first, followed by the Defender. Secret assignment emphasizes the guessing nature and leads to a lighter, more random feel, while sequential assignment removes luck, but may give an advantage to the side that places last (the Defender, in the case of *Cry Havoc*).

These types of systems give the players a lot of flexibility in the goals they want to achieve in a battle. Are they trying to hold ground? Cause losses? Earn points? The player can use the options to pursue a variety of strategies.

Sample Games

Cry Havoc (Rodiek, Oracz, and Walczak, 2016)
Dune (Eberle, Kittredge, and Olatka, 1979)
Rex: Final Days of an Empire (Eberle, Goodenough, Kitteredge, Konieczka, Olatka, and Petersen, 2012)
Rising Sun (Lang, 2018)
Scythe (Stegmaier, 2016)

RES-15   Voting
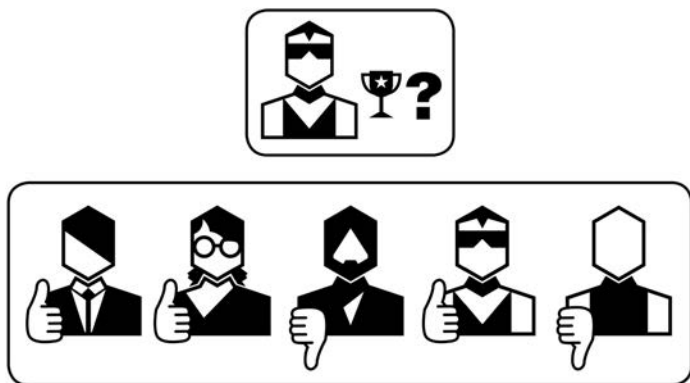
Description

Players vote on whether a proposed action will occur or not.

Discussion

The Voting mechanism is often used in games with a political theme, although some, like *Die Regeln Wir Shon*, are more abstract. In some games, each player gets one vote. In others, players may have multiple votes that they can apply.

Voting is in many ways an Area Majority mechanism (ARC-02), except that players are either on the "Yay" or "Nay" sides, rather than only able to win something individually. This can lead to shifting coalitions of players on either side of an issue, as interests align and diverge, underscoring the political nature of this resolution means.

The item being voted on can fit at various levels in the game. In *Junta*, players are voting on whether the budget proposed by El Presidente passes, and the money distributed to the players. This is an example of a sub-system of the game that links to other key mechanisms. *The Republic of Rome* is similar in that players are voting on which characters should gain offices, how wars are conducted, and even execution of characters. These decisions then feed into other systems to propel the game forward.

Some games have players vote on actual changes to the rules themselves. *Democrazy* and *Das Regeln Wir Shon* are the prime examples of this, as players play cards that contain possible game rules, and players vote on them.

Proposing rules that help several players, including yourself, but yourself a little bit more, is a key skill in the game, and can lead to intriguing and exciting game play. These rules changes range from what actions are available to players, how resources can be exchanged, how the game ends, and what contributes towards victory.

Galactic Destiny, which includes a Galactic Senate mechanism, also has players vote on new rules to be added, but these are not the core of the game. They impact what actions players may perform, and what is legal or illegal.

As mentioned earlier, some voting games, like *Das Regeln Wir Shon*, give one vote to each player, and a simple majority wins. However, there are other variations. In *Junta* and *Republic of Rome*, the players represent factions, and so they may have control of various characters or blocks of voters that give them more than one vote. If players are powerful enough, they may even be able to pass anything they want.

Some games vary from simple majority in votes. In *Article 27: The UN Security Council Game*, a unanimous vote is required for a measure to pass. Bribery and other inducements are encouraged to get players to vote your way.

While voting systems can be dynamic and interesting, they also encourage negotiation, which can make this mechanism very time consuming. This should be carefully considered by the designer when determining if it is appropriate for the player experience desired.

Sample Games

Article 27: The UN Security Council Game (Baden, 2012)
Battlestar Galactica: The Board Game (Konieczka, 2008)
Das Regeln Wir Schon (Schmiel, 1994)
Democrazy (Faidutti, 2000)
Galactic Destiny (Mauro, O'Maoileoin, Pulis, and Pulis, 2007)
Hoax (Eberle, Horn Jr., Kittredge, and Olatka, 1981)
Junta (Goldberg, Grossman, Marsh, Marsh, Tsao, and Vrtis, 1978)
The Republic of Rome (Berthold, Greenwood, and Haines, 1990)
The Resistance (Eskrisdge, 2009)
Werewolf (Davidoff and Plotkin, 1986)

RES-16   Player Judge

Description

One player, the judge, decides the outcome of the Action.

Discussion

The standard use of this resolution mechanism is in games where players are performing a task, and there is no objective criteria as to which is best, so one player acts as Judge to select the winner. For example, in *Apples to Apples*, one player is the Judge, and the other players select one of their noun cards to match an adjective card. The Judge then selects which they think is closest.

Similarly, in *The Big Idea*, players use noun cards to pitch products that fulfill a need, and the Judge selects which they like the most.

In these games, the role of Judge either rotates around the table in a regular fashion, or passes to the player who won the last round. The latter is a type of balancing mechanism as the Judge usually cannot score, so it gives other players an opportunity to close the gap (VIC-18).

This Player Judge mechanism allows players to tailor their answers to the Judge, and what their preferences might be. The best implementations of this system have anonymous responses, as in *Apples to Apples*. In games where it is known which player goes with which answer, the Judge may go against the spirit of the game, and deliberately not select players due to their score, rather than the intrinsic worth of their submission. Personal relationships that are outside of the game may also impinge (like someone giving preferential treatment to a spouse). While this mechanism is typically used in lighter games,

so this may not be that much of an issue, it is still a consideration, particularly when playing with children who may be more emotionally involved.

Some games, like *Say Anything*, sidestep this issue by having the players bet on which answer the Judge will select. This makes it impossible for the Judge to game the system and keeps players more involved in the game.

Sample Games

Apples to Apples (Kirby and Osterhaus, 1999)
The Big Idea (Ernest, 2000)
Cards Against Humanity (Dillon, Dranove, Halpern, Hantoot, Munk, Pinsof, Temkin, and Weinstein, 2009)
Say Anything (Crapuchettes and Pillalamarri, 2008)

RES-17   Targeted Clues
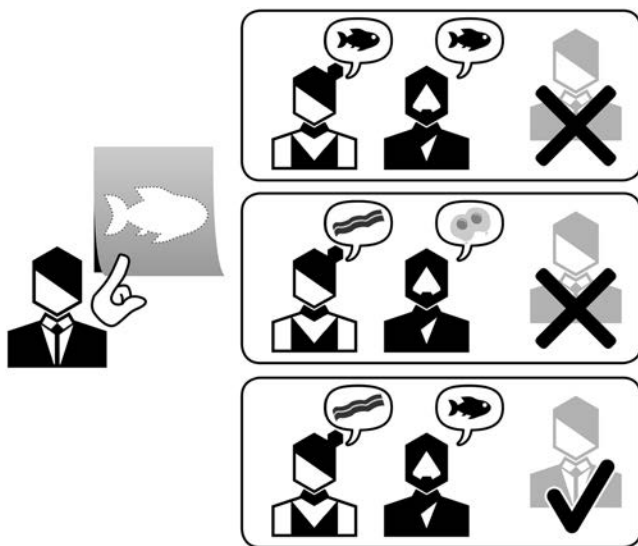
Description

A player gives clues that he or she wants some, but not all, players to guess.

Discussion

This resolution mechanism is often used in party games, or lighter social games. The core idea is that one player is giving clues to the group about, typically, a word or phrase, and the other players try to guess the answer. However, it is bad for the clue-giver if either no players guess correctly, or if all players guess correctly. The player scores the most points when some of the players guess correctly, but not all.

For example, in *Barbarossa*, players make small clay sculptures to represent something—a lion, for example. If no one guesses that it is supposed to be a lion, or if everyone does, the sculpting player does not score. They need to make a sculpture that is somewhere between obvious and obscure. *Dixit* operates similarly but with pictures.

Decrypto is a variation on this idea. The players are broken up into two teams. One team has a list of four words that all players on the team can see. The clue giver needs to give a clue that will allow their team to select the

right word from the list. The other team can hear those clues but does not see the word list. Over several rounds, players need to give multiple clues for the same word, and if the other team can figure out the word or concept, they can win. Thus, clues need to be given that are straightforward enough for your team to get it, without the opposing team figuring it out.

Sample Games

Barbarossa (Teuber, 1988)
Cluzzle (Hamilton, 2004)
Decrypto (Dagenais-Lesperance, 2018)
Dixit (Roubira, 2008)

RES-18   Tie-Breakers
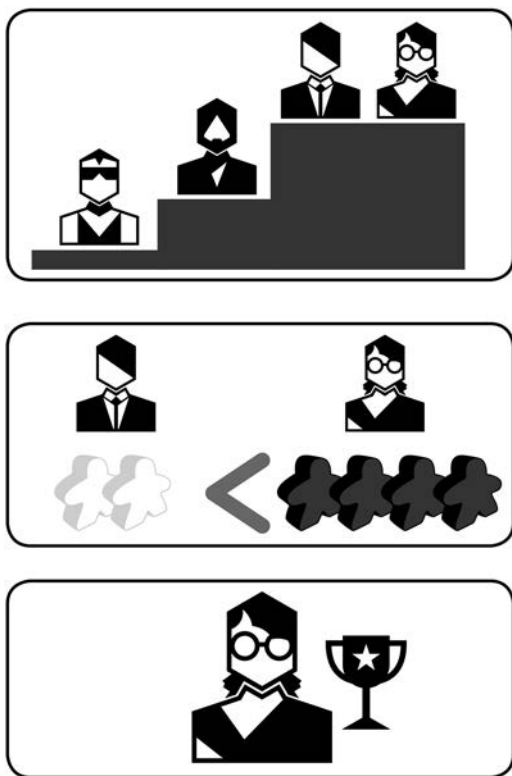
Description

If a resolution results in a tie, players look to an alternate means to break it.

Discussion

While we include this in Resolution, this is a meta-mechanic that can apply to Victory, Auctions, and many other mechanisms. While there are a wide variety of tie-break mechanisms, they typically fall into one of these categories:

- *Resource*: The player with the most or least of a particular resource will break the tie. For example, in *Trade on the Tigris*, if the score is tied at the end of the game, the game is won by the player with the fewest Barbarian tokens. If these are also tied, the win goes to the player with

the most Culture tokens. In a two-player game this resource may take the form of a Priority token, with the player holding the Priority token breaking the tie, and then passing the token to their opponent. This is similar to the Possession arrow in basketball.

- *Positional*: The player in a specific position in the turn order, or on a track, will break the tie. A common tie-breaker is for the player who is closest to the First Player will break the tie. As another example, in *Rising Sun*, the player who is higher on the Honor track wins the tie. In conflict games that use dice to resolve, ties will go to the defender. *Risk* works this way, for example. If the defender rolls a 6, they will win regardless of what the attacker rolls. Most often ties go to the defender, but in some games that want to encourage aggression, ties may go to the attacker.
- *Random*: Players roll off or use some other randomization means to break the tie. This can be exciting but time-consuming. For certain tie-breakers, most notably if players are tied at the end of the game, breaking the tie randomly will be unsatisfying for players.
- *Secondary Values*: Components have a unique secondary value that is used to break ties. For example, in *Libertalia*, the role cards have a number on them that says when in sequence they should be played. For example, the Monkey card is #2, and is executed before the Cabin Boy which is #5. If two players both play a Monkey, they both have #2 on them. However, to resolve the tie, there is a smaller Flag number on each card, which is unique between all players. For example, one player has a 3 Flag on their Monkey card, while another has a 5, so the 3 would go first. The flag numbers are distributed so that on average each player will win the same number of ties. This gives a quick and simple way to break ties.

The procedures described above, like in *Libertalia* and *Rising Sun*, determine which player wins the tie. However, some games award a tie-breaking ability to a specific player, who then decides which player is chosen. For example, in *A Game of Thrones*, the player that wins the auction for the Throne gains the ability to decide who wins all ties. This immediately brings Negotiation elements into the game, (ECO-18) as players can lobby the player who resolves ties.

It is also possible to not have a tie-breaker. For in-game resolutions, ties may be resolved as *friendly* or *unfriendly*. A *friendly* resolution means that all tied players gain the benefit of the action. If the leader in a particular category scores ten points, for example, if players are tied, they all score the ten points.

In *unfriendly* ties, tied players receive a reduced award or no award at all. Either way all players are treated equally.

For final victory, some games do not offer tie-breakers, and have the players share in the victory. This may or may not be acceptable to players depending on the likelihood of ties and the length and seriousness of the game. If possible, tie-breakers for final victory should reward the players who have had a harder route to win, for example by going last in the turn order, by acquiring a harder-to-obtain resource, or by using fewer resources overall.

Sample Games

A Game of Thrones (Petersen and Wilson, 2003)
Libertalia (Mori, 2012)
Rising Sun (Lang, 2018)
Risk (Lamorisse and Levin, 1959)
Trade on the Tigris (Engelstein and Sturm, 2018)

RES-19   Dice Selection

Description

Player rolls multiple dice and selects one based on a rule.

Discussion

In this Dice Selection mechanism, players roll a set number of dice and choose one of them to represent the result. The most common implementation of this has players roll two dice and select the highest or lowest. *Dungeons & Dragons* uses this system and refers to the two states as "advantaged" and "disadvantaged." An alternative is for players to roll three dice, and to choose the median die.

A High/Low selection is a way for designers to skew single die results fairly significantly towards the high or low end. Conversely, a median selection system makes extreme results unlikely.

Result	1 Die	2 Dice, High (%)	2 Dice, Low (%)	3 Dice, Median (%)
1	16	3	31	7
2	16	8	8	19
3	16	14	19	24
4	16	19	14	24
5	16	25	8	19
6	16	31	3	7

The table above shows the chances of rolling different numbers with a standard die roll, rolling 2 dice and selecting the highest (or lowest), and rolling 3 dice and selecting the middle value. Rolling 2 dice and selecting the highest almost doubles the chances of a result of 6, and a result of 1 is 80% less likely than with a standard die roll. Selecting the middle out of 3 dice emphasizes results of 3 and 4, while cutting the chances of a 1 or 6 in half compared to standard roll.

Root presents a related system, where 2 dice are rolled for battles, with the Attacker taking the higher roll, and the defender the lower. This encourages aggression.

Sample Games

13th Age (Heinsoo and Tweet, 2013)
Dungeons & Dragons (Arneson and Gygax, 1977)
Root (Wehrle, 2018)

RES-20   Action Speed
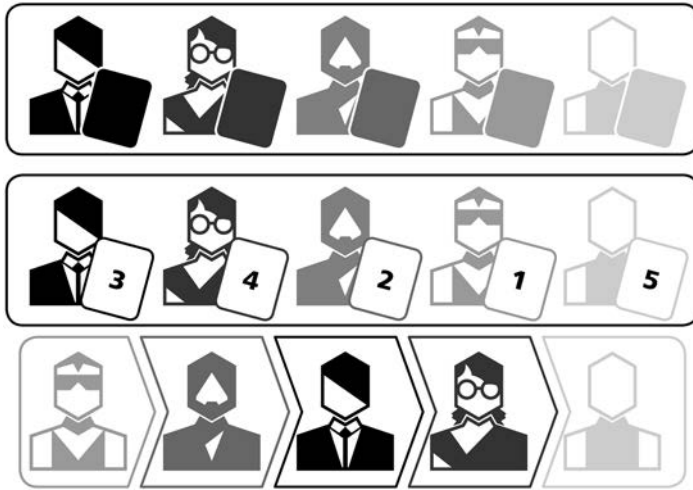
Description

Actions are rated for a speed or initiative. Faster actions are executed first.

Discussion

This system is most commonly used in Simultaneous Action systems (TRN-09). In *Critical Mass*, each player selects an action card from their hand and plays it simultaneously. Each is rated for speed, and faster actions go sooner than slower ones.

Critical Mass uses numeric speed ratings. Some games use descriptors, which can be as simple as Fast or Slow, as in *The Ares Project*, or more thematic, like First Strike in *Magic: The Gathering*.

While this often represents the speed of an action, it can also be more abstract. In *Libertalia*, characters have a priority rating, and operate in order of priority, from lowest number to highest.

Typically if actions have the same speed, they are resolved simultaneously, although a tie-breaker may be used (RES-18). Each card in *Libertalia*, for example, has a unique number on it as a secondary tie-breaker.

Speed ratings give players a clear indication of the order of execution of actions, and the designer another resource to use for balance purposes. Faster actions can be weaker, while slower actions can be more powerful, but more likely to not take effect.

Sample Games

The Ares Project (Engelstein and Engelstein, 2011)
Critical Mass (Chang, 2018)
Libertalia (Mori, 2012)
Magic: The Gathering (Garfield, 1993)
Titan (McAllister and Trampier, 1980)

RES-21   Rerolling and Locking
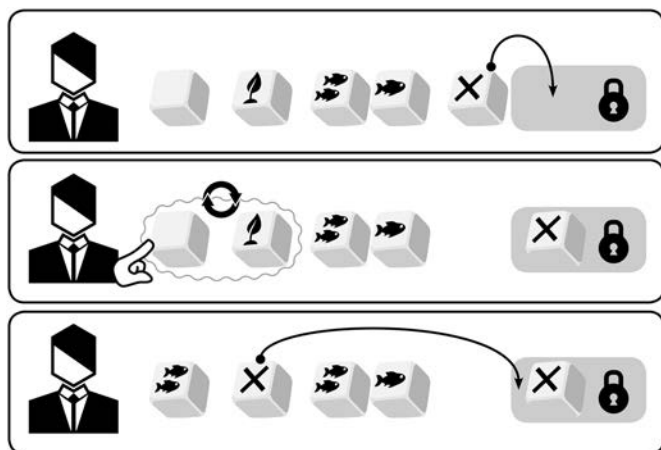
Description

Dice may be rerolled, or may be locked, preventing rerolling.

Discussion

Many people are first exposed to the idea of Rerolling through the classic game *Yahtzee*. After rolling, the player may choose to reroll any number of dice, and may do this twice, for a total of three throws. *Yahtzee* illustrates some typical characteristics of reroll systems:

- When dice are rerolled you must take the result (you can't go back to the first result)
- You can reroll dice regardless of whether they were rerolled or not

There are variations on this, of course, but this is typical.

From a simplistic perspective, where you are interested only in how high the number rolled is, assuming the player rerolls anything that is less than a "4," the reroll will add, on average, 0.75 to the final number. While it is similar in result to a +1 modifier, rerolls are experienced differently by the player. First, the player is choosing whether to reroll or not. This gives them finer-grained control and gives more tactical nuance to the act of rolling than just gaining a

set modifier. Also, rolling dice can be inherently exciting, and rerolls make that happen more frequently. Finally, modifiers (as discussed in RES-02), even +1 modifiers, add to player cognitive load. Just looking at the die result is simpler. However, unlike modifiers, rerolls can result in the final result being worse than the initial roll. Whether this is desirable for the experience is a decision that needs to be determined by the designer.

The opposite mechanism to rerolling is Locking. In a Locking mechanism, certain die faces cannot be rerolled. They are stuck on that face for the remainder of the turn. Having a combination of rerolls and locks brings a Push Your Luck mechanism (UNC-02) to the table, as players need to risk improving their result with locking more dice. *Zombie Dice* is one of many games to implement this combination, as shotgun blast results are locked, and getting three shotgun blasts in total ends your turn with a bust.

Escape: The Curse of the Temple uses locked dice in a real-time dice rolling game to force players to interact with each other (to help unlock the dice of other players), and in general to disrupt the players' flow and force them to make some tough decisions.

Sample Games

Cosmic Wimpout (Swilling, 1975)
Escape: The Curse of the Temple (Ostby, 2012)
King of Tokyo (Garfield, 2011)
Yahtzee (Lowe, 1956)
Zombie Dice (Jackson, 2010)

RES-22 Kill Steal
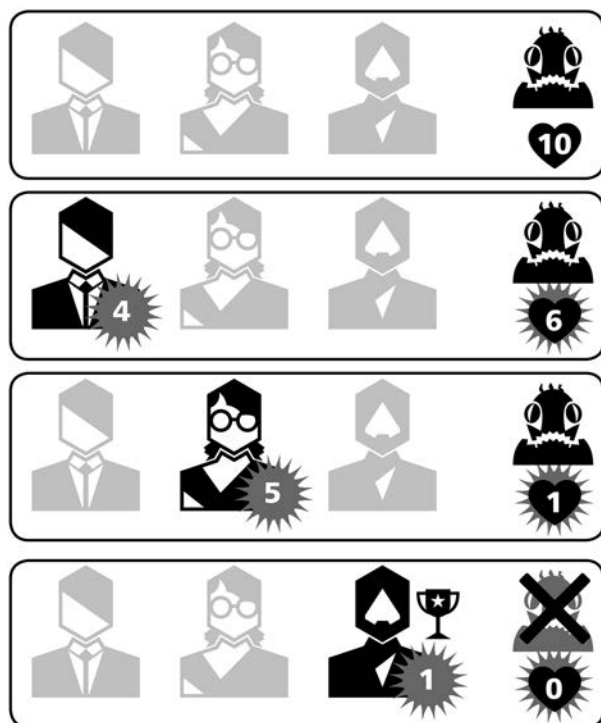
Description

Players contribute towards completing a task, but only the player who finally completes it gets a benefit.

Discussion

This Kill Steal mechanism originated in video games, which is where the term came from. In tabletop games, it is most frequently seen in combat games, where the player scoring the last hit to kill a creature gains the experience, treasure, or other reward.

In *Cutthroat Caverns*, players are trying to defeat creatures to reach and defeat the final boss and win the game. If all players are killed, they all lose, but if at least one survives, the player with the most points wins. See Semi-Co-Op (STR-05) for more details about this type of game structure. But

while all players collectively battle creatures, only the player that lands the final hit that kills it gains the points. This adds a lot of interesting dynamics as players maneuver to land that final blow.

Similarly, in the purely competitive games *Dungeon Run, Wildlands*, and *Space Freaks*, as players attack, if monsters or other players are not defeated, the damage they suffer carries over. Whichever player actually reduces the health to zero gains the reward.

This mechanism is easy for players to understand and work with, but it does make things more contentious and raises the stakes, as if you are performing an attack that should defeat an enemy, but you get unlucky and it doesn't, other players can swoop in for the kill, and your efforts are for naught. Some conflict games, like *Adrenaline*, avoid Kill Stealing by giving points to all players who contributed in defeating that opponent, but at the expense of additional bookkeeping to track who caused what damage.

This mechanism is not limited to combat. It has been used in an economic game like *Valparaiso*, where players construct buildings in districts, but the player who constructs the final house gets a bonus, or an abstract like *6 Nimmt*, where players place cards into rows based on their number, and the person who plays the sixth card takes the whole row (although taking rows is a bad thing, so perhaps this is better classified as a Reverse Kill Steal).

There are echoes of this mechanism in Gating and Unlocking (ACT-15), as many games have tracks that players advance on, but the first player to reach a certain space gets a one-time bonus.

Sample Games

6 Nimmt (Kramer, 1994)
Cutthroat Caverns (Covert, 2007)
Dungeon Run (Bistro, 2011)
Space Freaks (Jantunen and Wikström, 2017)
Valparaiso (Malz and Malz, 2018)
Wildlands (Wallace, 2018)

5

Game End and Victory

❧

Two characteristics that separate games from other activities are having a goal and a defined end-game point. Even in a role-playing game (RPG), which may not have a formal end-game point, a campaign or narrative arc reaches a climax, and though the characters may continue on to the next adventure, goals still exist. Achieving goals, or achieving them better than other players, defines who wins the game. Goals and end-game points are frequently intertwined in games, so we are exploring them together in this chapter. The first section primarily features ways of determining the winner, and the second section contains triggers for ending the game. We conclude this chapter by looking at several ancillary considerations for these topics.

The first few mechanisms detail different aspects of *Victory Points* (*VPs*). Giving points to players is a straightforward way to determine who wins a game. Indeed, any victory system can be expressed as VPs. For example, *Snakes & Ladders*, which is a Race game (VIC-07), could be treated as having points. Rather than reaching square 100, players have points based on the square they are on. The first player to get 100 points (exactly) is the winner and ends the game. This is a trivial example, but designers should be on the lookout for other ways to define victory that better meet the theme of the game. For example, in many business or economic games, the victory goes to the player with the most money, or the one who surpasses a monetary threshold.

Many games allow players to collect points from several different activities. Thousands of years ago, *Go* allowed the players to score points by both surrounding territory and capturing enemy stones. Having multiple ways to gain points gives players multiple strategic approaches and allows players to judge the relative values of actions.

VIC-01   Victory Points from Game State
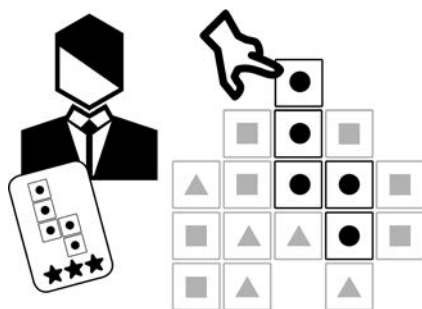
Description

An event causes the Game State to be evaluated relative to some scoring condition. Players earn points based upon how that state matches the condition.

Discussion

In most points-based games, players manipulate the Game State and then gain points based on that State. In some games, like *7 Wonders* or *Agricola*, points are only tallied at the end of the game. However, there are a variety of ways scoring can be triggered, which can be grouped broadly into three categories: Scheduled, Player Action, and Random systems.

In Scheduled systems, there are predefined intervals for when scoring will happen, and players know when they are approaching. For example, in *El Grande*, scoring happens three times during the game, after a set number of rounds. Regardless of which actions the players take, scoring will happen at exactly those intervals. In *Galaxy Trucker*, players score at the end of each run, when a fixed number of hazards are encountered.

In a Player Action system, players are the ones who trigger scoring. Sometimes this is completely at the discretion of the players, and sometimes the precise timing falls within a band of possible values. For example, in *Twilight Struggle*, players that are dealt a Region Scoring card must play it sometime during that hand. However, the exact timing is dependent on a Player Action. *The Expanse Board Game* is more open-ended, as players can draft a scoring card any time one is available. They do not have to do it within a certain time frame.

In a Random system, there are scoring cards or tokens that are mixed in with other items. When these are drawn, scoring occurs. In *Airlines*, Scoring cards are shuffled into the deck. As each is drawn, scoring happens. The drawing of the last card also ends the game (VIC-12). In practice, truly random scoring systems are rare. Frequently, scoring cards are shuffled into the bottom third of the deck, or some similar range. Other random triggers involve seeing two, or even three more of the same type of card, as in *Incan Gold*, where the second hazard of the same type drawn ends the round, or *Ethnos*, where the third dragon drawn ends the age. These systems are random, but their likely outcomes fall within a predictable range.

Games that score just one time, at game end, can fall into any of these categories depending on how the end of game is triggered.

Many systems are a blend between these categories. *Twilight Struggle* has elements of all three, as Scoring is under player control (somewhat), must occur by a definite point in the game (Scheduled), but it is also Random in that it is not known in which round the Region Scoring cards will be in play. Rather than seeing these differences as categorical, we can say that scoring systems have some or all of these characteristics.

Area Majority (ARC-02) and Economic games (Chapter 7) in particular tend to use the VP from Game State mechanism. Area Majority games are very concerned about board state, and their core concept is maneuvering your resources to be able to obtain the most majorities when scoring is triggered. Similarly, in Economic Games, where money is often a proxy for VPs, businesses can pay out based on the state of the boards and markets. *Power Grid*, for example, pays out money based on connected cities at the end of each turn.

A Scheduled trigger is best suited for more strategic games, as it allows for long-term planning. Random triggers are excellent at creating tension but can reward players who simply happened to be in a superior position when scoring occurs. Player Action triggers can be highly strategic or quite tactical, depending on implementation. Players can plan and trigger scoring when it is most beneficial to them, leading to interesting choices. It can also add tension as other players try to take advantage of another player triggering scoring, particularly in games where the possibility of a scoring option is hidden (as in *Twilight Struggle*).

While Scheduled trigger systems are more strategic, they can also lead to bad edge effects. An "edge effect" is a distortion of gameplay when it approaches a boundary. If players know exactly when scoring will occur, the final actions leading up to scoring can be subject to over-analysis and game-lengthening

delays as players attempt to optimize their scores, particularly if there are no hidden elements. Depending on the nature of the game, this can impact players' enjoyment.

Some Schedule-based systems put scoring at the end of each player's turn, like *Small World* and *Through the Ages: A Story of Civilization*. Because of the proximity of the player's actions to when scoring occurs, this blurs with Victory Points from Player Actions (VIC-02). It is worth noting that sometimes these systems award points at the start of a player's turn, not the end; *King of Tokyo* is an example. This means that players need to maintain their state as the other players take their turns and can lead to interesting interactions.

Sample Games

7 Wonders (Bauza, 2010)
Agricola (Rosenberg, 2007)
Airlines (Moon, 1990)
Azul (Kiesling, 2017)
El Grande (Kramer and Ulrich, 1995)
Ethnos (Mori, 2017)
The Expanse Board Game (Engelstein, 2017)
Galaxy Trucker (Chvátil, 2007)
Go (Unknown, 2200 BCE)
Incan Gold (Faidutti and Moon, 2005)
King of Tokyo (Garfield, 2011)
Power Grid (Friese, 2004)
Primordial Soup (Matthäus and Nestel, 1997)
Small World (Keyaerts, 2009)
Through the Ages: A Story of Civilization (Chvátil, 2006)
Twilight Struggle (Gupta and Matthews, 2005)

VIC-02   Victory Points from Player Actions

Description

Players earn points by performing actions.

Discussion

In contrast with Victory Points from Game State, this mechanism gives players points based on discrete actions which may be very local. An example would be capturing stones in *Go*, where each stone is worth one point. Surrounding territory in *Go*, the other way of scoring points, is only evaluated at the end of the game, and until that point can be invaded, shrunk, or expanded.

Eclipse and *Kemet* offer Victory Points (VPs) for winning battles. Many games, like *Lords of Waterdeep, Nexus Ops*, or *Splendor*, have players take actions to complete or claim private or public goal cards (VIC-11), which are worth points.

The relationship between the Action that you perform to gain VPs and how that affects your position and the game state has an important impact on the flow of the game. In some, like *Lords of Waterdeep*, completing quest cards is the main point of the game, and doesn't aid or hinder your ability to perform other actions in the future.

However, in games like *Dominion* and *Splendor*, taking Victory cards can hinder your ability to gain more Victory cards. In *Dominion*, the point cards become part of your deck, but they have no purpose if drawn. They simply clog things up. In *Splendor*, purchasing high value cards does not give you as much of a "bang for your buck" for getting gem bonuses as purchasing lower cost cards. In these games, the players need to choose between building up their engine or economy and cashing in on it. It creates what we call a "pivot,"

where players need to transition between building and scoring. This can be an interesting puzzle for players to work through.

Sample Games

Carcassonne (Wrede, 2000)
Codenames (Chvátil, 2015)
Dominion (Vaccarino, 2008)
Eclipse (Tahkokallio, 2011)
Go (Unknown, 2200 BCE)
Kemet (Bariot and Montiage, 2012)
Lords of Waterdeep (Lee and Thompson, 2012)
Nexus Ops (Cantino and Kimball, 2005)
Splendor (André, 2014)

VIC-03   Temporary and Permanent Victory Points
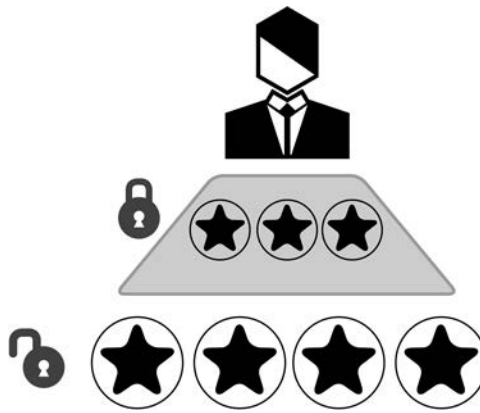
Description

Some Victory Points (VPs) are never lost. Others depend on the game state and may be lost if that state changes.

Discussion

This mechanism is typically used in games where the ending condition is a player reaching a certain number of VPs. For example, in *Catan* the game ends when a player reaches 10 points. In *Kemet* it ends when a player reaches 8 points.

Gaining permanent VPs is important to help drive the game to a conclusion. If all points are temporary, it encourages players to try to take down the leader, and pull them further away from winning, which can lengthen the game. *Munchkin*, where player level is a proxy for VPs, has this issue, as do *Dune* and *Cosmic Encounter*, which require players to hold a certain number of spaces.

Having a mix of temporary and permanent points is a good way of dealing with this issue, as it both drives the game towards a conclusion and offers opportunities for players to make a sudden grab for victory or move their opponents away from victory if they have a lot of temporary points.

Kemet is a good example of this technique. Permanent VPs are gained through winning battles, controlling temples, certain Power cards, and other means. Temporary points are gained by holding special regions on the board.

So, if a player has a bank of VPs but is a few points shy of victory, he or she can launch attacks on spaces to try to gain those last few points and win. This can lead to dramatic moments in the game and can also incentivize players to over-extend themselves and take a chance, which increases tension.

Sample Games

Catan (Teuber, 1995)
Kemet (Bariot and Montiage, 2012)

VIC-04   Victory Points as a Resource

Description

Victory Points (VPs) may be spent as a currency to impact the game state.

Discussion

Economic games, where money represents victory, are the primary examples of this mechanism. Having players spend and invest money to make more money is at the core of business and finds representation in many business games. This forces players to think about valuation and Return On Investment (ROI) as key drivers in their decisions. What is the expected payback on the available options?

This mechanism is also used outside of economic games as well. *Small World* is a great example, where players must spend VPs to skip over certain options on a Draft Track, creating an auction-like mechanic for valuing the races available (AUC-08).

Typically, players will be more cautious about spending VPs when they are not themed as money. In the context of an Economic game, players may not even really think about money as a "Victory Point" currency. We are so used to using it in our everyday lives that we inherently understand the concept of investing for future payout. However, when they are represented as a VPs, Honor, or other thematic element, they take on a different connotation, and players tend to be more emotionally attached to them.

Understanding this underlying psychology gives the designer another tool for shaping the player experience.

Sample Games

1830 (Tresham, 1986)
Age of Steam (Wallace, 2002)

Empire Builder (Bromley and Fawcett, 1982)
The Expanse Board Game (Engelstein, 2017)
Power Grid (Friese, 2004)
Small World (Keyaerts, 2009)

VIC-05   Hidden and Exposed Victory Points
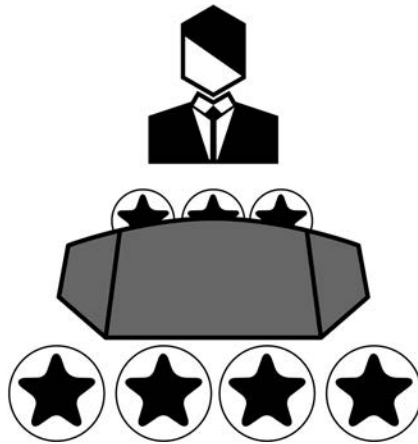
Description

Victory Points (VPs) may be public or private information.

Discussion

The decision of whether to have the number of VPs each player has be public or private information can have a big impact on the play experience. It is particularly dependent on the method for ending the game, and the overall amount of hidden and public information.

If a game has a set number of turns, so that players know exactly when the end is coming, and most information is public, including VPs, it can lead to over-analysis during the last turn, as players try to optimize that last play. Alternatively, there can be situations where the last turn is meaningless because the leading player cannot be unseated (in which case consider VIC-15 Short Circuits). Typically, this is considered undesirable by players, although certain types of games and players can support this. If the points are hidden, or if players are not sure what other players can do, through hidden information, this tendency is alleviated.

As an example, the 1999 game, *Vinci*, had players controlling civilizations that would rise and fall across Europe. Scores were open, and the number of turns was fixed. *Vinci* was in general positively regarded; however, many reviewers found the final turn very unsatisfying. Players scored points at

the end of their turn, and turns were deterministic. Players could calculate exactly how to maximize their score, and often spent quite a bit of time doing so, to squeeze out one more point. Years later, the game was reworked and re-released as *Small World*. The main structural change was the introduction of hidden scores, and a minor random element. These changes were sufficient to alleviate the last turn issue, and give the game a much lighter feel, turning it into one of the staples of the hobby gaming market.

Conversely, having too many hidden bonus points at the end of the game can lead to an unsatisfying play experience. See VIC-06 for a full discussion.

Sample Games

Azul (Kiesling, 2017)
Small World (Keyaerts, 2009)
Suburbia (Alspach, 2012)
Tigris & Euphrates (Knizia, 1997)
Vinci (Keyaerts, 1999)

VIC-06   End-Game Bonuses
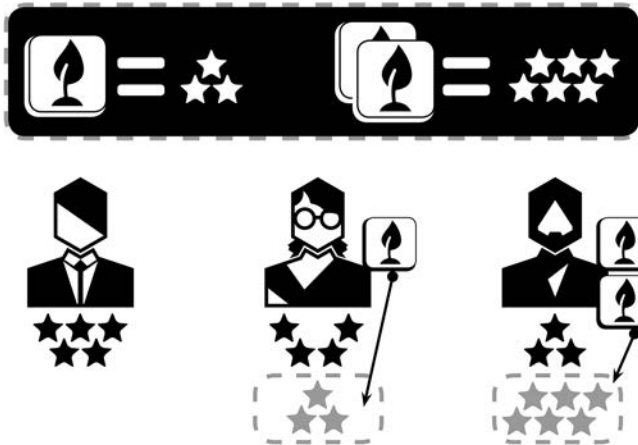
Description

Players earn bonus Victory Points (VPs) at the end of the game.

Discussion

This is a popular technique for giving players strategic direction. Giving players a specific goal to earn points early in the game gives new players an idea of what they should be doing.

End-Game Bonuses can be either Personal or Public. Points from Personal goals can only be earned by the owner, while Public goals may be pursued by multiple players. In some games, goals are non-exclusive, and can be scored by multiple players, while in others, only the player who achieves the goal "the best" receives the points.

Public goals provide a natural interaction point for players and can be used where there is not as much player interaction through the other mechanisms. In their simplest form, public goals are a method for turning any puzzle into a competitive game. In *Dimension*, for example, players use the same set of spheres to build a pyramid that satisfies as many of the six public goals as possible.

Private goals help differentiate players and can give a strong direction to their play. For example, in *Ticket to Ride*, the tickets tell players which cities to connect, but points are awarded (or lost) only at the end of the game. This gives players a literal roadmap of their goals.

There are a number of benefits of keeping personal goals hidden, like making it impossible to precisely determine who is winning and adding an element of deduction as players attempt to block each other. *Ticket to Ride* with exposed goals would be a very different, and more frustrating, experience.

Another design consideration is when and how goals are assigned. Sometimes they are random, and sometimes players must construct or choose their goals. A concern for designers is that if goals are assigned randomly, later in the game players may luck into points by being randomly dealt a goal that they have already achieved. This is one reason earlier assignment of bonuses is generally preferred, unless countered by a penalty for not achieving them (as in *Ticket to Ride*). Games such as *Race for the Galaxy* may give players access to a random selection of possible End-Game Bonuses, but players may choose to build them or not. *Concordia* allows players to draft cards which will give bonus points in specific categories. Having more cards in a given category increases the point value.

Terraforming Mars has an interesting approach to assigning end-game goals. Players may use an action and spend money to unlock specific public End-Game Bonuses. The amount of money required increases each time a new goal is unlocked, so waiting until you are certain about what you want to unlock means spending more resources. Only three goals at most, can be unlocked, putting more pressure on players to decide which goals they think they can win at.

Designers should also consider the ratio between points earned during the game and points earned at the end. If the ratio is very large, and bonuses are complex or hidden, it can be very difficult for players to know where they stand. This increases the skill and experience required to play the game well.

For example, in *Concordia*, all points are earned from End-Game Bonuses. To offset that issue, the game includes an optional intermediate scoring step which is basically a practice scoring so that players can make sure they understand the available bonuses, as well as get a better feel for their relative position.

Sample Games

Concordia (Gerdts, 2013)
Dimension (Luchau, 2014)
Race for the Galaxy (Lehmann, 2007)
Suburbia (Alspach, 2012)
Terraforming Mars (Fryxelius, 2016)
Ticket to Ride (Moon, 2004)

VIC-07 Race
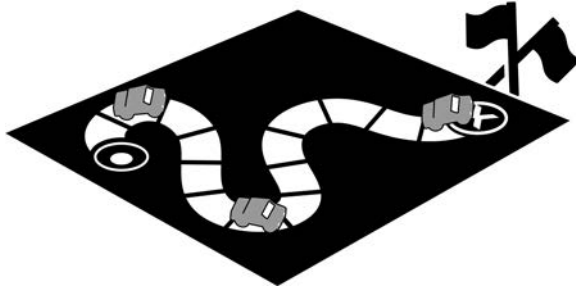
Description

The winner is the first player to reach the end of a track.

Discussion

This mechanism is both a way of determining when the game ends and determining a victory. Both typically occur at the same time as one or more players cross a finish line or reach a goal.

Some of the oldest games in human history are Race games, including *Senet*, *Backgammon*, *Snakes & Ladders*, and *Parcheesi*. They are intuitive about the goal and it is clear who is in the lead at any point.

There are a variety of games that are mechanically Race games, but don't have the trappings of a physical race. Any game that has players trying to reach a certain target quantity of Victory Points (VPs) is, in essence, a race game. *Catan* is a race to get to 10 points. *Empire Builder* is a race to get to $250,000,000.

Conversely, there are games that appear to be a Race, but that are actually not. Typically, these involve betting on the outcome of a race, as in *Royal Turf*, *Downforce*, and *Long Shot*. These are actually equivalent to VIC-01 Victory Points from Game State, where the situation on the board feeds into a point total.

More discussion on actual Race mechanisms are included in , "Movement."

Sample Games

Ave Caesar (Riedesser, 1989)
Backgammon (Unknown, 3000 BCE)
Catan (Teuber, 1995)
Empire Builder (Bromley and Fawcett, 1982)
Formula De (Lavauer and Randall, 1991)
Hare & Tortoise (Parlett, 1973)
Kemet (Bariot and Montiage, 2012)
Lord of the Rings (Knizia, 2000)
Mush! Mush!: Snow Tails 2 (Lamont and Lamont, 2013)
Parcheesi (Unknown, 400)
Senet (Unknown)
Sky Runner (Glimne, Karlsson and Sevelin, 1999)
Snakes & Ladders (Unknown, ~200 BCE)
Sorry! (Haskell, Jr. and Storey, 1929)

VIC-08   Player Elimination
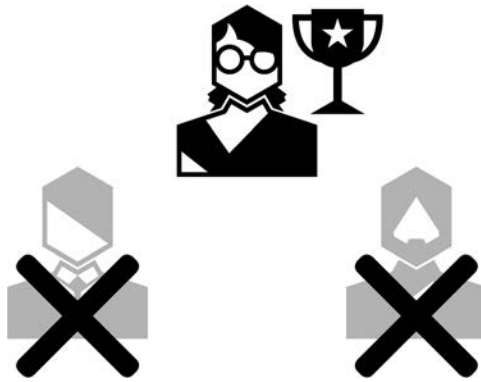
Description

The winner is the only player remaining in the game.

Discussion

Player Elimination is typically considered an anti-pattern, a mechanism to be avoided. From a purely practical standpoint, elimination may result in a player not being able to participate with the group for an hour or more, leading to awkward social situations.

However, it can be effectively used in shorter and lighter games that may be played multiple times in rapid succession. If being eliminated means that you are out of the game for 5 or 10 minutes, as in *Love Letter* or *Liar's Dice*, that is very different than being eliminated early from a game of *Risk* or *Monopoly*.

Player Elimination can also be effective if it fits into the narrative and theme of the game. For example, winning in *Nuclear War* requires all players but one to be eliminated. However, when a player is eliminated, they are given a special Final Retaliation turn where they can launch all the missiles that remain in their hands at the players of their choice. This is both satisfying and thematically consonant, and results in many plays having no winner at all.

A different social dynamic arises in team-based games with elimination, like *Werewolf*. After being eliminated, players can still participate vicariously, as they may still be part of the winning team. *Werewolf* also benefits from being interesting for non-participants to watch.

BANG! extends this two-team concept by adding a third side that switches allegiance. The two main teams are the Lawmen (led by the Sheriff) and the Outlaws. The Outlaws win if the Sheriff is killed. The Lawmen win if the Outlaws and the Renegade are killed. The Renegade wins if all the Lawmen and Outlaws are killed. The Renegade's strategy is to initially help protect the Sheriff, and then turn on the Lawmen once the Outlaws are eliminated. Since roles are hidden, this makes for a very exciting dynamic, even for players who have been eliminated, as their team may still win.

Another variation on Player Elimination is *End-Game Elimination*. Based on certain criteria, one or more players may be eliminated from the possibility of winning the game. For example, in *High Society*, players spend money to gain objects that are worth Victory Points (VPs). The player with the most VPs wins, except that the player with the least money remaining cannot win, so players need to track what other players are doing and avoid overspending. Similarly, in *Cleopatra and the Society of Architects*, players may take more powerful actions by taking Corruption tokens. At the end of the game, the hidden Corruption totals are revealed, and the player with the most Corruption cannot win.

While these examples are deterministic, End-Game Elimination can also be applied randomly. For example, in *The Hunger Games: District 12 Strategy Game*, during the game players may choose to, or be forced to, place tokens into the Tribute pool. At the end of the game, one Tribute token is drawn at random, and the player it belongs to is eliminated from a chance at victory. This system gives players a chance to do risk-reward analysis and is highly thematic with the source material. However, in general, it is not received as favorably as a deterministic End-Game Elimination mechanism as players may have many fewer tokens in the pool and still get chosen, making them feel they lost due to an unlucky break rather than mistakes they made.

Sample Games

BANG! (Sciarra, 2002)
Cleopatra and the Society of Architects (Cathala and Maublanc, 2006)
Coup (Tahta, 2012)
High Society (Knizia, 1995)
The Hunger Games: District 12 Strategy Game (Guild, Kinsella, and Parks, 2012)

Liar's Dice (Unknown, 1800)
Love Letter (Kanai, 2012)
Monopoly (Darrow and Magie, 1933)
Nuclear War (Malewicki, 1965)
Risk (Lamorisse and Levin, 1959)
Werewolf (Davidoff and Plotkin, 1986)

VIC-09 Fixed Number of Rounds
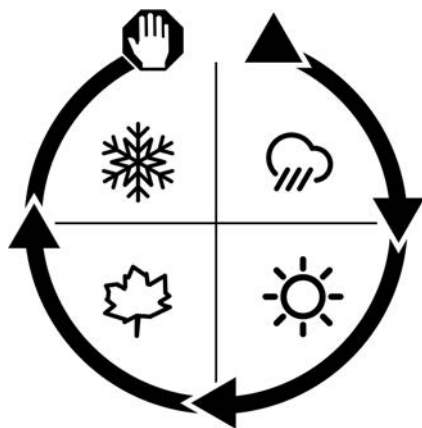
Description

The game ends after a set number of rounds.

Discussion

This is a basic approach to determine when the game will end. However, there are still some considerations for the designer.

First, players must track the current round, often with a marker on a track. It's not a big burden on the players, but it does require them to remember to advance the token at the end of each round.

If possible, a more natural way of tracking the current round is advised. An elegant approach is to have items used in the game come off of the round tracker, instead of pushing a maker along it. In *Castles of Burgundy*, the new building tiles that populate the board each round are divided into stacks and placed on the round tracker. Those tiles are placed on the board each turn, which is a step players are unlikely to forget, and players can glance at the round tracker and see, based on how many stacks remain, how many rounds are left in the game.

Similar techniques can be used for an end-game trigger. *The Speicherstadt* has a deck with a fixed number of cards. When the cards run out, the game is over. This eliminates the need for players to act to advance a marker. The depletion of the cards happens naturally over the course of the game. The

number of turns and rounds is the same every game—but the players do not directly track them.

For example, in *Modern Art*, the end of each round features the valuation of paintings, with players placing markers for the most valuable paintings for that round. However, there are only three slots for these markers, corresponding to the rounds in the game. The valuation step will not be missed by players, so this does not increase the rules' burden on the players.

The other consideration is end-game edge effects. If the players know that this is the final round, it may change their behavior, which may be undesirable. One aspect of this is discussed in Hidden and Exposed Victory Points (VIC-05).

Sample Games

Castles of Burgundy (Feld, 2011)
Die Macher (Schmiel, 1986)
Guilds of London (Boydell, 2016)
Modern Art (Knizia, 1992)
Small World (Keyaerts, 2009)
The Speicherstadt (Feld, 2010)
Twilight Struggle (Gupta and Matthews, 2005)

VIC-10   Exhausting Resources
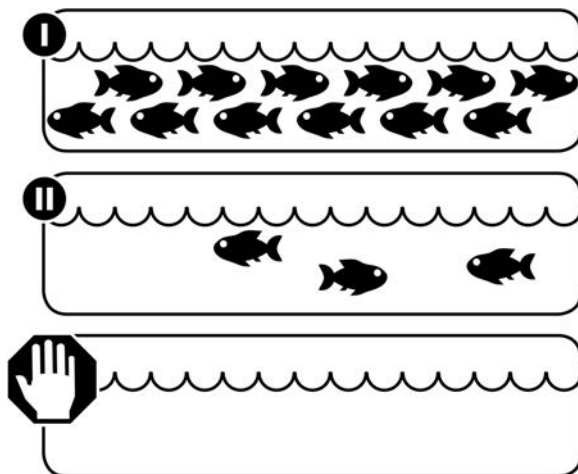
Description

The game end is triggered by a resource being exhausted. Players can affect the length of the game by how these resources are used.

Discussion

The Exhausting Resources mechanism is a nice balance between driving the game towards a conclusion and giving the players some control over the pacing.

In the *18xx* series of games, the game end is triggered by all money being taken out of the bank. In *Through the Ages: A Story of Civilization*, when the final Age III cards are drawn, the game ends, giving players the option to draw a lot or a few of the cards to manage the pace. *Race for the Galaxy* has a pool of Victory Point (VP) tokens, which end the game when exhausted, and *Dominion* concludes when three stacks are exhausted.

While these examples all have a shared resource pool, some games end when an individual pool is exhausted. *Ticket to Ride* ends when one player has 0–2 trains left. In *Light Speed*, the game moves on to final scoring after one player has placed all of their ships on the table.

This technique is frequently used as a loss condition for cooperative games. For example, in *Pandemic*, having to place a disease cube but having none

available in the pool will end the game in a loss, as will placing all the ghosts in *Ghost Fightin' Treasure Hunters.*

Sample Games

1830 (Tresham, 1986)
Dominion (Vaccarino, 2008)
Ghost Fightin' Treasure Hunters (Yu, 2013)
Light Speed (Ernest and Jolly, 2003)
Pandemic (Leacock, 2008)
Race for the Galaxy (Lehmann, 2007)
Through the Ages: A Story of Civilization (Chvátil, 1986)
Ticket to Ride (Moon, 2004)

VIC-11   Completing Targets
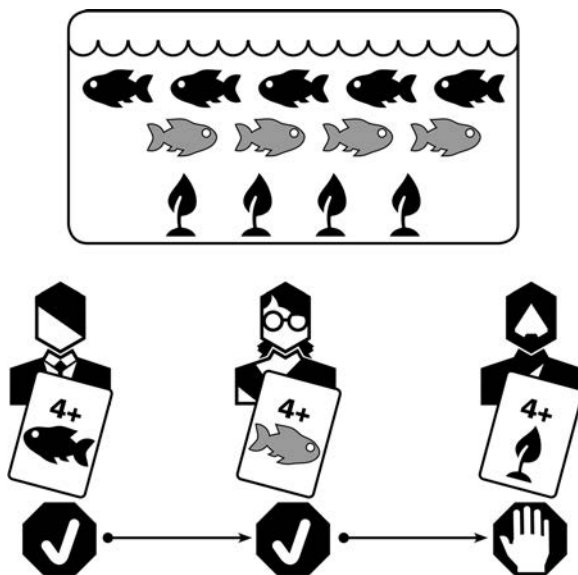
Description

The game ends after a set number of targets or goals are completed.

Discussion

In one sense the Completing Target mechanism is related to Exhausting Resources (VIC-10), as meeting X targets could be represented by removing "mission accomplished" markers from a pool and having the game end when those markers are exhausted. The difference in player experience is substantial, though, and gaining accomplishments is thematically more coherent in most cases than exhausting "mission accomplished" tokens.

Completing Targets is also similar to Race end-game conditions, where the game ends when players hit (typically) a victory point goal. However, the goals can be more than just the accumulation of points, such as curing all diseases in *Pandemic*, taking enough keeps in *Dune*, or destroying the One Ring in *War of the Ring*.

In all of these examples, the game is won by the player(s) triggering the event that ends the game. However, this is not necessarily the case. For

example, in *Race for the Galaxy*, the game can end several ways, one of which is by a player getting seven cards into their tableau. But the player who does this does not necessarily win. Winning is determined by other means than the game ending.

As there is no reason to end the game if you're not going to win, this type of trigger can lead to over-analysis. For this reason, designs that can be triggered by a player action often include hidden points or bonuses that can make it difficult to judge who is leading. Another design technique that can be considered is giving a bonus for triggering the end of the game, to incentivize players to take that action. This mechanism can be found in *Concordia* and *Azul* and is often a factor used to balance issues like players getting an equal number of turns, but some players knowing that the game will end when they take their final turn and others now knowing it. See our discussion of End-Game Bonuses (VIC-06).

Sample Games

Azul (Kiesling, 2017)
Concordia (Gerdts, 2013)
Dune (Eberle, Kittredge, and Olatka, 1979)
Pandemic (Leacock, 2008)
Race for the Galaxy (Lehmann, 2007)
War of the Ring (Di Meglio, Maggi, and Nepitello, 2004)

VIC-12   Fixed Number of Events
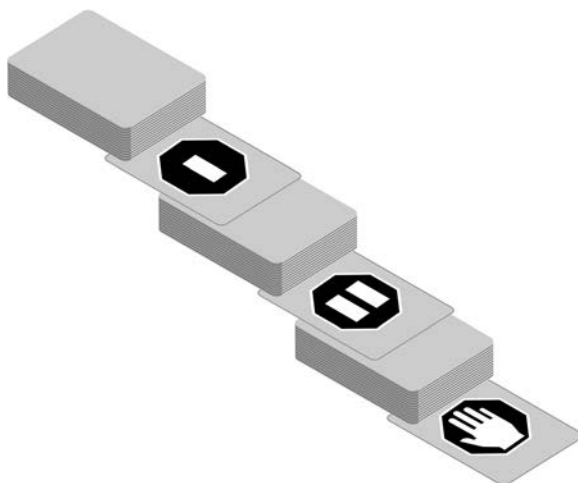
Description

The game ends after an event occurs a specified number of times.

Discussion

The Fixed Number of Events mechanism is most closely associated with card decks. A number of special trigger cards are shuffled into the deck. When the last of these is turned up, the game will end.

Airlines implements this system by mixing five Score cards into the stock deck. Each time a Score card is turned up, an intermediate scoring will occur. The last Score card initiates Final Scoring and the end of the game.

A similar system is used in *High Society* but is not directly tied to scoring. Instead, four special Red cards are inserted into the Auction deck, along with 11 Yellow cards. When the fourth Red card is turned up, the game ends.

This system can add a lot of variability and tension to a game, as players know approximately when it will end, but not exactly. A possible downside of this system is that the special cards may all happen very early in the game, or very late, which creates long stretches with no scoring. It is possible in *High Society* for the four Red cards to be the first four cards turned over!

To combat this, many games that incorporate this mechanism use an initial deck construction method to ensure that the special cards are reasonably well

distributed. *The Expanse*, for example, has the players divide the deck up into three piles, and shuffle two Scoring cards into each section. This ensures a somewhat even distribution, without the players knowing exactly when Scoring cards will be turned up.

Get the Goods controls the distribution by shuffling ten Scoring cards into the deck, with scoring happening when the 4th, 7th, and 10th cards are turned up. This allows tension to build as Scoring cards are turned up, while still giving a high probability of a reasonable spread of Scoring cards throughout the deck.

This mechanism does not require card decks. In *Pandemic*, players lose if there are a certain number of Outbreaks. Players track these on a chart on the board.

Sample Games

Airlines (Moon, 1990)
The Expanse Board Game (Engelstein, 2017)
Get the Goods (Ado and Moon, 1996)
High Society (Knizia, 1995)
Pandemic (Leacock, 2008)

VIC-13   Elapsed Real Time

Description

The game ends after a set amount of actual time has elapsed.

Discussion

Games with the Elapsed Real Time mechanism have an overall timer that is independent of the actions the players are taking. The key advantage is, of course, that players know exactly how long the game will take, which helps them schedule and plan. Also, having a timer naturally adds an element of tension to the game.

The exact implementation of the timer varies. While some older games, like *Escape from Colditz*, had players set any timer they had around the house, or simply check a clock, most modern implementations use some electronic means. *The Omega Virus* has the timer built into the taunting computer in the center of the board, which gleefully tells the players as time runs out. *Break the Safe* has a digital countdown timer, evoking many heist films. *Atmosfear* had players play a videotape to time the game. *Escape: The Curse of the Temple* and *Space Alert* have an external soundtrack that is played, that provides ambient sound effects as well as advising the countdown.

Electronic voices and soundtracks also have the advantage of being able to incorporate mid-game instructions for players.

Escape Room games, like the *Exit: The Game* series, also rely on elapsed time, typically tracked by a smart phone.

This mechanism needs extra attention when used in competitive games. The possibility that players may stall when winning, to run out the clock, needs to be addressed. This was a weakness in *Escape from Colditz*, a one-vs.-many game (see "STR-03, Team-Based Games" in Chapter 1), where

one player controlled the German guards trying to prevent the Prisoner Of War (POW) players from escaping. In the original version of the game, the German players had a strong incentive to stall and take as long as possible to make their moves.

The Omega Virus tackles this issue by having an "everyone loses" condition if time runs out, turning it into a semi-co-op (STR-05). Another option is to have simultaneous play, which disincentivizes players from stalling.

Sample Games

Atmosfear (Tanner, 1991)
Break the Safe (Uncredited, 2003)
Escape from Colditz (Brechin, Degas, and Reid, 1973)
Escape: The Curse of the Temple (Ostby, 2012)
Exit: The Game (Brand and Brand, 2016)
FUSE (Klenko, 2015)
The Omega Virus (Gray, 1992)
Space Alert (Chvátil, 2008)

VIC-14   Connections
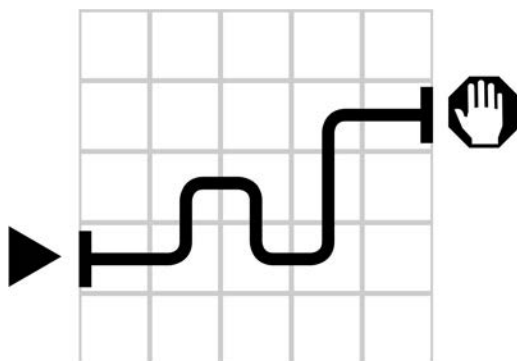
Description

The game ends when a specified number of connections are made on the board.

Discussion

The Connections mechanism can be both an end-game trigger and a means of victory. It is related to the Race mechanism (VIC-07).

In basic Connection games, like *Twixt*, it serves as the measure of victory. The first player to connect opposite sides of the board ends the game and determines the victor. *TransAmerica* is won by the first player to connect all of their cities into a single network.

There are many games, however, that end based on connections, but in which connections don't ensure victory. The most prominent example are the Crayon Rails series, which started with *Empire Builder*. In *Empire Builder*, players build rail networks. The game ends when a single player connects a certain number of major cities together in their network, as well as passes a certain threshold of cash. Both conditions are required for game-end and victory.

Connection can also be used as a sub-game. In *Android*, players try to create connections between different groups, which give in-game benefits. In the *18xx* and *Age of Steam* series, players place hexagonal tiles that have tracks printed on them onto the board in different configurations. *Cable Car* does the same with square tiles. Placing those tiles enables players to create

routes between stations allowing for delivery of goods and earning money. Typically, these routes are shared by all players.

Connection games need to deal with several topology issues. Can players cross the paths of other players? Games that do not permit it, like *Twixt*, often become static and have an optimal strategy. It is more typical to allow players to cross or even parallel other players' connections by paying a penalty or increasing resource cost to do so, and/or by requiring a special tile.

Sample Games

18xx (Tresham, 1974)
Age of Steam (Wallace, 2002)
Android (Clark and Wilson, 2008)
Cable Car (Henn, 2009)
Empire Builder (Bromley and Fawcett, 1982)
Santa Fe (Moon, 1992)
TransAmerica (Delonge, 2001)
Twixt (Randolph, 1962)

VIC-15   Circuit Breaker/Sudden Death

Description

The game has a fixed and known victory condition, and a special variable condition that ends the game prematurely.

Discussion

Sudden Death conditions can be used for two purposes. First, they can help end a game once one player is far in front, out of the reach of the other players. This is referred to as a *Circuit Breaker*, and is commonly seen in war games. For example, in *Rise and Decline of the Third Reich* and *The Russian Campaign*, if one player controls a certain number of key locations, they win immediately. In *Twilight Struggle*, if one player reaches 20 Victory Points (VPs) on the Tug-of-War style Victory Point track (VIC-19), then the game immediately ends.

The Circuit Breaker is good for ending a lopsided game, leading to a more positive play experience (or at least a shorter one!) for the losing side. Playing out an obviously lost game is typically not a fun experience.

This mechanism can also be used to add an alternate way for players to pursue victory. In *Liberté*, the game normally ends after all faction blocks have been placed. However, there are two special conditions that players can try to meet (Radical Landslide and Counter-revolution) to win immediately. *Space Base* includes a card that says "You Win." If a player manages to complete

the task shown on the card, the game ends immediately and they win. This technique can be used to open different strategic options for players, or to give players that are behind the chance for a Hail Mary attempt to win the game. When they happen, they can be exciting and memorable victories.

Most of the loss conditions for Cooperative Games are also Sudden Death. This adds to the puzzle that the players need to solve to reach a successful conclusion.

Somewhat related, *Hearts* has an alternate condition that adds a fun twist. Players normally gain 1 point for each heart they take, and 13 points for the queen of spades (points being bad). But if a player takes all the hearts and the queen of spades, they force each opponent to take 26 points. This mechanism works especially well, as it turns what is normally bad into something great. Looking out for someone trying to "shoot the moon," as it is called, adds a lot of interest to *Hearts*.

Sample Games

7 Wonders Duel (Bauza and Cathala, 2015)
The Fog of War (Engelstein, 2016)
Hearts (Unknown, 1850)
Liberté (Wallace, 2001)
Rise and Decline of the Third Reich (Greenwood and Prados, 1974)
The Russian Campaign (Edwards, 1974)
Space Base (Clair, 2018)
Twilight Struggle (Gupta and Matthews, 2005)

VIC-16   Finale
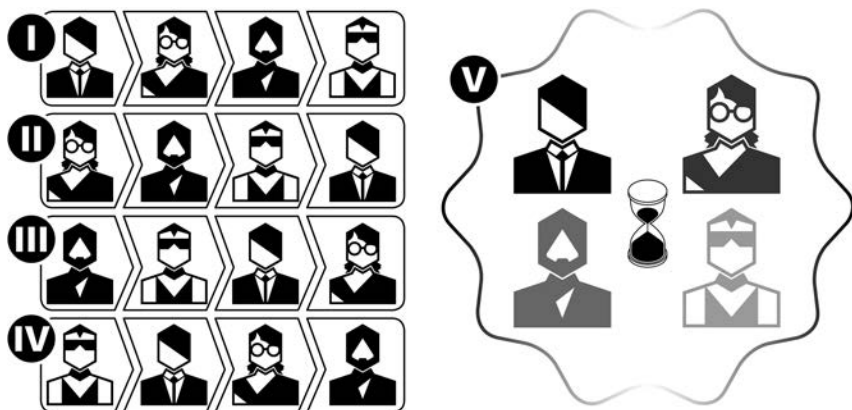
Description

When the main game ends, a special mini-game is played to determine the victor.

Discussion

This Finale mechanism adds a coda to a game, as it transitions to an alternate play mode at the end.

In *Monsters Menace America*, players spend the bulk of the game moving their monsters around the United States, stomping on cities, battling the military, gaining upgrades and becoming more powerful.

When the endgame is triggered, the players begin a monster demolition derby of sorts. The board is ignored, and the monsters simply battle against each other to determine the final victor. While the player that did the best during the first part of the game has the best chance to win, it could still be anyone.

Cable Car is a connection game. But when players complete their connections they do not simply win. Instead, they need to begin running their cable car from one end of their track to the other, moving a few spaces per turn. The remaining players continue taking their turns, and anyone who completes their track can start moving their car. The player who gets their car to the end of their track first is the winner.

This final contest rewards efficiency in both building the track as well as maximizing the speed of the car. If you complete a very circuitous route first, you may still lose to a player who was better able to manage their tiles better and build an efficient route.

Killer Bunnies and the Quest for the Magic Carrot is another example. Players can earn a numbered Magic Carrot during the course of the game. When they are all claimed, the game ends, and the winner is determined via lottery. The players draw one carrot at a time from a second carrot deck. The carrots drawn are losing carrots. Whoever has the final carrot remaining in the deck is the winner.

This mechanism makes it clear to players what they need to do during the game to win and adds an exciting end game element. However, it can also cheapen the meaning of the first part of the game, as a player may dominate the main game, earning ten tickets while the other players each get only one, and still lose. As such, this is best suited for quicker and lighter games.

The Finale mechanism is infrequently used as it often requires players to learn a whole different set of mechanisms to be used for the ending.

Sample Games

Cable Car (Henn, 2009)
Killer Bunnies and the Quest for the Magic Carrot (Bellinger, 2002)
Monsters Menace America (Connors and Knight, 2005)

VIC-17   King of the Hill

Description

Players earn points by occupying a special position on the board.

Discussion

King of the Hill (KotH) brings several positive attributes to a game. First, it is simple for players to understand what they need to do to achieve victory. Gaining points or other benefits by controlling the key location makes the objective clear to first-time players. In *King of Tokyo*, players earn points by remaining in the center of the board throughout the turn, giving the board state great clarity.

Second, it forces players into conflict. Staying in your own corner of the board ("turtling") will not move you closer to victory.

Finally, it gives players a safe space to rebuild and lick their wounds if they are weaker. If a player is in a bad position, they can simply stay out of the line of fire until ready. This can push battle games to a more casual place, as the strong either cannot, or are not incentivized to, pick on the weak. It also leads naturally to a Catch the Leader mechanism (VIC-18), as everyone will gang up on the player earning points in the center.

Because of all these items, pure KotH can make a game feel lighter. Players will try to knock each other out of the center, but conflict does not extend beyond that.

Some games have a reward other than Victory Points associated with holding the center. For example, in *Nexus Ops*, the player controlling the center Monolith may draw special Energy cards that aid in various ways. This encourages players to head for the center and the bonuses there, but also allows for alternate paths to victory.

Sample Games

The Ares Project (Engelstein and Engelstein, 2011)
King of Tokyo (Garfield, 2011)
Nexus Ops (Cantino and Kimball, 2005)

VIC-18   Catch the Leader
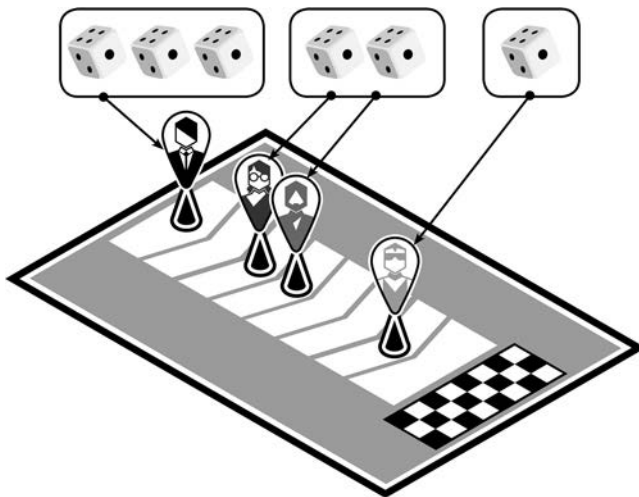
Description

The game systems advantage players that are behind or disadvantage players that are ahead.

Discussion

This is a meta-mechanism that can be implemented in a variety of ways. For example, *Power Grid* changes turn order based on who is leading. The player in last always takes the most advantageous position. *Age of Steam* forces players to reduce their Victory Points (VPs) based on how many they have. Players who have more points must lose more. Other games may give special tokens or abilities to players that are lagging.

While these are all overt, some Catch the Leader mechanisms are more subtle. A King of the Hill mechanism (VIC-17) typically exposes the leader to attack, and not other players—or players that are further behind are less attractive targets. This will naturally incentivize players to try to pull back the leader.

The designer should consider the severity of the Catch the Leader mechanism. If it is too strong, it can be advantageous for players to sandbag, and try to stay back to make a strong late move rather than be penalized

earlier. Depending on the theme and nature of the game, this may or may not be desirable.

Designers should also look out for the opposite of a Catch the Leader mechanism ("snowballs"), where the game mechanisms make it easier for players in the lead to get further ahead. Economic games are susceptible to this, as the measure of victory (money) is also the resource that helps growth and power. *Monopoly* is an example. Splitting the victory currency from cash can alleviate this issue. For example, players may need to use cash to buy antiques, which actually give VPs. This forces players to decide when to turn their working resource into a victory resource. See Victory Points as a Resource for more details (VIC-04).

Sample Games

Age of Steam (Wallace, 2002)
The Expanse Board Game (Engelstein, 2017)
Monopoly (Darrow and Magie, 1933)
Power Grid (Friese, 2004)

VIC-19   Tug of War
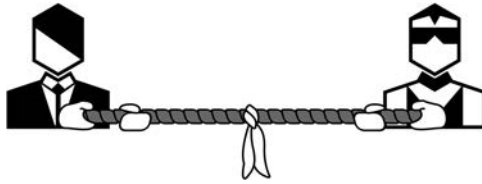
Description

A marker is moved up and back on a track towards or away from a neutral position.

Discussion

Tug of War can be both a scoring mechanism and an end-game trigger.

In its simplest form, two players will move a marker back and forth along a track, with each of them owning one end of the track. If the marker reaches the end of a track it typically triggers an event, such as ending the game, as in *Twilight Struggle*. In this case it also triggers victory for the player who moves the marker to their end.

It may also trigger a scoring event, as in *Guardians*, where each location has a short tug-of-war track. If the marker reaches the end of a track, the player owning that end scores points for the location, and it is removed from the game and replaced.

Tug of War is not limited to two players. When there are three or more sides represented, each has a branch leading from a central neutral point. *Churchill* is a three-player game, with players debating over issues around World War II. Each issue starts in the center of the track. When a player influences an issue, it moves towards their track, or, if it is on another player's track, first towards the neutral point, and then up their track. *Churchill* also has a special trigger if an issue reaches the end of one of the tracks. In that case, the issue is locked for that player, and it can no longer be influenced up and down the tracks. The game also features multiple issues on the tug-of-war track at the same time, allowing the designer to introduce more complexity and player options by allowing multiple issues to be influenced with one action, or special bonuses for certain types of issues.

Another example of multiple players influencing multiple items is *Starship Samurai*, where players are trying to sway factions to their side. Each player has a track on the alliance board, and if a faction is on another player's track, in order to sway them to your side you first move the faction token down towards a neutral zone off of that player's track, and then up your track.

The location of the marker can also award points or abilities at certain times. In *Twilight Struggle*, for example, if no Sudden Death conditions are triggered (VIC-15) and the game ends by concluding the final turn, the winner is decided by the location of the marker on the track. The location of the markers at Conference end in *Churchill* at the end of the debate phase determines who gets to decide on the outcome of the issue. *Starship Samurai* awards victory points or resources based on the location of each faction at the end of the round.

This mechanism is very clean and easy for players to understand, particularly in the two-player version. It is easy for players to see where they stand, and what actions influence the track. When used for an end-game condition, it is typically used as a Sudden Death condition, as requiring that the marker reach the end means that there needs to be some means to drive the game towards a conclusion. It also means that as one player moves closer to victory, the other moves further away. This can reduce tension as compared to a Completing Targets system (VIC-11), where all players may be close to victory at the same time.

Sample Games

7 Wonders Duel (Bauza and Cathala, 2015)
Churchill (Herman, 2015)
Guardians (Flores, 2018)
Starship Samurai (Vega, 2018)
Twilight Struggle (Gupta and Matthews, 2005)

VIC-20   Highest Lowest
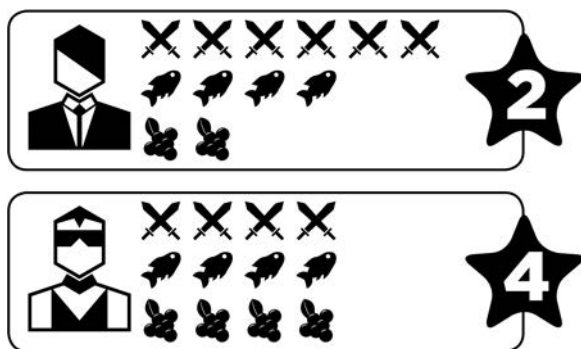
Description

Each player's score is equal to the lowest value of several categories. Whoever has the highest lowest value is the winner.

Discussion

As the title of this Highest Lowest mechanism may be a bit unclear, here is a more lengthy explanation using the diagram above. Let's say players are collecting the four icons in the image above—swords, fish, leaves, and grapes. Player A has 10 swords, 5 fish, 7 leaves, and 2 grapes. Their final score will be the lowest of those four—in this case the 2 grapes, so 2 points.

First used in Knizia's *Tigris & Euphrates*, this scoring mechanism forces players to pursue multiple paths equally. Specializing in gaining red, for example, will not be a winning strategy. This forces players to generalize, and typically encourages player interaction as they compete in the same areas.

Tigris & Euphrates has players collecting cubes of different colors to determine the final score. When using cubes, this system is the same as collecting sets of one of each color. Later implementations like *Ingenious* and *Wendake* use tracks, which can make it easier to visualize the current score, as it is just the lowest track marker.

Ingenious adds an additional twist, as while final scoring is based on the lowest color value, during the game bonuses are awarded for getting a high value of a particular color. So, tension is introduced between staying balanced and specializing.

Wendake has two separate pairs of tracks, and the value of each pair is equal to the lowest of the two. Then, the scores for each pair are added together to determine the final score. Adding this additional level of detail groups certain aspects together and opens up more strategic design space.

Sample Games

Between Two Cities (O'Malley, Pedersen, and Rosset, 2015)
Ingenious (Knizia, 2004)
Tigris & Euphrates (Knizia, 1997)
Welcome to Centerville (Jensen, 2017)
Wendake (Sabia, 2017)

6

Uncertainty

~

Games, like life, are full of uncertainty: the roll of the dice, the turn of a card, the cube tumbling through the cube tower. But even in games of perfect information, such as *Chess*, our opponents' choices make our knowledge of how the game will unfold, imperfect.

The source of uncertainty and how uncertainty is perceived contributes much to the shape of the overall player experience. Uncertainty that comes from a truly random process, like a die roll, creates a lighter and more chaotic feeling for players—even if the design calls for throwing enough dice enough times to smooth out the worst ends of the distribution curve. Players participating in a rock-paper-scissors contest, however, will feel a greater sense of agency and will harbor a belief, right or wrong, that the outcome of the contest is not random.

Uncertainty lurks in many unexpected places. Can you rely on your memory? Did the King of Hearts already go out? Did you properly deduce where Jack the Ripper moved to? What is your partner signaling to you with that drawing? Who is the werewolf? Can you balance Rhino Hero on the next card up the tower?

Uncertainty can create chaos, but players can also manage uncertainty using different tools. Betting, bluffing, and even deck-building all help manage card-draw randomness. Letting players see the result of a random process before needing to make a decision about it, such that the random result is an input in their decision-making—*input randomness*—makes randomness something players respond to, rather than rely on. On the other hand, forcing players to make a high-stakes decision contingent on a random outcome—*output randomness*—creates enormous drama and tension.

Because uncertainty can have a powerful impact on the game experience, designers often seek to control its influence in a variety of ways. In some cases this is baked into the design itself, through the distribution of cards in a deck, or the number of dice that must be rolled, and similar systemic design elements. In many cases though, the power to mitigate uncertainty is given to players. Dice manipulation powers, card- and deck-manipulation powers, and other kinds of special abilities do give players greater agency.

While there is a loud contingent of players who disdain randomness and luck in games, a word to the wise: the most successful commercial games typically have far more luck in them than the most highly regarded hobby games. Games with more uncertainty and randomness tend to be accessible to more players, and facilitate enjoyment even when there are large skill differences between players at the same table. Having a clear focus on the intended market for your game will serve as a crucial guide in determining how to handle uncertainty.

Designers have a broad palette of colors to paint with when it comes to the sources of uncertainty, its framing, and how players experience it. Managing uncertainty properly is key to the art of game design.

UNC-01   Betting and Bluffing
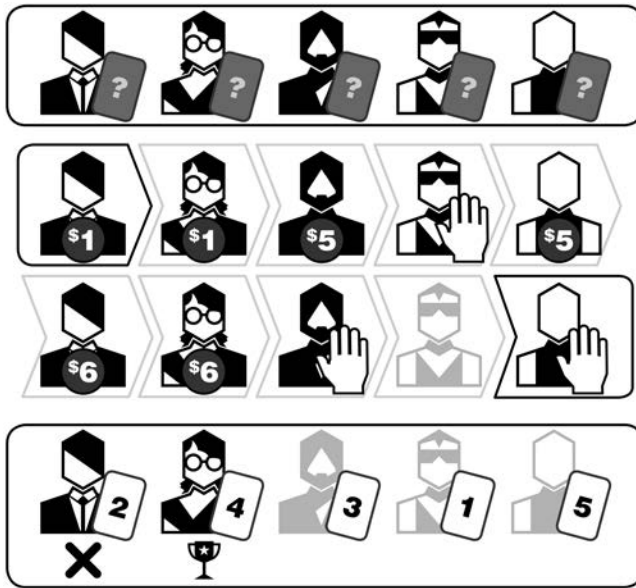
Description

Players commit a stake of currency or resources to purchase a chance of winning everyone's stake, based on some random outcome like being dealt a superior set of cards or rolling a higher number. Players typically have partial information about the overall game state, and may "bluff," by representing through their in-game actions that they hold a stronger position than they do. Conversely, players may "fold," or quit the contest, and limit their losses to whatever they had already staked.

Discussion

Some of the oldest games in human memory are betting games, often involving dice, and rather than try to recapitulate every type of betting game and mechanism, we'll restrict ourselves to how the mechanism is used in the modern board-gaming context. Nevertheless, a field trip to your local casino is highly recommended for extended study of these topics.

One common group of games that feature betting is trick-taking games, like *Tichu*, where players place a "bet" by predicting the number of tricks they

will take. The role of betting in these designs is to allow players to self-balance the outcomes of a random card deal. Players will bet more aggressively with a stronger hand, Racing games like *Camel Up* offer wagering to allow players to wager for the same reason. One might pedantically note that the game doesn't actually simulate or model camel racing as much as it models wagering on camel races. Nevertheless, this is a very popular way for designers to make games about racing, while sidestepping many of the challenges of modeling an actual race.

The games above have wagering, without any real bluffing elements. Conversely, there are games like *Coup* which feature bluffing, but not any wagering. In *Coup*, players hold role cards that enable certain actions. These cards are held in hand, as secret information, and a player can declare that they possess any card, and take any connected action. As long as no player challenges, the action occurs, but if a challenge is issued, the active player must show the card they claimed and force the challenger to discard a role card, or the player must discard one of their own role cards if they do not hold the role card they claimed. Players who discard their last role cards are eliminated from the game. This dynamic is present in many social deduction games, which we discuss in a dedicated section (see "UNC-04" in this chapter).

Other games that are only about bluffing include *Skull and Roses, Liar's Dice, Cockroach Poker* and the classic game *Cheat* (which our saltier readers may know by its more bovine name). What these games share in common is that they have no currency to wager, and that when a player makes a challenge, uncertainty exists only based upon player actions.

A key design element for including bluffing is hidden information, of course, but also some form of information transmission. In poker, the information is in the form of betting patterns, and the community cards visible on the table. In *Coup*, the character a player chooses gives them special abilities. The actions a player may perform based on the role give context to the choice, and the possibility of the bluff. It is better if the hidden information doesn't change too frequently, to give a history to the choices a player makes. If the hidden information constantly changes, it reduces the opportunities for players to try to see through a bluff, leaving players with a random guessing game.

Bluffing is common in the party game space, but *Wits & Wagers* introduced betting into the trivia genre. Players answer numbers-based questions and arrange their numerical answers on a betting line in order from lowest to highest. Players may then make two bets on which answer is closest to the actual answer printed on the card. By cleverly allowing players to make two wagers, the game expands from being only about how much confidence

players have in their own knowledge to a richer set of choices. Players must consider whether their wagers are revealing too much to their opponents, while also looking to how other players bet to try and suss out likely answers based on those betting patterns. If you're playing with a doctor, for example, you might follow their bets on biology and medical topics—until they catch on to your strategy and lay a trap for you!

One of the most interesting places to find bluffing and wagering is in modern resolution mechanisms for combat, some of which are discussed in Chapter 4. In various games, players put forward some combination of known strength, and some hidden amount of strength, and simultaneously reveal and then resolve abilities to determine a winner. The hidden strength may be represented by a number on a die, as in *Tiny Epic Kingdoms*, a leader card, like in *Dune*, or a battle card, as in *Kemet*. Combat is entirely deterministic, and all possible combat modifications are also known, such that in many combats, players know which player will win if they spend their maximal strength. The game is in out-thinking or out-guessing your opponent as to how much strength he or she will spend. These combat systems are what we might call all-pay, in that the committed resources are discarded. This is a key distinction between auctions and wagers more generally: in auctions only the winner pays, but in a wager, the losers pay.

The ability to read and out-guess your opponents, to know their minds, is described by the Japanese word "Yomi." Yomi is especially prominent in games with a simultaneous reveal mechanism like 1v1 fighting games. However, role-selection games (ACT-02) like *Race for the Galaxy* have this flavor too: assessing which roles your opponents will select, and thus, which you should select is the Yomi experience. In *The Mind*, that same notion is pushed to the limit, but in a co-op game. In *The Mind,* players must, without communicating, somehow play hands of cards in ascending numerical order. There are no turns, and not all car ds are dealt from the deck, so players must simply play based on their instincts and their ability to sense what their partners might hold.

Sample Games

Camel Up (Bogen, 2014)
Cheat (Unknown)
Cockroach Poker (Zeimet, 2004)
Coup (Tahta, 2012)
Dune (Eberle, Kittredge, and Olatka, 1979)

Kemet (Bariot and Montiage, 2012)
Liar's Dice (Unknown, ~1800)
Manila (Delonge, 2005)
The Mind (Warsch, 2018)
Race for the Galaxy (Lehmann, 2007)
Skull and Roses (Marly, 2011)
Tichu (Hostettler, 1991)
Tiny Epic Kingdoms (Almes, 2014)
Wits & Wagers (Crapuchettes, 2003)

UNC-02   Push-Your-Luck
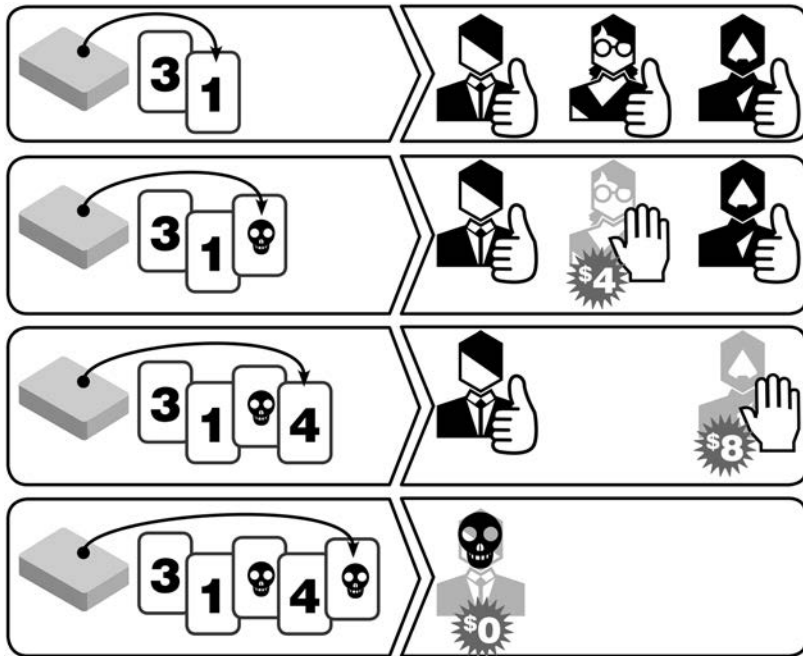
Description

Players must decide between settling for existing gains, or risking them all for further rewards. Push-Your-Luck is also known as press-your-luck.

Discussion

A good example of a game whose central mechanism is Push-Your-Luck is Sid Sackson's *Can't Stop.* In *Can't Stop*, the active player rolls four dice and advances up to two pawns in tracks numbered from 2 to 12, based on matching the sum of any two dice to the numbers on the tracks. The player may choose at any point to stop rolling, and lock in their progress along the tracks, or reroll to attempt to advance again. However, if after rolling, the player cannot match the sum of the dice to any of the three active tracks the player is advancing on, the player "busts," and all progress from that turn is lost. Push-Your-Luck is a type of wager in which players have less control over the ante or the stakes than in most casino games.

An important dynamic in push-your-luck games is how changes to the stakes can alter player behavior. In *Can't Stop*, when a player reaches the top of any numbered track, the track is closed, and nobody else can score it. The first player to reach the top of three tracks is the winner. Players may be more timid at the start, but when one player is close to reaching the top of a track, competitors also racing up that track usually become much more aggressive and risk-tolerant, as they attempt to close the track themselves. This is doubly so when a player is close to winning the game, and the other players try to win it all themselves in one epic turn. When there's nothing to lose, why not press-your-luck?

Some of the behaviors and emotions that Sackson evokes in *Can't Stop* stems from behavior that echoes the sunk-cost fallacy, in which investing additional resources into some goal is based not on the chances for succeeding, or the expected return on the investment, but on an emotional connection to what has already been invested in the past. In addition, Sackson is also depending on the difficulty in computing probabilities in *Can't Stop*. Avid gamers, whether raised on *Backgammon* or *Catan*, are adept at calculating probabilities featuring 2d6, but calculating the probabilities of successfully rolling at least one of two or three different numbers on 4d6 is the kind of thing that few players can do in their heads. This obfuscation is critical, since games in which expected values can always be calculated exactly can feel stale and boring.

Can't Stop is unforgiving. A single miss, a single roll of the dice that fails to advance a runner on a track, leads to a bust. In *Yahtzee,* players roll five dice, and may choose to keep any number and reroll the rest before being forced to score the results. However, players are limited to a total of three rolls. In *Favor of the Pharaoh* there is an additional restriction that players must keep, or lock, at least one die result before rerolling the remaining dice. In *Tiny Epic Galaxies* players may spend a specific resource to purchase additional rerolls.

Alternatively, instead of focusing on the die roll, Push-Your-Luck can be implemented in the chase for rewards. In *Roll Through The Ages: The Iron Age* players race to build monuments, but the first player to complete the monument will get a larger reward than all subsequent players. Players must choose between participating in the race for monument completion, or devoting their resources to a different pursuit. Similarly, in *Incan Gold*, (also known by its original name, *Diamant,* which remains its European title) players simultaneously choose whether to explore more deeply into a temple in hopes of turning up more gems on the next turn of a card from the expedition deck, or to leave. At first, there is no risk attached to staying in, but after the

first of a type of hazard card is revealed the danger is that a matching hazard will be revealed and all gems discovered will be lost. Players who leave early get to retain all their gems gained so far, while players who remain will be splitting new treasure with fewer players, making staying in the cave more rewarding as well as riskier.

Formula De ties a player's movement to gears represented by dice. Higher gears allow players to roll dice with more sides, up to a D30 for top gear—but curves offer a speed limit past which cars take damage. Take too much damage and you're out of the race!

Dice are a common means of implementing a press-your-luck mechanism, but they are far from the only one, as per the aforementioned *Incan Gold*. In *Oh My Goods!*, cards representing resources are played face-up into a market row until two cards showing a half-sun icon are revealed. Players must assign their workers after seeing one market row revealed, and can assign workers to tasks that require more goods to be completed than are currently showing in the market row. A second market row is then revealed, which may provide sufficient resources for players to complete their work… or not! Notably, the game allows players to assign workers to work in way that will yield the maximum reward, which requires all resources be available, or to work for a lesser reward, in which case a resource can be missing. This allows players to choose the stakes and probabilities of their wager, while retaining the "bust" outcome that characterizes these games.

Press-your-luck can be the central mechanism in a game, but it appears just as frequently as a part of a larger game. In *Ra,* players draw tiles from a bag to create an auction lot. Prior to each draw, the active player may call an auction, but auctions are more often triggered when a *Ra* tile is drawn out of the bag. There are multiple dimensions of luck-pressing baked into play: tiles are worth different amounts to players based on a set-collection mechanism (see "Set Collection" in Chapter 12), some tiles will impact players negatively, while other tiles are highly desirable to all players. Drawing another tile instead of calling the auction can radically change the overall value of the lots, and change them differently for each player. Towards the end of the round, when only one player remains, that player continues drawing tiles until he or she wishes to stop and purchase the lot. However, if a *Ra* tile is drawn at this point, the round ends immediately and the player loses his or her opportunity to buy. It is not uncommon to hear chants of "Ra! Ra! Ra!" during this phase of a game, demonstrating how meaningful the stakes feel in this masterpiece.

Ra's Push-Your-Luck mechanism permeates the whole game, yet it is clearly in service to the auction-and-set-collection core. In many games, the

Push-Your-Luck element is a layer of flair rather than a core of the experience. In *Mystic Vale,* a kind of deck-building game (see "CAR-05" in Chapter 13) players flop cards to establish their mana pool for the turn, until three spoils symbols are showing on the cards. Players may choose to risk flopping an additional card to expand their mana pool, but if another spoils symbol shows, the player busts and loses his or her turn. This mechanism is entirely optional and additive, and players can play and win without ever engaging in it, but it can be wisely leveraged to accelerate a deck's construction too.

Push-Your-Luck as a mechanism is straightforward to understand, even if the risks can be difficult to calculate, and it easily creates drama, tension, and excitement. It should be considered an essential part of every designer's toolkit.

Sample Games

Backgammon (Unknown, 3000 BCE)
Can't Stop (Sackson, 1980)
Favor of the Pharaoh (Lehmann, 2015)
Formula De (Lavauer and Randall, 1991)
Incan Gold (Faidutti and Moon, 2005)
Mystic Vale (Clair, 2016)
Oh My Goods! (Pfister, 2015)
Ra (Knizia, 1999)
Roll Through The Ages: The Iron Age (Lehmann, 2014)
Tiny Epic Galaxies (Almes, 2015)
Yahtzee (Lowe, 1956)

UNC-03   Memory

Description

Hidden, trackable information whose tracking gives players an advantage.

Discussion

Memory can be a game mechanism, or a capability a player draws upon when engaging with one or more mechanisms. It's an important design ingredient, a lever whose setting will have substantial impact on a game's weight, intended audience, and general reception. Our discussion will focus on games where memory is at the center of the game design, rather than where memory is an ancillary skill that the game tests.

Memory games can be seen on a spectrum. At one end, are games like the classic game *Memory* and the modern game *The Magic Labyrinth,* in which the only skill the core game mechanism tests is whether players can remember things. In *Memory,* it's the specific location of various items in the face-down grid of tiles. In *The Magic Labyrinth,* players need to remember the correct path through the maze, because the walls of the maze are invisible, and the game uses magnets on the underside of the board to define that path. *Memoarrr!* borrows a bit from both of these games, with cards that feature two elements that must be remembered, and then arranged spatially.

Further down this spectrum are games where memory is crucial to the core gameplay in patent and obvious ways. *Stratego* and *Lord of the Rings: The Confrontation* feature player pieces on standees or blocks. These pieces have unit information on only one side, such that players can't see the identities of opposing pieces before they encounter them. In an encounter, players reveal

the pieces, then flip them back, leaving the players to use their memories to track the location and identity of the revealed pieces. These games have fairly small and stripped-down rulesets that put the spotlight squarely on memory, but block-style war games like *Sekigahara: The Unification of Japan* use this same mechanism to add fog of war—the uncertainty of the disposition of enemy forces that is typical in war.

This type of memory mechanism, sometimes called "Hidden Trackable Information" (HTI), for short, challenges players to remember information that was once revealed to them. We've discussed positional examples so far, but those examples are perhaps the least polarizing. In *Small World*, players must announce how many coins (i.e., victory points or VPs) they have collected at the end of their turn, but not their total. It would be trivial to track this information with a paper and pencil, but in the context of a fast-moving game of territory control, it's easy for players to lose track of who is ahead. This is intentional on the part of the game designer! *Small World* is the successor to *Vinci*, a Roman-themed game that is mechanically almost identical. One key change between the two games was making the victory points hidden, trackable information. This helped to prevent dynamics which plagued *Vinci*: bash-the-leader behavior, and the extent to which players optimized their play on the last turn. This change, along with cute art and a lighthearted feeling, turned *Small World* into an evergreen success in the casual games space.

Another example of HTI is found in *El Grande*. In addition to placing cubes onto the board, players may choose to place them into the Castillo, a tall tower. Players cannot look in the Castillo, they need to remember how many cubes are there. At the end of the round, each player secretly selects a province in which to place his or her Castillo cubes. Remembering how many cubes of each player are in the tower can be challenging—even remembering how many of your own are in there can be difficult for players. But this lends a fun, swingy punctuation to what otherwise is a very calculable game.

HTI can be especially controversial when it exists in more complex games, but it is nonetheless common in *18xx* games and other heavy economic or auction games (see "Economics" in Chapter 7 and "Auctions" in Chapter 8, respectively), where player or corporate cash holdings are hidden. To some extent, this thematically reflects the ways in which corporations are secretive about their finances. Mechanically, pricing an auction or predicting an opponent's actions is much simpler when the total money in the system is known, and is even easier when the allocation of that money is known.

Memory and HTI sharply reduce accessibility and inclusion. To help players who have trouble remembering, many games provide tracking components,

like *Clue's* guessing pad. Other games provide some aid to memory, like *Hunt for the Ring*, where the Nazgul players have a handful of tokens with different markings that they can use as they wish. In *Hanabi,* the rules explicitly encourage players to find a limit on communications that maximized the fun for the group. This leaves open an enormous range of possibilities, from playing *Hanabi* as a strict memory game where each individual must keep track of his or her own hand, to one with almost no memory component since players are free to remind one another what each of them has been clued to in his or her own hands previously. Even under such rules, however, players must remember when they were clued about the state of their hands, and which new cards they have drawn since then.

Many games rely heavily on memory, even though they're not explicitly memory games, and players with better memory (or card-counting systems) will have a substantial advantage. Trick-taking games and classic card games in general fall into this category, since players who can remember which cards have already been played can make better decisions about what to play next, and the relative values of cards still in their hands. Another common dynamic is games in which remembering the types of sets your opponent is collecting allows you to interfere with them effectively, as in *Animals On Board*. In these games, cards or tiles collected by players are hidden away after collection. These are important design considerations, but they relate to memory as a player skill, rather than as a game mechanism. Admittedly, the line between these two is fuzzy, but we will wrap our discussion of memory mechanisms here.

Sample Games

Animals on Board (Sentker and zur Linde, 2016)
Clue (Pratt, 1949)
El Grande (Kramer and Ulrich, 1995)
Hanabi (Bauza, 2010)
Hunt for the Ring (Maggi, Mari, and Nepitello, 2017)
Lord of the Rings: The Confrontation (Knizia, 2002)
The Magic Labyrinth (Baumann, 2009)
Memoarrr! (Bortolini, 2017)
Memory (Unknown, 1959)
Sekigahara: The Unification of Japan (Clakins, 2011)
Small World (Keyaerts, 2009)
Stratego (Mogendorff, 1946)
Vinci (Keyaerts, 1999)

UNC-04   Hidden Roles
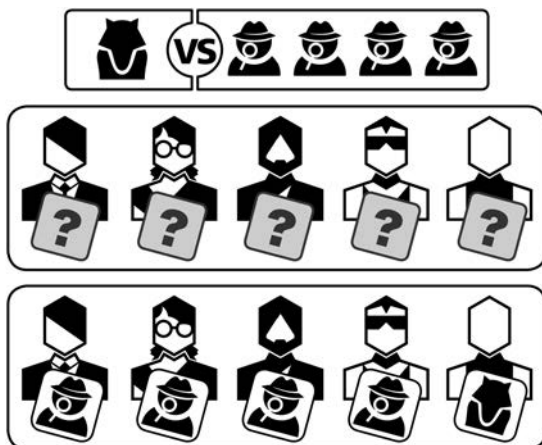
Description

One or more players are assigned differing roles that are not publicly revealed at the start of the game.

Discussion

While uncertainty lurks in many games, in Hidden Roles games, uncertainty is at the very heart of the gameplay. We can broadly talk about three types of Hidden Roles games: social deduction games, traitor games, and competing roles games. We touched on this topic earlier in the chapter about game structure (see Chapter 1). Social deduction games are team games in which the object of gameplay is to deduce the team allegiances of the players, like in the classic open-source game *Mafia* (which, ten years after its invention, was recast as *Werewolf*).

It's worth noting that in these games, usually only one team faces uncertainty. The werewolves know who all the villagers are, and as such, the werewolves are playing a role-playing game whose win condition is to successfully deceive the villagers for long enough to devour them. The villagers are playing a deduction game where the evidence is mostly in the social interactions at the table rather than the almost non-existent mechanical interactions. In this section, we'll generically refer to the "villagers" to represent the team, typically positioned as the thematic protagonists, that has less knowledge of

the game state, and "werewolves" to describe their opponents, who know the identities of most or all players.

Shadow Hunters, Two Rooms and a Boom, and *BANG!* are exceptions to this general rule. In these games, the players do not know the identities of any of the other players (except for the Sheriff in *BANG!*, who is known to all). This gives these games a different feel, as there is less paranoia, as all players are on an equal footing, and an early part of the game is players trying to determine who is on their team without tipping their hand.

Traitor games, as distinct from social deduction games, have some other win condition for the "villager" side besides revealing the traitors. In *Battlestar Galactica: The Board Game*, players try to reach Korhol (or some other destination), and the game operates like a cooperative game (see "STR-02" in Chapter 1). However, a traitor may lurk among the players, secretly sabotaging them. In traitor games, the traitor, upon discovery or self-revelation, often shifts into a different role with a new win condition, new actions, and different player powers.

Traitor games need to use hidden resolution systems so that players can cause trouble while maintaining anonymity. In *Battlestar*, players play cards face-down during the crisis phase, trying to sum up to a value of cards of a certain color. Because the cards are played face-down, the traitor can sabotage the crisis resolution effort without revealing himself or herself; although, through deduction, the other players may start to uncover their identity. *Dark Moon* has players roll dice behind a screen. Each player must select one die to use to resolve the action. Traitors may use their worst rolls so as not to benefit the team, but showing a bad roll does not guarantee a traitor, as a loyal player may just have a bad roll and have no good dice to choose from.

In our final category, competing roles games, players are not on fixed teams, and have hidden identities, but revealing those identities is not directly tied to winning or losing. *Ravenous River* and *Coup* are examples of competing roles games. In *Ravenous River*, each player is secretly assigned one of seven animal identities. Animals eat one other type of animal and are in turn eaten by one other type. Players use cards to manipulate the positions of any animals, not just their animal, seeking to end the round in the same region as their prey and not their predator. Deducing the identities of the other players can help in executing a strategy, but isn't worth any points towards victory.

The uncertainty in all of these types of games is not the operational uncertainty of attempting an outcome without knowing whether it will succeed, but it still is a kind of output randomness that injects noise between a player's intention and the results of his or her action. In *Mascarade,* player

roles can move around from player to player, such that a player may not know what role he or she has at any given time, which creates a lot of uncertainty. Like in *Coup,* players can claim the actions associated with any role, but unlike in *Coup,* roles can get shuffled and players may not look at their own role cards freely; they must spend their turn doing so.

An important source of uncertainty in social deduction games in particular is in the unstructured conversation during which players discuss potential targets and coordinate for the upcoming resolution phase, typically a vote. The conversation phase offers players opportunities to lie, obfuscate, bluff, posture, or hide in a shroud of silence. Experientially, this phase is crucial, and whether players enjoy this genre of game rests largely on how much they enjoy this part of the game.

Some games attempt to enforce some structure in the discussion phase, by creating mechanisms with in-game consequences that players must grapple with. In *Salem 1692,* players play action cards on one another that impact status and abilities, including accusation cards that operate in place of the voting phase of other social deduction games. In *Shadow Hunters* players give cards with yes/no questions to other players, which they must answer. In *Ravenous River,* as mentioned above, a player may have the opportunity to manipulate the positions of a few animals, including animals other than themselves. These actions, and their potential point-scoring consequences, provide evidence of the player's secret identity. This is related to hidden end-game goals (VIC-06).

We've touched briefly on *Werewolf* in its most basic form. However, its most popular commercial iterations, such as *Ultimate Werewolf,* and *The Resistance: Avalon,* feature a dizzying array of additional roles, each of which change the dimensions and possibilities of gameplay. Some roles offer players additional private information about other players and their roles or team identities. Others can protect players from being eliminated, which injects performative uncertainty into the elimination action. Some roles provide an elimination power, which can be helpful to the "villager" side, but might actually cloud the situation and make it more difficult to assess who the "werewolves" are because players don't know which team eliminated which players.

There's much more to be said about the various types of roles possible in these kinds of games, which is beyond the scope of this work. However, one role is critical to consider: the role of the moderator. In many social deduction games, the need to hide substantial aspects of the game state from a shifting set of audiences makes these games inherently fragile and subject to inadvertent revealing of information, or even tolerance for some mild

cheating. Because these games also have unstructured conversation phases, driving the game towards conclusion can sometimes be difficult. That's why many of these games call for a moderator who does not play the game, at least in the sense that the moderator can neither win nor lose, but simply administrates the game, and especially enforces time limits, whether formal and agreed upon or informal and socially accepted.

Since the moderator is the only person who knows the complete game state, playing as the moderator can be quite appealing to players who enjoy spectating and people-watching. The moderator role can also be performed with theatricality, and has an element of role-playing that sits in its own layer of game-engagement that is separate from the core game engine. And of course, like any refereeing role, the moderator can have both unintentional and intentional impacts on the course of the game through their manipulation of soft power, like when to call a discussion to a close and insist on a vote.

Perhaps for these reasons, the moderator role has been eliminated in many modern designs. In *One Night Ultimate Werewolf*, a prerecorded voice, run by an app, takes players through the paces of each round, such that a moderator is not required. In *Dracula's Feast,* both the moderator and the idea of player elimination are removed, and players have asymmetric win conditions, some of which are not tied to discovering other players, but to being accused of inhabiting certain roles. These differences put the game firmly into the competing roles category, rather than social deduction category. In order to get around the problem of sharing information secretly, players each have a "Yes" and "No" card that they can show to the one player asking them a question. These games can often have multiple players winning by fulfilling different conditions. *Two Rooms and a Boom* is particularly instructive in this area.

Voting-based player elimination is very common in social deduction games, and that mechanism can create negative social consequences. From the perspective of a cultural critic, these games are intended to recreate uncomfortable social and political realities like mob justice, betrayal, and schoolyard cliques. Some games lean into these dynamics, like *Secret Hitler*, which not only requires that players step into a magic circle where they may have to self-identify as a Nazi, or as Hitler himself, but must also participate in a morally gray universe in which even non-Fascists might pass Fascist policies. Designers need to take care that players understand the nature of the magic circle that they're stepping into, and what might be expected of them in their suspension of real-world rules during play.

Sample Games

BANG! (Sciarra, 2002)
Battlestar Galactica: The Board Game (Konieczka, 2008)
Coup (Tahta, 2012)
Dark Moon (Derrick, 2011)
Dracula's Feast (Hayward, 2017)
Mascarade (Faidutti, 2013)
One Night Ultimate Werewolf (Alspach and Okui, 2014)
Ravenous River (Shalev, 2016)
The Resistance: Avalon (Eskrisge, 2012)
Salem 1692 (Hancock, 2015)
Secret Hitler (Boxleiter, Maranges, and Temkin, 2016)
Shadow Hunters (Ikeda, 2005)
Two Rooms and a Boom (Gerding and McCoy, 2013)
Ultimate Werewolf (Alspach, 2010)
Werewolf (Davidoff and Plotkin, 1986)

UNC-05   Roles with Asymmetric Information
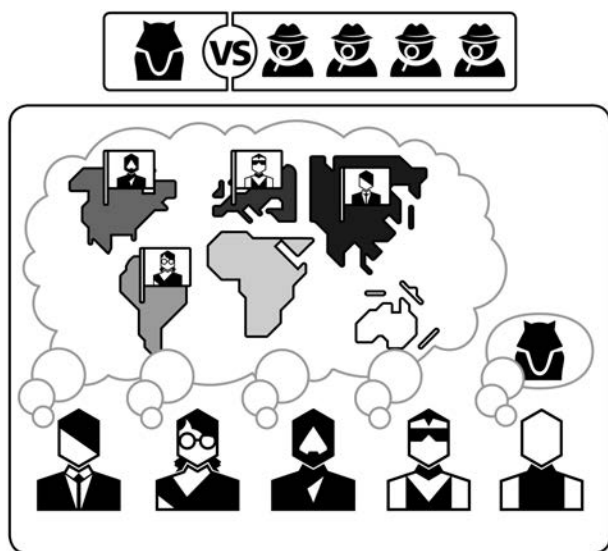
Description

One or more players are secretly assigned roles at the start of the game which have different win conditions, and receive different starting information about the game state.

Discussion

In Hidden Roles (UNC-04) we speak of games where the "werewolves" have complete or nearly complete knowledge of the identities of the other players. The opposite dynamic is also possible, where the "werewolf" may know the identities of the other players, but is missing some other critical information that all the other players share. Generally, the goal for the "werewolf" is to figure out that secret, and the goal for the "villagers" is to both keep that secret safe and to guess the identity of the "werewolf." In some games, one or the other is sufficient to secure the victory for the "villagers" and in others both are required.

In *Spyfall*, for example, players are told that they are at one of many potential locations. One player, the spy, doesn't know the location, but their identity as the spy is hidden from the other players. The spy attempts to

deduce the location all the players are at, while the other players attempt to figure out who the spy is, through asking and answering questions related in some way to the location. Non-spy players must be careful to ask and answer in a way that signals only to other players that they know the location, without giving it away to the spy. The spy must ask and answer questions in a manner that doesn't draw suspicion, even though they don't know where they are!

Another example that introduces a third role with Asymmetric Information is *A Fake Artist Goes to New York*. In this game, the moderator is a player, and also wins or loses. The moderator chooses both a category and the secret word within the category, and chooses who the fake artist will be by revealing only the category to them, but not the secret word. The other players then each begin play, adding one line to a shared drawing on their turn, attempting to signal to other players that they know what the secret word is.

Similar to *Spyfall*, the players don't want to give away what they're drawing, since the fake artist wins if they can guess the secret word. The moderator is aligned with the fake artist, and is thus incentivized to choose a category and word that will make it easy for the fake artist to correctly guess the word. The moderator is the only player at the table with complete knowledge of the game state.

There is a genre of games which leverages this same type of informational asymmetry, but with less emphasis on player roles. For example, games in which cards or tiles are held facing out, like *Hanabi* and *Abracada… What?*, don't put players into different roles, but each player is denied knowledge of only their own hand. Each of these is subtly different: *Abracada… What?* is closest to *Spyfall* in that each player faces the tension of acting despite ignorance, but there is no doubt as to the player's identity or goals in the game from the perspective of the other players. *Hanabi* is cooperative, and the dramatic irony that the inactive players feel because they can see the active player's hand as they agonize over the right play is part of what makes that game special.

The mass-market game *Headbanz*, in which one player tries to guess at a word on a card that all the other players can see, leverages this type of hidden information that isolates a single player, whether for the whole game or just for their turn, through sharp informational asymmetry. So does the absurdist *Win, Lose or Banana*, where the player who draws the "Win" card tries to guess which player holds the Banana card, but is the only player who doesn't know the disposition of all the cards. What's notable about these games is that the social dynamic of being the only person not in the know creates enormous pressure, tension, and the possibility for humor—often at one player's expense.

This technique does not have to be used only in competitive games. Cooperative games may put communication restrictions on one or more players, and challenge them to convey information to other players (STR-02). *Mysterium* places one player in the role of a ghost, who needs to get the other players to correctly identify the elements of a mystery (location, person, and weapon), but can only communicate by playing one or more elaborately illustrated cards to the players as a "dream."

Though hidden information not generated by player actions is everywhere, little of it exists in classic European style games. Though we often draw the line between these styles based on whether they employ input randomness or output randomness, the element of having only public information also aligns closely with the European design school.

Sample Games

Abracada…What? (Kim, 2014)
A Fake Artist Goes To New York (Sasaki, 2012)
Hanabi (Bauza, 2010)
Headbanz (Glimne and Strandberg, 1991)
Insider (Kwaji, Okano, Shinma, and Itoh, 2016)
Mysterium (Nevskiy and Sidorenko, 2015)
Nyctophobia (Stippell, 2018)
Spyfall (Ushan, 2014)
Werewords (Alspach, 2017)
Win, Lose, or Banana (Cieslik, 2009)

UNC-06   Communication Limits
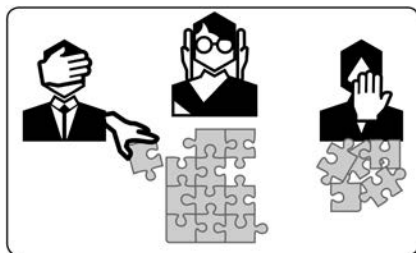
Description

Games may limit players from communicating with one another openly. These restrictions can be absolute as they relate to certain specific pieces of information, or they may restrict certain types of communication, such as speaking.

Discussion

Communication limits are most common in cooperative games, but they exist in other kinds of games as well. Many games limit players from revealing privately held cards. In *Cosmic Encounter,* players may openly discuss which cards they intend to play, but the actual cards cannot be shown, in order to preserve the possibility of a double-cross. In traitor games, identity cards are an obvious example of communication limits.

In cooperative games or games with intra-team cooperation, communication limits operate to make the game more difficult. Party games like *Charades, Pictionary,* and *Show & Tile,* all ask players to communicate non-verbally, with pantomime, drawing, or building with tangrams, respectively. These games are all games of inductive reasoning, where the clues provided suggest an answer. *Hanabi* is particularly notable in that the more players come to the game with agreed-upon principles and conventions for how to play, the more the game shifts from being about inductive reasoning to deductive reasoning. Games with deduction mechanisms, in which players gain information by asking specific types of questions—like *Clue* or hidden movement games like *Specter Ops*—are another example of communication limits as a mechanism to manage uncertainty, preserving enough of it for interesting play.

Returning to *Hanabi,* players are restricted not only in the type of information they are allowed to provide, or the modality by which it may be

provided, but also by frequency with which they may communicate. Players have a limited number of clues, and if no clues are available players may not communicate at all. *Mysterium* takes a similar approach, except that communication is only limited between certain player roles. The ghost and the mediums may only swap information through cards, but the mediums may freely converse with one another. In *Witness,* players may only communicate their information once, which leaves players unable to confirm what they've heard or clarify anything they might have missed.

In the absence of specific rules of what information can be shared, play groups are left to manage themselves. In *The Game,* the rules indicate that players may not share the specific values of cards in their hands, but may say "don't play on that pile" or "don't make a large jump on this pile." In practice, this can often lead to results very similar to players playing with open hands, especially when players at the table have different ideas about what should and should not be allowed. This dynamic is on full display in *The Mind*, where the rules bar all communication, yet the gameplay is all about reading the slightest and most subconscious of cues. Once again, each group will have very different mores and norms by which they play.

Sample Games

Charades (Unknown, early 19th c.)
Cosmic Encounter (Eberle, Kittredge, Norton, and Olatka, 1977)
Crazy Karts (Perret, 2016)
The Game (Benndorf, 2015)
Hanabi (Bauza, 2010)
The Mind (Warsch, 2018)
Mysterium (Nevskiy and Sidorenko, 2015)
Pictionary (Angel, 1985)
Show & Tile (Loomis and Shalev, 2018)
Specter Ops (Matsuuchi, 2015)
Witness (Bodin, 2014)

UNC-07   Unknown Information
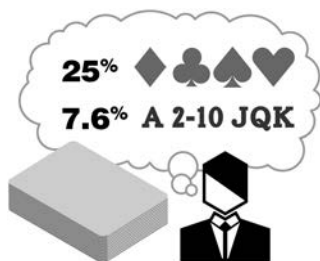
Description

Aspects of the game state are unknown to all players, but lie within a known range.

Discussion

There are three categories of hidden-yet-knowable information: information known to no players, information known to one or more players, and information known to all but one player.

Unknown Information creates uncertainty during any given play of a game, and creates variety in repeated plays. Event decks are a good example of this kind of uncertainty. Players know the range of possible results, and often the cadence by which information will be revealed, but they don't know the specifics, and the specifics can substantially impact strategy. In an initial play, players may not even know the true range of possibilities, and indeed, some game instructions encourage players to look through the deck to familiarize themselves with the possibilities, or provide a card manifest or similar catalog of possibilities. *Pandemic*'s infection deck generates enormous tension precisely because the uppermost cards, formerly the discard pile, are known to the players.

How unknown information will impact players on reveal can vary mechanically too. When modeling exploration, like the face-down sector tiles of *Eclipse,* explored tiles are revealed to all players. In *Karuba,* a new path tile is revealed each turn but each player may use the tile differently, either adding it to their personal board or discarding it for movement. Cards that enter a market, like the ability cards in *King of Tokyo*, can be seen by all players, but an acquisition mechanism limits and determines who can take advantage of

them. In tile-laying games like *Carcassonne,* where players don't have a hand, the new tile drawn is known to all players, but only one player has agency over its placement.

Sample Games

Carcassonne (Wrede, 2000)
Eclipse (Tahkokallio, 2011)
Karuba (Dorn, 2013)
King of Tokyo (Garfield, 2011)
Pandemic (Leacock, 2008)

UNC-08   Hidden Information
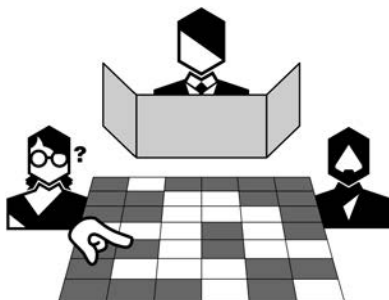
Description

Aspects of the game state are hidden from all but one or a few players.

Discussion

Information can be known to one or more players, but not to all players. This includes information we've covered elsewhere, like Hidden Roles (UNC-04), or private hands of cards. However, in this context, we refer less to those sets of information which are permanent elements of a player's role in a game, like their hand of cards. Instead, we're considering things like the strength of the monsters that all players can battle for victory points in *Champions of Midgard*. The types of information that may be hidden in this manner typically fall into a few categories: secret player abilities, secret goals, strength of enemies, and the location of specific items or resources. Players might spend actions or resources to gain this knowledge, or not. Another type of information of this sort is specific knowledge of another player's hand based on deduction. If you hold the Princess in *Love Letter,* you can be certain that nobody else does, but no other player can be certain about whether the Princess is in your hand, any other player's hand, or the draw deck.

   Designers employ a variety of mechanisms and components to manage hiding and revealing this kind of information. Cards are especially common, as in *Clue*, where players respond to an accusation by showing a disproving card only to the accusing player. Other options include face-down cards, player screens, tokens with common backs but different fronts, and figures with information on the bottom of their bases. More exotically, in *Pikoko,* a competitive trick-taking game, players hold their hands facing out, so each

player can see every card in hand, except those held in their own hand. *Careers* begins with players selecting their own victory conditions as a mixture of Fame, Happiness, and Money, and recording it on their personal play sheet.

These techniques can help add new layers of strategy for advanced players. Once players understand what the range of the hidden information is, they can try to deduce what it is from players who know it. This also offers opportunity for bluffing. For example, paying attention to what elements players include in a guess in *Clue* may give astute players knowledge of what cards other players have been shown. But knowing that players may be looking out for that may cause advanced players to continue to include elements in their guesses that they think will lead their opponents to draw erroneous conclusions.

Sample Games

Careers (Brown, 1955)
Champions of Midgard (Steiness, 2015)
Clue (Pratt, 1949)
Kingsburg (Chiarvesio and Iennaco, 2007)
Love Letter (Kanai, 2012)
Pikoko (Porter, 2018)

UNC-09   Probability Management
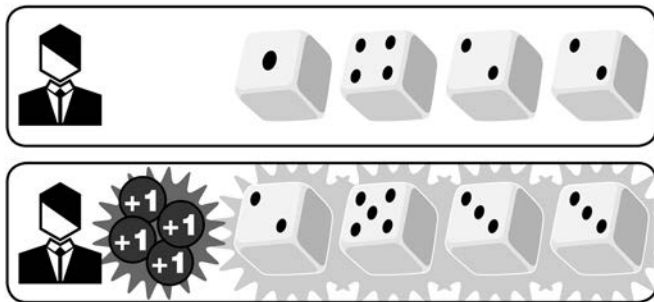
Description

Mechanism which allows players to influence the probabilities of certain outcomes, but not directly determine them.

Discussion

Probability Management is intrinsic to all dice and card games. At its most direct, players can gain dice modifier tokens that allow them to add or subtract from the value of a die, as in *Kingsburg* or *Sagrada.* More obliquely, in *Backgammon* players can move their blots (the name given to the checkers) into positions that minimize the probabilities of good rolls for their opponents and maximize those probabilities themselves.

Betting games allow players to assign stakes to probabilistic events like dice rolls or card deals. However, the type of Probability Management we'll cover here is exemplified by deck-building games. In a deck-building game, such as the progenitor of the genre, *Dominion*, players draw a hand of cards from a private deck each turn, and play those cards to acquire other, more powerful cards, usually from a central market. Players try to acquire more powerful cards, and cards that synergize together. By keeping the deck tuned so that draws consistently surface those cards, players seek to increase the average output of their deck, in whatever terms—currency at the start of a game, and victory point later is a typical framework. We'll discuss Deck-Building in depth in its own section (CAR-05).

Some games offer probability manipulation at rarified skill levels. In *Twilight Struggle,* some cards leave the game after being played for their events. High-level players are careful not to trigger cards showing their

own events, and to trigger, in as safe a manner as possible, their opponent's events. Over time, the weight of the deck shifts and forces the opponent into many difficult hand-management situations where they must trigger highly damaging events. In *Alhambra,* players can draw currency into their hands, either by taking a single card, or any number of cards adding up to no more than 5. Players gain a bonus action when purchasing tiles with exact change, and a great deal of the skill in this game lies in managing a hand that can match many values. Failure to realize this aspect of gameplay results in a substantial loss of player agency.

Sample Games

Alhambra (Henn, 2003)
Backgammon (Unknown, 3000 BCE)
Dominion (Vaccarino, 2008)
Kingsburg (Chiarvesio and Iennaco, 2007)
Orleans (Stockhausen, 2014)
Puzzle Strike (Sirlin, 2010)
Sagrada (Andrews, 2017)
Twilight Struggle (Gupta and Matthews, 2005)

UNC-10 Variable Setup
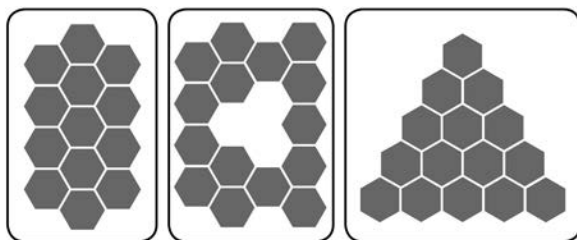
Description

The starting game state varies from game to game, through changes to shared game components like the map, and/or or changes to starting player setups, resources, objectives, etc.

Discussion

Variable Setup is sometimes equated with replayability, and can certainly contribute to it, though they are not the same thing. The line between setup and gameplay isn't always that clear either. But setup can have an outsize effect on uncertainty and overall game outcomes. *Catan*'s rules recommend new players play with a specific board layout, and provide rules for board construction that ensure that no one spot is over-powered relative to others. Players often ignore this rule, and this imbalanced setup can easily advantage one player over the other. Similarly, the randomly dealt alien powers in *Cosmic Encounter* define the game almost entirely, and shape its dynamics even more dramatically than *Catan*'s setup. *Dominion's* selection of ten kingdom cards is similarly impactful—those cards can be considered the last page of the rules.

In many cases, variable setups don't impact uncertainty once setup is complete, because nothing that happens in the game is probabilistically dependent on setup. After faction board tops and bottoms are selected in *Scythe*, for example, there is no further uncertainty. This is as distinguished from *Battlestar Galactica: The Board Game*, where more interactions are available with the loyalty deck, and the makeup of that deck can change prior to the next loyalty phase.

Some variable setups incorporate hidden or unknown information. In *Specter Ops*, the runner who is trying to evade the hunters gets to secretly select a few equipment cards out of the available pool. In theory, hunters can know

the complete set of equipment cards and how they work, though whether that's true in practice—whether players do in fact look in the rulebook to read about all the equipment—is questionable. Designers should provide player aids summarizing this type of information if it's important that players know all the possibilities.

Designers need to be careful that randomized setups don't create balance issues. This is particularly true in longer games. Often, having limitations on the randomization (like redoing a setup if a certain number of the same type of tile are placed in a row), or giving players a pregame chance to respond to the random setup is required. An example of the latter is found in *Catan*, where there is a snake draft for placement of player's initial settlements. This allows players to moderate the vagaries of the initial chance board setup.

Sample Games

Battlestar Galactica: The Board Game (Konieczka, 2008)
Catan (Teuber, 1995)
Cosmic Encounter (Eberle, Kittredge, Norton, and Olatka, 1977)
Dominion (Vaccarino, 2008)
Scythe (Stegmaier, 2016)
Specter Ops (Matsuuchi, 2015)

UNC-11   Hidden Control
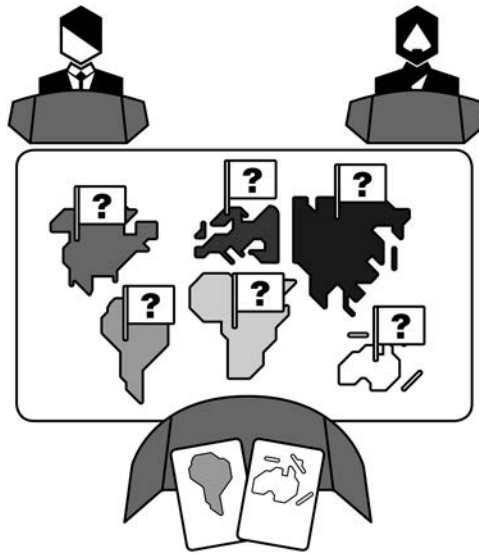
Description

Players have hidden influence on locations or characters, which they reveal to perform actions.

Discussion

In a game of this kind, play is divided up between assigning influence and either declaring or spending that influence to trigger the effects of the character or location in question. In *Mythology,* players secretly assign control points to heroes (or monsters, events, etc.) in one phase. In a later phase in the round, any player may attempt to activate these heroes by announcing that they are taking control. If nobody challenges that control, the action succeeds. If another player challenges, the players engage in an auction-like process of declaring an amount of control points that they had previously assigned. Players may choose to reveal none, some, or all of the control points they have assigned in an effort to take control of the hero, and the player who reveals the most influence is awarded control.

In *Kremlin,* players influence politicians in the Soviet party, each of whom can trigger certain actions based on their altitude in the party hierarchy.

Players write down influence they assign to politicians on a secret log sheet and then reveal some or all of the claimed influence to control these politicians. Revealed politicians are targets for exile, or, in some versions of the game, execution by the KGB, so players must balance the risks and rewards of revealing control.

This mechanism can also be used as part of a traditional public influence system. In *Colossal Arena*, players bet on battling creatures. The player who has placed the highest value of bets on a creature may use its special ability. However, at the start of the game, each player may place a secret bet on a single creature. Timing when to reveal your secret bet to seize control of a creature is a key tactic in the game.

This kind of revealed influence is an uncommon mechanism, perhaps because it requires a log sheet or some other form of tracking, which can be cumbersome. It is also fragile to player deception that is hard to discover. But, used judiciously or with proper physical techniques, it can be compelling. This is perhaps an area that will be explored more in digital hybrid games.

Sample Games

Colossal Arena (Knizia, 1997)
Conspiracy (Solomon, 1973)
Kremlin (Hostettler, 1986)
Mythology (Peek, 1980)
Nothing Personal (Avery and Vasel, 2013)

7

Economics

In one sense, games are about gaining and using assets to achieve victory. Maximizing efficiency, utilization, and value are all important as players strive to win.

Many things can be considered "assets" in a game. They can be obvious, like money in *Monopoly*, and goods like bricks or grain in *Catan*. Or they can be capital assets, like properties or buildings that generate other resources, or intangible, like turn order, board position, network efficiency, or hand size. In this text we will use the generic term "asset" to represent any of these. The term "resource" will refer to money and goods, and not structures or intangibles.

Economics is the study of the allocation of scarce resources. It is not surprising that many aspects of business and economics are adapted into board-game mechanisms. In this chapter we examine a variety of mechanisms that derive from manipulating resources and other sources of value.

ECO-01   Exchanging
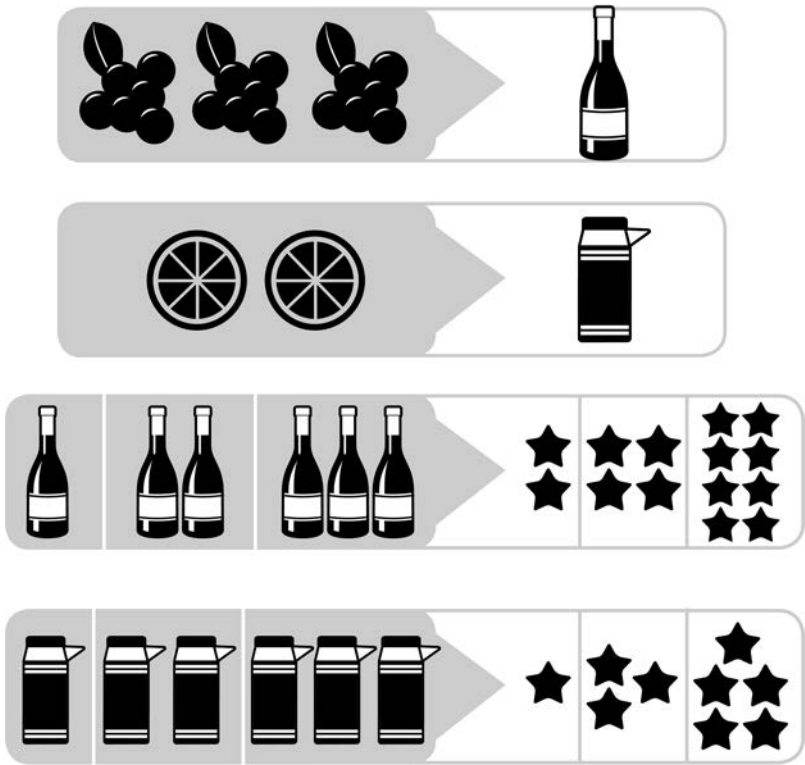
Description

Players Exchange a set of assets for a different set with the bank.

Discussion

While traditionally this mechanism is thought of as Exchanging similar types of resources, for example Exchanging two sheep for a wood at a sheep port in *Catan*, under the expansive definition of assets, it also covers purchasing as a mechanism. For example, in *Monopoly* players exchange the asset *money* for the asset *property*. Similar considerations apply, so they are both covered here.

Often there are fixed formulas for exchanges. Again using *Catan* as an example, a Road costs a Brick and a Grain, and a Town costs a Brick, Grain, Wool, and Wood. These types of requirements can be used to give relative

value to different paths, or add an arc, as different resources may be required in different ways under different strategies or at varying points of the game. What was valuable early may become less so later on.

Some systems feature hierarchical organization of resources. For example, in *Roads and Boats,* Wood is used to make Boards, Boards make Fuel, Fuel and Gold make Coins, and Coins and Paper make Stock Certificates. As is typical in this style of game, each of these transformations is a one-way trip.

Another example of hierarchical resources is *Century: Spice Road*. In this game, yellow turmeric cubes are the least valuable, followed by red saffron cubes, green cardamom cubes, and then the most valuable brown cinnamon cubes. In this case, exchanges are possible (and common) between all levels. Certain cards allow conversion of a brown cube back into several yellow and red cubes.

Hierarchical systems give players a clear sense of value. However, if this value is too clear, other mechanisms need to be introduced to obstruct players from getting use out of that value. Otherwise, the resources are basically fungible like coins of different denominations. For example, in *Century: Spice Road* players may exchange cubes for the Victory Card resource. The point value of those cards is strictly equal to the value of the cubes, from one point for yellow cubes, up to four points for brown cubes. Although not explicitly stated, this 1–4 valuation of colors helps players quickly determine the relative value of the converter cards. One that turns a green (value 3) into a brown and yellow (value $4 + 1 = 5$) gives a net gain of +2. A card that turns a red into a green has a value of +1. While the value of the cards is known, the players need to collect cards that enable them to perform exchanges as efficiently as possible to get the specific set of cubes required by the victory card. Thus time becomes another resource that players must consider when determining the value of exchanges.

Non-hierarchical systems allow players to transform resources in different directions, laterally. The sheep-port in *Catan* that was mentioned earlier is an example. At that port, any other commodity may be obtained by turning in two sheep. Permitting lateral exchange of resources gives a system more flexibility and allows players to specialize, as focusing on just a few resources will not limit them from getting others they may require.

Sample Games

Castle Dice (Peterschmidt, 2013)
Catan (Teuber, 1995)

Century: Spice Road (Matsuuchi, 2017)
Concordia (Gerdts, 2013)
Factory Fun (van Moorsel, 2006)
Gizmos (Walker-Harding, 2018)
Glass Road (Rosenberg, 2013)
Monopoly (Darrow and Magie, 1933)
Roads and Boats (Doumen and Wiersinga, 1999)
Sidereal Confluence (Deichmann, 2017)

ECO-02   Trading
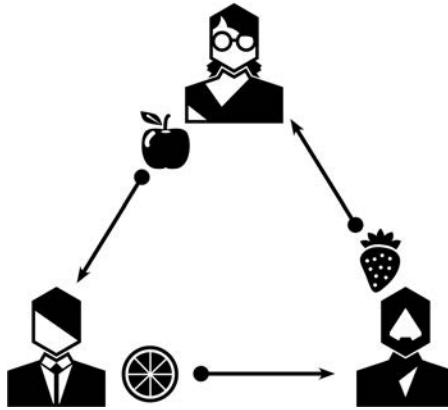
Description

Players may Trade assets with each other.

Discussion

This is a form of Exchanging (ECO-01), except that players determine the terms of the exchange. In order for Trading to work, the resources being traded need to have different value to different players. This is often accomplished through the use of Sets. See Chapter 12 for full details on the supporting mechanisms. The value also needs to be difficult to precisely determine. Again, sets are often used to accomplish this, as players may not know exactly which cards their opponent has. Future value can also be obfuscated, usually based on random future events.

Games typically limit what can be traded. For example, *Civilization* gives players Commodity cards, and only those may be traded. In *Sidereal Confluence*, on the other hand, where a variety of types of resources may be combined in different deals. Sometimes games will strictly require like-for-like trades (e.g., two cards for two cards).

The actual mechanism of Trading can be conducted in several ways. Most common is a defined open Trading session, where players shout out deals and proposals, as in *Civilization*, *Trade on the Tigris*, *Sidereal Confluence*, and many other games. Open Trading is fun and chaotic but has several downsides. First, trade phases tend to be time-consuming, as players haggle. It can also leave

out players who don't have many things to trade or are otherwise uninvolved. Also, players who are less assertive may suffer a handicap. For these reasons, Trade Phases often are timed, and players may only make deals within those windows. If players can make a trade at any point during the game, it may lengthen the game noticeably, and also lead to odd timing effects—what if the players can trade between a combat resolution, and removal of casualties? Questions that are not covered by the rules are likely to arise and outright exploits may lurk beneath the surface.

However, there are games that allow Trading at any time. *Monopoly* is a good example.

Another consideration in trades is the truthfulness factor. Most games require some level of truth on the part of the players. In *Civilization*, players must tell the truth about two cards out of the minimum of three they are required to include in a trade. They may say whatever they would like about the others. In *Trade on the Tigris,* each trade card has a top and bottom half with different resources. Players must tell the truth about the top but may say anything about the bottom. Introducing deception elements into the trade mechanism can add some spice and excitement, but some players will feel uncomfortable about it, and others will simply not have a poker face.

Regardless, however, when Trading resources, the deal typically must be performed as defined. Because of this, most games ban future promises as part of a trade, as it is difficult to police, and requires rules for what happens if an agreement cannot be fulfilled. This is in contrast with Negotiations, where players often do not do what they promise (ECO-18). It is also worth mentioning that introducing Trading gives players a tool to self-balance a game. If one player is in the lead, others may refuse to trade with them, or force them to accept less favorable trade. This is a soft Catch-the-Leader mechanism (VIC-18).

Sample Games

Catan (Teuber, 1995)
Chinatown (Hartwig, 1999)
Civilization (Tresham, 1980)
Monopoly (Darrow and Magie, 1933)
Pit (Cayce, Gavitt, and Parker, 1903)
Sidereal Confluence (Deichmann, 2017)
Trade on the Tigris (Engelstein and Sturm, 2018)

ECO-03 Market
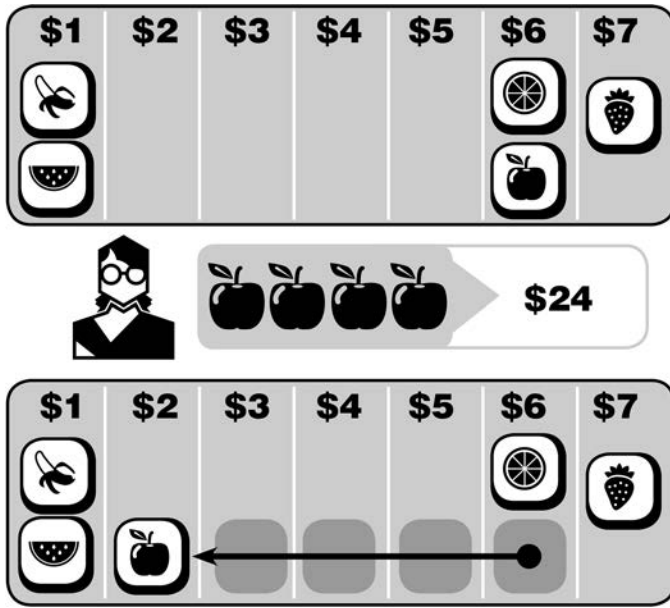
Description

Players may buy from or sell resources to Markets, where prices and quantities can vary.

Discussion

Markets are a specialized form of Exchanging (ECO-01), as players are typically exchanging stocks or commodities for money, all of which are resources. However, there are some specific considerations for this implementation, particularly around changing prices. Note that we are defining a Market mechanism as one where prices change. Mechanisms like that, found in *Concordia*, where you can buy or sell for a fixed value throughout the game would fall under Exchange, even though it is called a Market.

One mechanism for varying prices is using a track as in *Supremacy,* where there is a price track for each commodity, with a marker indicating the current buy/sell price. If a player sells that commodity the price is reduced, and if they buy it the price increases. If a player buys or sells multiple units, all units can

either be sold at the same price prior to adjustment (as in *Supremacy*), or it can drop one space with each good sold (as in *Crude*). While the latter makes it more difficult for players to exploit the system, it makes the calculations a bit more complex.

Price tracks can be 2-dimensional grids, as in the *18xx* series. In those games, selling shares makes prices move down within a pricing column, while issuing dividends moves it to another column with a different price scale. This gives more fine-grained control to the design, and there can be special effects when the price hits the top or bottom of a row or column.

Rather than have a marker record the current price, the actual commodity tokens can do so. This is done by placing one commodity per space on the pricing track. The price of the commodity is based on the farthest space up the track covered by the commodity, or sometimes the farthest visible space. As commodities are bought, higher price spaces are revealed, and as they are sold, the higher price spaces are covered so the price drops. Visually, the former method usually calls for numbers to be printed above or below the track spaces, which takes up more room, while the latter allows the numbers to be printed on the track spaces themselves.

This elegant track system is used in *Crude*, *Power Grid,* and others. When players take a resource off the track, they simultaneously are adjusting the pricing for that resource, without having to remember to do anything else. *Wealth of Nations* adds a twist in that the buy and sell prices are not the same in each space. There is a delta that creates friction in the market system.

Markets can sometimes be one-way ratchets. In *Acquire*, players may only buy shares from the market, not sell them. And as the hotel chains they represent expand, the price of the shares goes up, and can never go down. In other cases, like *Rococo,* prices for thread and fabric go down throughout the course of the turn, decreasing as each player makes purchases. This ostensibly models the decline of prices in a bazaar as closing time approaches and is also helpful for balancing first-player turn-order advantage.

Market systems create a lot of player interaction, as players may attempt to manipulate the price to their advantage or deprive their opponent the ability to gain needed resources. They also help to self-balance resource production. If one resource is being over-produced or under-used by the players, the price will be driven downwards, and players will adjust accordingly. In a system where the physical resource tokens are placed on the market track, they may even become completely unavailable if players are hoarding them.

Sample Games

1830 (Tresham, 1986)
Acquire (Sackson, 1964)
Chicago Express (Wu, 2007)
Concordia (Gerdts, 2013)
Crude: The Oil Game (St. Laurent, 1974)
Greed Incorporated (Doumen and Wiersinga, 2009)
Power Grid (Friese, 2004)
Rococo (Cramer, Malz, and Malz, 2013)
Shark (Vanaise, 1987)
Stockpile (Sobol and Orden, 2015)
Supremacy (Simpson, 1984)
Wealth of Nations (Carroll, 2008)

ECO-04 Delayed Purchase
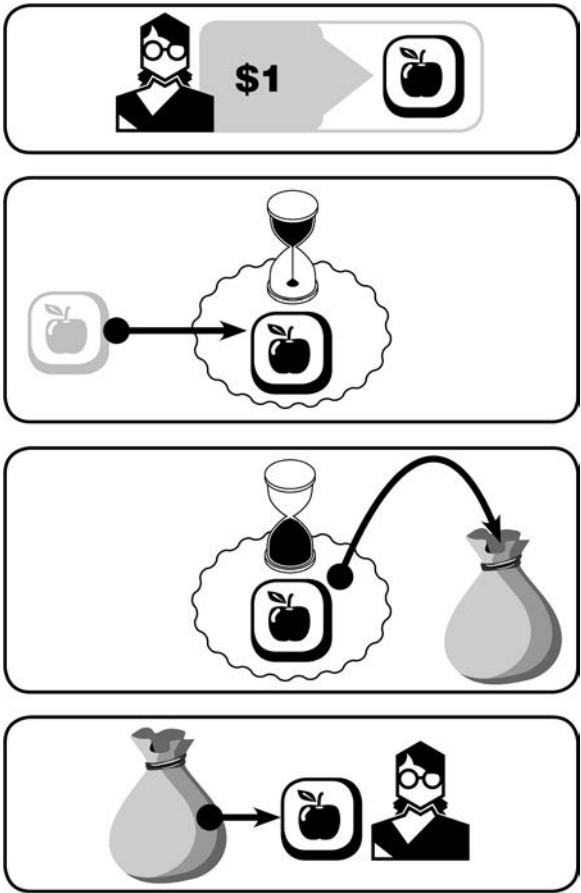
Description

Items that are purchased do not enter play right away but arrive on a future turn.

Discussion

In most games, when you purchase an item, it is immediately available to use. However, in the real world, it can take time to produce something, or get something delivered.

Several games use this Delayed Purchase mechanic to force players to plan ahead. A simple implementation is to place purchased items directly on a

turn track, and they become available when the turn marker moves into that space. This can also be done with a specialized production or training track, where units are advanced one box each turn. This was used in *Time War*, where Teams are trained by advancing them through a schematic of a training facility. Each turn, they move one box through the facility, and when they reached the exit they are fully trained. However, players can remove teams early, but then they are only partially trained, and less effective. In *Star Wars: Rebellion,* ship construction is managed this way too. But various special cards can move ships down the track, accelerating production.

Strategic wargames use this production track mechanism, but have wanted, for realism purposes, to have different durations to produce different units. For example, an infantry unit might take a month, while an aircraft carrier might take a year. Because of the number of units being built, moving tokens from box to box is unwieldy, so designers created the Production Spiral. When units are being built, the tokens are placed by following the spiral arm out from the current month until the matching unit type is found. The tokens are then placed in the section of the arm. When the Month marker is moved, all tokens in that wedge become available to the player. *World in Flames* is a good example.

Another way to implement this is to place purchased items into a discard area, as is common in deck building games like *Dominion*. Here the delay before the purchases are available is randomized, since the discards are shuffled before creating the draw deck. This can create an issue with games with a fixed number of turns, as items that are acquired late in the game may never see play. This can be avoided by making late game purchases just worth Victory Points, or by having a special shuffle towards the end of the game. *Core Worlds* uses that latter technique, as the discards may be shuffled in before the final turn, regardless of whether the draw deck is depleted or not. While not guaranteeing that cards purchased at the end will be drawn, it does increase the chances.

Sample Games

Core Worlds (Parks, 2011)
Dominion (Vaccarino, 2008)
Star Wars: Rebellion (Konieczka, 2016)
Time War (Peek, 1979)
World In Flames (Pinder and Rowland, 1985)

ECO-05   Income
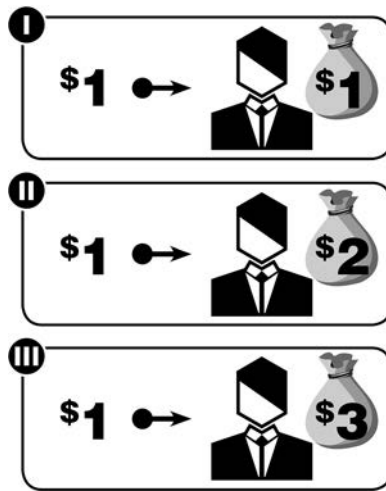
Description

Players gain resources at defined times.

Discussion

To foster a sense of growth and forward progress, most games with economic elements have some form of Income, where players receive additional resources. This is a large topic, and several specific mechanisms discussed in this chapter fall into this category. See "Automatic Resource Growth" (ECO-06), "Loans" (ECO-07), "Exchanging" (ECO-01), "Market" (ECO-03), and "Random Production" (ECO-12). However, there are some broad generalizations that can be discussed.

First, the designer needs to consider the timing of when Income is received. It can be scheduled, player-controlled, or random. *Brass* and *Eclipse* are examples of games with scheduled Income phases. They come at a definite point in the sequence of play, and players can plan around that.

Player-controlled systems rely on players to take actions that result in Income. Typically it is self-controlled: a player makes a decision to take a Production action that generates resources (as in *Global Mogul*), or sells something via a Market (ECO-03). However, in some systems, part of a player's Income may

rely on the actions of other players. For example, in *Le Havre* and *Caylus*, a player gains Income if other players use their buildings (ECO-14).

This increases player interaction and rewards players that consider their opponents' positions. However, this is typically implemented as only a portion of a player's Income, and not a significant one.

There are games where all, or close to all, of a player's Income is dependent on other players. In *Container*, players produce and ship containers. But other than taking loans, you may only gain money by enticing another player into purchasing one of your containers. As can be expected, this makes these games a lot less forgiving, and subject to social pressures. *Container* in particular has this reputation.

Income can also be random. Roll and Move games like *Monopoly* typically incorporate this. Players either rely on others landing on their property spaces, or passing Go to collect money. But there are other more sophisticated systems for randomly allocating resources. See Random Production (ECO-12) for details.

Games can also be Open Economies or Closed Economies. In an Open Economy, there is a bank that pumps more resources into the game system. In contrast, in a Closed Economy, all the resources that exist are already in player hands, and they just move between players during the course of the game. The vast majority of games are Open Economies. This helps foster a sense of progress and is easier for designers to balance. An example of a Closed Economy game is *Dream Factory*, which is discussed in detail in the (appropriately named) Closed Economy mechanism in Chapter 8, "Auctions."

Sample Games

Brass (Wallace, 2007)
Catan (Teuber, 1995)
Caylus (Attia, 2005)
Container (Delonge and Ewert, 2007)
Dream Factory (Knizia, 2000)
Eclipse (Tahkokallio, 2011)
Global Mogul (Crenshaw, 2013)
Le Havre (Rosenberg, 2008)
Monopoly (Darrow and Magie, 1933)
Nippon (Sentieiro and Soledade, 2015)

ECO-06   Automatic Resource Growth
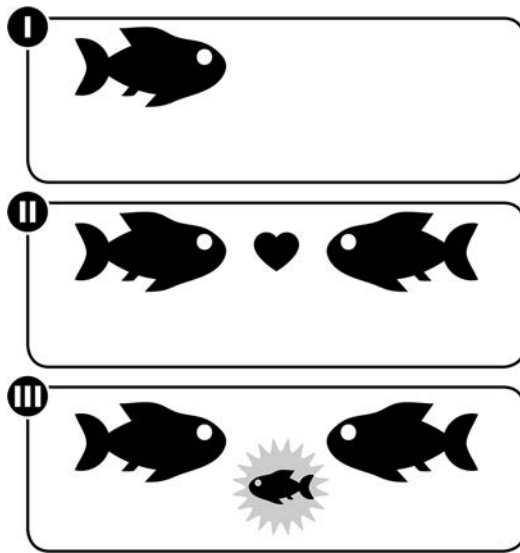
Description

Resources held by a player will automatically grow over time.

Discussion

In the purest form of this mechanism one or more resources increases by a set amount (usually one) each turn. This allows the designer to gradually ramp up player power in a simple and intuitive manner.

A popular example of this is in the digital card game *Hearthstone*. The resource Mana is used to play cards. The Mana available at each turn begins the game at one and is increased by one at each turn until it reaches a maximum of 10. This gives the game an arc, as the options are much more restricted at low Mana values, and complexity and combos are gradually introduced. It also encourages players to balance their decks. If they only select cards with high Mana values, they will not be able to play for several turns. But if they only select low Mana cards, they may run out of cards quickly as they play multiple cards per turn later in the game.

A variant on this system has unused resources grow. Thematically, this can be expressed as bank interest or as breeding animals. *Agricola* uses the latter

option. If a player has two or more of the same type of animal, they gain an additional one. This encourages efficiency and can force players into deciding the value of using resources now, versus having more for later.

Sample Games

Agricola (Rosenberg, 2007)
Hearthstone (Donais and Sakomoto, 2014)

ECO-07   Loans
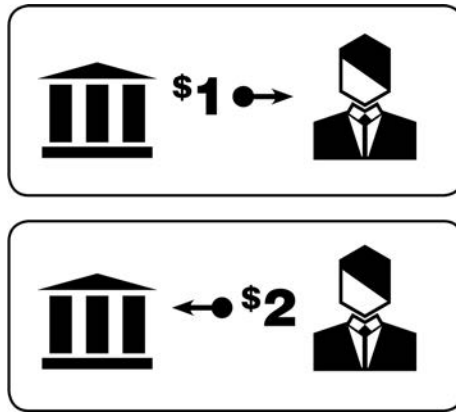
Description

Players may take a Loan from the bank to get more money.

Discussion

Many games with money allow players to borrow. These can serve several purposes for the design. First, they can be punishments for players who do not manage their money properly, and exist to keep those players in the game. But they can also provide a means to victory, giving players resources required to jump-start their engine, or complete a big project. In fact, some games, like *Railroad Tycoon: The Board Game,* essentially require taking Loans to be a part of a winning strategy. Designers need to be careful to frame the concept of Loans in their game to incentivize players in the appropriate way.

There are several varieties of Loan mechanisms in games, around the way they are paid back, and other effects they have on the game. In some games, Loans are never paid back during the game. They simply count against a player's final money totals or victory points.

In other games, such as *Railways of the World*, players pay interest each turn based on bonds they have issued (another way of representing Loans). Whenever a player wishes, they may take a bond certificate and $5,000. Each turn they must pay $1,000 per bond, and bonds may never be repaid. Players lose one victory point (VP) for each bond they have at the end of the game.

In *Brass,* players may use an action to take a loan of $30. This never has to be repaid, but immediately reduces ongoing income.

Wealth of Nations adds a few wrinkles to this system. Each Loan gives cash in declining increments ($20 for the first, $19 for the second, and so on), but can be repaid for $25. Any Loans held at the end of the game reduce the score by 3 VPs.

In *Monopoly,* players may take Loans but need to disable one of their properties to do so. Flipping a property allows the player to take the mortgage value from the bank. While it is flipped, the player may not collect rent if someone lands on the property. To unmortgage a property, a player must pay the mortgage value plus 10% interest. Other than the loss of the use of the property, there is no penalty for having a property mortgaged through the entire game. By rule, players must mortgage properties when faced with a cost that they cannot pay. This mechanism takes choices away from players, while needlessly extending a trailing player's long, slow, death spiral. Designers should avoid this type of mechanism.

Sample Games

Age of Steam (Wallace, 2002)
Brass (Wallace, 2007)
Container (Delonge and Ewert, 2007)
Monopoly (Darrow and Magie, 1933)
Railroad Tycoon: The Boardgame (Drover and Wallace, 2005)
Railways of the World (Drover and Wallace, 2005)
Wealth of Nations (Carroll, 2008)

ECO-08   Always Available Purchases
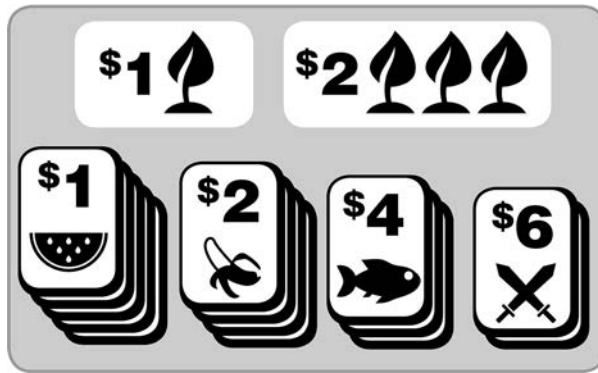
Description

Certain resources are Always Available to Purchase, while others may not or may be limited in quantity.

Discussion

This mechanism has traditionally been used in Deck-Building games (CAR-05). In *Ascension: Deckbuilding Game*, for example, there are two basic actions for players: purchasing an available card or attacking a card. In addition to a rotating queue of cards in the center, there are three cards that are always available: Heavy Infantry and Mystics are always available for purchase, and Cultists are always available to be attacked.

Having these cards gives a safety valve for players who face a board filled with high-level cards that they cannot afford, or early in the game when their hands may be weak. These cards are weaker than standard cards but are a reasonable consolation prize in case players get stuck with a low-value draw or allows them to use excess purchasing or attack power.

Dominion does not have random cards in the center, so the cost range of the cards is more constrained, and there is almost always something affordable. However, this mechanism is still used in the form of coin cards. Having these standard cards helps players develop a sense of value and gives them a target to know what they need to do to gain the highest scoring Province cards.

Sample Games

Ascension: Deckbuilding Game (Fiorillo and Gary, 2010)
Dominion (Vaccarino, 2008)
Star Realms (Dougherty and Kastle, 2014)

ECO-09   I Cut, You Choose
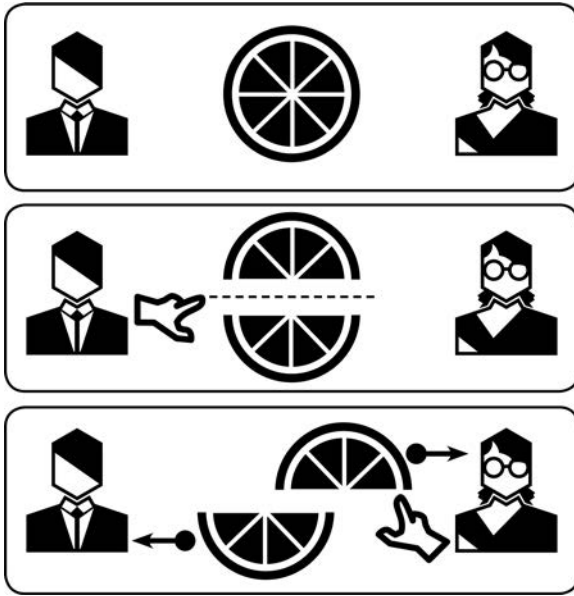
Description

One player divides a set of resources into different groups. Other players have first choice of which group to select.

Discussion

This I Cut, You Choose mechanism is based on a technique that parents often use with two children who are, for example, dividing up a bar of candy. One child breaks it into two pieces, and then the other selects which one they want. This ensures that the one doing the dividing is incentivized to make it as equitable as possible, because they know the other will take the larger piece.

In general, when this mechanism is used, it is between two players. For example, in *San Marco*, players are paired up each turn, and one is designated to divide drawn cards into two stacks. Then the other player selects which stack they want to keep.

This mechanism forces players to consider a wide variety of factors, both present and future, to put together offers that will entice the choosing player to pick the desired stack while giving them as little as possible.

Some games, like *New York Slice*, extend this mechanism beyond two players. In *New York Slice*, one player divides a stack of pizza ingredients into several stacks equal to the player count. Then, going clockwise, each player selects one stack, with the dividing player getting the last one remaining. In this multiplayer variation, it is next to impossible for four or more divisions to have even roughly equivalent value, so it is customary for each player to have equal turns being the divider.

For this mechanism to be interesting, the value of each division can't be obvious. True value for each player must be hidden or obscured. The most common way to do this is by integrating a variety of Set Collection mechanisms, which is the go-to method for having the same thing be worth different things to different players. See Chapter 12 for full details.

Sample Games

New York Slice (Allers, 2017)
Piece O' Cake (Allers, 2008)
San Marco (Moon and Weissblum, 2001)
Sundae Split (Bivins, 2017)

ECO-10   Discounts
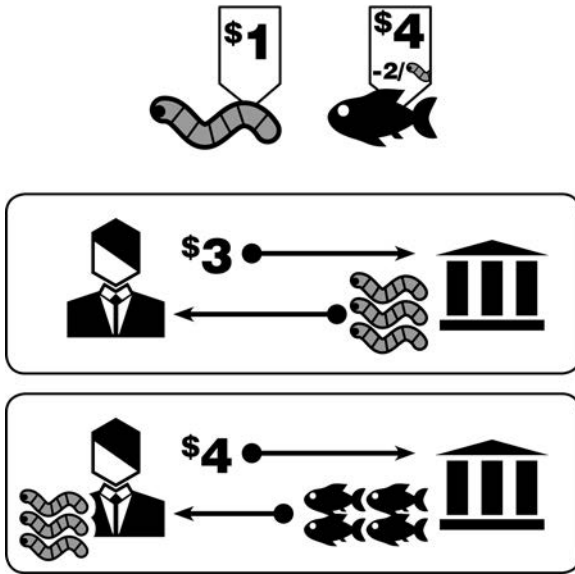
Description

A player can obtain an asset at a reduced cost.

Discussion

In the typical implementation of this mechanism, players accumulate Discounts that make future purchases less expensive, these Discounts persist, and they stack (build on each other). These characteristics make this mechanism well suited to create an engine-building effect, where players are able to achieve more as the game continues.

In *Splendor*, for example, cards are obtained by cashing in gems (ECO-01). Many of these cards Discount all future purchases by one or more gems. As the game progresses, it becomes easier for players to obtain more expensive cards, as they need fewer gems once they take the discounts into effect.

7 Wonders takes Discounts to an extreme by allowing players to acquire a card at no cost if they have the prerequisite building. This is distinct from an Upgrade mechanism (ECO-11), as the original card is retained. It is not converted into the new building—it merely allows for its acquisition at no

cost. However, these Discounts are not fungible. They only apply to the single building specified on the card.

One of the earliest examples of Discounting is *Civilization*. Technology advances (called Civilization cards) gives players Discounts towards a specific category of Civilization card, usually the same category as the card itself. For example, Music, which costs 20 and is in the Art category, gives a 10 Discount towards any future purchases in Art for the rest of the game. This encourages players to specialize in certain areas. It also helps to create a Technology Tree (ACT-16) without actually defining any prerequisites, by having the most advanced cards be so expensive that they realistically can only be obtained through Discounts.

Sample Games

7 Wonders (Bauza, 2010)
Civilization (Tresham, 1980)
Splendor (André, 2014)

ECO-11   Upgrades
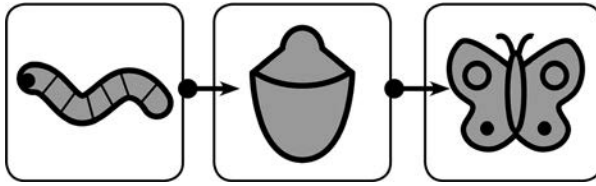
Description

Assets may be Upgraded to improved versions.

Discussion

Upgrades share many characteristics with Discounts (ECO-10), but with some distinctions. Typically, they are implemented by first representing the action or ability with a card or tile, and then replacing it with a better version, or adding another card or element to it to show its improved status.

Implementing Upgrades can nudge players to specialize, particularly if it is much more expensive or even impossible to go directly to the upgraded resource without the lower-level resource. As such, this can also be used to implement a Tech Tree (ACT-16).

A specialized form of upgrade is seen in train games such as *1830* and other *18xx* games. Early in the game, players place yellow tiles, which have simple single-track sections. Later, they may place more complex green or brown tiles that include overpasses and junctions. However, when upgrading a tile all existing track must be preserved. This limits the types of upgrade tiles that can be used and creates competition and bottlenecks for certain limited key tiles.

Some games force upgrades through obsolescence. At certain points, the game advances to a new stage (ACT-15), and some items may become obsolete and be discarded. The *18xx* games use this mechanism by having trains go obsolete, constantly forcing players to reevaluate their board position and future growth.

The physicality of the upgrade is typically done by replacing a card or tile; however, sometimes it is done by rotating or flipping. *Maiden's Quest* and *Flip City* make full use of this option by having players rotate or flip cards within a deck to increase (or reduce) their strength. While this gives designers a lot

of flexibility in a small space, it places a burden on players to shuffle properly and maintain orientation. Other means for upgrading include adding a new card or card portion. *Mystic Vale* does this with clear plastic cards, each of which is populated in its top, middle, or bottom third. Layering the cards together enables all three sections to be seen at the same time. Cards are not the only elements that can be upgraded, nor the only way to show upgrades. In *Monopoly*, a property can be improved by adding houses, and eventually, hotels, to it. In *Catan*, settlements can be upgraded to cities, each represented by a different token.

Upgrades are a common mechanism outside of the specific economic lens taken in this chapter. From promoting pawns in *Chess* to leveling up characters in a dungeon crawl, to adding a fortification to a territory or hex, Upgrades represent a means of investment that increase player power, contribute to narrative, and help players create connections to elements in the game.

Sample Games

1830 (Tresham, 1986)
Attika (Merkle, 2003)
Brass (Wallace, 2007)
Catan (Teuber, 1995)
Chess (Unknown, ~1200)
Flip City (Chen, 2014)
Maiden's Quest (Shannon, 2018)
Monopoly (Darrow and Magie, 1933)
Mystic Vale (Clair, 2016)
Through the Ages: A Story of Civilization (Chvátil, 2006)

ECO-12   Random Production
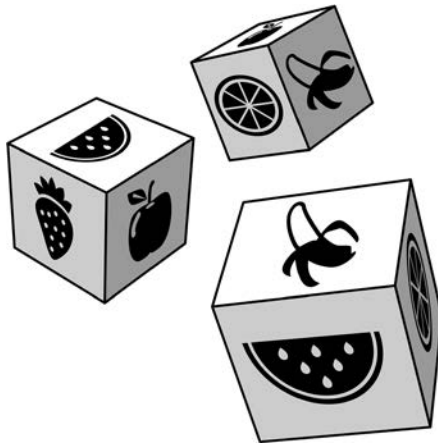
Description

Resources are generated from a random process and distributed to qualifying players.

Discussion

The Random Production mechanism was introduced in *Crude* but was popularized in *Catan*. In both of these games, players begin their turn by rolling two dice. In *Catan*, the die result determines which tiles activate, and any players with settlements or cities touching that tile receive resources. In *Crude*, the dice activate both the related row and column for the active players, and either the related column or row for their neighbor.

This mechanism keeps all players involved on other players' turns, by offering the possibility of gaining resources. Players must remain flexible in their planning, since they can't guarantee resource production, or the specific mix of resources they'll get. There's also a slot machine effect, as players may hit a small "jackpot" if they hit a needed number.

This system was extended by *Machi Koro* by defining special abilities that only trigger on a player's turn, or that only trigger on other players' turns.

This was further refined in *Space Base*, where each ability card has two sides. The blue side has an ability that triggers on your turn. If the card is replaced, it rotates to its red side, and now triggers when an opponent rolls

that number. Since, in games with more than two players, there are more opponent turns than your turns, getting cards to their red side is an important strategy.

A weakness of these systems is that they can be susceptible to player perception of streaky dice rolls. In actuality, given the number of dice rolls in a typical game of *Catan*, it is inevitable that some numbers will be rolled more than average, which means that some will be rolled less. This introduces a level of randomness that may or may not match the design intent, and player expectation. Designers also need to realize that players are poor judges of what is a normal "streak" in a game like this and will perceive their frequency as worse than average even when they are exactly as expected. The *Catan* Event Cards expansion introduces a deck of 36 cards featuring each of the different possible outcomes of a roll of 2d6. A reshuffle card sits 5 cards from the bottom, indicating when the deck is to be reshuffled. Whether this is an improvement or not is largely in the eyes of the beholder, and the designer.

Sample Games

Catan (Teuber, 1995)
Crude: The Oil Game (St. Laurent, 1974)
Machi Koro (Suganuma, 2012)
Space Base (Clair, 2018)

ECO-13   Investment
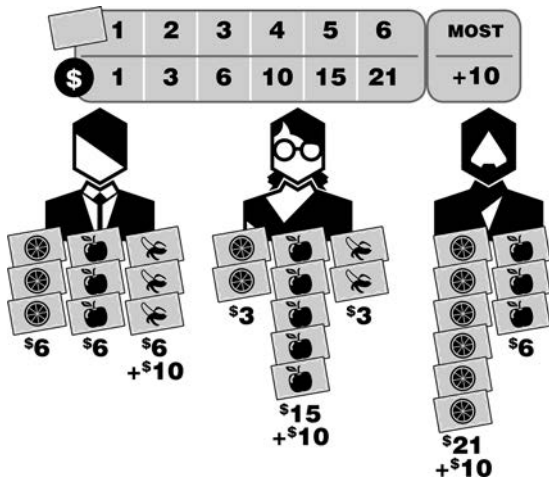
Description

Players own a share of an entity.

Discussion

Typically, this Investment mechanism represents ownership in the form of stock. Players may buy shares of stock and accrue benefits based on the amount of stock owned.

The benefits take two basic forms. In the simplest, players earn a dividend based on the number of shares owned. This may occur periodically, or at specific trigger points. Other systems give benefits to the player who owns the most shares, or to the top shareholders. This is very similar to an Area Majority system (ARC-02), so the considerations there apply.

Often it is a combination of these two. In *Acquire*, for example, players buy shares in hotel chains, which grow during the game, and merge if they touch. When a chain merges, each share pays a set amount, with the top two shareholders earning special bonuses.

In *Airlines*, scoring happens at variable intervals based on Card Draw (CAR-04). Each airline awards points based on the number of flight paths it has claimed on the board. The player with the most gains 1 victory point (VP) per flight path, and the player with the second-most gains half of that.

The parallels with Area Majority are clear, as having one more share than your opponent is just as good as owning 100% of the shares. The number of shares that are available is usually limited. In *Airlines* it varies by company, so players can lock in a guaranteed majority by having, for example, 4 shares in a 7-share company. This is distinct from the typical Area Majority game, where players can put as many resources as they like into a single entity. This distinctive mechanism is sometimes referred to as Area Control.

Another instructive example in *Airlines* is the way values change for different airlines. Each has a different number of markers that can be placed on the map to claim more routes. Airlines with more shares have more markers. This makes them potentially more valuable, but players must do more to gain and have the most shares. See Connections (VIC-14) and Network Building (SET-04) for further discussion.

An analogous but different form of Investment is Contribution. Players who contribute to a particular effort are entitled to a share of the spoils. For example, in *Tobago*, players contribute clues to narrow down the location of a treasure. When it is located, players who contributed clues to the correct location earn a reward. In *Dragon's Gold,* players cooperate to slay a dragon, and players who participate (no matter to what degree) are entitled to participate in the negotiations to divide the treasure.

Sample Games

Acquire (Sackson, 1964)
Airlines (Moon, 1990)
Chicago Express (Wu, 2007)
Dragon's Gold (Faidutti, 2001)
Get the Goods (Ado and Moon, 1996)
Shark (Vanaise, 1987)
Tobago (Allen, 2009)
Wheedle (Knizia, 2002)

ECO-14   Ownership
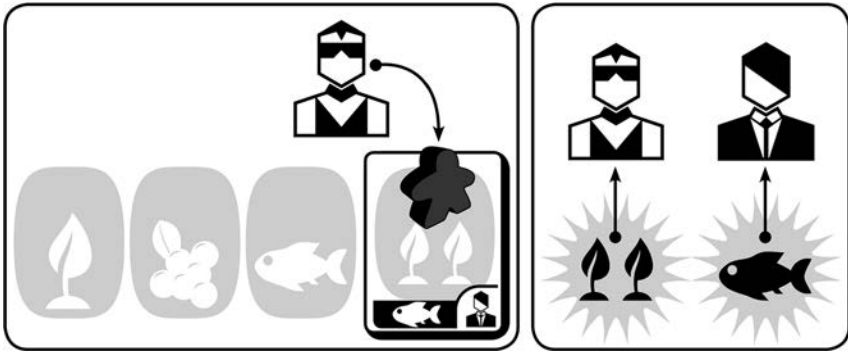
Description

Players own entities, and perform actions for those entities, or collect benefits if others use them.

Discussion

In *Le Havre* and *Caylus*, players may build buildings, which become new action spaces that all workers can use (see "Worker Placement" in Chapter 9 for more details). Typically, the owner can use the space free-of-charge, but when other players use the space, they must pay a fee to the owner.

This type of Ownership mechanism introduces a lot of different value calculations for the player. If I invest in this building, is it attractive enough that other players will use it and I will recoup my investment? If I take advantage of a building owned by another player, will it benefit my opponent more than me? As such, this mechanism can create a lot of player interaction.

In many rail games, including *Empire Builder, Railway Rivals,* and *Rail Baron*, players may use tracks built by other players for a fixed cost. This leads to decisions about how often a player may need to take a certain route in the future and rent-vs.-buy calculations.

A more advanced form of Ownership is featured in *1830*, *18xx* games more generally, *Imperial,* and more. In these games, players purchase shares in companies (or countries in the case of *Imperial*), and the player with the most shares is the executive owner and has the ability to take actions on behalf of that entity. In *1830* players can build track and stations, buy trains,

and decide whether or not to issue dividends. In *Imperial* players may build armies or navies, declare war on other countries, or build up their economy. Typically, the money and assets of the company belong to the company. Players have their own money and assets, and these are strictly separate. There are specific means by which players can profit from running the company, not all of which are to the benefit of the company or the other shareholders. Like in real-world business, there are many strategies for enrichment, and these games offer a high level of complexity and steeper learning curves.

If a player obtains more shares than the current owner, they take over Ownership. This can lead to major shifts in board state. While owners usually don't like to lose their position, it can sometimes be an important tactic, particularly in the *18xx* series of games. In those, the corporations, which represent railroad companies, must have trains. When trains become obsolete, they are discarded, and new ones must be purchased. If the railroad does not have enough money, the owner must pay for new trains out of pocket. An important tactic is for the owner to drain money out of the company treasury and then dump their shares to stick the almost-bankrupt company with another player.

Greed Incorporated is also based around this idea, as the key strategy in this game is getting Ownership of a company, getting it pay you bonuses, and bailing out before it goes under.

Ownership of this type makes a game multilevel. Players need to consider the individual player positions within companies, the companies' positions on the board, and the relative strengths and cash positions of all.

Sample Games

1830 (Tresham, 1986)
Acquire (Sackson, 1964)
Belfort (Cormier and Lim, 2011)
Caylus (Attia, 2005)
Empire Builder (Bromley and Fawcett, 1982)
Greed Incorporated (Doumen and Wiersinga, 2009)
Imperial (Gerdts, 2006)
Le Havre (Rosenberg, 2008)
Rail Baron (Erickson and Erickson, 1977)
Railway Rivals (Watts, 1984)

ECO-15   Contracts
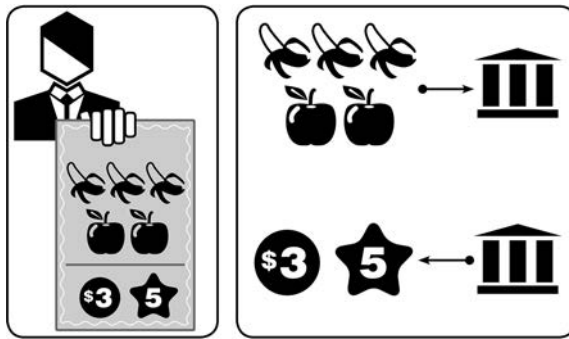
Description

Players fulfill Contracts to earn rewards.

Discussion

Typically to complete a Contract, players turn in a specific combination of goods and earn a reward, which is usually money or victory points (VPs).

Contracts can either be *public* or *private*. Public Contracts are face-up and shared by all players who race to fulfill it first. Often the Contract is discarded, but sometimes other players can fulfill the Contract later for a lesser reward. *Century: Spice Road* is an example game with Public Contracts.

Private Contracts, by contrast, may only be fulfilled by the player that has them. They may be known to all or kept hidden until fulfilled. In *Empire Builder,* players have three Contract cards to deliver a specific good at a specific city. These are face-up so all players can see them, but only the owner may complete the delivery.

There are a variety of ways that players may obtain Contracts. They may be obtained via random draw (as in *Empire Builder* or *Century: Spice Road*), by selecting from a tableau, by drawing several and selecting which to keep and which to discard, by draft, or even by auction (as in *Mow Money*).

Contracts give players immediate direction and goals, which can be particularly important for new players. Public Contracts increase player interaction, but also may lead to "feel-bad" moments if a player is really close to completing a Contract but is scooped by an opponent at the last

second—particularly if 2nd place rewards aren't available. In these cases, it is helpful if whatever is used to fulfill the Contract is generally useful, so that the effort to acquire that specific set of resources, or bring them to a specific location, is not completely wasted.

Sample Games

Century: Spice Road (Matsuuchi, 2017)
Empire Builder (Bromley and Fawcett, 1982)
Goa (Dorn, 2004)
Mow Money (Saunders, 2016)
Ora et Labora (Rosenberg, 2011)
Schoko & Co. (Hirschfield and Monnet, 1987)
Undermining (Tolman, 2011)

ECO-16   Bribery

Description

Players offer bribes to other players to get them to perform specific actions.

Discussion

Bribery is a subset of the Trading mechanism (ECO-02); however, it is typically more structured and given a different thematic basis. In a Bribery mechanism, a player needs to make a decision, and the other players then make monetary offers to entice the active player to make a particular choice.

Santiago uses this mechanism to great effect. Players are constructing irrigation canals around fields. Each turn, one player is the overseer, and needs to decide where they will be constructed. The other players may influence the decision by laying a stick of their color in the direction they prefer, along with some coins. If the overseer decides to build in a way that contains another player's bribe, they take it. However, they are free to build in a completely different direction than any of the bribers would like. Bribes that are not taken are returned to the players.

This system rewards players that are able to judge where the overseer may want to build anyway, and also gives the overseer opportunity for bluff, convincing the other players that the overseer wants to build in a different direction than they truly do, to entice other players to place bribes where they were planning to go anyway. The overseer also needs to value the benefit of a particular build to their opponent, as opposed to the bribe that they would receive.

While Bribery usually involves one active player and many potential bribers, *Tonga Bonga* implements a multiplayer simultaneous bribe system. Players have sailor tokens, but they cannot staff their own ships. Their sailors must be sent to other players' ships. At the start of each round, players place bribes on different positions around those ships. Then, in sequence, each player places

a sailor on an available space, potentially gaining the bribe there. Sailors have different ratings, and a higher-rated sailor can kick out a lower-rated sailor from a position—a kind of Auction or Area Majority mechanism (ARC-02). After all sailors have been placed, players gain coins on their spaces.

Players need to balance gaining coins, versus sending their best sailors to help their opponents move their ship, which ultimately is the way to win the game. Money is only a means towards an end and does not yield direct victory points.

Sheriff of Nottingham uses Bribery as a one-on-one mechanism. Players are trying to bring goods into the city and need to declare what they are bringing in to the Sheriff, who is played by a different player each round. Players place the cards they wish to get into the city in a sealed pouch, and must declare the contents to the Sheriff, truthfully or not. The Sheriff has to decide whether to inspect the bag or not. If the player was lying, the Sheriff gains, if not, the player gains. Before the Sheriff decides to inspect or not, the player may offer a bribe for them to not inspect, which can lead to interesting negotiations and Yomi (UNC-01).

Sample Games

Intrigue (Dorra, 1994)
Santiago (Heley and Pelek, 2003)
Sheriff of Nottingham (Halaban and Zatz, 2014)
Tonga Bonga (Dorra, 1998)
Traders of Genoa (Dorn, 2001)

ECO-17   Increase Value of Unchosen Resources
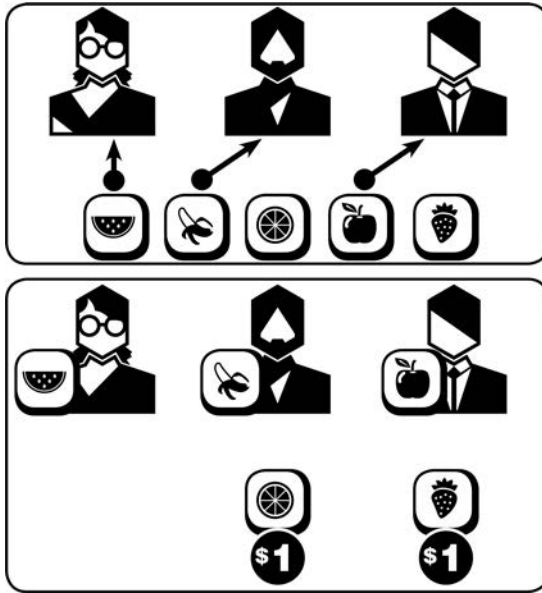
Description

If players do not select certain Actions or Resources, then they increase in value.

Discussion

Puerto Rico is one of the earliest examples of this mechanism. Each player selects one role during a round, but there are more available roles than players. The roles that are not chosen gain a coin at the end of each round. In the future, when a players select that role they also gain the coins on it. This mechanism is a specific type of Dutch Auction (AUC-08).

  Small World and *Century: Spice Road* also implement this system in a different guise. When a players select a new faction in *Small World,* they select it from a queue. They may take any available faction in the queue but must place a coin on each one that they skip over.

  In *Agricola*, a worker placement game (Chapter 9), some spaces are stocked with an addition resource each turn. If those spaces are not selected, they will

accumulate more and more resources, until a player claims them and takes all the resources on the space.

These systems all have in common that they allow the players to value the choices. The value of unselected options gradually increases, until the value reaches a point that entices a player to choose it. While this doesn't eliminate the need for the designer to balance options, it gives some flexibility to price options that have values that may change over the course of the game or are random combinations that vary in power (as in *Small World*).

Sample Games

Agricola (Rosenberg, 2007)
Century: Spice Road (Matsuuchi, 2017)
Puerto Rico (Seyfarth, 2002)
Small World (Keyaerts, 2009)
Vinci (Keyaerts, 1999)

ECO-18   Negotiation

Description

Players make agreements about courses of action.

Discussion

Negotiation as a mechanism is very similar to Trading (ECO-02). We are drawing a distinction here between the exchange of resources, which defines Trading, and the influencing of actions that people take, usually in exchange for a promised action by the negotiating player. Bribery (ECO-16) combines these, exchanging resources for an action. The dividing line here is certainly fuzzy, but useful.

Negotiation games often include deals that are non-binding. *Diplomacy* is a classic example. Players can discuss and coordinate moves, but nothing in the game binds players to follow through when they secretly write their orders.

Designers may include rules that mandate binding Negotiations. Typically, these require that the terms of the deal be resolved immediately, and not

extend to future turns or actions. This is a practical matter, as it becomes difficult to remember what the negotiated deal terms were and eliminates the need to include rules for what happens of the agreed-upon action physically cannot be performed.

Non-binding deals raise the emotional stakes for many players, because they raise questions of honesty and loyalty, which are social rather than economic norms. Negotiations can also dramatically lengthen games, and so negotiation periods may need to be time-limited.

While any game is potentially subject to players negotiating, there are a few techniques for designers to add it as a specific feature. One is to have a dedicated Negotiation or discussion phase, as is done in *Diplomacy* or *The Resistance*. The rules should contain some structure around length of Negotiations and what is or is not binding.

Negotiation can also be encouraged through Voting (RES-15), Hidden Roles (UNC-04) and Simultaneous Action Selection (TRN-09). These mechanisms introduce discussion and negotiation naturally, although it is recommended that the legality of negotiation (and again, the scope), be referenced in the rules.

Finally, negotiation can be supported thematically. Games that are modeling deals, or politics (like *I'm the Boss* or *Republic of Rome*) will naturally lead to player negotiation.

Sample Games

Cosmic Encounter (Eberle, Kittredge, Norton, and Olatka, 1977)
Diplomacy (Calhamer, 1959)
A Game of Thrones (Petersen and Wilson, 2003)
I'm the Boss (Sackson, 1994)
Intrigue (Dorra, 1994)
Republic of Rome (Berthold, Greenwood, and Haines, 1990)
The Resistance (Eskrisge, 2009)
Werewolf (Davidoff and Plotkin, 1986)

ECO-19   Alliances
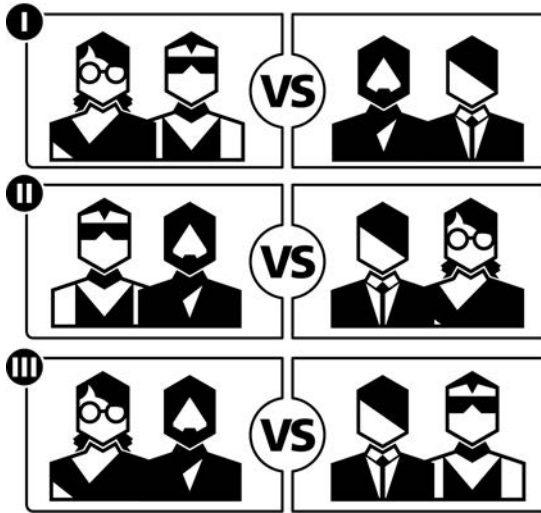
Description

Players have formal relationships that may change over the course of the game.

Discussion

In pure Negotiation games (ECO-18), agreements to cooperate are informal and can be made or broken at will. This mechanism differs in that there is a formal step to enter into and leave an Alliance, and the game rules specify how the Alliance operates.

For example, in *Dune,* each turn, cards are revealed from the Spice deck. If one of them is a Worm card, the players are allowed to make and break alliances. These alliances are in force until the next Worm card is revealed. Players that are allied may not attack each other, combine their score for winning purposes, win together, and may cooperate in other ways. When the next Worm is revealed, players may decide if they want to continue the alliance, ally with another player, or go it alone. *Empires in Arms,* a detailed simulation of the Napoleonic Wars, has a robust and complex alliance system, with a variety of possible formal relationships between players.

In *Struggle of Empires*, each Round begins with players bidding for the right to divide the players into two teams of their choosing. Like *Dune*, players who are allied fight together and may not attack each other. However, players still win or lose individually, which creates interesting dynamics.

Cosmic Encounter has players trying to conquer planets from their opponents. Each time this occurs, there is a formal alliance step, where players may choose to ally with the attacker, defender, or stay out of it, and there are defined benefits and penalties if their side wins or loses. So this is a similar system, although it is much shorter in duration, lasting one turn.

There are a variety of other takes on this system. *Through the Ages* has Treaty cards that players can offer to their opponents to gain mutual (sometimes asymmetrical) benefits. The Trick-Taking card game (CAR-01) *Mu* has partners assigned for the hand based on a bidding phase. Hidden Role games (UNC-04) secretly put players on different teams.

Sample Games

Cosmic Encounter (Eberle, Kittredge, Norton, and Olatka, 1977)
Dune (Eberle, Kittredge, and Olatka, 1979)
Empires in Arms (Pinder and Rowland, 1983)
Mu (Matthäus and Nestel, 1995)
The Resistance (Eskrisge, 2009)
Struggle of Empires (Wallace, 2004)
Through the Ages: A Story of Civilization (Chvátil, 1986)
Werewolf (Davidoff and Plotkin, 1986)

8

Auctions

❧

A common concern in game design is how to allocate resources fairly among players. One of the most versatile solutions is an auction. Auctions provide for player agency, drama, interaction, strategy and calculation. They are engaging and skill-testing, while providing players the opportunity to acquire whatever they wish, as long as they are able to pay.

The branch of mathematics called Game Theory studies auctions extensively, and game designers can draw on a rich trove of auction types with widely varying dynamics. Auctions can help keep a game in balance because players can dynamically adjust their pricing in response to fluctuations in the value of goods in a game.

For a time, auction mechanisms were wildly popular, and Reiner Knizia, the master of the auction, dominated the tabletop industry and the awards circuit with a dizzying array of clever and innovative auction games. Other genres, like *18xx*, also incorporated auctions, especially on setup. Yet, over time, the auction has waned in popularity, as Worker Placement (Chapter 9) and Drafting Mechanisms (CAR-06) presented alternative methods for allocating actions and resources in games.

Why did this shift occur? To some extent, gamer tastes change, like fashion, but designers should be aware of some of the drawbacks of the auction mechanism that contributed to its decline. Auctions depend on players being able to make accurate valuations of the lots up for auction. As players gain experience with a game, these assessments are easier to make, but for many players, the first few plays can be very frustrating. Auctions are also fragile to players who make bidding mistakes, like over-spending early. In many auction games, one bad judgment can cripple a player for the rest of the game.

A challenging counterpoint to players being able to accurately judge value is that they should not be able to judge it **too** accurately. As an example, consider how much you would bid for a $10 bill. Any bid other than $10 doesn't make sense: bid more and you'll over-pay. Bid less, and you'll be out-bid. There needs to be some obscuring of the precise value of the lot up for bid. Some ways to do that include hidden goals, having the values depend on what lots may be available in the future, or a mechanism like set collection (Chapter 12) which makes the same good have different values to different players.

Auctions can also slow a game down quite a bit. While this isn't a problem when auctions are the central mechanism of the game, it can present problems for pacing and play-time when they're a sub-system in a bigger game. Fortunately, there are many auction mechanics that are specifically designed to address this challenge, and we discuss them in this chapter. Multiple-lot auctions, simultaneous, or single-bid auctions, and auctions with substantial constraints on bidding amounts all help make auctions work better in the context of tabletop games.

As you read this section, you may find that many other mechanisms can be described as a kind of auction or are isomorphic to an auction. We'll point to examples throughout this section that may be surprising or eye-opening. Keep in mind, however, that the math underlying an auction, or any mechanism, is only one piece of the puzzle. How players experience a mechanism, how it's presented, and the way it supports the game's theme and setting are as much a part of the mechanism as the underlying math. Nonetheless, auctions are like the skeletal system of games. In many cases, it is their mathematical dynamics and structure that support the rest of the structure.

AUC-01   Open Auction
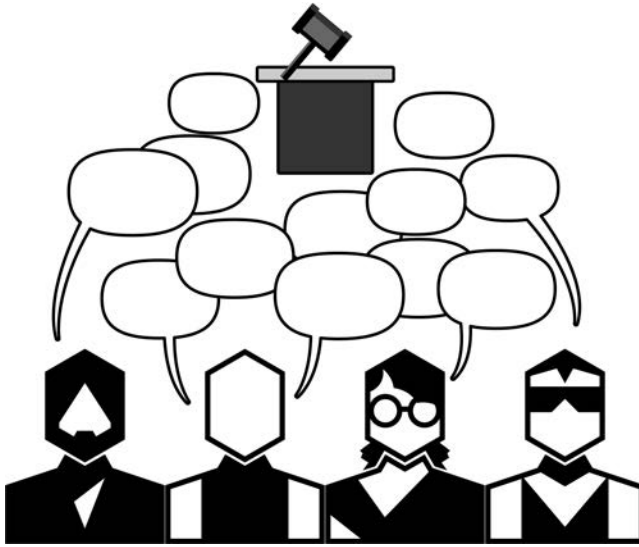
Description

Players shout out bids as they will, with no turn order. While an Open Auction will typically end when a certain amount of time with no increases occurs, or it is clear that no one wishes to raise the current bid, a true Open Auction allows a seller to accept any bid at any time and close the Auction. Though the usual outcome is that the high bidder is the winner, no rule requires this outcome.

Discussion

An Open Auction is quite unusual in that it has no auctioneer, and no rules—not even the rule that the highest price must win. In a sense, an Open Auction is more like an out-loud simultaneous negotiation. The reality is that very few auctions, in the real world or in board games, are truly open. That's because Open Auctions are pretty messy! Multiple bidders often want to bid the same amount, and the bidding increments can be all over the place. Some bidders may not hear all the bids, and confusion is all too common. Without an auctioneer, these auctions can be difficult to govern fairly. In the boardgame context, it's worth pointing out that they also tend to be really noisy and

frenetic. The only game we could find that uses Open Auctions is *Monopoly*. In perhaps the most-overlooked rule in the game, when a player decides not to buy a property from the bank, the property is sold at an Open Auction to any player (including the one who chose not to buy it from the bank initially) at any price. Given this example, designers should carefully consider whether an Open Auction truly suits their game, or whether a different auction structure might work better.

Despite their weaknesses, Open Auctions do have some important features. First, iterative bidding provides a lot of information as players reveal their preferences and for the goods up for auction. The auction integrates a means for allocating resources with a way for players to trade opinions about how valuable they are.

Another important feature of the Open Auction is that the dominant strategy for any bidder is to stay in the auction until their value for the auctioned goods is reached. This means that, absent external issues like very large disparities in player wealth, the winner will pay a price close to the actual value for the item—or, to be precise, they will pay one dollar (or other bidding increment) more than the price at which the 2nd-highest bidder valued the item.

In general, Open Auctions are more theoretical than practical. There are many small tweaks to the basic structure that create much more suitable dynamics for use in tabletop games. We include the mechanism of Open Auctions here to act as a basis for comparison.

Sample Games

Monopoly (Darrow and Magie, 1933)

AUC-02 English Auction
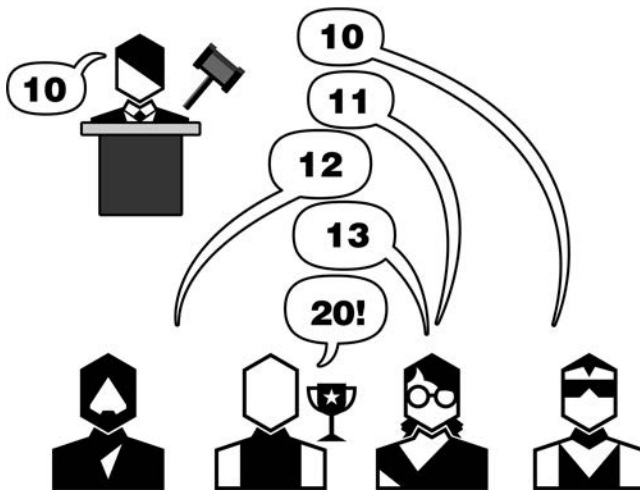
Description

An auctioneer asks for bids of a certain amount and players indicate their willingness to bid at that amount, usually by holding up a hand or paddle, or by calling out. Players are permitted to adjust the increment of the bid, usually by shouting out their actual bid, though this is done infrequently, and usually either to indicate a smaller increment than the auctioneer requests, or a much larger one. When a certain amount of time with no increases occurs, or it is clear that no one wishes to raise the current bid, the auctioneer declares that the high bidder is the winner.

Discussion

The English Auction is probably what most people think of when they hear the word "auction." The auctioneer, at the front of the room, speaking in a too-fast-to-follow cadence while various bidders use paddles to signal their intent to bid in ever-increasing amounts until, at last, the "going, going, gone!" is sounded and the winning bid is declared.

The primary differences between an English and an Open Auction are in their governance. An English Auction employs an auctioneer to recognize bidders, to determine which bids are valid, who the current winning bid

is, and what is the appropriate bid increment to maximize the settlement price of the auction, while also bringing the auction to a swift conclusion. The compensation of auctioneers in the real world suggests that these skills are non-trivial, and that better auctioneers execute better auctions, which produce higher prices for sellers.

For designers, the need for an auctioneer can make English Auctions less appealing, even though the benefits they provide in terms of certainty, fairness, and speed are substantial. Fortunately, designers can turn to a variety of similar auctions that capture those benefits without requiring mediation—including auctions in which the auctioneer may bid. We'll look at those in the next sections.

An overlooked feature of English Auctions is that the price of the auction moves against the preferences of the bidders—that is, it goes up. While that's what most of us think of when we think of auctions, there are auctions in which the price moves the other way, starting at some high number and them moving down. See Dutch Auction (AUC-08) as an example.

English Auctions are dynamic and dramatic, but they share the core of the open auction in that they reveal a lot of information to the bidders about one another, and they have a weakly dominant strategy of simply staying in the bidding until your value is reached.

There are some other strategies that bidders employ though, whose effects are primarily psychological. Players might make a large jump in bid increment to intimidate other bidders, or they might leave their paddle in the air (aka "Lighthouse bidding") to show they're in for the long haul. Bidding quickly and crisply is another way to demonstrate an intention to stay in the bidding for a while. These strategies may have the desired effect of driving other players off, but they can also inadvertently raise prices beyond what was necessary to win the auction. Finally, a player may make a bid that is larger than her own value for the lot in order to inflate the final settlement price of the auction. This move can backfire, however, if no other bidder raises the bid further.

An important aspect of English Auctions, and auctions with auctioneers more generally, is to whom the closing price is paid. In some auctions, rather than paying the bank, the player who chooses the item up for bid receives payment, unless they are the winner of the item, in which case payment is made to the bank. In practice, the result of this mechanism, which is featured in *Modern Art*, is that the auctioneer player, the one who put the item up for bid, very rarely purchases it, because effectively, they pay double: the cost of the item, and the forgone gains from letting someone else win it and collecting

the payment. Thus, effectively, the player who puts the item up for bid plays as the auctioneer, rather than an active bidder, for the duration of that auction.

The dynamic and engaging nature of English Auctions is exciting, but designers will typically have to turn to another mechanism for implementation at the table.

Sample Games

Chicago Express (Wu, 2007)
Modern Art (Knizia, 1992)

AUC-03   Turn Order Until Pass Auction
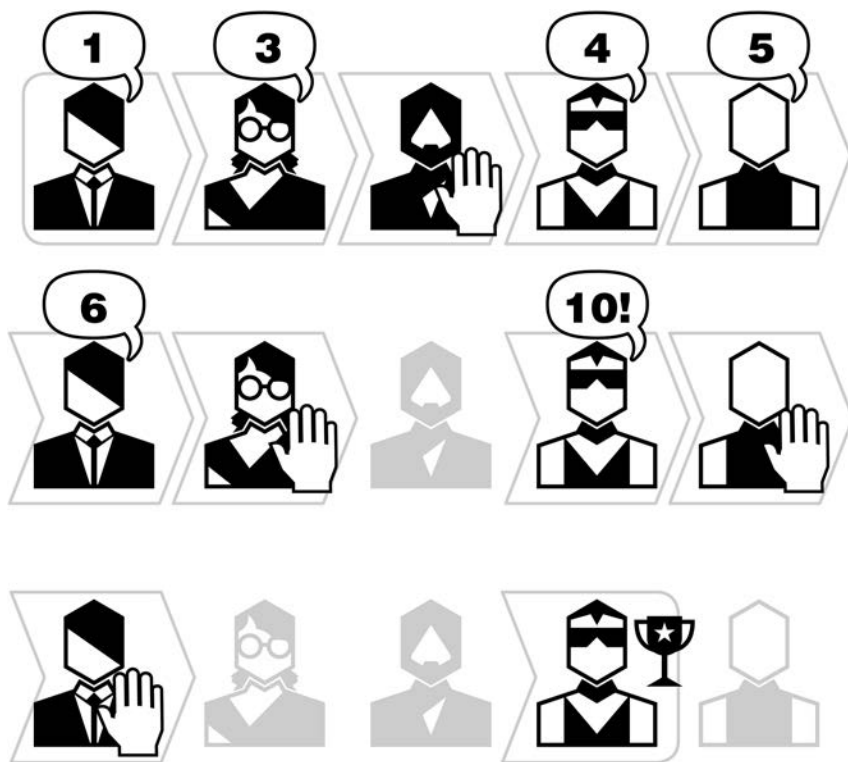
Description

Starting with one player and going in turn order, players may raise the current bid or pass. When all players but one have passed, the player remaining in the auction is the winner.

Normally players that pass may not re-enter the auction. However, allowing re-entry is a variation that is not uncommon.

Discussion

The benefits of this Turn Order Until Pass mechanism are in its simplicity and how it aligns with players' expectations. Players are rarely confused by how to run this kind of auction, so it doesn't require an auctioneer. Popular games, like *Power Grid* and *Through the Ages: A New Story of Civilization*,

feature this type of auction, and in a boardgame-adjacent space, auctions in fantasy sports are typically of this kind, perhaps adding to the popularity and familiarity of the mechanism.

From a game theory perspective, the dominant strategy for bidders is the same as in an Open Auction: namely, to stay in the bidding until their value for the item for bid is reached. This can help prevent any player from receiving an unearned windfall simply because of the mechanics of the bidding.

Turn Order Until Pass provides a structure to govern the uncertainties that normally exist in Open and English Auctions. A player may only bid on his or her turn and must exceed the previous high bid. This ordered and clear structure make it an excellent choice for board games.

Turn Order Until Pass does have some drawbacks. For one, it's not as dynamic as Open Auctions, as the ordered process of bidding removes some of the energy from the auction process.

The imposition of a turn order on bidding also creates a bit of unfairness. If the current bid is $10, and it's not my turn, I can't bid $11. If $11 is the most I'm willing to pay, but the active player goes ahead and bids $11, there's nothing I can do. If nobody else bids, that player will win the auction at $11 even though more than one bidder was willing to pay that amount. In an English Auction, a skilled auctioneer will recognize when more than one bidder is stuck on the same bid, and will cajole one or the other to raise their bid. Failing that, the auctioneer will recognize the bid of whomever bid first—which may not be perfectly fair either, but at least provides all bidders with the theoretical opportunity to bid any number they wish. In a Turn Order Until Pass Auction, by contrast, some players will simply not have the opportunity to bid certain values.

Another issue introduced when there is no auctioneer is that an auction can drag if players don't increment their bids reasonably. In games where players hold a lot of money, players incrementing their bids $1 at a time can be painful. However, incrementing by $1 at a time is theoretically the dominant strategy to avoid over-paying, so it's tough to put the blame on the players for doing so. It's the designer's responsibility to incentivize behavior that leads to a better experience!

Turn Order Until Pass remains one of the easiest types of auctions to implement, to run, and to participate in. The mechanism exists in many different games as a relatively quick way to allocate resources or benefits. However, games that place a central focus on the auction mechanism usually introduce some additional twist. In recent years, Drafting (CAR-06) has overtaken simple bidding as the preferred method for quick allocation of

resources—not least because auctions require more precise valuation by players, which can be challenging, especially for new players. This issue is not unique to this specific kind of auction and has been discussed at greater length in the introduction to this section.

Re-entry after passing is a variant that allows players to pass but re-enter the bidding when their turn comes around again. Passing is risky, in the sense that if all but one player passes, the auction will close. However, re-entering after passing does create some interesting drama, but at a high cost in terms of play-time. When players pass, an auction speeds along since it has fewer participants. When re-entry is allowed, the number of participants in the auction never decreases. Perhaps the main advantage of allowing re-entry is preventing accidental windfalls, by allowing a previously passed player to raise the bid on a lot that should sell for more, but whose value is languishing for whatever reason.

Sample Games

High Frontier (Eklund, 2010)
Power Grid (Friese, 2004)
Through the Ages: A Story of Civilization (Chvátil, 2006)

AUC-04   Sealed-Bid Auction
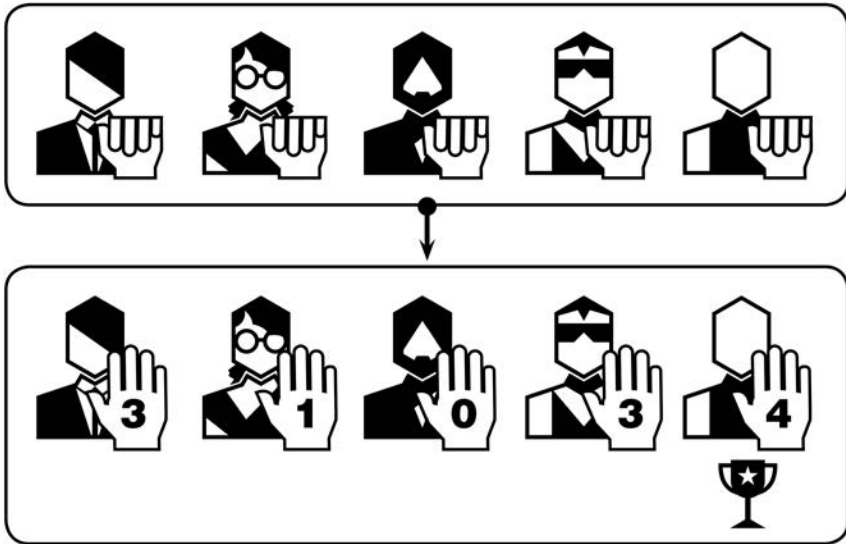
Description

Players secretly make a bid. All bids are revealed simultaneously, and the high bidder wins.

Discussion

Sealed-Bid Auctions, also called Blind-Bid Auctions, compress all the excitement of an auction into one tense bidding decision, followed by a big reveal. Designers favor them for these features, as well as for their speed. In games in which an auction is one sub-system in a larger game, or in which there are many sequential auctions, a single sealed-bid system is perfect for moving the game along. A good example of this is the *Game of Thrones* board game, in which players run a gauntlet of three auctions in a row every few turns. The consecutive auctions allocate special abilities among the players, and thus must be quick and decisive, as the rest of the game involves intricate and time-consuming planning, negotiations, and troop movements.

Sealed-Bid Auctions sacrifice some of the informational value of other iterative bid systems. Players who assess correctly that they will not be the

winners of an auction will often bid nothing, or perhaps a token amount, so as to deny other players knowledge of their true valuation. This may be a feature or a bug, depending on the intent of the designer and the needs of the design, but is worth keeping in mind when employing this mechanism.

Sealed-bid systems typically require some type of tie-breaker, since nothing stops players from bidding the same amount. Various tie-breaking methods exist. In the aforementioned *A Game of Thrones*, one of the abilities that players bid on is the ability to break ties—an ability that starts the game with one of the players. Other common tie-breakers include turn order or reverse order of current score (a kind of catch-up mechanism). Some games feature rebidding by the tied players, like *Spartacus: A Game of Blood and Treachery,* and *Container. Fist of Dragonstones* breaks ties through a rebid with a special currency that is only used for that purpose. This approach is decisive, but it lengthens the bidding process that sealed bidding is meant to curtail.

An ergonomic consideration for sealed bidding is the componentry used for currency. The easiest way to do sealed bidding is by placing currency in a closed fist. Designers should carefully consider the size and material for the currency to ensure that bids fit comfortably in most hands, that tokens are easy to stack and pick up, and that they are at least somewhat resistant to the palm-sweat these auctions engender. Other approaches to sealed bids include using a dial to set a value, as in *Dune*, setting a die to a value, as in *Tiny Epic Kingdoms*, or placing bids behind a screen, as in *Modern Art*.

Sealed-Bid Auctions are often used for combat resolution. In both *Dune* and *Tiny Epic Kingdoms,* players bid military strength, which might be further modified by other effects, to determine the victor of a military encounter. *Scythe* offers a similar auction, but players bid a resource to power their mechs rather than bidding actual troops.

Sealed bidding, more than any other type of bidding, may require losers to pay their bids (sometimes referred to as an "all-pay" auction). This has stronger thematic consonance when the bids represent a battle, rather than the purchase of goods. The lost bids make sense when they represent battle losses, but they make less sense when the bids are surrendered but no goods are acquired in return. All-pay auctions are used in game theory to model, among other things, elections and political contests, which perhaps makes them more fitting for use in the *Game of Thrones* board game. There is a lot of design space available in all-pay auctions, though players often express strongly negative reactions to these auctions, so proceed with care. Note that variants like loser-pays-half, as in *For Sale* (which is a turn-order auction, not

a blind bid), can help remove some of the sting, while incentivizing higher bids, ironically.

Sample Games

Container (Delonge and Ewert, 2007)
Dune (Eberle, Kittredge, and Olatka, 1979)
Fiji (Friese, 2006)
Fist of Dragonstones (Faidutti and Schacht, 2002)
For Sale (Dorra, 1997)
A Game of Thrones (Petersen and Wilson, 2003)
Modern Art (Knizia, 1992)
Scythe (Stegmaier, 2016)
Spartacus: A Game of Blood and Treachery (Dill, Kovaleski, and Sweigart, 2012)
Tiny Epic Kingdoms (Almes, 2014)

AUC-05   Sealed Bid with Cancellation
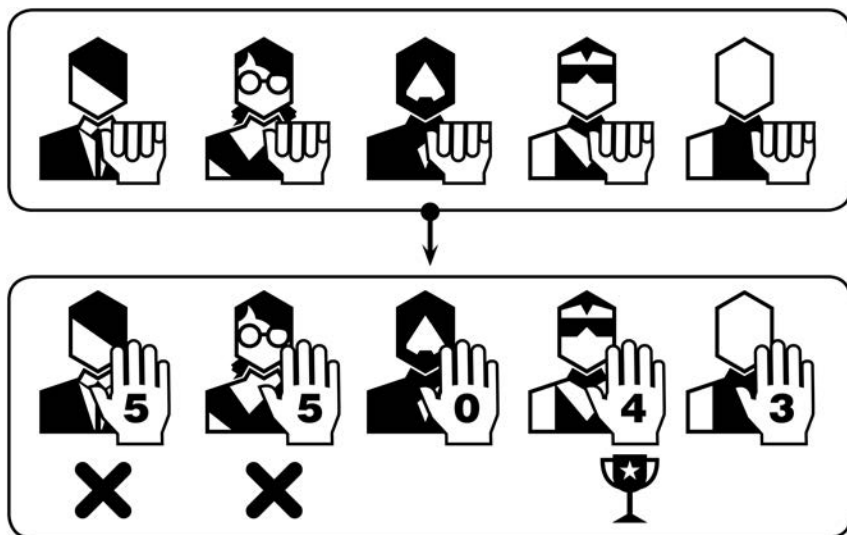
Description

Players secretly make a bid. All bids are revealed simultaneously, and the high bidder wins, unless there are ties for high bidder. Tied bids cancel each other out and are treated as the lowest bids.

Discussion

The purpose of ties cancelling out is in some sense a response to the challenge of running auctions without an auctioneer. A skilled auctioneer can help sort out two tied bidders and create some separation between them. Cancellation acts as a kind of heavy-handed auctioneer who refuses to acknowledge tied bids.

Mechanically, this type of auction works best when coupled with constrained bids that increase the chances of ties. When players are working from a defined and limited set of bid markers, they may have a much better idea about what their opponents could bid. The bidding game begins to resemble a bluffing or betting game more than a regular auction, as players know that bidding big can't guarantee their victory. If players are good at tracking which markers players have already used to bid, they can deduce

which low bids might actually win the auction, and which high bids are more susceptible to cancellation. This interaction does echo real-world dynamics in which the two strongest competitors can impede each other sufficiently to allow a weaker competitor to emerge from the fray with the prize.

This counter-intuitive mechanism hasn't proven especially popular over the years. The non-thematic notion that a seller would ignore a higher bid simply because more than one bidder made it flies in the face of economic rationalism. As such, this is a mechanism that can feel "gamey," or anti-thematic.

Another drawback to this mechanism is that bidders can find it quite punishing while also feeling random. When players reveal their bids and discover they both valued the lot really highly, but neither gets it, that can be very frustrating.

However, this same feature can lead to fun and dramatic moments, and increases the element of Yomi (UNC-01) for the players. As such, it works best in lighter games with more chaos. Players looking for a highly strategic experience will not be attracted to this mechanism.

Sample Games

Hol's Der Geier (Raj) (Randolph, 1988)
Sky Runner (Glimne, Karlsson and Sevelin, 1999)

AUC-06   Constrained Bidding
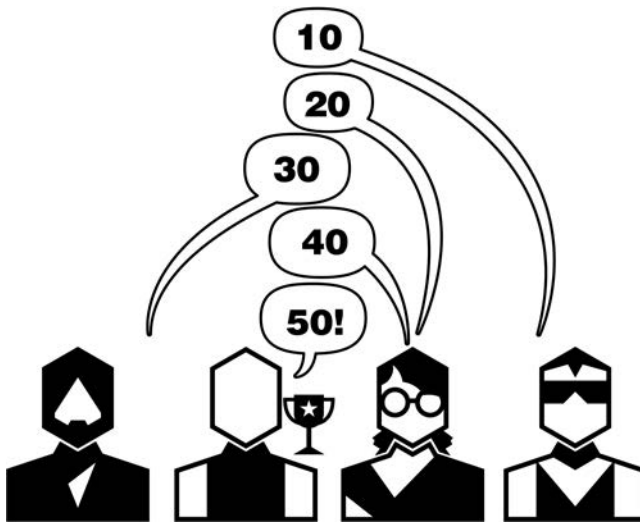
Description

This is a meta-mechanism that can modify other auction techniques. Players may not bid any number that they wish. They may only bid based on increments and/or combinations of certain resources.

Discussion

The greatest drawback of auctions as a game design mechanism is their length. The second-biggest defect is that it is difficult for players to make small distinctions in the value of the lots up for bid. Is some collection of goods worth 13? 14? 15? At small increments, it can be very challenging to make a determination.

Constrained Bidding offers a cure to both of these defects. Since there are fewer valid bids, and the increment required to raise the bid is higher, auctions come to a close more quickly. Players are rarely faced with the decision to increase their bid by one or two units, and those larger increments make it easier for players to value the lots up for bid.

One of the effects of Constrained Bidding is a reduction in the uncertainty of auction outcomes. It's easier for players to predict which other players might be interested in a lot, and how they'll bid. Some games will have

bidding tokens be hidden information to retain some of the tension in the auction.

Constrained Bidding is a favorite for designer Reiner Knizia, appearing in designs of his, including *Ra*, *Amun-Re* and *High Society*. Yet it hasn't caught on as a generally popular auction mechanism, and designers should be aware of some substantial drawbacks to it.

For one, Constrained Bidding, aside from the basic constraint of some minimum bid increment, is an especially artificial device. The need to raise a bid by a specific amount or based on the limitation of which bidding tokens you hold doesn't typically have any thematic justification. It's hard to imagine a real-world auction that would use this kind of mechanism.

Constrained Bidding also introduces a challenge in redistributing the used bidding tokens. In most auction games, the money system is either fixed, or based on some economy that enables you to buy and sell the goods up for auction. But in a fixed token system, all the advantages those fixed increments grant to speed of auction come at the cost of their non-liquidity. Put simply, you can't make change! Designers need to carefully consider both the balance of initial apportionment of bid tokens and how they come back to their owners after use.

One area in which there is still considerable design space is multiuse bidding counters. Will you use a powerful card as currency to bid in an auction? Or will you save its power for use in another aspect of the game? One might see *Twilight Struggle* (and many other area majority games) as a series of simultaneous auctions, with the multiuse cards representing a kind of fixed bid. Admittedly, in *Twilight Struggle*, the cards, when used as action points, are more liquid than a true Constrained Bid Auction, but it's in the same family.

Indeed, there is an entire category of games that are based on bidding cards with multiple uses, often with players having duplicate decks. *Libertalia* and *Eggs & Empire* come to mind immediately. The cards can be seen as a kind of Constrained Bidding token, and players typically have to use each card once before being allowed to pick up the discards. What distinguishes these games from true auctions is twofold. First, the games don't always have an actual lot up for bid. The revealed cards may interact with a pot of gold, for example, but they don't represent contingent offers to purchase some lot as in most auctions. Second, even when a lot or lots do exist, like in *Eggs & Empire*, winning the auction doesn't necessarily lead to winning the lot. More generically, the player with the highest bid doesn't necessarily win the auction. Typically, in these games, in addition to the currency value on the card, there

are some additional effects and interactions that can impact the auction's outcomes dramatically. Nevertheless, these games merit a mention here as they are a means of using the Constrained Bid structure in an engaging and more thematically resonant way.

Sample Games

Amun-Re (Knizia, 2003)
Cyclades (Cathala and Maublanc, 2009)
Eggs & Empire (Pinchback and Riddle, 2014)
High Society (Knizia, 1995)
Libertalia (Mori, 2012)
Ra (Knizia, 1999)
Stockpile (Sobol and Orden, 2015)
Twilight Struggle (Gupta and Matthews, 2005)

AUC-07 Once-Around Auction

Description

The players each have one opportunity to bid, either passing or raising the prior bidder. The order of bids is determined by one of the Turn Order structures. After the last player has their opportunity to bid, the high bidder wins.

Discussion

The Once-Around Auction structure takes a straightforward approach to shortening auctions by simply collapsing the whole auction into one round. This works very well for speeding the auction, but it does have disparate impacts on players depending on their position in the turn order. The first player is faced with the substantial challenge of making a bid without any other information. Their bid will set the market and is vulnerable to being outbid by any player, who can bid as little as one dollar more. By contrast, the last player in turn order has perfect information. They know exactly how much to bid to win the lot. Often, the player in the next-to-last place is faced with a lot that is relatively inexpensive, but which they don't actually want. However, they feel like they must police the auction and raise the bid to prevent the last player from getting a windfall.

Whether the strong left-right binding (the term used to describe games that are strongly impacted by turn order, and specifically, the players seated to the right and left of a given player) of this mechanism is positive or negative is largely a matter of perspective, but it is something to design around. For example, turn order can itself be priced in such a manner that the advantage provided by going last in the auction is accounted for. Alternatively, going

first in other aspects of the game may be quite powerful, to help balance the disadvantage of going first in the auction.

Another approach is to use constrained bids that require bidders to raise the current winning bid by a more substantial increment, or to provide the first bidder with the right to match the final bid and take the lot.

Once-Around Auctions aren't that common in modern designs, having been superseded by Sealed-Bid Auction (AUC-04) that are agnostic to turn order, or by drafting mechanisms that eliminate the role of currency entirely. Generally, they should be used when tight coupling to turn order is desirable and turn order is central to the design.

Sample Games

Medici (Knizia, 1995)
Modern Art (Knizia, 1992)
New Amsterdam (Allers, 2012)
Tin Goose (Clakins, 2016)

AUC-08 Dutch Auction
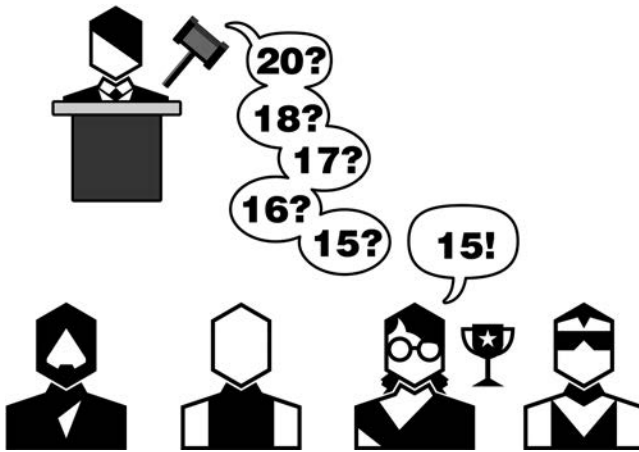
Description

A simultaneous single-bid system in which the lot starts at a very high price, and then is gradually decreased by the auctioneer or other controlling mechanism, until someone agrees to claim the item at its current price, ending the auction. The first bidder to accept the current price is the winner, such that there are no ties. A Dutch Auction is sometimes also called a one-bid auction because of this feature that the first bid made is also the only bid in the auction.

Discussion

The Dutch Auction has a storied history, having been invented in the seventeenth century in Holland to manage the sale and trade of tulip bulbs that arrived in Holland via the Ottoman Empire. A Dutch Auction maximizes the price at which a good is sold, and incentivizes buyers to act quickly, since once a bid is made there is no opportunity to counter the bid; the auction is over!

Dutch Auctions only work well when there is a single item up for bid, or a single lot. All bidders must receive information of the offer price dropping simultaneously and must be able to respond immediately. Any bidder with an informational time lag is highly disadvantaged in this kind of auction, whether that time lag is on hearing the newly announced price, or in submitting a bid.

One way to execute a Dutch Auction is with an actual clock that counts down prices, as in *Merchants of Amsterdam*, but the componentry alone makes this an unusual approach.
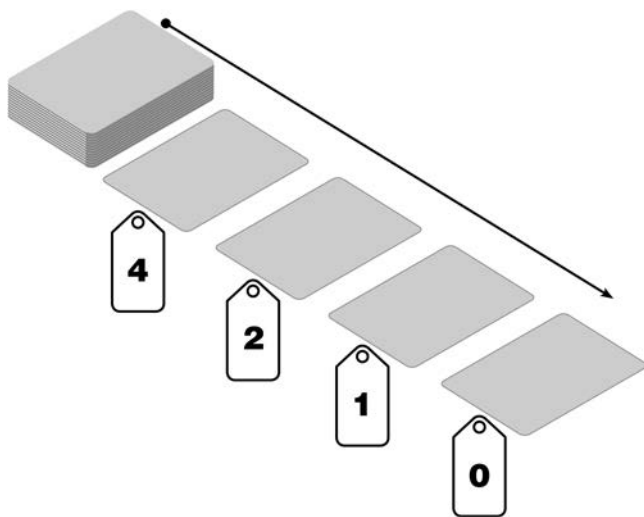
Dutch Auctions spread over multiple turns are very common in board games and are often implemented as a row or river of cards. Each position in the row is tied to a price and players may purchase a card from any position. When a card is purchased, more expensive cards slide down and become cheaper. In many games, the last card is free, and in others, the cheapest card will disappear from the market every turn, and a new card will enter at the pricey side. Examples of this market row include *Suburbia*, Phil Eklund's *Pax* series, and *Through the Ages*. A common variant can be seen in *Small World*, in which players can purchase the first card in the row for free or pay 1 coin per card they want to bypass until they reach the card they wish to purchase. The trick here is that a player acquires any coins on a card they purchase, which means it's not necessary to have a card-clearing mechanism in the market. Eventually, the first option will be worth taking for the coins piled on it.

This implementation isn't strictly a traditional Dutch Auction, since more than one good is up for auction at the same time. It's also typically mediated by turn order: you can only make a purchase on your turn. Because of different mechanisms for adjusting the market each turn, every player does not have an equal opportunity to pay any price they wish for a given good. In some cases, like *Through the Ages*, calculating at what cost

a card will be available to you, or manipulating that by purchasing cards that are cheaper and forcing cards to slide down multiple positions is a key strategy.

Despite some of these issues, the market row has become a staple of game design and a favorite method for reasonably fair resource allocation. The logic of this mechanism can sometimes find its way into worker placement games. For example, in *Agricola*, some buildings will accumulate resources if nobody places a worker there. Eventually, the rewards available are so rich that someone claims them. Through the lens of the Dutch Auction, we'd say that the price per share kept going down until a buyer was willing to purchase the whole lot. This isn't quite a Dutch Auction, it's really an auction with a fixed price (one worker, though it could be a monetary price in a different context), but in which the rewards increase. However, note that unlike traditional auctions, this auction shares a primary feature with Dutch Auctions, which is that the value moves in favor of the buyer. Dutch Auctions use price to effectuate this, rather than size of return, but they are conceptually quite similar.

Dutch Auctions as implemented through market rows are quite a robust and durable solution for game designers. They typically don't take up too much board space, they're ergonomic, decisive, quick, and make for interesting decisions. In some games, like *Morels*, or *Majesty: For The Realm*, they can be a bit tedious when it comes to constantly sliding down cards. *Vikings* uses an ingenious wheel mechanism to address this situation elegantly, by placing the prices on the wheel and rotating it to adjust the prices of the tiles laid around its perimeter.

Designers will frequently turn to this river-of-lots mechanism when using some non-monetary currency for resource acquisition. The aforementioned *Through the Ages* uses an Action Point currency (ACT-01) for card acquisition. Though *Small World* themes the cost as monetary, money is worth an equal number of victory points, so the actual cost to acquire a lot is victory points. This mechanism is also quite amenable to variations involving allowing players to reserve a card in the market for purchase later at a lower price, or claiming a card so that its eventual acquisition cost is paid directly to the player.

Sample Games

Agricola (Rosenberg, 2007)
Majesty: For the Realm (Andre, 2017)
Merchants of Amsterdam (Knizia, 2000)

Morels (Povis, 2012)
Pax Porfiriana (Eklund, Eklund, and Gutt, 2012)
Small World (Keyaerts, 2009)
Suburbia (Alspach, 2012)
Through the Ages: A Story of Civilization (Chvátil, 2006)
Vikings (Kiesling, 2007)

AUC-09   Second-Bid Auction
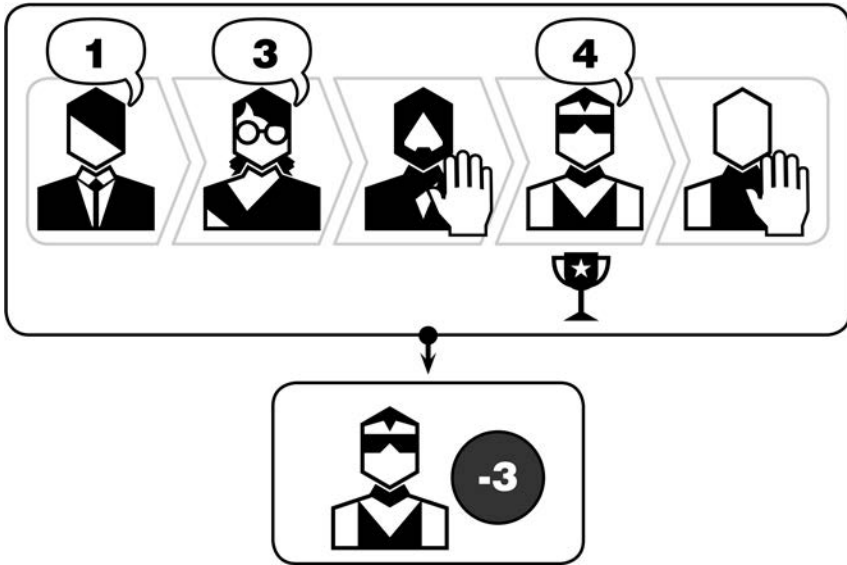
Description

This mechanism modifies other auctions, such as Turn Order Until Pass, or Sealed Bid. The amount paid by the Highest Bidder is equal to the second highest bid.

Discussion

In game theory, Second-Bid auctions, also called Second-Price auctions, or Vickrey auctions, are well studied in relation to the question of how will the choice of auction type impact the price of a good? If I have a car that I want to sell, for example, which auction type will fetch me the best price? One way to ensure the highest possible price for the seller is to use an auction mechanism that encourages bidders to make mistakes in their bidding strategies. A Dutch Auction (AUC-08) is a great example. The added pressure of the clock, and the possibility of someone else making a bid that can't be countered leads to somewhat higher settlement prices than a traditional English Auction.

In many cases, there is a desire to create a fast and fair auction, in which the best strategy for all bidders is to simply bid the highest price they are willing

to pay. In a traditional auction, the correct strategy is to bid $1 more than the previous bid until your reserve point is met. You don't increase your bid by more than $1 over the previous bid because maybe nobody will outbid you and you'll win the auction at a lower price than the amount you were willing to pay. This makes for slow going at times.

A second-highest auction is the solution to the question of how to make auctions fast and fair for buyers and sellers. In essence, your bid in a Second-Price auction is not an offer to pay that amount, but to pay anything up to that amount. Your bid of $1,000 is really a bid of $999, such that anyone who wants to buy the item must pay $1,000 or more. The dominant strategy in a Second-Price auction is to bid your true value for the lot. If all other players value the lot at a lower price, you'll pay their valuation, not your higher price. If other players value the lot higher than you, you won't win, but they'll never pay less than your true value.

Vickrey Auctions are extremely rare in board games. The only example we were able to turn up was Reiner Knizia's *Das letzte Paradies* (*The Last Paradise*), a largely forgotten title. In part this is because Vickrey Auctions aren't that different from other auction types when it comes to board games. In any non-blind auction method, a Vickrey settlement method will yield a final price that is roughly the same as the non-Vickrey, or perhaps one bid increment smaller. That's a lot of rules overhead for such a small change in price. In blind bidding systems, the Vickrey does impact actual prices more substantially, but in many cases, the game design capitalizes on that inefficiency in the auction. Put another way, the returns to bidding skill are higher in Non-Vickrey Auctions, whereas Vickrey Auctions provide a clear dominant strategy to the bidders. In a sense, the efficiency of Vickrey Auctions may make them less interesting for gameplay.

Perhaps another important reason Vickrey Auctions aren't used is because their game-theoretical impact isn't patently obvious to players. If you explain the way the auction works, most players don't intuitively understand that their best bet is to bid their true value. A game that uses Vickrey to try and make auctions more fair and less chaotic may find that players are simply confused by it.

Where Vickrey Auctions really shine is in a situation that doesn't come up in board games very often, which is in allocating a large lot of identical goods. Want to sell 100 tons of cinnamon? A Vickrey Auction is a great way to find the settlement price at which all 100 tons will sell. Once that price is found, even bidders who offered more for some portion of the lot will only be charged the lowest price that clears the whole lot. In essence, the buyer is

trading away the highest possible returns for speed and certainty in the sales process. An echo of this idea can be found in *Harbour,* where a player must sell their entire lot of goods when they choose the sell action, but this sale is to the bank. One might imagine that this transaction is the end result of a Vickrey Auction that happened off-sceen, so to speak. Vickrey Auctions, though important for study and for understanding auction strategies, have relatively few practical applications in board games, at least so far.

Sample Games

Das letzte Paradies (Knizia, 1993)
Harbour (Almes, 2015)

AUC-10   Selection Order Bid
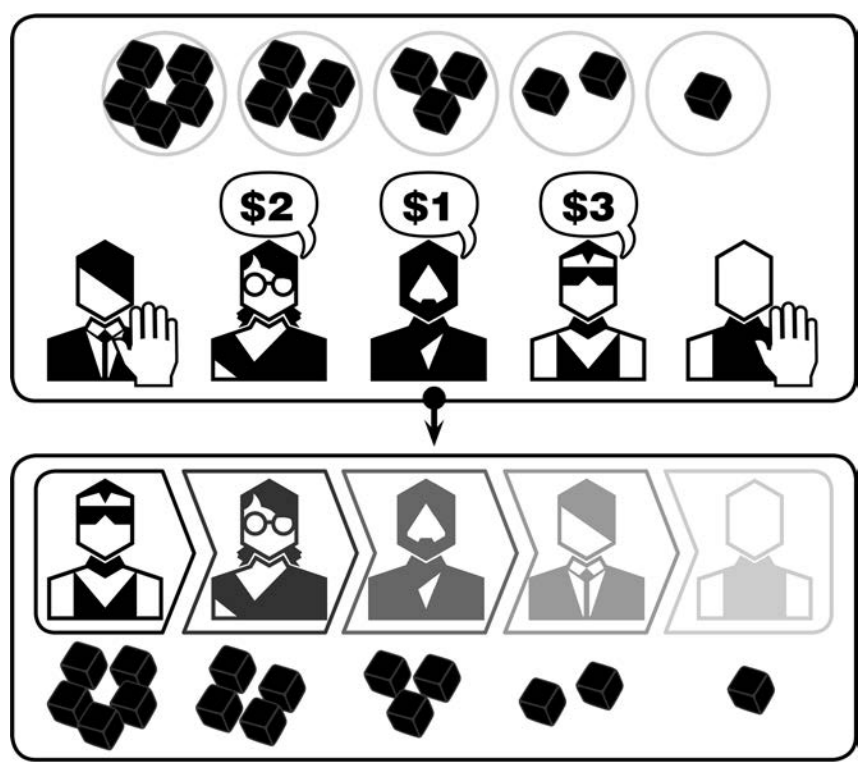
Description

Selection Order Bid is a form of multiple-lot auction in which players are not directly bidding on the lots themselves, but the order in which they'll draft the lots. As the bid increases, players may pass and accept a later place in the order. In some cases, players must pay their entire current bid (an all-pay mechanism), and in others they may recover some of their bid.

Discussion

There are many systems for auctioning off multiple lots, but Selection Order Bid may be the most elegant. An elegant example is *For Sale*, where players bid to draft first from a collection of property cards. The cards range in value substantially, and a given flop of cards can either cluster closely, with the

lowest being separated from the highest by only a few dollars, or they can be spaced quite widely apart. Players bid in turn order for the right to draft first. A player may choose to pass and collect the lowest-value card remaining. When passing, the y pay half their previous bid. The last player to remain in the auction receives the most valuable card but must also pay his or her full bid.

Another way to think of the pay-half-when-pass variant is that it's actually a simultaneous bid on two lots: a full-price bid on the most valuable money card, and a half-price bid on the least valuable remaining money card. Considered in this fashion, Selection Order Bid is a type of constrained bidding system, or even a sort of ante. If you want to bid $10 on the high-value card at the open of the auction, you're essentially agreeing to pay $5 for the lowest-value card, which you could have had for free. This is somewhat analogous to a penny auction, where players must pay a fee for each bid they make, even if it is not the winning bid. The halved value of the bid that will certainly be spent can be seen as the bid fee, rather than a bid itself.

In certain games this type of auction also forces players to evaluate how much lots may be worth to other players. For example, if players are collecting different symbols or colors, the lots will have different values to different players. If a certain lot is only good for one player, that player can take a chance and bid low assuming that the lot will be remaining when the player's selection opportunity comes.

Sample Games

Age of Steam (Wallace, 2002)
Eggs & Empire (Pinchback and Riddle, 2014)
For Sale (Dorra, 1997)

AUC-11   Multiple-Lot Auction
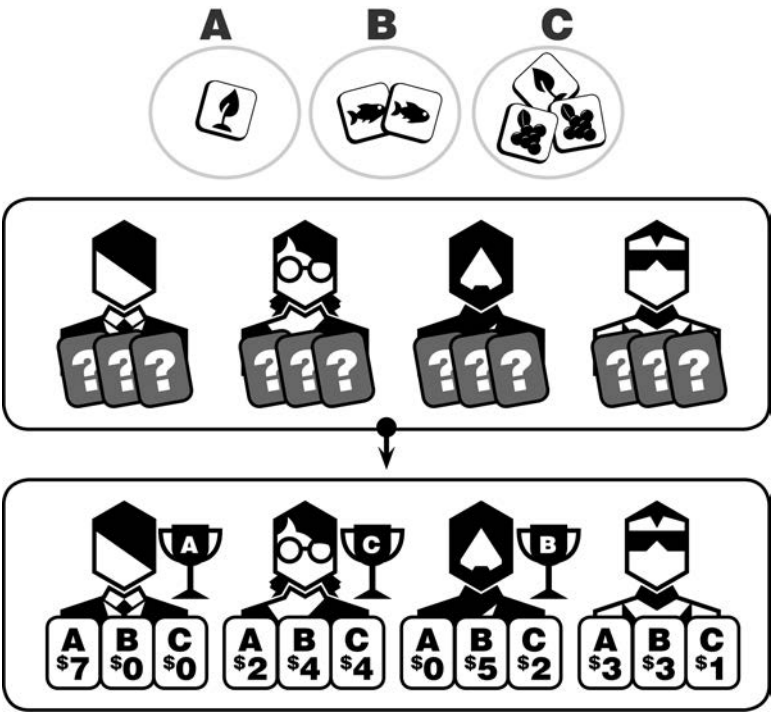
Description

An auction in which players simultaneously bid on Multiple Lots in parallel, instead of bidding for one lot at a time serially.

Discussion

Multiple-Lot Auctions are very common in tabletop board games because they compress the amount of time it takes to allocate lots among the players, and because the physical affordances of board games, like tableaus and player-colored tokens, lend themselves to organizing and displaying information needed to run these types of auctions clearly.

   Multiple-Lot Auctions ask players to manage two different axes of decision making at the same time: which lots to bid on, and how to divide money between those lots, without knowing which lots they might win or lose. In

a serial auction, a player's valuation of a later lot might change dramatically based on winning or losing a previous lot. In an extreme case, like *Fresh Fish*, once a player has won a fish market stall, he or she does not bid at all for a second fish market stall. Simultaneous auctions don't have this kind of rebalancing of player valuations.

Another interesting characteristic of Multiple-Lot Auctions is that the lots themselves may be of entirely different types. A classic Gamemaster game, originally called *Shogun* (and later *Samurai Swords* and *Ikusa*) features a Multiple-Lot Bid in which players secretly allocate money to a mix of auctions and market purchases. Players can assign money to bid for turn order and for the services of the ninja. The rest of their money can be allocated to build fortifications, hire ronin and levy additional units. Upon revealing their secret allocations, the auctions for turn order and ninja are resolved, and players can then use the other allocated funds to purchase their fortifications, ronin and other units. Not only are the benefits of turn order and the ninja quite different from purchasing units or defensive structures, the auctions themselves operate by somewhat different rules. Any players bidding on turn order will receive priority over non-bidders in choosing their preferred ordering—their money grants them some benefit. However, the ninja auction is an all-pay auction, but only one player will receive the services of the ninja. If the top bidders are tied, they will pay, but none of them get to use the ninja!

Multiple-Lot Auctions bear a very close resemblance to another game mechanism: Area Majority (ARC-02). Though area majority games often model military conflicts, as in *El Grande*, they are mathematically similar to Multiple-Lot Auctions. The troops, or influence cubes, etc. can be abstracted to bidding tokens, and the player with the highest bids wins the lot. Area majority games typically offer rewards to more than only the highest bidder. This is a nested Multiple-Lot Auction. Each different area that players seek to influence houses its own set of lots, worth different amounts of victory points to bidders.

Multiple-Lot Auctions are compatible with many other auction mechanisms like Fixed-Placement Auction (AUC-15), Sealed-Bid Auction (AUC-04), and Dutch Priority Auction (AUC-16). Their resolution can be all-pay, winner-pay, cancellation, and others. In some Multiple-Lot Auctions, players are limited in how many lots or how many types of lots they can win too. This mechanism is among the most common and most flexible in the auction family.

Sample Games

El Grande (Kramer and Ulrich, 1995)
Fresh Fish (Friese, 2014)
Revolution! (duBarry, 2009)
Shogun/Samurai Swords/Ikusa (Gray, 1986)

AUC-12   Closed-Economy Auction
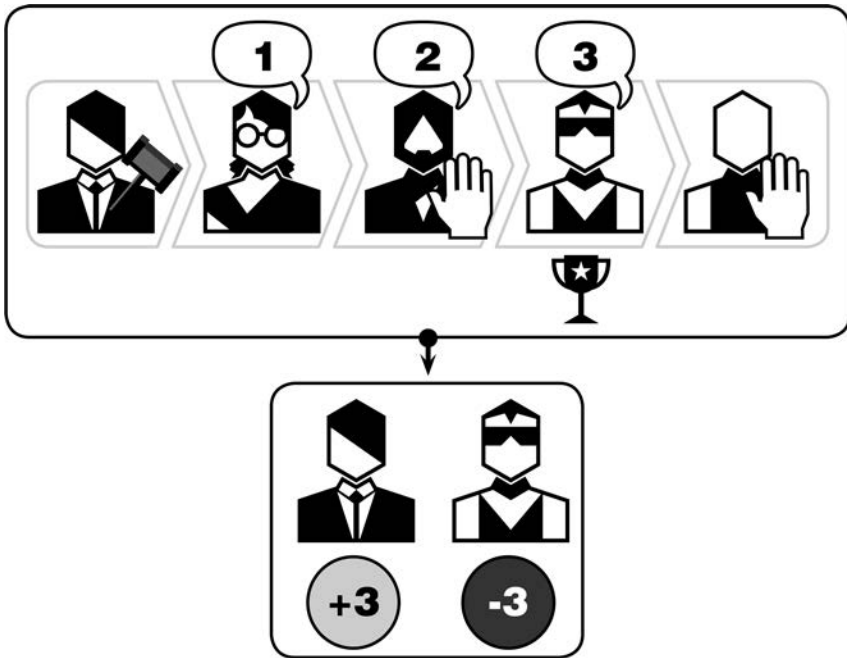
Description

Closed-Economy is a meta-mechanism that can modify any auction type. In a Closed-Economy Auction, all the money spent in the auction is paid out to the auction participants themselves. The total amount of money in the system never changes.

Discussion

While many auctions feature the winning bid being paid to one of the players at the table (such as *MarraCash* or *Modern Art*), a true Closed Economy is relatively rare. There's typically some way to earn more money or inject money into the system. However, Closed-Economy systems do exist, and are perhaps more common in constrained bidding systems that feature unique bidding markers, like *Ra*.

True Closed Economies create a zero-sum game where each player's loss is one or more players' gain. The auction mechanism provides players with

opportunities to convert their paper wealth, their opportunity capital, into actual wealth in the form of in-game resources or benefits. The core dynamic for players is timing the game properly, and being wealthy at the right time and poor at the right time.

In some implementations, like *Dream Factory*, money paid is split among all the players. In this case, the "remainder" issue needs to be dealt with for sums of money that don't divide evenly among the players. Typically this is handled by leaving the remainder in the center of the table, where it is added to the next winning bid before being distributed.

Sample Games

Dream Factory (Knizia, 2000)
Modern Art (Knizia, 1992)
No Thanks! (Gimmler, 2004)
Ra (Knizia, 1999)

AUC-13   Reverse Auction
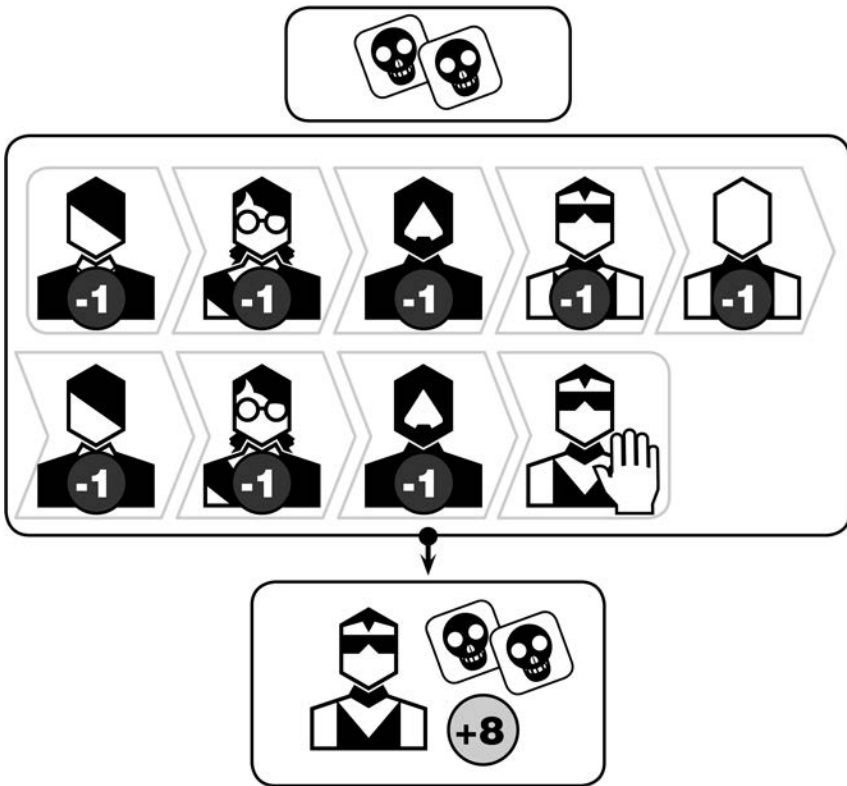
Description

Players bid to avoid taking the lot up for bid because it has some negative effect. Common effects include a negative victory point value, or a requirement to discard something of value such as a resource or special ability. Typically, in a Reverse Auction all players, except the claimant of the lot, pay their bids. Sometimes, the lot claimant will receive those payments.

Discussion

No Thanks! is a classic example of Reverse Auctions. The structure of the auction is Turn Order Until Pass, with a constrained bid of 1 victory point per bid. Each lot is worth some number of points, but the winner of the game

is the player with the fewest points. Bidding tokens cancel out one of these "bad" points, so they're helpful towards winning the game. When a player passes, they take both the card and all the bidding tokens placed on the card. The key mechanism in the game is that each sequence of consecutive cards is worth bad points equal to the lowest card in the sequence. Thus, a "9" card is worth 9 bad points to all players, except for the player who already has the "'10." For that player, the "9" is actually worth a good point, because the "10" card will no longer count for them, and instead they'll get only 9 bad points. This twist, which leads to players having sharply different values for a given lot, creates a fascinating auction dynamic.

In the world of classic card games, *Hearts* stands out as the Reverse-Auction variant of the familiar trick-taking genre. In *Hearts*, players play with straightforward trick-taking rules, but seek to avoid winning any hearts in the tricks they collect. Hearts are worth bad points… unless a player collects all of them (and the Queen of Spades) to "shoot the moon." In that case, all the other players collect the bad points for that hand. While trick taking is its own mechanism, and indeed a genre of games unto itself, it has a close relationship with auctions, which is a topic we'll explore in greater depth in Trick-Taking Games (CAR-01) in Chapter 13. Suffice it to say that trick taking is almost like a Once-Around Bidding Auction with multiple currencies. In most games, the tricks are inherently valuable, but in H*earts* they are only meaningful based on whether they contain hearts or the queen of spades.

In *High Society,* players bid for valuable possessions and title cards in traditional auctions, but have reverse auctions for Misfortune cards. The claimant of the Misfortune card recovers any money cards previously bid to avoid the lot, but all other players must discard their money cards. In this implementation, the lot up for bid defines the auction procedure.

By contrast, *Eggs & Empire*, a simultaneous-bid multilot auction game, provides auctions that have both positive and negative lots mixed into the same auction. The player bidding the lowest will be forced to accept the negatively valued lot. One can think of this auction as a Reverse Auction in which bidders who avoid the negative lot receive an extra reward, or as a traditional all-pay auction in which the lowest bidder receives a penalty. Another similar hybrid auction can be seen in *the Game of Thrones* board game. Players make simultaneous sealed bids of power to defeat the Wildlings. If the sum of the power bid by the players is equal to or greater than the Wildlings' strength, the Wildlings are defeated, and the highest bidder receives the benefit of reclaiming a discarded leader back into their hand. If, however, the sum of

power bid is less than the strength of the Wildlings, all players must remove armies from the board equaling two points of unit strength. The lowest bidder must remove armies equaling four points of unit strength.

As these examples demonstrate, a Reverse Auction is usually implemented within some more complex auction environment. In part this may be because Reverse Auctions are inherently negative in experience. The "winner" receives a negative effect, and the "losers" all pay money. Everyone's a loser! Because of this negative experience, designers use Reverse Auctions as a seasoning, a way to flavor a game, rather than as its central mechanism. *No Thanks!* remains the seminal example of a Reverse Auction as the central mechanism of play.

Sample Games

Eggs & Empire (Pinchback and Riddle, 2014)
A Game of Thrones (Petersen and Wilson, 2003)
Hearts (Unknown, 1850)
High Society (Knizia, 1995)
No Thanks! (Gimmler, 2004)

AUC-14   Dexterity Auction
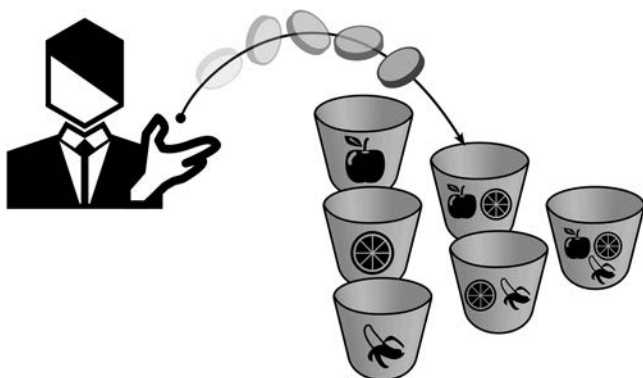
Description

A Dexterity Auction requires performance of some act of dexterity to submit a valid bid. Typically, this would involve the bid marker itself being placed into some valid bidding area, but other methods for implementing this may be used.

Discussion

Going, Going, GONE! by Dr. Scott Nicholson is the design that most readily comes to mind because of its explicit auction theming. In the game, multiple items are up for bid simultaneously, and players bid in real time by dropping their bid tokens into cups corresponding to each lot. Only tokens that land in the cups count, and the time available for bidding can be fast enough that placing a bid is not assured.

While *Going, Going, GONE!* is squarely a Dexterity Auction, one could perhaps view games like *Crokinole* and *Shuffleboard* as being Dexterity Auctions.

Consider *Crokinole,* where players flick their bid markers, attempting to acquire points by occupying board areas. Each side only scores when more of its markers are in a given scoring zone than the other side. The main difference between this and an auction is that in *Crokinole*, if you land 2 more markers than your opponent in a scoring zone, you score points for each marker. That

would be like bidding on a diamond and winning one diamond for each dollar by which you outbid your opponent.

One can readily imagine a mechanism which awards to the player with the most darts, or stones or markers in some area a singular benefit. This would be a Dexterity Auction where player skill in landing the bid would be more important than player intent to bid some amount.

Dexterity Auctions have been implemented in video games that are boardgame-like in nature, most notably *M.U.L.E.* and *Sumer*. In these games, players move on-screen avatars against the clock, representing offers to buy or sell. This allows players to "fake" a bid by moving far ahead and then pulling just behind their opponents as time runs out, to force them into winning an item at a higher price than they might have intended.

It's worth noting that dexterity is one of those mechanisms, like memory, that can be deeply polarizing, and potentially inaccessible to those with physical disabilities. It can be especially dissonant when it is one component in a multimechanism game. A game that otherwise emphasizes planning and calculation may frustrate players when their plans are ruined by an errant toss.

Sample Games

Crokinole (unknown, before 1876)
Going, Going, GONE! (Nicholson, 2013)
M.U.L.E. (Berry, 1983)
Sumer (Favorov, Gunnarrson, Raab, and Suthers, 2017)

AUC-15   Fixed-Placement Auction
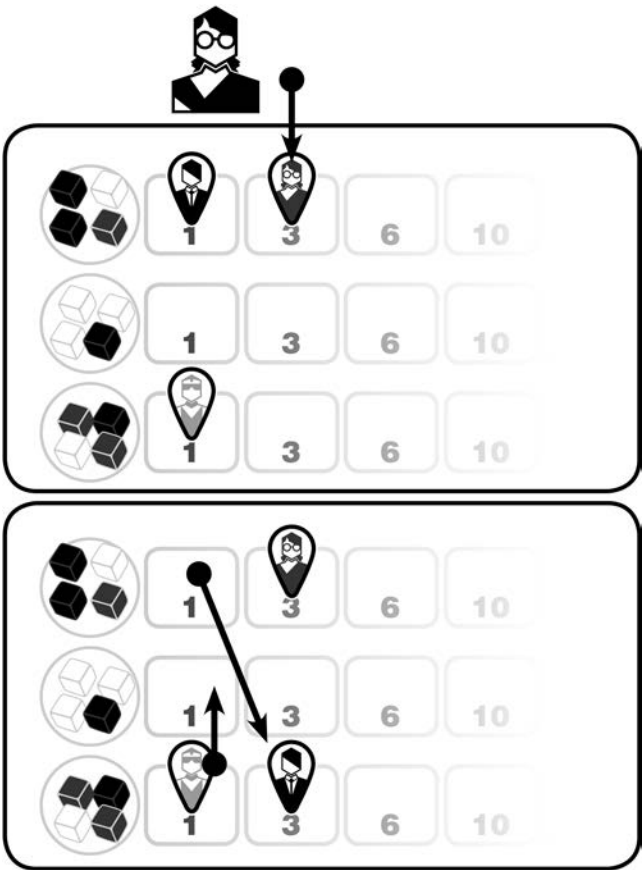
Description

Fixed Placement is a meta-mechanism that modifies a multiple-lot auction by creating rules about which lots players may bid on, and representing bids visually on a board or cards. It is often combined with constrained-value bids. A Fixed-Placement auction ends when every player passes and/or no player has the right to bid further. The highest bidder for each lot wins the lot.

Discussion

Multiple-Lot Auctions are a fairly common type of auction in board games. These auctions introduce a new wrinkle into bidding by forcing players to

evaluate several lots at once. Depending on bid timing rules, there may also be strategic elements to sequencing your bids or forcing an auction to close early.

Multiple-Lot Auctions present some challenges to tracking. How should the top bid be represented for each lot? What rules should govern bid order? How can the game prevent multiple-lot bidding from devolving into a series of one-lot auctions, in which players ignore all but one lot up for bid at a time?

Fixed Placement can help solve all these problem. Visually, Fixed-Placement Auctions provide a track on which players can mark the value of their bid using a player pawn. The right to bid can be governed by turn order. In some games, like *Amun-Re*, turn order is interrupted whenever a player is outbid. That player becomes the active player, who takes the bid marker representing the bid that was just surpassed and makes another valid bid with it. The entire auction ends when each player is the top bidder for some lot. In *Cyclades*, there are more lots than there are players, but each player has only a single bidding token, so each player will win exactly one auction, and some lots will go unpurchased each turn.

Critically, in both of these games, a player may not immediately rebid on the lot for which they were just outbid. This rule encourages players to bid close to their actual value for a lot, since if they bid lower, they may not have an opportunity to return to rebid on that lot. In theory this should speed these auctions, though in practice, new players may evaluate this dynamic incorrectly, leading to frustration and overlong analysis. Both of these games also feature triangular increases in valid bid increments, which prevents the tit-for-tat, raise-by-one bidding that can grind an auction to a near-halt.

In *Vegas Showdown*, bids are submitted strictly in turn order. Bidding too low has multiple consequences: not only will a player be outbid, but they will have to wait until the next turn to bid. In the meantime, other players will get to place bids, potentially raising the costs of lots the passed player was interested in purchasing. *Vegas Showdown* does allow immediately rebidding on the same lot, though the value of the next valid bid increases in a delayed triangular pattern (each interval is repeated three times before increasing).

Perhaps the greatest strength of Fixed Placement is that it offers an opportunity to integrate bidding with other game actions. Since there is a visible record of current bids, a design can invite players to take unrelated actions, instead of restricting bidding to its own phase. While *Vegas Showdown* takes advantage of this feature, there remains a lot of design space here.

Sample Games

Amun-Re (Knizia, 2003)
Cyclades (Cathala and Maublanc, 2009)
Vegas Showdown (Stern, 2005)

AUC-16   Dutch Priority Auction
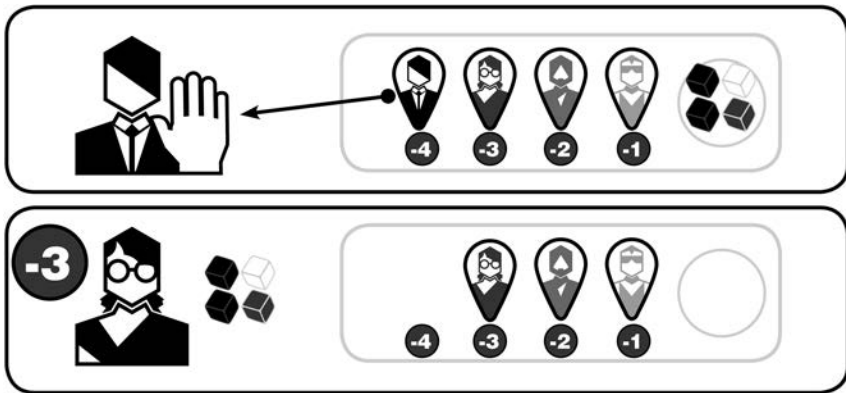
Description

A Dutch Priority Auction, a term of our own invention, is a multiple-lot auction in which prices for the lots are determined based on the number of bids placed on the lots up for bid. The winning bidder is the first player, in bid priority, who chooses to pay the current price for a lot, which is equal to the number of bidding tokens there. Priority may be determined by a variety of factors, including global turn order or turn order for each lot based on order of bid placement. Players may typically pass on the purchase when they are the priority bidder by removing their bidding token. This has the effect of reducing the price for the lot by one.

Discussion

A Dutch Priority Auction has features of a Dutch, or descending-bid auction, coupled with an ordered, turn-based bidding system to help direct traffic and coordinate the sale of multiple lots simultaneously. In this system, prices will initially move towards the seller (i.e., they'll rise) as bids are added, and then move back towards the buyers, as prices descend when bidders decline to buy at a given price.

Unlike a traditional Dutch auction, in which any player may accept the going price and end the auction by calling out, a Dutch Priority Auction determines an active player, the priority player, who may choose to accept the going price or pass. In *Die Speicherstadt* (available in the United States as

Jórvík, with a Viking theme and some minor balance tweaks), this priority is determined in an initial round of bid-marker placement. Earlier placement provides earlier priority in the auction resolution phase.

The priority player may choose to pass. In most cases, passing means removing a bid marker, and thus lowering the asking price by one. Usually, passing in this kind of auction simply means not acting at this time. If the passing player has another bid marker at a lower priority, should the auction continue until that marker comes up, the player will be allowed to purchase the lot at that time.

Spyrium adds another element to this core, which is that a player, when passing, receives money equal to the bid markers remaining on the lot. The choice is between a current purchase at a higher price, or receiving an equal amount of money, but passing on the purchase. In some cases, an early pass can fund a later purchase of the same lot!

The effect of this style of auction is to require players to declare the lots they're interested in, somewhat separately from the price. Players may not have enough bid markers to claim the right to bid on every lot they like, and must restrict themselves to only those lots that are most meaningful to them. However, bid markers must do double-duty. They cannot only be used to stake out lots a player desires, they must also be used to raise prices on other players. There is no other way to raise the price for a lot except to place a bid marker on it. Bid markers placed late in the first phase may have no other function, since they are late in the priority order for auction resolution too.

Sample Games

Die Speicherstadt (Feld, 2010)
Jórvík (Feld, 2016)
Spyrium (Attia, 2013)

9

Worker Placement

❧

Worker Placement, a type of Action Drafting (ACT-02), is often credited to designer Richard Breese and his game, *Keydom*, in 1998. Nonetheless, it was *Caylus*, by William Attia, that popularized the mechanism and inspired its name.

Mechanically, Worker Placement is isomorphic to action drafting. Players select actions in turn order by placing one of their pawns, or workers, into the action space, or building. This is the core mechanical concept and thematic conceit, and the mechanism has proven so durable because of that tight theme-mechanism correspondence. It's easy to understand why placing the worker in the sawmill will generate wood.

Worker Placement can be described as action drafting, or even as a highly specialized type of auction, but while resource allocation mechanisms may share mathematical similarities and incentivize similar player behavior, the experience of these mechanisms can vary a great deal based on how they're presented. Their intelligibility to the player will also vary a great deal based on the setting, theme, and logical coherence of the mechanism. *For Sale*'s auction is readily understood by players, as it is squarely in context. An auction for property is a familiar concept, even if most players haven't ever bought a house at an auction. The thematic scaffolding, provided by *Dungeon Petz,* on the other hand, falls short in terms of making its mechanism intelligible. Why is it that the largest group of workers secretly assigned to an action get to take the action first? There's no strong connection to a real-world dynamic that helps players remember and understand the rule. The Worker Placement metaphor of placing a worker in a production building to generate a good helps players understand the structure and incentives of the underlying game system, which is one reason why it is such a popular core mechanism.

In this chapter we'll talk about other implications and expectations of the mechanism, including blocking, gaining workers, adding buildings, and more, as we delve deeply into this touchstone of modern design.

The term "Worker Placement" has lost some of its cohesion, and today, it is often used as a synonym for a Euro-style game, irrespective of the presence of workers or action drafting. Thus, it would not be out-of-place for *Terraforming Mars* or *Roll for the Galaxy* to be described as "Worker Placement." We will restrict our analysis to games which use action drafting, recognize some form of blocking, and conceive thematically of some kind of worker. This narrower definition also excludes quite a few games which employ the worker metaphor but not its underlying mechanism. For example, we exclude cooperative games like *Charterstone* and *Robinson Crusoe: Adventures on the Cursed Island*, because these games lack a true drafting or blocking element. Games with workers placed onto private tableaus like *Orleans* and *Through The Ages: A Story of Civilization*, or games in which workers represent a currency or bid marker rather than a draft marker, as in *Jórvík, Spyrium,* and *Keyflower* are also outside the scope of our definition. However, our definition is intended only to limit the scope of our analysis, and not to stake a claim in how the term should be used by anybody else. Whatever words we use, we believe these elements of drafting, blocking, and thematic coherence are important distinguishers that deserve a term by which to refer to them.

WPL-01 Standard Worker Placement
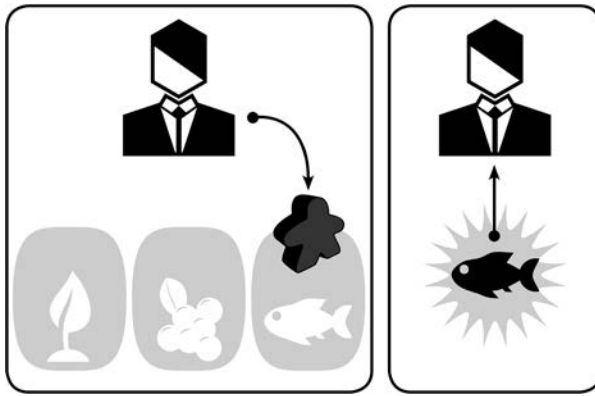
Description

Players select actions, in turn order, by placing a worker from their supply on a building associated with a specific action and then execute that action immediately. The round ends when all workers have been placed, at which point they return to their owners' pools and a new round begins.

Discussion

This familiar structure, typified by games like *Lords of Waterdeep* and *Agricola*, is an improvement over the ur-game, *Caylus*, in which buildings resolved after all Worker Placements were complete. Immediate resolution makes for faster play, and obviates the need for players to remember which resources they will receive when making their next placement. Later games, like *The Manhattan Project* and *Tzolk'in: The Mayan Calendar,* have workers returning only when their owners recall them. In the former, players get the building's reward on placement, while in the latter, the reward is tied to the moment of recall, since the reward escalates the longer the worker is left out on the board. With each passing turn in *Tzolk'in*, workers rotate over on the ingenious gear system to a higher tier of rewards that will be distributed when the worker is recalled.

Most Worker Placement games employ the mechanism for all actions in the game. Turn order is typically set by placing a worker on a building that grants turn order priority. Increasing the number of actions that may be taken in a turn is themed as getting new workers, which is an action tied

to a building. Maintenance costs are represented as feeding or paying for your workers. Increasingly, there are games that incorporate some Worker Placement elements in the context of a broader game. Examples include *Copycat, Rococo* and *Belfort.*

Sample Games

Agricola (Rosenberg, 2007)
Belfort (Cormier and Lim, 2011)
Caylus (Attia, 2005)
Charterstone (Stegmaier, 2017)
Copycat (Friese, 2012)
For Sale (Dorra, 1997)
Jórvík (Feld, 2016)
Lords of Waterdeep (Lee and Thompson, 2012)
The Manhattan Project (Tibbetts, 2012)
Mint Works (Blaske, 2017)
Orleans (Stockhausen, 2014)
Robinson Crusoe: Adventures on the Cursed Island (Trzewiczek, 2012)
Rococo (Cramer, Malz, and Malz, 2013)
Roll for the Galaxy (Huang and Lehmann, 2014)
Spyrium (Attia, 2013)
Terraforming Mars (Fryxelius, 2016)
Through the Ages: A Story of Civilization (Chvátil, 1986)
Tribune: Primus Inter Pares (Schmiel, 2007)
Tzolk'in: The Mayan Calendar (Luciani and Tascini, 2012)

WPL-02 Workers of Differing Types
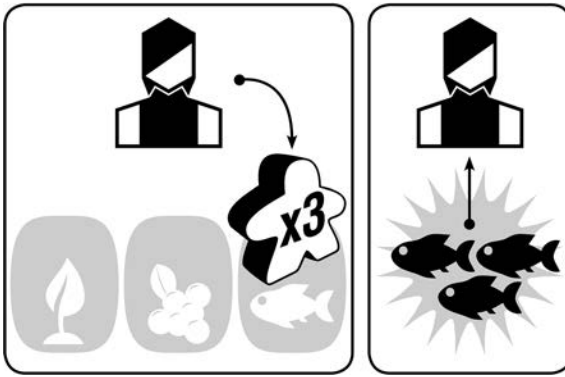
Description

Workers can differ in abilities, or can be upgraded and downgraded, or are valid for placement in different areas and buildings.

Discussion

Improved workers are a common variation on standard worker placement. Improved workers can count as more than one basic worker as in *Belfort*, or they may allow you to break standard placement rules, like in *Leonardo Da Vinci*. *Tzolk'in* puts a different spin on this idea by having the rewards for a space improve the longer that a worker is allowed to stay out on that space. Thematically, this can be understood as a worker spending more time working. Another take on this idea is the notion that workers can improve. In both *Praetor,* and *Euphoria: Build a Better Dystopia,* workers, represented as dice, are more capable and provide better returns when they show higher numbers. Players can take actions to increase the values of these worker dice. In *Village,* workers can age and gain experience, which improves their effectiveness.

Some games have workers who participate in different placement contests, or have buildings that can only be accessed by certain types of workers. *Pillars of the Earth* has workers who can collect resources, and master builders, who are placed during a second round of placement, and who can access other actions besides resource collection. *The Manhattan Project* similarly features

specialists, like scientists and engineers, and certain buildings require those specialists to operate. *Glenn Drover's Empires: Galactic Rebellion* (previously known as *Age of Empires III: The Age of Discovery*), and *Viticulture,* feature as many as eight different kinds of workers who might participate in majority contests and even battles, in addition to taking actions.

Sample Games

Age of Empires III: The Age of Discovery (Drover, 2007)
Belfort (Cormier and Lim, 2011)
Euphoria: Build A Better Dystopia (Stegmaier and Stone, 2013)
Glenn Drover's Empires: Galactic Rebellion (Drover, 2016)
Leonardo Da Vinci (Acchittocca, Brasini, Gigli, Luperto, and Tinto, 2006)
The Manhattan Project (Tibbetts, 2012)
Pillars of the Earth (Rieneck and Stadler, 2006)
Praetor (Novac, 2014)
Tzolk'in: The Mayan Calendar (Luciani and Tascini, 2012)
Village (Brand and Brand, 2011)
Viticulture (Stegmaier and Stone, 2013)

WPL-03   Acquiring and Losing Workers
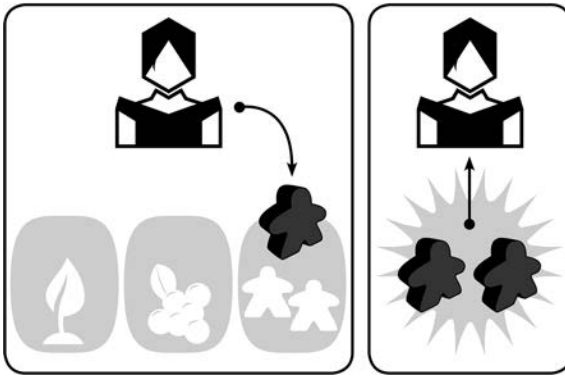
Description

Workers beyond the original complement may be acquired in some manner, either temporarily or permanently. Workers may also be lost as the game progresses.

Discussion

Rather than improving existing workers, many games allow acquisition of new workers. These new workers represent a substantial growth in a player's overall action budget, and as such, acquiring more workers is often a dominant strategy. In *Stone Age,* the reproduction hut is typically chosen first or second in every round. Because of the power of adding workers, designers have taken to metering worker growth. In *Lords of Waterdeep,* all players receive a new worker on a fixed turn in the middle of the game. *Caverna* requires that players build housing for new workers to acquire them—an investment of resources up-front that the new worker's productivity will pay for in the future. Any kind of purchase price on a worker has to be considered in light of the number of actions that worker will be able to take and the returns those actions will provide. Usually, buying workers early has a higher payout than buying them late for this reason.

In *Last Will,* the number of workers a player may deploy varies each turn based on the place in turn order that they choose. More workers means going later in the turn order, thus reducing the expected value of those additional

workers, since the best spots will be taken by the time those extra workers are up for placement. *Euphoria* sets a hard cap on the total value of pips that can be showing in a player's pool of available worker-dice, which sharply limits a player's incentive to collect more workers.

Temporary additional workers are featured in *Snowdonia, Russian Railroads,* and *Power Grid: Factory Manager.* These workers will return to the general pool after use, and must be hired or acquired again for reuse. A similar way to throttle player appetites for more workers is through a feeding or worker upkeep cost for permanent workers. *Agricola* is famous for the unforgiving tightness of its feeding mechanism, and the substantial penalties incurred for failing to feed your family, while *Stone Age's* toothless approach makes a starvation strategy quite viable.

Worker attrition is the flipside of this dynamic of gaining workers. *Euphoria's* workers may get too smart and, as a group, have too high a pip value, at which point one escapes (or perhaps, is sent for re-education…). The aging workers of *Village* eventually pass on, and the workers in *Praetor* retire. Other games actively encourage sacrificing workers for a benefit. *Asgard* is a visceral example, but discarding a die in *Alien Frontiers*, themed as landing a spaceship (the die) on a planet to establish a colony, is mechanically identical.

Sample Games

Agricola (Rosenberg, 2007)
Asgard (Zizzi, 2012)
Caverna: The Cave Farmers (Rosenberg, 2013)
Euphoria: Build a Better Dystopia (Stegmaier and Stone, 2013)
Last Will (Suchy, 2011)
Lords of Waterdeep (Lee and Thompson, 2012)
Power Grid: Factory Manager (Friese, 2009)
Praetor (Novac, 2014)
Russian Railroads (Ohley and Orgler, 2013)
Snowdonia (Boydell, 2012)
Stone Age (Brunnhofer, 2008)
Village (Brand and Brand, 2011)

WPL-04   Workers-As-Dice
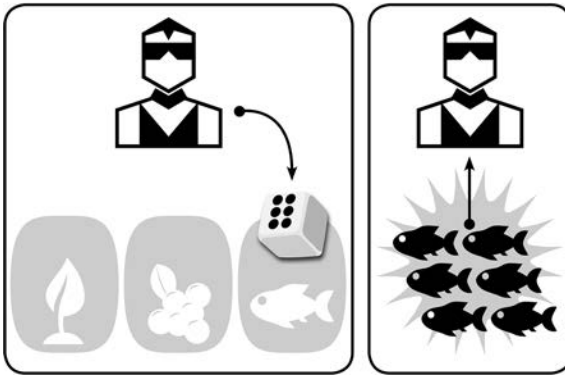
Description

Workers are represented by dice whose pip values impact play.

Discussion

Workers-As-Dice is a broad genre, and it is frequently accompanied by the mechanism of playing a combination of workers in a building. In *Alien Frontiers,* players allocate all of their dice on their turns to buildings that take a different combination of dice and values, and have different requirements for placement. This approach leads to some analysis paralysis because of the large number of combinations that are possible with as many as six dice. Other titles, like *Kingsburg,* limit the dice pools to three dice. Each roll presents a substantially smaller set of placement permutations for players to consider, not only because of the smaller number of dice but because there are fewer valid buildings for any given combination.

Workers-As-Dice can also function to determine the effectiveness of workers. In *The Artemis Project,* worker dice collect a number of resources equal to their pip value—as long as resources remain available in the supply. However, the higher pip value dice are awarded resources last, which may leave the placing player out of luck if the resources run out before they can collect the reward.

Champions of Midgard features warrior dice whose faces represent attack strength. The dice are assigned to overcome monsters, and are rolled together,

summed, and compared to the monster's strength. For some players, this is an unacceptable level, and type, of randomness in a worker placement game. Whatever your position on the matter, it is representative of the ongoing hybridization of game styles and game mechanisms.

The manner in which the dice change values over the course of the game can vary. In some games the dice are rolled each turn, giving a random distribution that players need to work with. *Alien Frontiers* works in this way. In other games, the players obtain the dice on a certain side, or have to expend resources to change them to other, perhaps more powerful, sides.

Sample Games

Alien Frontiers (Niemann, 2010)
The Artemis Project (Chow and Rocchi, 2019)
Champions of Midgard (Steiness, 2015)
Kingsburg (Chiarvesio and Iennaco, 2007)

WPL-05   Adding and Blocking Buildings
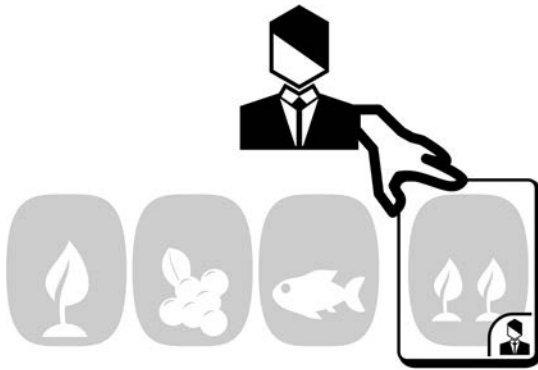
Description

Buildings, and their corresponding actions, may be added to the pool of actions players may select from. Buildings may also be occupied to prevent or hinder players from accessing those actions.

Discussion

Buildings define available actions in a worker placement game, and how designers manage the availability of actions is critical to the overall flow of the game. Some games retain a static set of actions throughout the game, like *Stone Age*. Other games introduce new actions in a set pattern. *Agricola* features new actions that reveal themselves each round, but the actions are drawn from a very small subset, guaranteeing, for example, that the "Family Expansion" action will reveal itself in one of three consecutive rounds.

Many games allow players to add buildings, and to claim ownership for them. As early as *Caylus*, players could add a building and receive victory points when another player occupied it. *Lords of Waterdeep* has variable owner rewards for building usage by others. Some games break the core notion of action drafting by introducing private actions. *Russian Railroads* themed these as engineers, rather than buildings, but private buildings, themed as buildings, exist in *The Manhattan Project*. On the opposite end of the spectrum are public actions that are always available to all players, like the resource-gather actions in *Stone Age*, which are in a public area, or the brewery actions in *Brew*

Crafters, which are depicted on each player's board. The section on Ownership (ECO-14) has more details on this concept.

Underlying the difference between these actions is the concept of blocking. Worker placement is a kind of action drafting, and drafting denotes a dwindling set of possible choices. Worker placement depicts claimed actions as a building staffed by a worker, so a building that cannot take an additional worker is considered blocked. The typical worker placement game allows each building to be used by one player each round, and is blocked when one worker is in it. Modest exceptions allow for two or three players to use a building—an easy way to scale the actions available in a game as the player count increases.

Some games eschew "hard" blocking in favor of "soft" blocking. In *Coal Baron*, players don't block buildings by occupying them, they simply increase the costs of other players accessing them. *Carson City*, a Western-themed game, has workers in the same space duel to see who claims its reward. Bumping, another kind of soft blocking, allows an occupied building to be reused, but the worker currently occupying the building is removed, and the owner gains some kind of bonus. In *Euphoria*, a game which otherwise requires players to spend a turn recalling workers, simply the act of being bumped is beneficial to the player being bumped—an especially elegant combination of mechanisms.

Blocking is a player-driven placement restriction, but the game itself may impose placement restrictions as well. Some games require multiple workers to be played in order to activate a space, as in *Russian Railroads* or *Francis Drake*. This is especially common among Worker-As-Dice games. Sometimes, players must exceed a particular pip value with one or more dice. Other times, a building calls for a sequential run of dice or a pair or larger set of values, like in *Alien Frontiers*. Both *Egizia* and *Francis Drake* establish a linear relationship between buildings, such that once you skip over a closer building to activate one further down the river or road, respectively, you can never go back. A more prosaic placement restriction is a cost, like in the case of a resource-conversion or building action, which requires inputting resources to build some finished product or obtain some advanced resource. *Kingdom of Solomon* offers players bonus action buildings that are substantially more powerful than the standard spaces, but which require assigning all remaining workers. This can be viewed as a declining price auction (AUC-08) for these bonus actions, with the price expressed in terms of workers, that is folded into the larger worker placement structure.

Sample Games

Agricola (Rosenberg, 2007)
Alien Frontiers (Niemann, 2010)
Brew Crafters (Rosset, 2013)
Carson City (Georges, 2009)
Caylus (Attia, 2005)
Coal Baron (Kiesling and Kramer, 2013)
Egizia (Acchittocca, Brasini, Gigli, Luperto, and Tinto, 2009)
Euphoria: Build a Better Dystopia (Stegmaier and Stone, 2013)
Francis Drake (Hawes, 2013)
Kingdom of Solomon (duBarry, 2012)
Lords of Waterdeep (Lee and Thompson, 2012)
The Manhattan Project (Tibbets, 2012)
Russian Railroads (Ohley and Orgler, 2013)
Stone Age (Brunnhofer, 2008)

WPL-06   Single Workers
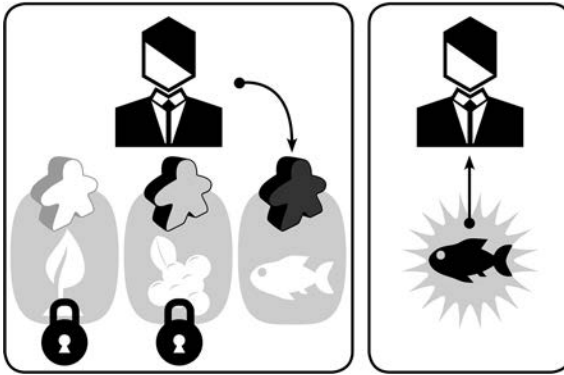
Description

Players control only a Single primary Worker and cannot acquire more workers.

Discussion

On the far end of the worker placement spectrum are the Single-Worker games, which we include in our definition only when they retain a blocking element—otherwise, we characterize these as Action Point games (ACT-01) when players can't interfere with or block each other at all, and Action Drafting games (ACT-02) when players can block each other absolutely.

In the intermediate space between these lies a game like *Kanban*. Players block and influence each other's placements along at least three different axes: (1) players cannot take an action space occupied by another player, (2) they cannot take an action space in the same department they occupied last turn, and (3) they must consider the role Sandra, the neutral boss, will play. In Easy mode, Sandra's presence in a department may encourage players to work in that department in order to win her approval. In Hard mode, they may choose to avoid Sandra's critical eye and the penalties that accompany it.

Another Vital Lacerda game, *The Gallerist,* takes an opposite approach to Single-Worker blocking. Players have a primary worker, and can acquire

several assistants. When players move their primary worker to a new space, they may choose to leave an assistant behind. If that assistant gets bumped by another player, the assistant will be able to take an action as compensation. In a sense, the game records a kind of history of where each player has been, and enforces consequences for collisions, snake-like, between the head of one player and the tail of another. It is arguable whether this actually qualifies for our definition of worker placement, though, since no cost is imposed on the placing player in a manner that could be construed as blocking. Instead, a benefit is given to the player whose assistant is being bumped. *Istanbul* implements this trail concept more fully, and is perhaps the game that most successfully implements substantial movement and spatial relationships within a worker placement framework. Here, blocking is more fully realized, as the placing player must pay the blocker to use the space.

Single-Worker games are quite similar not only to role-selection games, as mentioned above, but also to Rondel Games (ACT-10) and Time Track Games (TRN-13). The worker metaphor and the use of meeples and similar tokens has as much to do with how we categorize the games as the underlying action selection method itself.

Sample Games

Fabled Fruit (Friese, 2016)
The Gallerist (Lacerda, 2015)
Istanbul (Dorn, 2014)
Kanban (Lacerda, 2014)

WPL-07   Building Actions and Rewards
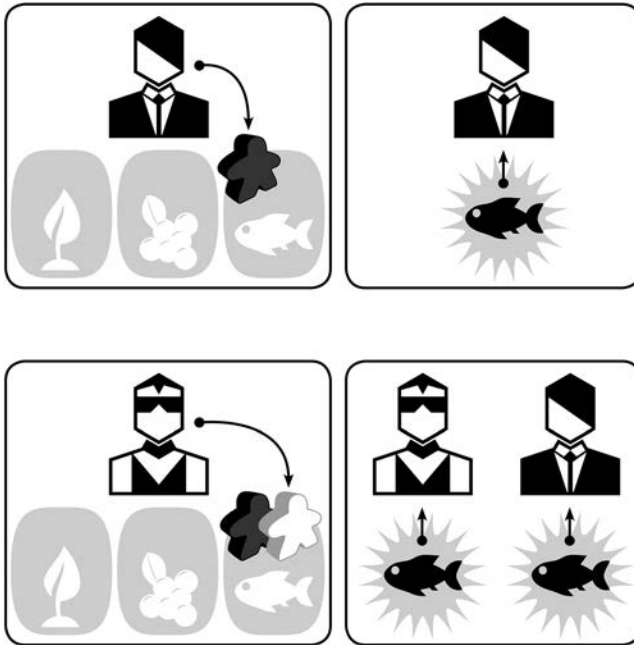
Description

Buildings can offer varying rewards to different players, based on ownership and turn order, or they may be upgraded to increase their rewards to all players.

Discussion

Buildings may offer a greater reward for the first player to claim the building and lesser rewards for players following. This is quite similar to selection bonuses in a role selection game, a flavor of Action Drafting (ACT-02). Other versions of reward choice allow for the player to choose among one of two or more rewards, as in *Caylus*, where players may sometimes take two of one resource or one of another. *Yedo* offers an extreme version of this mechanism: players place workers in districts, rather than specific buildings, and may choose from a variety of possible resolutions, including collecting resources, purchasing weapons, or completing a mission specific to that district.

One way buildings can vary in rewards is through improvements of different kinds. In *Wisdom of Solomon* (originally released as *Kingdom of Solomon*), players can build roads between different spaces, creating resource regions that yield the cumulative benefit of all the connected spaces when activated by a worker. In *Agricola,* and other Uwe Rosenberg designs, some spaces will accumulate an additional resource from turn to turn, growing richer and richer until a player finally selects them. Various games offer cards or special abilities that improve the conversion rate of some building or set of buildings that have a cost or offer some exchange. Conversely, buildings may become deactivated or workers may be hindered from doing their work, as with the Provost in *Caylus* or the City Watch in *Yedo*. A radical approach to varying buildings can be seen in *Fabled Fruit*, in which buildings can be replaced entirely with others in mid-play.

Sample Games

Agricola (Rosenberg, 2007)
Caylus (Attia, 2005)
Fabled Fruit (Friese, 2016)
Wisdom of Solomon (duBarry, 2018)
Yedo (Ginste and Plancke, 2012)

WPL-08   Turn Order and Resolution Order
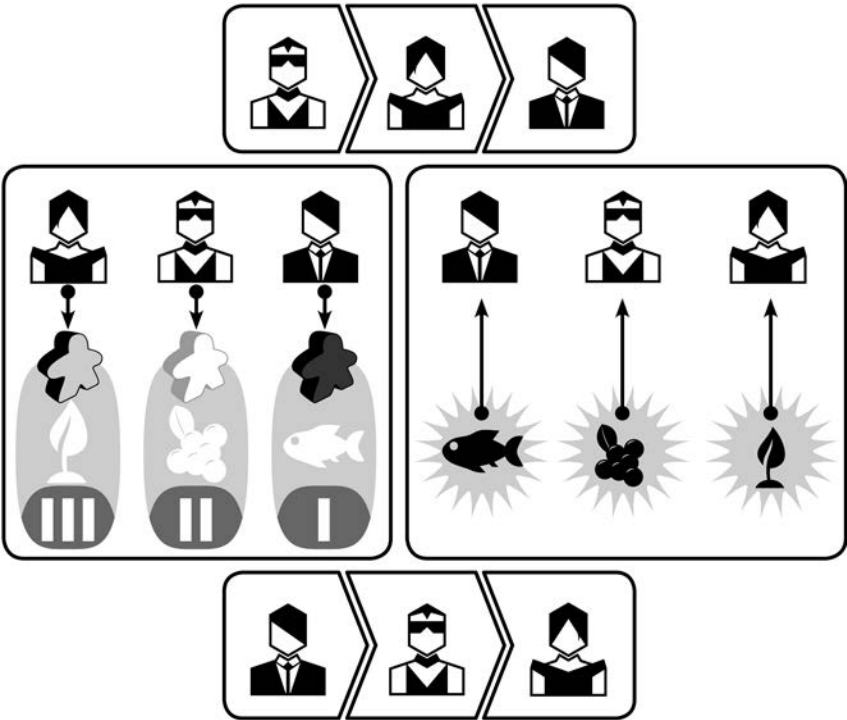
Description

Worker placement is ultimately a drafting mechanism, and the order by which actions are selected and resolved is an opportunity for design variations.

Discussion

Allocation of resources is a foundational concern of nearly every game, and allocation by draft means that Turn Order is crucial. While some worker placement games simply rotate Turn Order clockwise, like *Stone Age*, most fold Turn Order into the worker placement engine itself. The simplest approach is a building that grants Turn Order priority, as in *Lords of Waterdeep*. While this is a simple approach, it has a substantial drawback in that it's a choice with strong left-right binding. In other words, the impacts on the players adjacent to the new starting player are large: the player to the left gains an

unearned windfall because they get to go second, and the player to the right, through no fault of their own, is pushed to the end of line. One design answer is to allow for multiple players to play into the Turn Order building, with the player playing earliest getting the most favorable placement. More discussions of this topic are in Claim Turn Order Action (TRN-05).

As discussed in Acquiring and Losing Workers (WPL-03), *Last Will* has players draft a combination of Turn Order, workers available, and assistant actions in one. Earlier positions in Turn Order have fewer workers and abilities, while later positions have more.

An especially unusual mechanism for Turn Order is the master builder token-pull system in *Pillars of the Earth*. Each player's master builders are placed in a bag and pulled at random, one at a time. The player whose builder is pulled may choose to pay the current price in gold to take the action, or may pass and accept a much later position in Turn Order. The price of the action is then decreased by one gold. If this sounds familiar, it's because it's another variation on the Vickrey auction (AUC-08, Dutch Auction). See also Random Turn Order (TRN-11).

The randomness of this mechanism drew widespread critique, but it did have a spiritual successor. In *Lords of Waterdeep*, up to three players can visit Waterdeep Harbor to play an Intrigue card. In addition, once all players have exhausted their available workers, the workers assigned to Waterdeep Harbor can be reassigned to any available actions space. The similarity to the mechanism in *Pillars of the Earth* is that placing a worker in Waterdeep Harbor offers the reward of playing an Intrigue card, at the cost of having to wait for the remaining workers to be placed before getting another choice at an action with that worker. This implied cost goes down with every succeeding turn, just as the explicit cost of the master builder goes down with each player's turn. The random aspect of *Pillars of the Earth* was not reproduced, but the core notion of variable price for placement priority was retained.

Returning to variations on Turn Order, *Francis Drake* has Turn Order for the following phase set by the previous phase. The player who takes the fewest actions in the first phase goes first in the next phase. *Belfort* allows players to spend a worker to exchange Turn Order position with another player during the placement phase. However, the game features a strong polarity in the benefits of Turn Order. In the worker placement phase, going early is best, but in the building phase, which features an area majority contest, going last is most advantageous.

This phase difference brings up another point of design distinction, which is when worker actions get placed versus when they get resolved. The simplest

placement rule is that each player places one worker on their turn (*Agricola*), which encourages good pace in play. Increasing the complexity, players may be allowed to claim a building, even if it requires more than one worker (*Francis Drake*), or may be allowed to play either one worker, or assign all their remaining workers to a group of public action (*Belfort*). Sometimes, each player places all their workers on their turn (*Alien Frontiers*).

Placement is not synonymous with resolution, however. *Caylus* resolved placements and distributed rewards only at the end of the placement phase, when all workers are out. This delay in resolution creates space for the provost mechanism, which may cause buildings too far down the road to fail to activate, even though they are staffed by workers. It also allows players to set up combos, where resources gained earlier along the road can be used by workers further down the road, regardless of the order that those workers were placed in. Similarly, the *Tzolk'in* escalating rewards case requires resolution to occur when workers are recalled, rather than placed. However, in *Tzolk'in,* the decision is to either place a worker, or return all workers from one building, rather than recalling the whole class of workers from across the board. *Belfort* workers don't collect their goods until all players have completed placement, because the player with the most workers gathering in each building will gain a bonus resource.

When workers return home is another element of the worker placement mechanism that designers have experimented with. In *The Manhattan Project* players resolve their actions on worker placement, but must spend a turn retrieving workers. This tends to create a strong blocking dynamic, since players receive benefits up front, and their workers continue to block other players until they are retrieved. Timing your retrievals relative to other players is critical for effective play. In *Istanbul* workers can be retrieved for free by moving back through the spaces they were left on, or by spending a valuable action recalling all workers to the fountain in the center of the bazaar. Through careful planning, players can plot efficient courses, recover workers for free, and gain an action advantage over their opponents.

Sample Games

Agricola (Rosenberg, 2007)
Alien Frontiers (Niemann, 2010)
Belfort (Cormier and Lim, 2011)
Caylus (Attia, 2005)
Francis Drake (Hawes, 2013)

Istanbul (Dorn, 2014)
Last Will (Suchy, 2011)
Lords of Waterdeep (Lee and Thompson, 2012)
The Manhattan Project (Tibbetts, 2012)
Pillars of the Earth (Rieneck and Stadler, 2006)
Stone Age (Brunnhofer, 2008)
Tzolk'in: The Mayan Calendar (Luciani and Tascini, 2012)

10

Movement

$$\backsim$$

Perhaps the most common dynamic in games is movement. In large part this is because movement is inherent in what games model, whether it's an armed conflict, a journey, or a race. Movement is an incredibly effective and powerful tool in the designer's arsenal because of how dense movement can be in terms of information. Moving a single piece changes its relationship to every other piece on the board. And yet, signaling that change, communicating that it has occurred, is as simple as picking up a piece and placing it down again.

The most ancient board games we know of, like the Egyptian games *Mehen* and *Senet,* have pieces moving around a board. *Chess, Checkers, Shogi, Parcheesi, Backgammon, Monopoly*, and *Candyland*, all feature movement as a key mechanism. Some of these games feature movement in a single direction, along a fixed path, while others offer greater choice, or even free play within a two-dimensional space. In some games, the pieces on the board are all identical, while in others the power to move is encoded in the pieces themselves. Some games have specific spaces that are more valuable to occupy, while in others the positional value of any space can change as the board develops.

Movement is a way of creating dynamic and evolving situations, which can force players to change their plans and react to their opponents. Done well, movement rules are easily understood, yet lead to emergent gameplay. But movement rules are hard to get right. Dealing with questions like blocking, line of sight, terrain types, movement along a diagonal, and more, can turn what seems like an elegant and simple concept into a tangle of conflicting and confusing rules. Among the innovations of the European design school was an increasing abstraction of movement rules, or even total abandonment of movement.

Despite the challenges, movement remains a durable feature of many board games. Movement is fun, and it lends itself well to many different kinds of games in a huge variety of implementations and specific mechanisms, while being conceptually familiar and intuitive, no matter what the context.

MOV-01   Tessellation
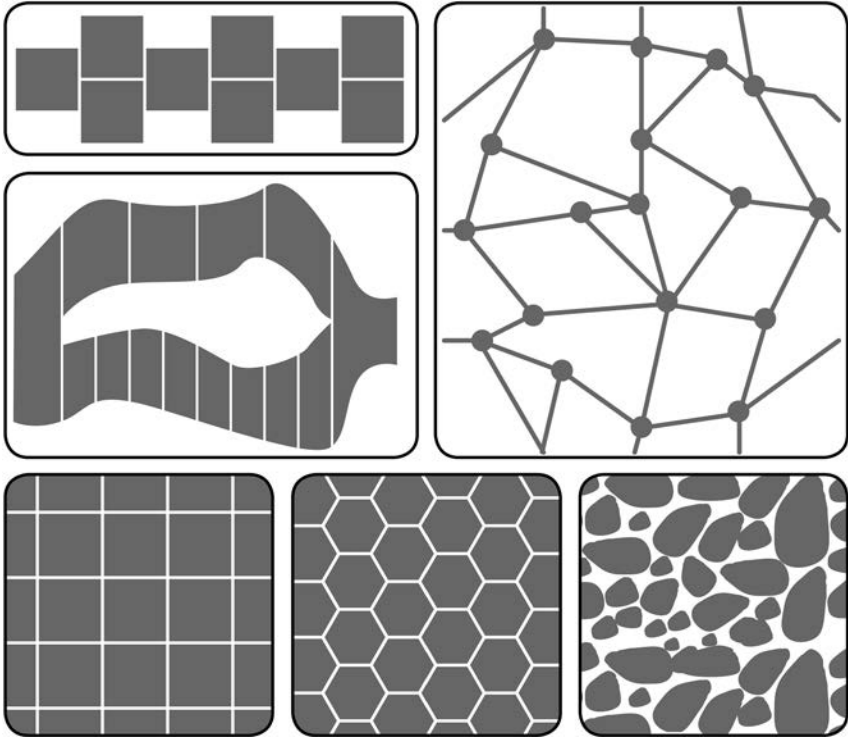
Description

The playing field is divided into spaces to regulate movement.

Discussion

There are several ways to sub-divide boards, all of which are covered in this section.

The most basic is a one-dimensional division. This is often called a *track*, and it is commonly used in Race games, Roll and Move games, and others. There are several variations on the standard track.

First, there may be alternate paths that branch off of the main path. These can be a shortcut that reduces the distance needed to travel, or a path that gives bonuses or other information, as in *Careers*, where each potential career choice has its own path.

Second, certain spaces, or collections of spaces, may be divided into sub-spaces the width of the track. This is typically used in racing games to create lanes, allowing multiple players to occupy the same space, and to create "inside" and "outside" lanes. The number of lane spaces can be reduced, sometimes even down to one, to create bottlenecks that create challenges for players. This is used to great effect in *Ave Caesar* and *Downforce*, where vehicles move a set number of spaces based on cards. Forcing players to waste a good card because they cannot get through a bottleneck is a key strategy.

Boards can also be laid out in two dimensions, either with a regular pattern or irregular shapes. The most common regular patterns are squares (as in *Chess*) and hexagons, used in many wargames, such as *PanzerBlitz*. Triangles may also be used, but are uncommon as they limit options for adjacency, and tend to look busy.

If squares are used, the designer needs to decide if pieces may move diagonally. From a distance standpoint, a diagonal move is approximately 50% further than an orthogonal move, which needs to be compensated for in games striving for realism. Hexagonal Tessellations do not have this issue, and all natural moves are the same distance. This is why they are commonly used for wargames and others require realistic movement. Note that a square grid with each row shifted 50%, making a brick pattern, is isomorphic to a hex grid (and easier to prototype, particularly when creating tiles—even rectangular cards can be used for this purpose).

Some games need to model three-dimensional space, typically those that take place in space, in the air, or under the sea. A common approach is a dashboard or log sheet for each vehicle that tracks the altitude. This system is used in *Richtofen's War* and *Air Force*. Some, like *Attack Vector: Tactical,* have tokens placed next to or beneath pieces to indicate height above or below the playing surface. Others, like *Chopper Strike* and *Sub Search,* physically create multiple levels of play area by vertically stacking boards, separated by supports. These are physically striking and easy for players to interpret, but need to limit the number of levels due to cost, physical size of the board, and ease of reaching in between levels to reach pieces.

Irregular patterns are called Area Maps. *Diplomacy* is an example. There are several design considerations for Area Maps. First, if they regulate movement, the areas should be approximately the same size, or at least "movement equivalent." For example, a mountainous region may be divided into smaller, more numerous spaces so it takes more moves to traverse.

If possible, regions should not touch at a corner, they should only touch along an edge.

Area maps are isomorphic to point-to-point movement, where boxes or circles are connected by lines. Sometimes point-to-point maps can be preferable, as they clearly show connections, and connection information (like rivers or borders) may be more evident. Point-to-point maps are also common in space games, where the connection between stars is shown.

Some maps are a combination of two-dimensional point-to-point and one-dimensional tracks. For example, *Trains and Stations* has tracks in between cities that players must build along.

If a region contains important information, like terrain type or resources, the graphics should be visible and distinct even if pieces are present.

Sample Games

Tracks:
Ave Caeser (Riedesser, 1989)
Careers (Brown, 1955)
Downforce (Daviau, Jacobson, and Kramer, 2017)
Monopoly (Darrow and Magie, 1933)
Snakes & Ladders (Unknown, ~200 BCE)
Sorry! (Haskell, Jr. and Storey, 1929)

Squares:
Chess (Unknown, ~1200)
Checkers (Unknown)
Go (Unknown, 2200 BCE)

Hexagons:
Blitzkrieg (Pinsky and Shaw, 1965)
PanzerBlitz (Dunnigan, 1970)
Squad Leader (Hill, 1977)
Lords of Creation (Wallace, 1993)

Three-Dimensional:
Air Force (Taylor, 1976)
Attack Vector: Tactical (Burnside, Finley, and Valle, 2004)
Chopper Strike (Uncredited, 1976)
Richtofen's War (Reed, 1972)
Sub Search (Uncredited, 1973)

Area:
Diplomacy (Calhamer, 1959)
El Grande (Kramer and Ulrich, 1995)
Risk (Lamorisse and Levin, 1959)

Point-to-Point:
A House Divided (Chadwick and Emrich, 1981)
Pirate and Traveller (Sanderson, 1908)
Twilight Struggle (Gupta and Matthews, 2005)

Combination:
Master of the Galaxy (Bokarev and Seleznev, 2018)
Trains and Stations (Lang, 2013)
World in Flames (Pinder and Rowland, 1985)

MOV-02   Roll and Move
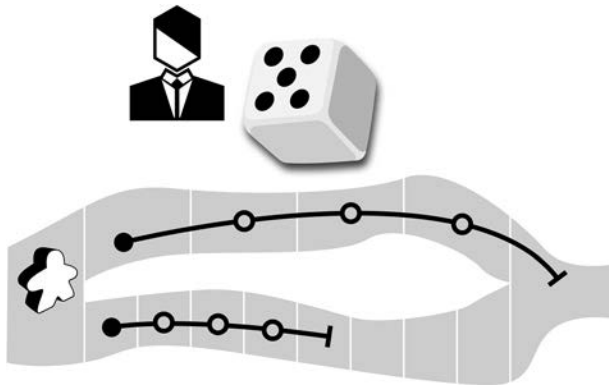
Description

A randomizer is used to determine how far to move a piece. The space landed on determines the action(s) a player can take.

Discussion

Roll-and-Move games are emblematic of many of the earliest games people are exposed to. This Roll-and-Move mechanism has also been used in some of the oldest known games, including *Senet* and *Backgammon*.

Because Roll and Move has been used in so many simplistic children's games, it has the reputation as an anti-pattern. Players do not feel in control of their actions, and are at the mercy of the randomizer, which could be dice (*Monopoly*), a spinner (*Chutes and Ladders*) or cards (*Candyland*).

To mitigate this, the designer should extend the mechanism to allow for more player choice. One way is to give the players more ways to apply the results of the randomizer, as in *Backgammon*, where the player can use the dice in a variety of ways. Other options are to have mechanisms that allow the players to modify, use a subset of the number, or choose direction, as in *Talisman*, wager on movement as in *Long Shot* and *Camel Up*, or wrap it in a Push-Your-Luck mechanism like *Nur Peanuts!*. Other options are discussed in the following sections: Different Dice (MOV-07) and Probability Management (UNC-09).

Sample Games

Backgammon (Unknown, 3000 ʙᴄᴇ)
Camel Up (Bogen, 2014)
Long Shot (Handy, 2009)
Monopoly (Darrow and Magie, 1933)
Nur Peanuts! (Meister, 2001)
Parcheesi (Unknown, 400)
Senet (Unknown)
Snakes & Ladders (Unknown, ∼200 ʙᴄᴇ)
Talisman (Harris, 1983)

MOV-03   Pattern Movement
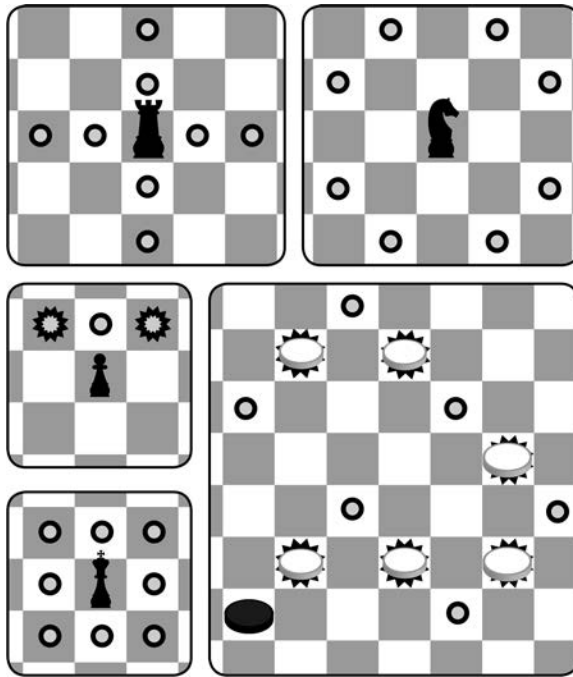
Description

Pieces move in a specific pattern relative to the board grid.

Discussion

This Pattern Movement mechanism gives pieces specific ways that they can move relative to a grid. There are three basic styles:

1. *Fixed Target Spaces*: This is similar to the way that knights move in *Chess*. There are a few specified target squares, and the piece may be moved to any of them. They may or may not be able to jump over spaces that are blocked by friendly or enemy pieces. These moves do not need to be reversible. While a *Chess* knight may return to the square it came from, a pawn may not move backwards. In *Shogi* the Gold, for example, may move diagonally forward, but not diagonally backward (although it may move straight backward).

2. *Any Distance in a Direction*: The Queen in *Chess* would be an example of this movement style. Pieces may move any number of spaces in a given direction, until blocked by another piece. Sometimes, the directions are fixed relative to the board, so pieces cannot return to where they came from. The Lance in *Shogi*, for example, may move any distance forward, but may never move backward until it is promoted.

3. *Jumping*: Jumping over pieces may be a requirement for moving or may be used to capture. Sometimes jumps can be chained, as in *Draughts* (*Checkers*) and *Chinese Checkers*, which can lead to dynamic and dramatic play.

Games with Pattern Movement often have a Promotion mechanism, where pieces that reach the end of the board (or close to the end, as in *Shogi*) are converted into a more powerful version of the piece.

Navia Dratp has pieces that promote by spending a currency to upgrade them. It is earned by moving and capturing, and different pieces cost different amounts to upgrade, which gives a great tool for balancing.

A different take on Promotion is shown by *The Duke*, where pieces are tiles with different movement patterns on either side. When a piece is moved, it is flipped over to its other side.

Movement Patterns can be difficult to learn if there is a different pattern for each piece, and it is not part of the piece, as in *Chess* or *Shogi*. However, some modern games, such as the aforementioned *Navia Dratp* and *The Duke,* print the movement pattern directly onto the piece, which makes it much smoother for newer players to learn and allows for even more different styles of pieces. Nevertheless, games like *The Duke* do present players with the challenge of remembering the movement pattern on the reverse side of each piece. Player references can help alleviate these issues.

Sample Games

Checkers (Unknown)
Chess (Unknown, ~1200)
Chinese Checkers (Monks, 1892)
The Duke (Holcomb and Mclaughlin, 2013)
Navia Dratp (Yamazaki, 2004)
Shogi (Unknown)

MOV-04 Movement Points
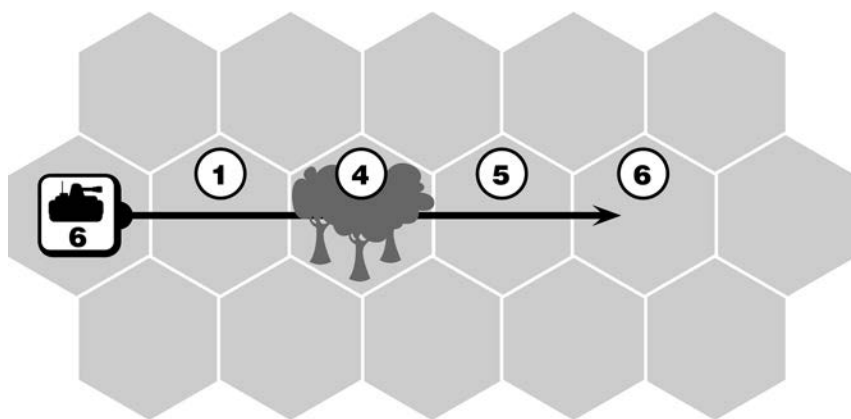
Description

A piece is given a number of points to spend on movement.

Discussion

This Movement Points mechanism allows the designer to differentiate units as well as movement conditions. It is commonly used in wargames, as in *Rise and Decline of the Third Reich*, for example, where infantry units have three movement points, and armor units have six. However, it is also used in train games like *Empire Builder* and racing games like *Formula De* to control movement. Normally, each space takes one Movement Point, but certain obstacles and terrain, like mountains, or swamps, may take more. In more tactical games, rivers and roads may slow or accelerate movement by controlling how many Movement Points are used. Movement Points may be further generalized as Action Points (ACT-01), where movement is just one of the actions that points may be spent on, as in *Tikal*.

Another extension is to allow normal Movement Points to be increased by incurring some limitation or penalty. For example, many wargames allow for units to "double-time" or "redeploy" at the expense of not being able to conduct an attack or come within a certain distance of an opposing unit. Others allow units to take on a status of "exhausted" by moving farther than normal, but having their other skills degraded until a "rest" turn is taken.

Sample Games

BattleTech (Brown, Leeper, and Weisman, 1985)
Empire Builder (Bromley and Fawcett, 1982)
Formula De (Lavauer and Randall, 1991)
Melee/Wizard (Jackson, 1977)
Rise and Decline of the Third Reich (Greenwood and Prados, 1974)
Tikal (Kiesling and Kramer, 1999)

MOV-05   Resource to Move
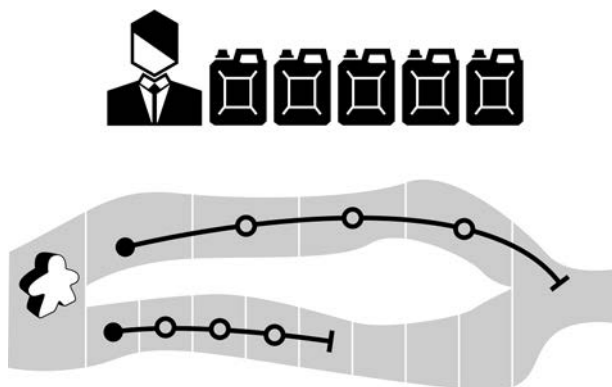
Description

Players expend a Resource to Move.

Discussion

Games where players are moving a limited number of pieces (typically one) may give them a resource that needs to be expended to move. This can take the form of a card with a numeric value, as in *Ave Caesar* or *Ben Hur*, or it can be a currency such as fuel or something more abstract. In *Hare & Tortoise*, players need to spend carrots to move, and can acquire them through various actions.

The resource may also have to be expended to change velocity. This is most commonly seen in space games, like *Attack Vector: Tactical*, where fuel modifies velocities. However, it can also apply to traditional racing games, like *Mississippi Queen*, where players are racing steamships on the Mississippi River. In *Mississippi Queen*, players may normally increase or decrease their speed by one. If they wish to accelerate or decelerate at a higher rate, they must expend coal, which is a limited resource.

Scotland Yard gives players a limited number of tickets of different types—Subway or Bus for example—one of which must be used each turn depending on the type of transportation taken. If the detectives exhaust their tickets before catching Mr. X, they lose the game.

Giving players a resource that they need to manage is one way to mitigate the common issues with random Roll-and-Move games (MOV-02), as it increases player choice.

Sample Games

Attack Vector: Tactical (Burnside, Finley, and Valle, 2004)
Ave Caesar (Riedesser, 1989)
Ben Hur (du Poel, 1987)
Elfenland (Moon, 1998)
Hare & Tortoise (Parlett, 1973)
Mississippi Queen (Hodel, 1997)
Mush (Moon, 1994)
Scotland Yard (Burggraf, Garrels, Hoermann, Ifland, Scheerer, and Schlegel, 1983)

MOV-06   Measurement
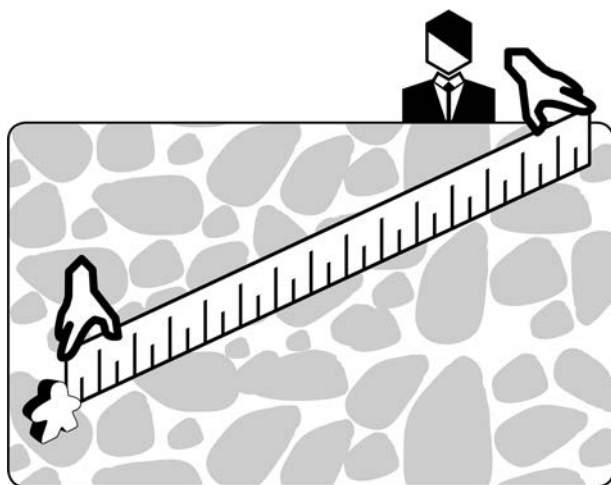
Description

Pieces may be moved up to a certain distance, measured by a ruler.

Discussion

In this Measurement system there is no grid or other tessellation breaking up the map. Pieces are free to move any amount up to their movement limit, expressed in inches, centimeters, or using a game-supply ruler. This system is typically seen in miniatures games, which are played directly on a table top.

Because of the analog nature of Measurement, these systems have several unique issues they need to deal with. First, attack, like movement, is also expressed in the Measurement units. The designer needs to decide whether to allow for Measurement at any time to determine range, or only after attacks or moves have been declared. Not allowing premeasurement gives an edge to players that are better at estimating ranges but tends to make for a lighter experience as sophisticated plans and strategies may fall apart because a charge falls a fraction of a centimeter short. Most modern games allow for premeasurement, although this does slow things down.

This is compounded by the second issue, that there is always some imprecision in moving and Measurement. These systems require players to communicate about intent of moves, and to act in a reasonable fashion.

Finally, unlike Movement Points systems (MOV-04), measuring can be challenging with different terrain types. Does movement in difficult terrain count as moving "farther" than in other terrain? How are those Measurements handled? These considerations make games more complex. These downsides are offset by games that feel more cinematic and realistic due to the open-ended nature of the scenery, movement, and combat.

Sample Games

Dropzone Commander (Lewis, 2012)
Infinity (Rodriguez, 2005)
Warhammer Age of Sigmar (Uncredited, 2015)

MOV-07   Different Dice
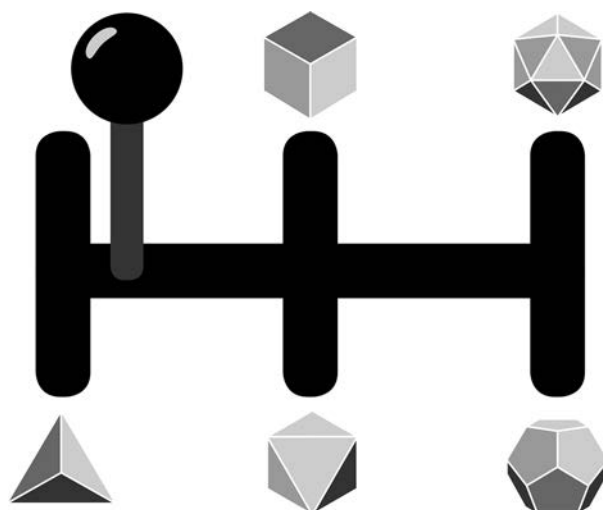
Description

Different Dice are used to move depending on unit or game state.

Discussion

As an alternative to giving fixed Movement Points to units (MOV-04), this mechanism assigns a particular die or dice that are rolled to determine how far a unit may move. This introduces some randomness in movement rates but allows the player (and designer) to control the range.

In *Formula De*, each gear is represented by a different die. Players roll the specific gear die to see how far they will move. These are special dice that have a specific min and max value—the D20 5th gear die, for example, goes from 21 to 30.

Battleball assigns a different die to each unit—D6s for the slow linesman, and D20s for the speedy wide receivers. In this case, however, the dice are standard, and go from 1 to 6 or 1 to 20 in these particular cases. This makes the wide receivers much more variable.

In the dog-sled racing game *Mush*, dogs are represented by different dice depending on the type of weather they prefer.

One of the advantages of this system is that there is very little rules overhead. Once the die is selected, you roll it to generate that number of Movement Points.

Sample Games

Battleball (Baker, 2003)
Formula De (Lavauer and Randall, 1991)
Mush (Moon, 1994)

MOV-08   Drift
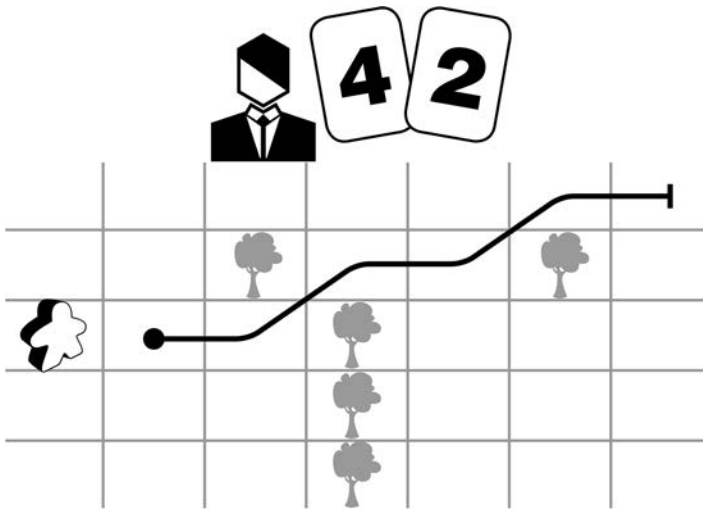
Description

Two movement cards are played to move. The sum represents the distance forward moved; the difference represents the sideways movement (Drift).

Discussion

First introduced in the dog-sled racing game, *Snow Tails*, this Drift system is both thematic and gives players options for clever play. Each of the two dogs pulling the sled has a number card placed on it. The sled is moved forward by the sum of the numbers, and it must change lanes equal to the difference, in the direction of the dog that was assigned the higher number.

Since players may only play one card per turn (with the card on the other dog remaining the same), careful management of resource, and how you Drift through the course, is essential for winning play.

While this system has not been used outside of *Snow Tails* and its successor *Mush! Mush!: Snow Tails 2*, we feel that it is worth including here because it shows how different movement mechanisms can be thematic, clever, and straightforward. It may well be that the close consonance between theme and mechanism is precisely why this hasn't been reused.

Sample Games

Mush! Mush!: Snow Tails 2 (Lamont and Lamont, 2013)
Snow Tails (Lamont and Lamont, 2008)

MOV-09 Impulse

Segment	\ Speed	1	2	3	4	5	6	7	8	9	10	11	12
A													●
B							●	●	●	●	●	●	●
C					●	●			●	●	●	●	●
D				●			●	●		●	●	●	●
E						●			●		●	●	●
F			●		●		●	●	●	●	●	●	●
G		●						●		●		●	●
H				●		●	●		●	●	●	●	●
I					●			●	●		●	●	●
J						●	●			●	●	●	●
K							●	●	●		●	●	●
L		●	●	●	●	●	●	●	●	●	●	●	●

Description

A turn is broken up into a series of small Impulses. Depending on their speed, units will be able to move in specific Impulses.

Discussion

Originally pioneered in *Star Fleet Battles*, this system simulates simultaneous movement of player pieces. Rather than one player moving their full distance, and then the next, moves are interleaved. There is a chart that shows which Impulses a ship will move in for different speeds. When a ship becomes active, it moves a single hex.

As an example, in *Star Fleet Battles,* ships may have speeds from 0 to 16, so there are 16 Impulses. A ship that is moving at speed 4 will move every fourth Impulse. A ship that is moving at speed 6 will move in Impulses 3, 6, 8, 11, 14, and 16.

This system increases realism by having ships gradually approach each other, rather than jump to a new location and fire from there. However, it does so at an increase in complexity and bookkeeping that requires one of the players to keep track of the progress of the turn, and alert players to when particular ships need to move.

Sample Games

Attack Vector: Tactical (Burnside, Finley, and Valle, 2004)
Car Wars (Irby and Jackson, 1981)
Star Fleet Battles (Cole, 1979)

MOV-10 Programmed Movement
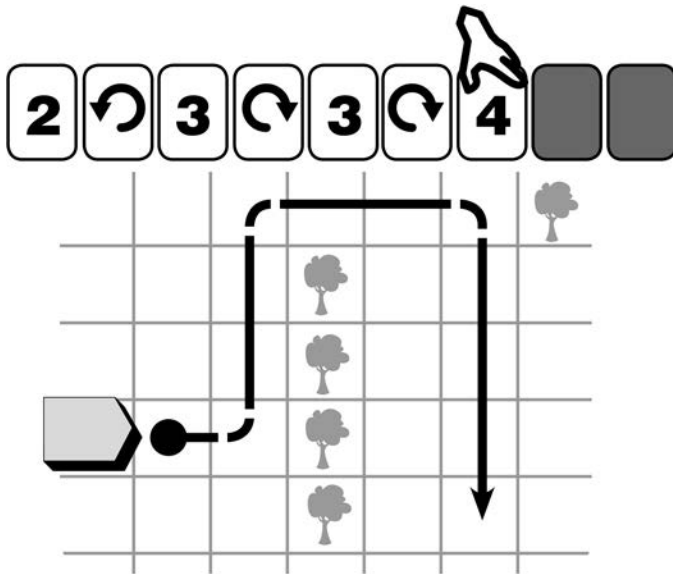
Description

Players simultaneously program their movement, and then reveal and execute it.

Discussion

This is a subset of Action Queues so the considerations there apply. However, there are some specifics relating to movement to cover here.

First is the Right-Left issue. Programmed Movement games often have turning as one of the orders. *Robo Rally* is an example. This can often be difficult for players to visualize and can result in turning the wrong way. It can be beneficial to have the turn cards labeled as Clockwise and Counter-Clockwise, rather than Right or Left, as these may be simpler for players to visualize, but the issue remains.

To avoid this, some Programmed Movement games either have a generic Turn action, allowing the players to choose facing at that time, or allow free rotations. *The Dragon & Flagon* is an example.

Another is how challenging the spatial puzzle will be, and how that fits into the game theme. *Robo Rally* creates a complex space for players to navigate by

constraining them in two ways. First, players draw a hand of nine cards, and must select five to be programmed. It is frequent that players do not have the exact cards they need to get where they would like to go, so that forces them to evaluate a variety of alternatives. In addition, there are features on the board like conveyor belts, pits, and pushers that, although deterministic, make it even more challenging to picture the result of a sequence of cards. There is also bumping—if players move into the same space as another robot, they push it out of the square, which can have a huge effect on where that robot ends up. Then, if robots take damage, they may have cards "locked" into place, making coming up with a plan even more challenging. All of these elements foster a feeling of chaos, which is the goal of *Robo Rally*, which players tend to either love or hate.

Space Cadets uses a similar system, with cards being drawn and placed in sequence to plot movement. But it gives a little more control to players, as there are fewer obstacles on the board, and ships pass through each other or may occupy the same space. Players also have more control, as they can slow down, reducing the number of cards played, or allocating more of the Energy resource to Helm, allowing for more cards to be drawn.

Another lever for the designer is the number of cards to be placed in the queue. This materially impacts the complexity of planning. While *Robo Rally* has players plot five cards, *duck! duck! Go* only has them plot one, befitting its intended younger audience. *Volt: Robot Battle Arena* has players place a die on a chart indicating the direction they want to move, with the die face indicating the distance. There is no facing—robots can move or shoot in any direction chosen. This puts the emphasis in *Volt: Robot Battle Arena* on guessing what the opponents will do, rather than on how to control your own robot.

Sample Games

The Dragon & Flagon (Engelstein, Engelstein, and Engelstein, 2016)
duck! duck! Go! (Nunn, 2008)
Robo Rally (Garfield, 1994)
Space Cadets (Engelstein, Engelstein, and Engelstein, 2012)
Twin Tin Bots (Keyaerts, 2013)
Volt: Robot Battle Arena (Matsuuchi, 2014)

MOV-11   Relative Position
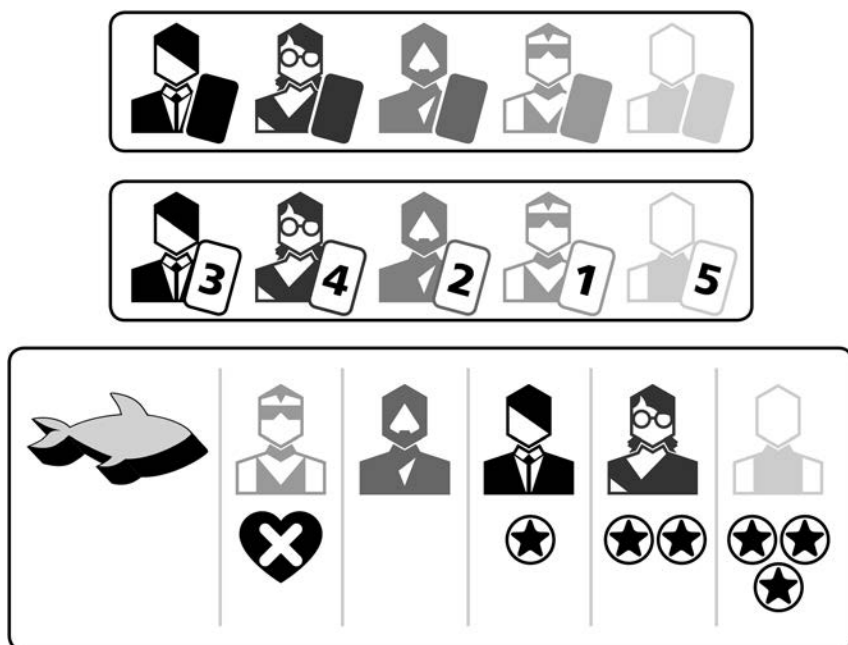
Description

The precise location of units is not tracked. Only their Relative Position is important.

Discussion

The standard use case for this mechanism is in racing games that track relative order but not specific position. For example, in *Formula Motor Racing,* the cars for the players are simply in sequence from first place to last. Players take actions to try to move further up towards the front of the line and be in first place when the game ends. The distance between first and second place is always the same. There is no further representation of distance or gaps between cars.

Similarly, in *Get Bit!*, players are swimmers trying to escape from a shark, and only their relative position is tracked. The shark attacks the player last in line.

This system has the benefit of simplicity and focuses on specific aspects of racing. It also eliminates the need for a board, track, or lanes, and the rules and space overhead that go with that. It also keeps the games competitive, as it is literally impossible for a car to get too far into the lead to catch or drop too far behind the leader. Everything is constrained.

Roadkill is a hybrid version of this system, which has a series of location cards that players race through. Not all players need to be on the same location card, but those that are placed in a ranked line.

Another type of Relative system is used in *Up Front*. This card-based tactical combat game has squads that move toward or away from other squads. Their location is represented by an abstract concept called Relative Range, which goes from 1 (far away) to 5 (right on top of each other). Abstracting movement in this way allows *Up Front* to focus on other tactical elements of the battle.

Racing or movement does not need to be the central metaphor for use of this mechanism. In *Guillotine*, players manipulate a line a people, with the character at the head of the line needing to put their head on the chopping block.

Sample Games

Formula Motor Racing (Knizia, 1995)
Galaxy Trucker (Chvátil, 2007)
Get Bit! (Chalker, 2007)
Guillotine (Peterson, 1998)
Roadkill (Greenwood and Verssen, 1993)
Up Front (Allen, 1983)

MOV-12 Mancala
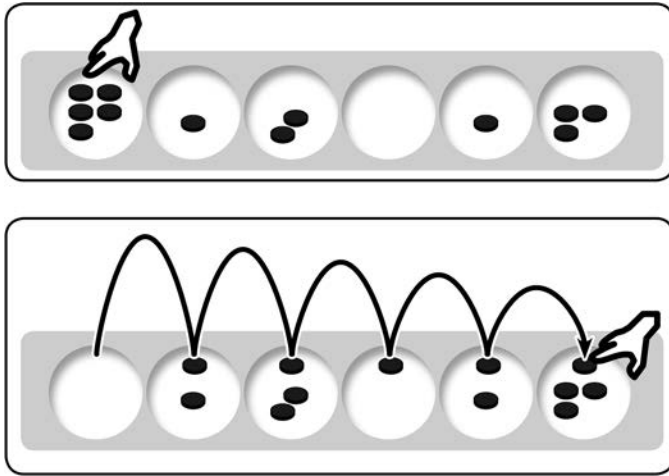
Description

Movement is based on the number of units at the starting location.

Discussion

This system arises from a family of games from Africa, most notably *Mancala*. In *Mancala,* the board is a series of pits organized essentially in a ring. Various numbers of playing pieces are in each pit. On their turn, a player selects a pit and removes all the pieces in that pit, and places one in each successive pit in a single direction. If there are three pieces in a pit, for example, one each will be placed in each of the next three pits going around the ring.

A common variation on this mechanism is that only one piece moves, but the distance it gets to move is exactly equal to the number of pieces in the space it starts in. In *Finca,* this system is used to move around a Rondel for action selection (ACT-10), and all pieces, regardless of owner, count toward the distance moved. *Finca* also has the twist that the strength of the action is based on the number of tokens in the destination space. In *Downfall of Pompeii,* players begin the game by placing their pawns into buildings in the city. After the first eruption, players can add pawns to a building equal to the number of pawns already in the building, and finally, after the second

eruption, players move pawns a number of spaces equal to the number of pawns on the originating space.

In *Theseus: The Dark Orbit*, players move their pieces around a space station, again based on the number of pieces located in the starting area. However, they have the choice of going clockwise or counter-clockwise.

These systems have a lot of opportunity for clever play and are highly interactive as pieces from all players are commingled and directly impact the options available to each.

Sample Games

Downfall of Pompeii (Wrede, 2004)
Finca (Sentker and zur Linde, 2009)
Mancala (Unknown, 700)
Theseus: The Dark Orbit (Oracz, 2013)

MOV-13   Chaining
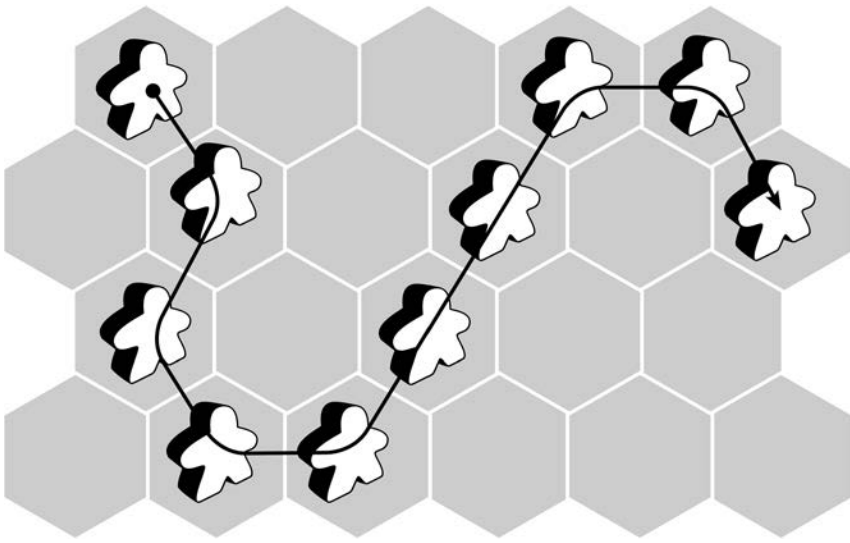
Description

Pieces are stationary but are built out in chains.

Discussion

While the pieces in these games are stationary, building them in chains gives a dynamic feel of movement. In fact, most of these games are typically about taking journeys and traveling.

In *Expedition* and *Lazer Ryderz*, players place a chain of arrow tokens or templates to show the path they are taking. They are considered to be at the tip of the chain. In both cases, if the chains cross, something special happens, which is the rationale for leaving the chain.

In *Through the Desert* and *Quartermaster General*, players do not have to play from the tip of the chain. They may extend from anywhere. This is more in keeping with the themes of establishing caravans or supply lines.

Using chains, rather than just a single unit, creates opportunities to blockade other players, forcing them to cross your path, or topologically isolate them. The static nature of the placements makes these games simple to teach but can open up tactical options for deeper play.

Sample Games

Expedition (Kramer, 1996)
Lazer Ryderz (Amato and Kline, 2017)
Quartermaster General (Brody, 2014)
Through the Desert (Knizia, 1998)

MOV-14   Bias
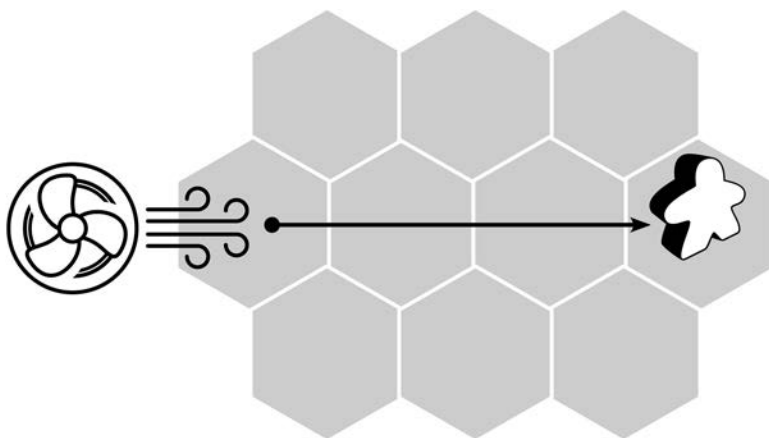
Description

Pieces automatically move in a certain direction, or it is easier to move in a certain direction.

Discussion

The Bias mechanism is typically used to simulate wind, currents, conveyor belts, and other physical systems. There are typically two types: Automatic and Influencers. Automatic Bias mechanisms move pieces in a set direction, typically at the end of each turn. An example is the conveyor belts in *Robo Rally*, which automatically move all robots on them, as well as possibly rotating them. Others are the rivers in *Niagara* and *The Adventurers: The Temple of Chac*, which slide all pieces on the river toward the falls, or the magnets or fans in *Darter.* This is also commonly seen as gravity in space games, such as *Demon's Run*, which move players that go too close to black holes.

These effects are often indicated to the player by arrows on the board showing the effect on pieces. If movable elements are causing the effect, iconography on the piece is often used.

Influencer mechanisms make it easier to move in certain directions. This is very common in sailing games, but it can also be seen in other themes, like mountain climbing. In *Yacht Race,* the distance a ship can move is directly related to the wind direction.

This mechanism can give texture to an otherwise featureless map, as in a sailing or space game. When players have some control over the element in question (moving magnets in *Darter*, or changing wind direction in *Yacht Race*), it can present the players with really interesting tactical possibilities. For example, in *Niagara* players can influence how fast the river flows each turn.

These mechanisms need to be used with some care, particularly with automatic biases when positioning is critical. If the system gets complicated, it can be difficult for players to picture where they will be at the end of their turn, particularly if this is combined with Programmed Movement (MOV-10), as in *Robo Rally*.

There are more complex variations on the mechanism. One is *Gravwell: Escape from the 9th Dimension*, where the Bias point depends on player location. Players move relative to the closest ship to them, whether ahead or behind.

A related mechanism is used in *Tutankhamen*. Players move along a track and may only move in one direction. They may move as far as they want, but only get to use the ability of a piece they land on. This one-way nature of the board gives the players challenging decisions of whether to race ahead for a desirable space further along the track, or to move slowly and get more actions, but have to use only those spaces skipped by other players.

Sample Games

The Adventurers: The Temple of Chac (Blossier and Henry, 2009)
Darter (Byrne and Conkey, 2004)
Demon's Run (Matheny, 1981)
Gravwell: Escape from the 9th Dimension (Young, 2013)
Niagara (Liesching, 2004)
Primordial Soup (Matthäus and Nestel, 1997)
Robo Rally (Garfield, 1994)
Tutankhamen (Knizia, 1993)
Yacht Race (Uncredited, 1960)

MOV-15   Moving Multiple Units
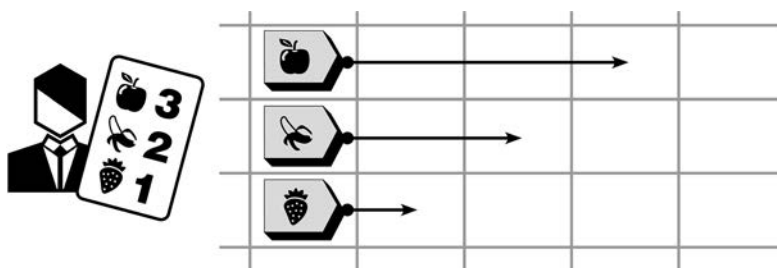
Description

Actions may Move one or Multiple Units.

Discussion

This is a subset of Command Cards (ACT-05). The considerations there apply.

This mechanism is used in its Command Card form by *Thunder Alley*, where players control a number of cars, and the cards are used to move a subset of them.

There are also games where players play cards that move Multiple pieces that may or may not belong to them. The Wolfgang Kramer card system, which includes *Daytona 500* and *Downforce,* gives players a hand of cards, each of which moves cars that may belong to them or to opponents. The key to the game is playing cards at a time when the cars you want to move a long way forward are relatively clear and can use the full movement, whereas cars you are not interested in are blocked in and waste some or all of the movement.

This type of system is frequently associated with Betting (UNC-01), allowing player interests to overlap or conflict at different points.

Another example is *Panamax*. In this game, ships move through the Panama Canal, and certain sections are too narrow for ships to pass each other. So, if you wish to move your ship in that section, it pushes ships ahead of them, giving them free movement.

Sample Games

Daytona 500 (Kramer, 1990)
Downforce (Daviau, Jacobson, and Kramer, 2017)
Long Shot (Handy, 2009)
Panamax (d'Orey, Sentieiro, and Soledade, 2014)
The Really Nasty Horse Racing Game (Knock, 1987)
Thunder Alley (Horger and Horger, 2014)

MOV-16   Map Addition
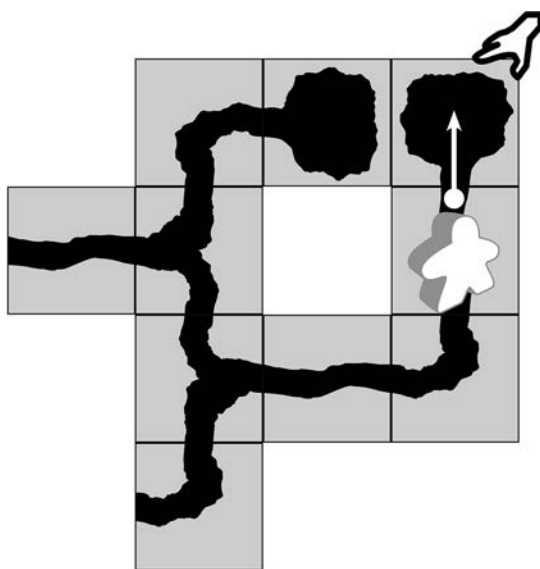
Description

The map is added to as it is explored.

Discussion

This Map Addition mechanism is commonly used in exploration games, as players expose new areas of the map. There are two broad types of games in this category: *Constrained*, where the shape of the board is known, and players must explore within those bounds, and *Unconstrained,* where players are free to explore as they wish (sometimes with some rules). There are also games where the map shape is defined by the scenario or mission but is hidden by the game mechanics, as in *The 7th Continent*, or known to only one player, as in *Descent: Journeys in the Dark*.

This mechanism is often implemented with tiles, and so is a subset of Tile Laying. Much of that discussion applies here. But there are some specific points for map building.

If players can build in any direction, it may keep them somewhat separated as each explores their own area. If more interaction is desired, some incentive

to move to the center needs to be included. The cooperative real-time game *Escape: The Curse of the Temple* implements this rather bluntly, by requiring players to gather on a single tile periodically. In the stress and hurry of a real-time game, it can be challenging to avoid getting spread out.

If using tiles, edges can be used to gate movement. For example, in *Eclipse*, tiles may be marked with a gate or be blank. If two gates match up on adjacent tiles, players may move between them. Later, a technology may be developed that permits movement even if only one gate is between two tiles. This allows for structure and movement restrictions even in the openness of space.

The Map Addition mechanism can also be used to introduce uncertainty into an essentially linear track. In *Mississippi Queen* and *The Mushroom Eaters*, new portions of the track are revealed as they are moved onto. In *Mississippi Queen,* this acts as a type of Catch-The-Leader mechanism (VIC-18), as the leader may be out of position to take advantage of the newly revealed tile.

Exploration can also be procedurally generated. In *Source of the Nile*, when exploring an empty hex, players roll on a series of tables to determine the base terrain type, rivers, and other features. The system cleverly incorporates adjacent spaces to make it more likely, for example, for a block of adjacent jungle spaces to emerge rather than a series of isolated jungle spaces.

Sample Games

The 7th Continent (Roudy and Sautter, 2017)
Descent: Journeys in the Dark (Wilson, 2005)
Dragon Island (Fitzgerald, 2017)
Eclipse (Tahkokallio, 2011)
Escape: The Curse of the Temple (Ostby, 2012)
Mississippi Queen (Hodel, 1997)
The Mushroom Eaters (Hayden, 2013)
Source of the Nile (Maker and Wesley, 1978)
Xia: Legends of a Drift System (Miller, 2014)

MOV-17   Map Reduction
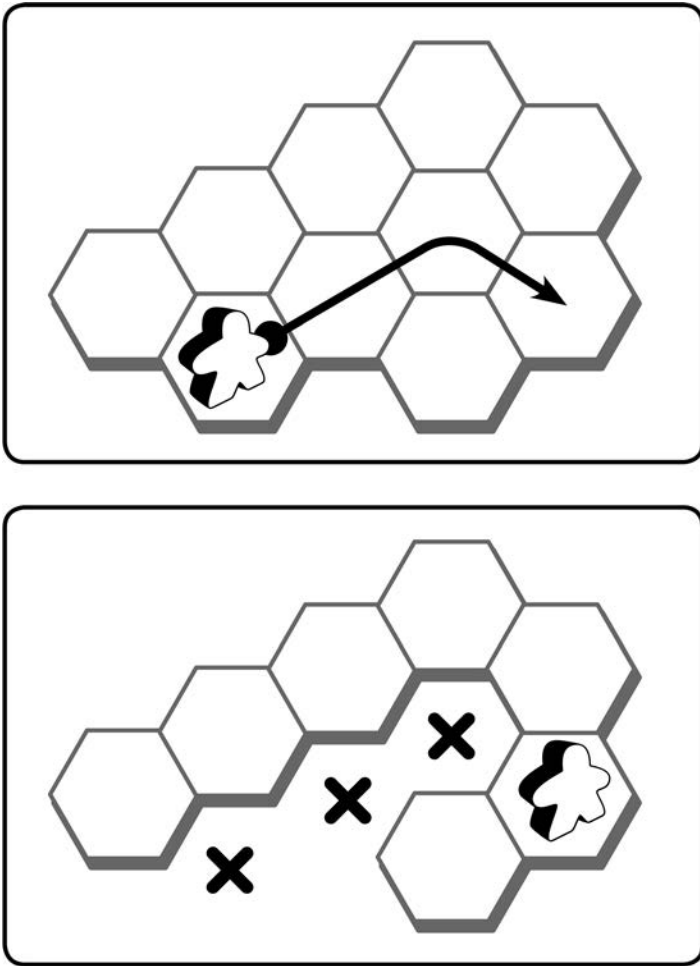
Description

Over the course of the game, the map shrinks.

Discussion

Removing parts of the map can be psychologically interesting for the players, as they feel more constricted both in space and options. We are exposed to this Map Reduction mechanism first as children through the game *Musical Chairs.*

Isolation and *Hey, That's My Fish!* are classic representatives of this mechanism. In both, players take a move and then remove a tile. In *Isolation,* it may be any tile on the board. In contrast, in *Hey That's My Fish,* it must be the tile that the player began their turn on.

In *Sinking of the Titanic,* the board is shrunk in a fixed fashion, rather than under player control, as the ship rotates beneath the water board and the board gradually becomes reduced more and more.

In some games, the board closing is something that happens toward the end of the game. In *The Omega Virus* sectors of the board may suddenly be closed to the players completely as the game nears its timed conclusion.

Also worth mentioning are the *Survive: Escape From Atlantis* series of games, where the board as a whole does not shrink, but safe tiles (land tiles in this case) are slowly removed, forcing players into shark-infested waters.

Many other games don't shrink the physical board; they simply reduce the options available to the players. *Ticket to Ride* and many other rails games naturally reduce the options available to players as more and more routes get claimed. To a substantial extent, the question of whether the board gets smaller or the options on it become fewer is mostly a matter of thematic consonance and what is practical given the physical components involved.

Sample Games

Hey, That's My Fish! (Cornett and Jakeliunas, 2003)
Isolation (Kienitz, 1972)
The Omega Virus (Gray, 1992)
Sinking of the Titanic (Uncredited, 1975)
Survive: Escape From Atlantis (Courtland-Smith, 1982)
Ticket to Ride (Moon, 2004)

MOV-18   Map Deformation
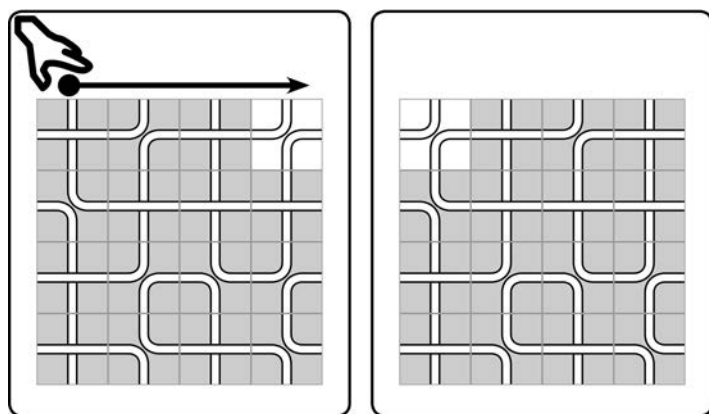
Description

The map is modified during the course of the game through rotation or shifts.

Discussion

In this Map Deformation mechanism, the map is traditionally composed of a series of (typically square) tiles, composed of smaller spaces. Player tokens are located on these tiles. When the tiles are rotated or relocated, the player tokens are moved along with them.

Because this can often radically change the game situation, this mechanism introduces a large dose of chaos into the proceedings. It can also make it difficult for certain players who may have spatial relation issues to visualize the result of the deformation. This is particularly true as tiles with more spaces on them are used.

This mechanism can be implemented through means other than tiles. In *Stay Alive* players move sliders around the edge of the board to control where holes are located, possibly dropping marbles out of the game. In both *Dune* and *Yedo,* an entire section of the board is blocked each turn by the sandstorm and watchman, respectively.

Because of the impact of Map Deformation, it is typically the centerpiece of the game, and not a secondary mechanism.

Sample Games

Dune (Eberle, Kittredge, and Olatka, 1979)
Dungeon Twister (Boelinger, 2004)
Stay Alive (Barlow, 1965)
Wiz-War (Jolly, 1983)
Yedo (Ginste and Plancke, 2012)

MOV-19 Move Through Deck
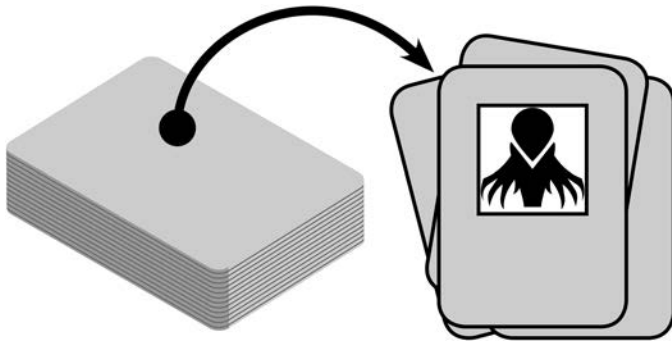
Description

Players Move Through a Deck of cards.

Discussion

This mechanism gives players the feeling of movement by forcing them to work through a deck to get to the bottom, or some goal card. In *Chainsaw Warrior,* for example, the deck thematically represents the house players are exploring, with cards representing rooms or encounters, and players take "move" actions to delve deeper.

This mechanism is also used in *Incan Gold*, where players flip cards to move deeper into the temple.

Adopting this metaphor allows designers to give players a sense of forward momentum while keeping the game compact, eliminating the need for a board or large map. It also makes it easier to randomize. The Gating and Unlocking mechanism (ACT-15) is good to use here to tier difficulty.

Sample Games

Chainsaw Warrior (Hand, 1987)
Incan Gold (Faidutti and Moon, 2005)
Maiden's Quest (Shannon, 2018)
One Deck Dungeon (Cieslik, 2016)

MOV-20   Movement Template
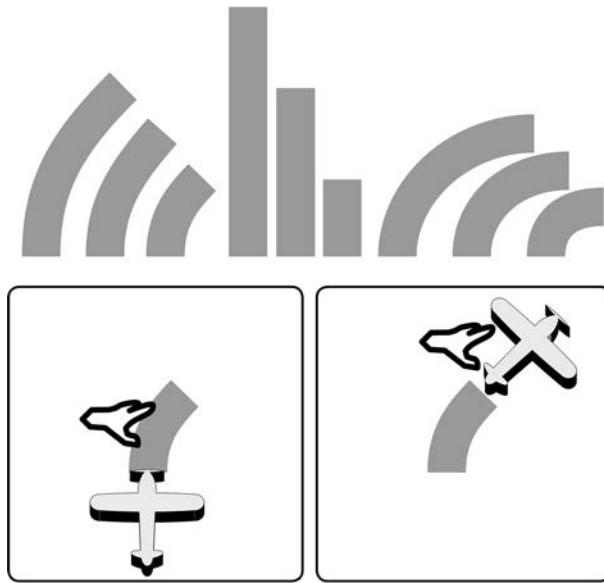
Description

A defined Movement Template is used to determine where a piece moves to.

Discussion

First pioneered in *Wings of War*, this system has been widely used since, most notably in the *Star Wars: X-Wing Miniatures Game*. Each turn, players simultaneously select which Movement Template will be used by each of their units. For example, it may be a Short Straight, a Gradual Left, or a Sharp Right. Moves are revealed, and the templates are used to determine where each piece will end.

Because of the use of the templates, this mechanism is best thematically integrated with pieces that need to keep moving, such as airplanes.

These games are similar to Programmed Movement (MOV-10), except that only one move is programmed, as opposed to the 3–5 that are common in traditional Programmed Movement games. These systems also typically do not have a board or spaces to regulate movement but are played directly on a table top. While this introduces some of the analog issues discussed

in Measurement, the use of the templates keeps things better constrained. However, rules for collisions also need to be developed.

The use of templates also allows for unit differentiation by defining which templates may be available to them.

Lazer Ryderz introduces a variation on the system by incorporating an Action Retrieval system (ACT-03) for when players are allowed to reuse certain templates.

A related system, included here for brevity, is *Diskwars,* where the units are discs. They are moved by flipping a certain number of times. The diameter of the disc and the number of times it may be flipped define the speed. In essence, the discs themselves are serving as the Movement Templates.

Sample Games

Diskwars (Gelle, Hardy, Jolly, and Petersen, 1999)
Lazer Ryderz (Amato and Kline, 2017)
Star Wars: X-Wing Miniatures Game (Little, 2012)
Wings of War (Angiolini and Paglia, 2004)

MOV-21   Pieces as Map
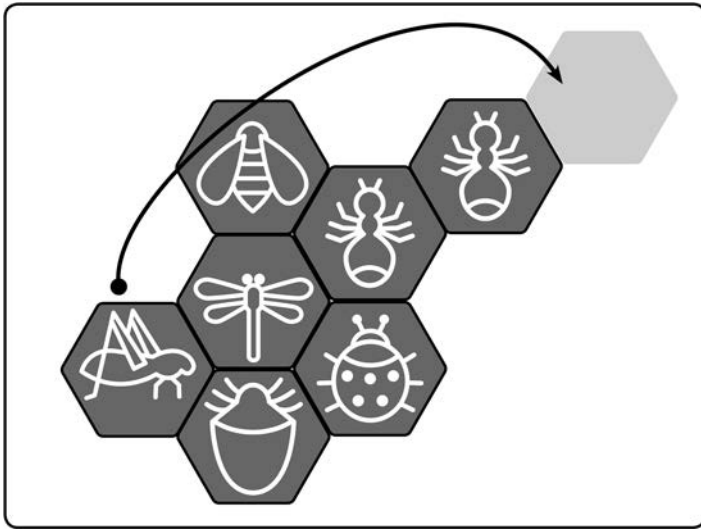
Description

The Pieces themselves compose the Map.

Discussion

These games blur the line between Units and Map, as the map is composed of the individual units themselves. Because of this, these games are typically played directly on the table surface without a board.

The two exemplar games for this mechanism, *Hive* and *Vortex*, use hexagonal tiles for units. Hexagons are a natural choice for this mechanism, as it gives more options for pieces to move.

Typically pieces must be adjacent to other pieces, so there is one single connected block of units. Pieces are added to the other edge, or moved around the outside. Pieces that are surrounded by others are usually locked in place, with only those on the outside of the block able to reposition.

Units may have intrinsic abilities (as in *Hive*) or gain special abilities based on adjacent tiles (*Vortex*).

Because all the pieces, both friendly and enemy, are in a connected block, these games are typically highly interactive, tactical, and quick.

Sample Games

Hive (Yianni, 2001)
Maelstrom (Hardy, Jolly, and Petersen, 2001)
Vortex (Hardy, Jolly, and Petersen, 2001)

MOV-22   Multiple Maps
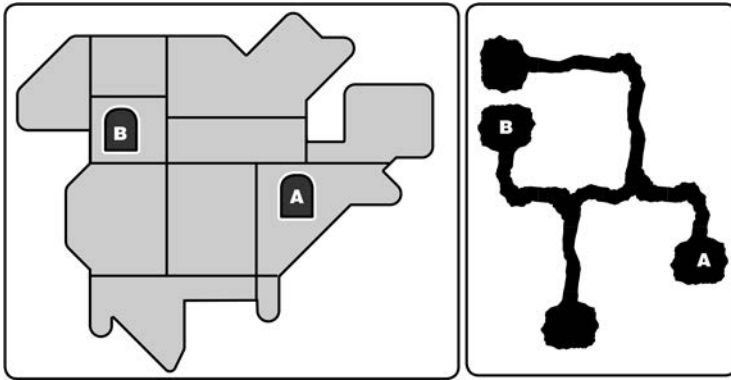
Description

The game takes place on Multiple Maps which are connected at defined points.

Discussion

This mechanism is implemented in *Iron Dragon*, a rail game set in a fantasy world. Trains may run through the main board, or transition to a special Underground map. The two are connected at specific points, which can make for interesting route building.

Khronos has multiple boards, but these are connected in time rather than space. They represent three different ages of the same region, and actions that are taken on older boards, like building structures, can ripple through into the future boards.

Fische Fluppen Frikadellen is a trading game that may be played by up to 15 players on three maps placed at separate places in the room. Each board is played individually—turns are not synced between boards—and players may move from board to board under certain circumstances, taking their goods with them in an attempt to make better deals. When arriving at a new board, they are inserted into the turn order. Players move around each map visiting individual stores for buying and selling, and prices fluctuate independently.

Having Multiple Maps forces players to approach the geometry of the situation in a different way. It may present shortcuts or advantages that need

to be evaluated in the context of the cost to take advantage of them. It also allows the designers to create more complex structures.

Sample Games

Buck Rogers: Battle for the 25th Century (Grubb, 1988)
Fische Fluppen Frikadellen (Friese, 2002)
Iron Dragon (Bromley and Wham, 1994)
Khronos (Urbon and Vialla, 2006)
World in Flames (Pinder and Rowland, 1985)

MOV-23　Shortcuts
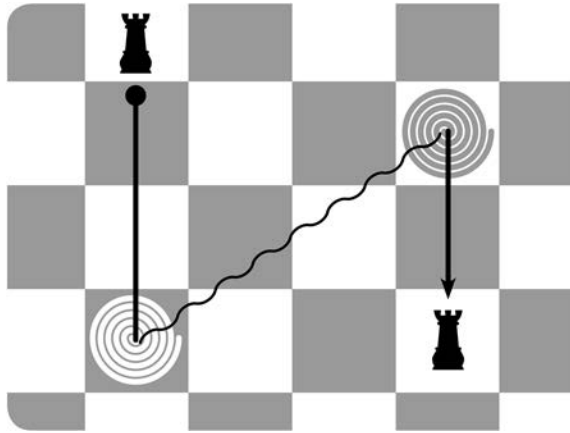
Description

A shorter or quicker route exists that may not always be available.

Discussion

Shortcuts are a way for designers to warp the geometry of the board, to give players other options. For example, in *Clue*, players may move directly between the diagonal corners of the board. This system reduces travel time, which is not a core feature of *Clue*.

Sometimes, shortcuts are only usable by certain characters, or with certain equipment. This is commonly used in dungeon-crawl type games, through the Secret Passage trope. Characters may need to use a skill to detect and be able to use them or need a special key.

Some games will have alternate paths that are shorter, but more treacherous. This is a way to present tactical options to players in what is traditionally a basic Roll and Move format (MOV-02).

Sample Games

Clue (Pratt, 1949)
Dungeoneer (Denmark, 2003)

MOV-24 Hidden Movement
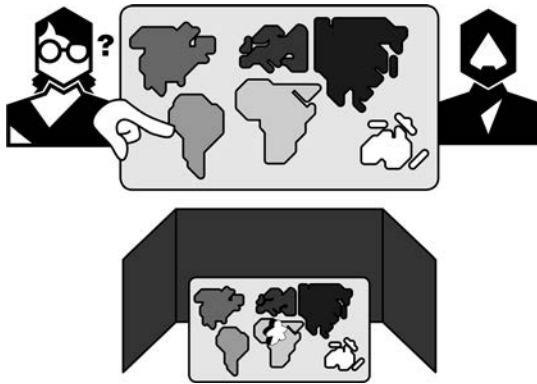
Description

Movement occurs that is not visible to all players.

Discussion

Hidden Movement is closely tied to many of the mechanisms discussed in Chapter 6, "Uncertainty," but there are specific considerations that are reviewed here.

Scotland Yard is a classic example of a game with Hidden Movement. One player, Mr. X, is trying to evade the other players for a set number of turns. Hidden Movement games require the hidden players to track their location somehow, and in *Scotland Yard* it is done by recording it on a pad. This method is commonly used in these games, as it also allows for the players to review the hidden players' locations after the game is complete, both for the fun of seeing "close calls" as well as ensuring that the rules were followed.

This last item deserves to be emphasized. By its nature, Hidden Movement requires actions to be taken without knowledge of the other players. So, typically the rules relating to this activity should be as simple as possible. In *Scotland Yard,* Mr. X uses Point-to-Point movement, (discussed in Tessellation MOV-01) to move around the map, using different forms of transportation. The connections between the points are color-coded to match the transportation options, making it relatively simple to understand,

and hopefully avoid mistakes. An error in a Hidden Movement game often cannot be found until after the game is over and can invalidate the entire experience.

There are games that have more complex movement and rules in general in order to support a specific play experience. *The Normandy Campaign* is the first entry in the Double Blind trilogy. In these war games, each player has a map of the play area, and keeps it hidden from the other behind a screen. The front line is represented by a chain of tokens. Any movement of pieces behind the front line (friendly territory) is not revealed to the other player. If a player wishes to move into enemy territory, they announce the numbers of the spaces they moving into, one at a time. If there are enemy forces in a space, the movement is stopped, and combat is resolved. Then the front line is adjusted, as spaces that are moved through transfer ownership. This series obviously requires that both players be very familiar with the rules and uses an honor system for following rules.

The game *Flat Top* simulates carrier battles in World War II, and both players use Hidden Movement on private boards to track the location of their naval task forces to try to find the enemy players launch search planes on the main board. However, since simply placing search planes launched from carriers directly onto the board would reveal the carrier locations, players are allowed to use Hidden Movement for search planes until they want to reveal them on the main board. They can't search until they are revealed, but they can move to a different location far enough from their carrier to try to mislead the opponent about their origin point.

Since deception and deduction are typically part of the Hidden Movement experience, most of these games have defined points or reasons when players must reveal their location. *Scotland Yard* requires the player to surface on certain turns. *Specter Ops* requires the hidden player to commit crimes at certain locations, which reveal their location, as does moving in Line of Sight of a hunter (ARC-08).

Another option for giving hints is used in *Captain Sonar*. In this game, each team announces what direction it is moving in (e.g., North or West). The other team records this information, and since subs cannot move through islands or off the map, can gradually figure out where the opponent is located.

The Fury of Dracula gives time-delayed hints to the hunters using an Action Queue system (ACT-06). Dracula plays a card showing the location he is moving to, but that card is added to a queue. Only the last card in the queue may be looked at by the hunters, so they see where Dracula was a few turns ago, but not where he currently is. This has the benefit of not requiring any

note-taking by the player conducting the Hidden Movement and helps detect rule violations.

Pyramid of Pengqueen offers a unique approach to detecting hidden locations. Players place magnetized pieces on either side of a vertical center wall. When two pieces are on the same space, they repel and fall off of the wall.

Another way to implement Hidden Movement is what we call the Anchor/Distance mechanism. In this, the unit that is moving is revealed in a specific location. Then each turn, or as a result of an action, it moves one further away from that space, increasing the Distance. However, the exact location is not recorded or determined in any way. At some point, the movement is completed or the unit is revealed. At that time, it is placed on the map a number of spaces away from the Anchor space determined by the Distance.

This system is used by *War of the Ring*. The Fellowship hides, and then each time it takes a Move action the Distance is increased by one on a movement track. The opponent (Sauron) may try to hunt and reveal the location of the Fellowship, or the Fellowship may declare its position voluntarily. When it is revealed, the Fellowship figure is moved on the map from its last known location to any space that is the Distance away from the starting location. The specific movement of the Fellowship must them be traced, and if the Fellowship traces its path through certain regions, like an enemy-controlled stronghold, consequences like taking increased corruption or damage will follow. In other words, on a turn-by-turn basis, the Fellowship's exact location is undetermined. Interactions with the Fellowship are tied to its last known location, but an interaction which reveals the Fellowship also forces a declaration of its last few turns of movement. One important consequence of this system is that paper tracking of the Fellowship is not required, and the experience is far less susceptible to human error.

In *4000 AD* fleets move by "warping" from one location to another. This is done by placing them into a plastic tray and recording where it starts. Then each turn it is advanced along the distance track, until the player decides to leave warp. At this point, the fleet may be placed anywhere that is the current distance from the origin.

Sample Games

4000 AD (Doherty, 1972)
Captain Sonar (Fraga and Lemonnier, 2016)
Flat Top (Taylor, 1977)

The Fury of Dracula (Hand, 1987)

The Normandy Campaign (Chadwick, 1983)

Pyramid of Pengqueen (Merkle, 2008)

Scotland Yard (Burggraf, Garrels, Hoermann, Ifland, Scheerer, and Schlegel, 1983)

Specter Ops (Matsuuchi, 2015)

Stop Thief (Doyle, 1979)

War of the Ring (Di Meglio, Maggi, and Nepitello, 2004)

11

Area Control

❧

Wargaming is a thread that runs through much of boardgame design, and indeed, modeling conflicts through games remains a popular genre. At the center of games of conflict is the notion of controlling an area.

How a game represents this idea is tied to the overall scope of the conflict depicted. Theater-level games that deal with continents and countries tend to be more binary and abstract about control, while individual and squad-level games may not even define it, though the force-projection capabilities of units will nonetheless enforce control over different parts of the board.

Area control games are more common in the American design school, but over time, European designers have brought indirect conflict and rapid resolution concepts into the space.

The term area majority is sometimes used in place of area control, and another term, area influence, is also used. There isn't a reliable definition for any of these terms. But here's one way to think of them: Area Influence is the highest-level category, which would cover all types of relationships between players, their tokens, and the specific areas they inhabit. Area Majority and Area Control would be two sub-branches of Area Influence. In practice, however, Area Majority and Area Control are the dominant mechanical forms we observe in games, and the distinction between the two is often ignored. Thus, we've chosen the name Area Control to stand for all the various mechanisms of control and influence that we'll discuss.

Many of the mechanisms discussed here are a subset of Chapter 10, "Movement." However their use is specialized and common enough to warrant a chapter of their own.

ARC-01   Absolute Control
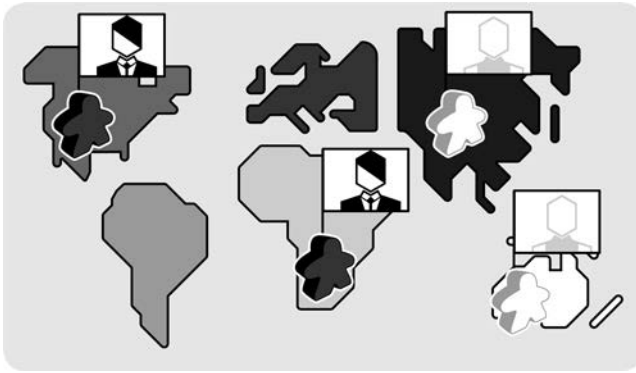
Description

One player has Absolute Control of an area.

Discussion

Absolute Control games, which are frequently referred to as Area Control games, have territories with a binary character: controlled by a single player, or uncontrolled. Controlled territories typically only contain one player's units, and other players are barred from co-existing in that territory. This type of control can be seen in *Risk*, where attempting to move into enemy-occupied territories triggers a battle. This is as distinct from games like *Chess* or *Onitama*, where a piece might project force across other spaces, but can never protect the space it occupies itself, and is simply captured when another piece enters its space. This is further distinct from games in which multiple factions can share a territory without triggering a confrontation, like *Root*.

This observation leads us to another element of area more generally, which is that it's important to know who controls the space, because the space occupied provides benefits, gives access to certain abilities, or produces resources. The reason to occupy the space is not simply tactical and positional. In *Axis & Allies,* spaces produce industrial production credits that can be used to buy new units. In *Small World,* territories may have different features like hills or mines, which may trigger specific effects or abilities, including bonus scoring.

Many games allow players to control a territory even though they have evacuated the units within it. Typically these are marked with a "control token" or something similar to indicate ownership of the area, like *Axis & Allies*. However, some games, like *Diplomacy*, do not do this, but rely on the players to remember which spaces are controlled. In *Diplomacy* this is not much of a hardship because control only matters to special Supply Center spaces, and there are few of those. The last player to control a non-Supply Center space has no impact on the game.

Another consideration is how areas change control. The most common is occupation by units. However, some games allow control to transfer without units, such as through diplomacy actions in *Pax Britannica* and *Divine Right*. In the latter, neutral countries (composed of many spaces) may be persuaded to join a player's side, in which case all the areas pass to the control of that player. Similarly they can revert to neutral status or control of another player. *Diplomacy* only allows Supply Centers to change control every second turn, which gives players more time and space to maneuver.

Sample Games

Axis & Allies (Harris, Jr., 1981)
Chess (Unknown, ~1200)
Diplomacy (Calhamer, 1959)
Divine Right (Rahman and Rahman, 1979)
Onitama (Sato, 2014)
Pax Britannica (Costikyan, 1985)
Risk (Lamorisse and Levin, 1959)
Root (Werle, 2018)
Small World (Keyaerts, 2009)

ARC-02   Area Majority/Influence
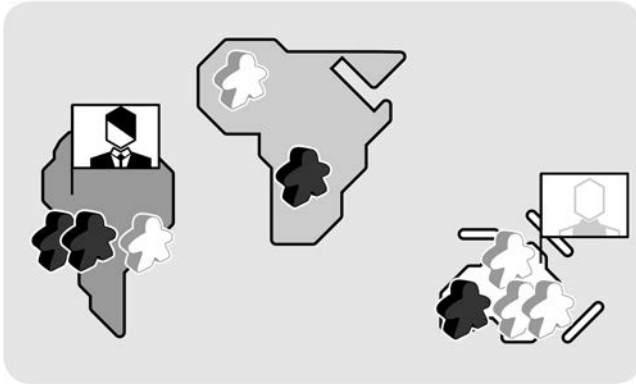
Description

Multiple players may occupy a space and gain benefits based on their proportional presence in the space.

Discussion

An elegant example of European design sensibilities applied to American-style conflict games is the area majority mechanism of *El Grande*. Each province is worth a different number of Victory Points (VPs) that will be awarded to the player with the most caballeros (soldiers) present in the province. Points are also awarded to the players with the 2nd- and 3rd-most caballeros in the region. Caballeros do not directly interact, and there is no conflict resolution mechanism of any kind. Instead, the game implements a Multiple-Lot simultaneous Auction (AUC-11) themed as a conflict game. The game is not won with tactical brilliance or a lucky streak of die-rolling, but through efficiency in winning auctions for VPs.

This idea of efficiency is clearer in an even older game from the late nineteenth century, *Reversi*. In *Reversi*, both players will, in turn, play 32 double-sided tokens to the board, flipping tokens of their opponent's color when they lie in an orthogonal or diagonal line between the newly placed token and one or more anchoring tokens. The game is only scored after all tokens are laid down, with the player controlling the majority of the 64 spaces on the board being the victor. One could similarly envision *Go* as an area

majority game, though it is strategically more of an area Enclosure game (RES-12).

In *Twilight Struggle,* players must not only have a majority of influence in a country in order to obtain control, they must have an edge over their opponent equal to the country's stability number. Stable countries with dependable governments, like Japan, have a stability number of 4, while war-torn, weaker nations who were pawns in the global contest, like Lebanon, have a stability number of 1. Controlling a country grants a few benefits, including doubling the cost of your opponent adding influence to the country through normal operations. However, being on the short end of that influence battle isn't all bad. As long as you had presence in the country, you could spread influence to adjacent countries. This is a good example of how different levels of presence and domination of an area can offer different tactical and strategic advantages.

The notable distinction of Area Majority games is that troops of opposing factions can co-exist in the same territory. In *Inis*, not only can opposing clansmen co-exist in the same space, there is even a victory condition which calls for sharing spaces with factions in six different territories. Relatedly, the combat mechanism of *Inis* allows for players to participate in a round or two of combat, and then mutually agree to stop fighting, without withdrawing any troops.

Civilization also allows for units from multiple players to co-exist in the same space, as long as the total number of tokens does not exceed the food value. If it does, conflict occurs, but there is ample opportunity for peaceful co-occupation. Unlike *Twilight Struggle* and *El Grande,* there is no inherent benefit from having more tokens in a space in *Civilization*, unless combat breaks out. But it can serve as a base from which to expand.

While some games allow a fluidity to the states of control a territory may exhibit, other games have moments where control must crystallize, and resolve in some way. While turn-based approaches are common, in which scoring happens at the end of the round, or at the end of some specific rounds, other games tie triggering resolution to the size of the forces present in the territory. In *Smash Up,* each base has a trigger number. Once the sum of forces played to that base equals or exceeds the trigger number, the base is scored. Similarly, in *Retreat to Darkmoor*, the legendary hero attacks a line of fleeing villains when the sum of the threat values of the villains breaches the hero's stability number. In *Darkmoor*, only those villains surviving the hero's attack are placed in the haven, whose victory points they will score based on majorities at game-end. For more on this topic see Chapter 4, "Resolution."

It is worth noting that in a standard Area Majority game, where rewards are granted based on the ownership of a space, ties need to be considered by the designer. Some games use "friendly" ties, where all players tied for first, for example, receive first-place points. Other use "unfriendly" ties, where players tied for first are awarded second-place points. Other tie-breaking mechanisms (RES-18) are possible, such as priority tokens, or simply not allowing players to create a tie.

Sample Games

Civilization (Tresham, 1980)
El Grande (Kramer and Ulrich, 1995)
Go (Unknown, 2200 BCE)
Inis (Martinez, 2016)
Retreat to Darkmoor (Loomis and Shalev, 2016)
Reversi (Mollet and Waterman, 1883)
Smash Up (Peterson, 2012)
Twilight Struggle (Gupta and Matthews, 2005)

ARC-03   Troop Types

Description

To compete for or establish control requires troops, inhabitants, influence, presence, or some similar metaphor for being in a place. Many games have a variety of unit types, with different abilities, and sometimes, different implications for area control.

Discussion

In some games, only certain units can exercise control over a territory. *Axis & Allies* requires infantry or armor units to take control of a territory away from an opponent. Fighter and bomber planes may not even land on newly captured territory, which can create some interesting decisions for players who are forced to decide between taking a valuable plane as a casualty of combat in order to capture a territory, or having the more expendable infantry unit take the hit, but be left with a plane that is unable to conquer the space. In *Kemet*, the powerful monsters and creatures summoned by the power tiles are not considered units, and cannot even remain on the board if their accompanying troops are eliminated.

   In the context of area majority games, the simplest distinction between unit types is their power. Some units have a strength of one, others are more powerful. *Dominant Species* has both a majority contest, based on total population of a species, as well as a dominance contest, which is calculated by evaluating the types of food a species can eat and the quantity of that food that is available in the hex being scored. A single unit may lose the population battle, but win the dominance battle. A more straightforward application of the idea of varying troop strengths is in *Belfort*, in which Elves and Dwarves

start at a strength of one, but can be promoted to count for two points of strength.

The idea of different unit types is another foundational concept in game design. It is both so old that it's hard to know where it first began, and is still a regular feature of modern design. Units can vary in their movement abilities, combat strength, cost, their ability to perform certain tasks or even to be placed in certain spaces, and more. Whether we're dealing with space operas, like *Twilight Imperium* and *Star Wars: Rebellion* or the highly simplified wargame-like system *Command & Colors*, we observe a broad variety of unity types and methods for distinguishing them from one another.

In the context of absolute control, some differences in troop types are tied to the uncertainty engine that resolves combat. Whether troops roll a die to hit, or can only be hit by a certain die value, or all the other variations on this core idea (Chapter 4, "Resolution"), the differences between troops are about how they influence random outcomes. This is one of the means by which designers moderate the impacts of output randomness. The types of troops committed, and the expected value they generate in terms of hits they can inflict on the opposing side, represent a wager, with the value of the territory occupied representing the pot to be won.

In an area majority context, there is a narrower range of variation. There are troops that are worth more than one point of strength, troops whose value is hidden, troops who can override rules that restrict additional troops from being added, or troops that provide tie-breaker benefits. Rarely, a unit might actually eliminate existing units from an opposing player, as the T-Rex, and Pterodactyl units do in *Triassic Terror*. In that same game, the Raptor unit also forces opponents to move units to another territory. *Cave Troll* is built entirely around the mechanism of special powers for units that influence the struggle for majorities in various rooms of a dungeon. Each player fields units that have abilities such as locking down a room in the dungeon to prevent other players from adding units there, or swapping units between rooms. In *Glenn Drover's Empires: Galactic Rebellion* (which is only the latest iteration of a game once published under the *Age of Empires* license) a variety of units perform functions either related to, or entirely additive to, their roles in the majority contest. A Diplomat will let you bring another unit along to a planet to increase your strength there, while a Smuggler will let you get trade goods.

Sample Games

Axis & Allies (Harris, Jr., 1981)
Belfort (Cormier and Lim, 2011)
Cave Troll (Jolley, 2002)
Command & Colors (Borg, 2006)
Dominant Species (Jensen, 2010)
Glenn Drover's Empires: Galactic Rebellion (Drover, 2016)
Kemet (Bariot and Montiage, 2012)
Nexus Ops (Cantino and Kimball, 2005)
Star Wars: Rebellion (Konieczka, 2016)
Titan (McAllister and Trampier, 1980)
Triassic Terror (Hawes, 2013)
Twilight Imperium (Petersen, 1997)

ARC-04   Territories and Regions
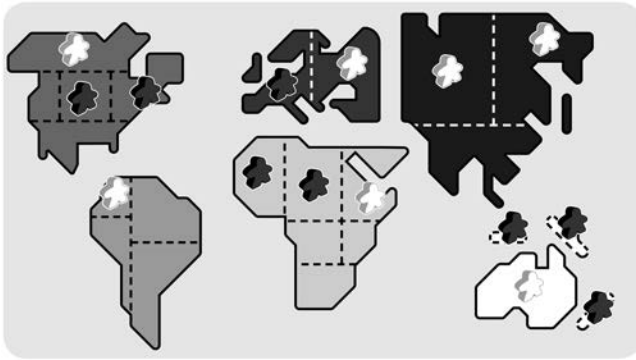
Description

Maps can exhibit hierarchical relationships among their constituent spaces, such that a territory might exist in a region, and various attributes and parameters may be tied to the control of these areas.

Discussion

The concept of Regions constituted out of a number of Territories is common in conflict games. One typical mechanism provides an additional reward to players who control a set of Regions that compose a territory. This mechanism, a kind of territorial Set Collection (Chapter 12) can be implemented based on absolute control, like *Risk*, or based on majority control, as in *Eight-Minute Empire: Legends* or *Twilight Struggle*. Setting regional control offers some natural hooks for designers to hang additional concepts off of. Making movement between Regions more difficult or expensive enhances defensibility of a region, once it has been taken. Factions can be assigned "homeland" benefits when in their own Regions too, as in *Risk Legacy*. In essence, regionalizing Territories provides another dimension by which to differentiate Territories, much as terrain does.

Regional effects provide opportunities to bring a setting to life by providing narrative and mechanical events that differentiate the Territories from one another. For Intellectual-Property (IP)-based games like *War of the Ring,* regional parameters ensure that iconic moments in the original story can be recreated with greater fidelity. Strider can only be revealed as Aragorn

and crowned king if he reaches Minas Tirith or Dol Amoroth. Similarly, the Corsairs of Umbar can only attack their historically hated enemies, Gondor, and cannot simply sail to any coastal region. *1960: The Making of the President's* card-driven system helps the Nixon player carry the West and the Kennedy player, the Northeast. The contest is decided mostly in the South and Midwest. Though deviations are possible, the core identity and patterns of the 1960 election are reinforced by providing different regional strengths to the Kennedy and Nixon players, baked into the makeup of their unique decks.

Sample Games

1960: The Making of the President (Leonhard and Matthews, 2007)
Eight-Minute Empire: Legends (Laukat, 2013)
Risk (Lamorisse and Levin, 1959)
Risk Legacy (Daviau and Dupuis, 2011)
Twilight Struggle (Gupta and Matthews, 2005)
War of the Ring (Di Meglio, Maggi, and Nepitello, 2004)

ARC-05   Area Parameters
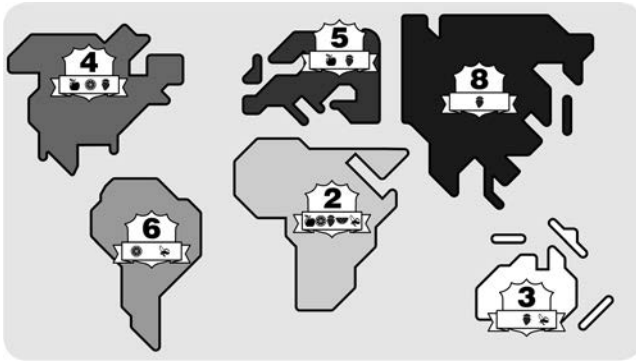
Description

In Area control games, Parameters are assigned to regions that impact why players might wish to control them and how they need to allocate resources to do so.

Discussion

The most common Area Parameters are the rewards gained for controlling areas. Those could be VPs, which are awarded to the majority owner in *El Grande*, or to a single owner in *King of Tokyo*. Other common rewards include resources, like in *Nexus Ops*, and access to special powers, like in *Alien Frontiers*. As previously discussed, access to adjacent territories can also be considered a special ability. Exploration games like *The 7th Continent* and dungeon crawlers like *Descent: Journeys in the Dark* will pile on a variety of parameters onto the tiles that make up their game boards—though admittedly, this is stretching the notion of area control extremely thin, particularly in a co-op context. *Memoir '44* has various bonuses and penalties for attacking and defending in and out of certain types of terrain, as well as rules modifying movement for units moving through terrain. It is a good example of the flexibility of assigning Area Parameters.

Carcassonne extends the notion of Area Parameters by assigning parameters to different features on each tile. These parameters include point value, and rules for when and how they can be scored. Though we don't typically think of *Carcassonne* as an area control game, or even a bidding game, both of those

ideas find expression in its game engine. Placing a pawn takes control, and represents a wager on the overall value of that feature when (and if!) it finally scores.

Another important Area Parameter is unit limits. These limits, sometimes called stacking limits because they defined how many counters could be stacked on top of one another in hex-and-counter wargames, establish a limit to the size of armies. Sometimes these limitations are global, as in *Heroes of Land, Air & Sea*, which has a 5-unit limit on territories. Other times, the stacking limit is expressed as a matter of control limits: in *Conquest of the Empire,* a general can lead a legion of up to 7 units. Some limits are enforced based on terrain and unit type. The most common examples are that naval vessels can't enter land spaces, and conversely, land units can't enter sea spaces. *Advanced Squad Leader* and other wargames often assign units a "stacking value," and each space can hold a maximum stacking total, which sometimes varies by terrain. Mountainous terrain often restricts mechanized unit movement, as in *Memoir '44* where only infantry can move through mountains, but artillery can be emplaced on mountains at setup.

Line of sight is another Area Parameter, but one that is more connected to how units interact with one another across multiple areas, rather than being the quality of an area being occupied. We will address it below in the following section on Force Projection.

Sample Games

The 7th Continent (Roudy and Sautter, 2017)
Advanced Squad Leader (Greenwood, 1985)
Alien Frontiers (Niemann, 2010)
Carcassonne (Wrede, 2000)
Conquest of the Empire (Harris, Jr., 1984)
Descent: Journeys in the Dark (Wilson, 2005)
El Grande (Kramer and Ulrich, 1995)
Heroes of Land, Air & Sea (Almes, 2018)
King of Tokyo (Garfield, 2011)
Memoir '44 (Borg, 2004)
Nexus Ops (Cantino and Kimball, 2005)

ARC-06   Force Projection

Description

Force Projection is the impact of the movement, attack, and other abilities of units on the decision-making of your opponent.

Discussion

Much of area control revolves around how units can claim and possess areas. However, achieving that control is a matter of how the various abilities and powers of units are arrayed and used in combination. *Chess* is a good example: in *Chess*, units occupy their own spaces, but the only relevant parameters tied to that are that pawn movement into the space is blocked, and bishop, rook, and queen units are blocked from passing through those spaces, and must end their movements on capture. Where units are positioned in *Chess* matters much for where they project force. A bishop, knight and rook may, from three different places on the board, train a withering triple attack on an opposing pawn. Similarly, a powerful queen piece might be harassed and forced off into a corner because all the spaces she could land on are being threatened by other units. Famously, a knight against the edge of the board can be corralled by a bishop in a position exactly three spaces away, orthogonally. In such a position, every space the knight may move to is threatened by the bishop. Force projection as a mechanism is strongly tied to Movement (Chapter 10).

Onitama uses Force Projection almost exclusively. In each game, five random movement patterns are in play, and cards rotate in and out of the possession of the players. Skilled players will be able to look ahead several moves and predict the unfolding of the game board based on where units project force. Many capture-based abstract games exhibit this quality, from *Checkers* and *Chess* to *Elementos* to *Hive*. *Photosynthesis* has a unique implementation of this mechanism. Trees don't project force the way a spearman might. Rather, they project force based on the size of shadow that they cast. As the sun rotates around the board, a tall tree will shadow others around it, preventing them from generating light points for their owners.

Force Projection is not uniquely related to area majority/control games. Enclosure games like *Blokus* exhibit this pattern, and auction games have a similar feeling in the way that each player's remaining money is a potential threat in every succeeding auction. The analogy between auctions and area majority games continues to resonate in this context as well. Force projection as we use it here is a spatial mechanism. The number of spaces an army can move, the range of an archer, the area of effect of a wizard's spell, or a sniper's line of sight mechanisms are what we'd call Force Projection mechanisms.

Sample Games

Blokus (Tavitian, 2000)
Checkers (Unknown)
Chess (Unknown, ~1200)
Elementos (Katz, 2015)
Hive (Yianni, 2001)
Onitama (Sato, 2014)
Photosynthesis (Hach, 2017)

ARC-07   Zone of Control
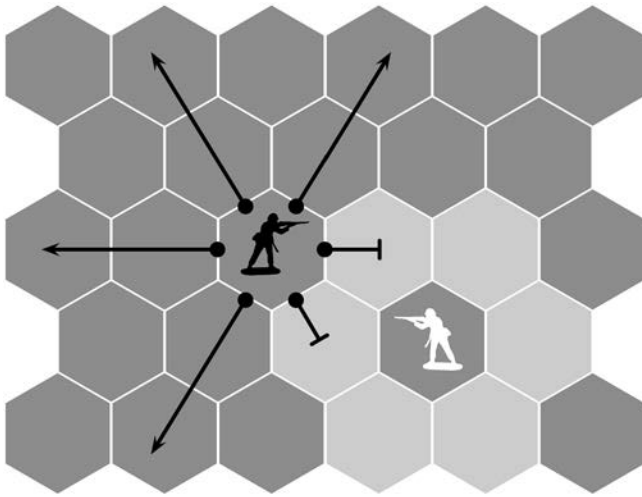
Description

Spaces adjacent to a unit impact the ability of opposing units to move or attack.

Discussion

The Zone of Control (ZOC) has been a staple of conflict games since the 1960s. It allows the designer to reduce the unit density and to still allow players to form lines with gaps that enemies cannot simply move through without consequence. It is a type of Force Projection (ARC-06), as it allows a unit to impact other areas of the board.

In the basic ZOC, units must stop when moving adjacent to enemy units, and are required to attack. Typically all opposing units that are in a ZOC must be attacked, which can lead to one unit having to attack more than one opposing piece.

This type of ZOC is sometimes called a Hard ZOC. There are also Soft ZOCs, where pieces may continue moving after they enter the ZOC but have to expend more Movement Points (MOV-04). In some games, this is not permitted, but units that begin in a ZOC may leave the enemy ZOC by

moving to a non-ZOC space, or may move directly from one ZOC to another, but must immediately stop.

Some games only assign ZOCs to certain types of units, such as Cavalry or Skirmishes, or deny it to units in a certain state, like Napoleonic units in a Square, or unsupplied units.

ZOC can also be created more organically by allowing units to take opportunity attacks against units that move adjacent to them, or past them, or that begin a move next to them but move away. While not a ZOC in the classic sense, it does impose consequences for moving units, and will shape the battlefield.

Sample Games

Blitzkrieg (Pinsky and Shaw, 1965)
Gettysburg (Roberts, 1958)
The Russian Campaign (Edwards, 1974)

ARC-08   Line of Sight
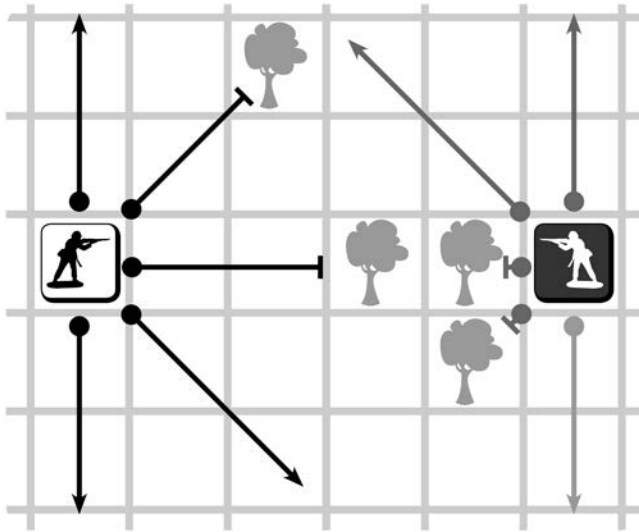
Description

Units may only see certain areas.

Discussion

Many tactical games need to determine if a unit can see another, typically for purposes of attacking. This is referred to as Line of Sight (LOS). A variety of mechanisms have been developed to deal with this situation, with different degrees of accuracy and complexity. LOS is a type of Force Projection (ARC-06) in that it controls which areas of the board a unit may impact.

The simplest LOS mechanism is to have a range of a certain number of spaces, and to trace the shortest path of spaces (hexes or squares, typically) to the target. If there is any terrain that blocks LOS, the firing unit cannot see the target. *PanzerBlitz* uses this method.

There are almost always multiple ways to trace paths from attacker to target, so typically the attackers may choose which path they prefer. While this has the benefit of simplicity, it also makes for some unusual situations, particularly on square grids. Its use is typically restricted to hex grids.

Games such as *Advanced Squad Leader* increase realism by having players lay a thread between the attacker and defender hexes. Dots are placed at the center of each hex to assist in this. If the thread touches any obstacles that block LOS, like buildings or forests, the LOS is blocked. The increased accuracy of this method comes at the cost of fiddliness in terms of moving pieces out of the way, and adds the possibility of arguments, as the LOS may just graze certain obstacles and it isn't totally clear if it is blocked or not.

These systems need to deal with elevation changes as well, to account for hills, gullies, and multilevel buildings. All of these add both complexity and realism. Most games use a "layer cake" approach, with pieces being able to see all spaces on the same elevation as them, and can only see lower levels if they are on the edge of their elevation (a "crest" hex). Some games even add rules for blind spots behind obstacles for observers at a height.

In *Nuns on the Run*, players are trying to avoid the nuns patrolling the grounds. Movement is Point-to-Point (MOV-01), and LOS is determined by placing a straight edge between the two points and seeing if it hits any walls. As a help to players, the spaces are numbered, and the rules include a table showing if two spaces (looked up by number) can see each other or not. *Nuns on the Run* also has facing. Nuns can only see 180 degrees in front of them. Other games like *Advanced Squad Leader* do not have facing.

Miniatures games often use a "model's eye" view to LOS. Players lean down to the table, and check to see if they can see the opposing models. Laser pointers can be helpful here in making a determination. Yet, as with the thread method, this can often lead to player arguments. There may also need to be judgement about whether some elements of the model don't count for LOS. *Warhammer Age of Sigmar*, for example, specifies that decorative elements added to a model like flowing capes and large crowns are not valid for LOS. This allows players to exercise their creativity when painting and decorating models. *Warmachine/Hordes* sidesteps this by having players use standard cylinders to represent models when checking for LOS.

The tactical battle game *Tannhäuser* takes a simplified approach to LOS. Spaces on the board are color-coded and grouped into "paths." Characters on the same path (same colored circles) can see each other. Some spaces between paths have two different colors—to represent that they can be seen from any space in either path.

LOS is a bedeviling aspect of game design. High-level conflict games don't require these rules at all, but squad-level combat games usually do, and these games often have some area control aspects to them. LOS usually interferes with force projection, so blocking LOS is a tool in the designer's toolkit for

modifying the way in which certain units shape the battlefield and the options players have for navigating it.

Sample Games

Advanced Squad Leader (Greenwood, 1985)
Nuns on the Run (Moyersoen, 2010)
PanzerBlitz (Dunnigan, 1970)
Tannhäuser (Grosselin and Poli, 2007)
Warhammer Age of Sigmar (Uncredited, 2015)
Warmachine/Hordes (McVey, Snoddy, and Wilson, 2003)

12

Set Collection

∿

Humans are pattern-seeking creatures, which perhaps explains why so many games incorporate some version of set collection. There's a nearly endless variety of types of sets to collect. Some sets are thematic, like Noah's pairs of animals, or the Three Little Pigs. Some are abstract, like Poker hands or melds in Gin Rummy, and some sets are arbitrary, like the compass, tablet and gear science cards in 7 Wonders. Even game concepts like contracts or tickets can be considered types of set. But no matter their variety and underlying commonality, all sets are built on the idea of synergy: the value or power of the set is greater than the sum of its parts.

The result of this characteristic of sets is that as players collect the components of a set, they will naturally diverge in their valuation of the remaining components. Picking up the fifth dumpling in *Sushi Go!* means much more than the first tempura—but for another player, that tempura completes their set and scores five points, while the first dumpling is worth only a single point. This value difference means that inter-player competition is no longer zero-sum. Players can set and achieve goals that are not in diametric opposition to their opponents, and the indirect conflicts that result engender a less aggressive dynamic that can appeal to players who may shy away from direct conflict.

Set collection can readily support multiple dimensions, and this is common to all but the simplest of games. Number-based sets can be collected in numerical order, or in multiples of a single number. Add in colors or suits for yet another dimension. These orthogonal dimensions create choices and tension, as players consider which types of suits to collect based on their value, distribution of their components, and what their opponents might be trying to collect.

The rich math behind set collection makes it a great tool for designers, but just as important for its popularity is the thematic consonance and intuitiveness of set collection. In *Ticket to Ride* there's no imaginable reason why, at least from a simulation perspective, a set of four blue train cards can connect Chicago to Omaha, and also Helena to Winnipeg, but not Winnipeg to Duluth, or Dallas to El Paso. Surely, the actual inputs of labor, capital and raw materials are similar, and it's hard to think why, in practice, the blue tracks are any different from the green ones. And yet, through set collection, these issues present no challenge to players, their understanding of the game, and their willingness to accept its conceits. Some tracks are green, and some are blue. Game on.

That's the real magic of set collection. It is an incredibly versatile mechanism for abstracting a whole host of possible game activities. Sometimes, these sets feel richly thematic and representative of the activities being simulated, and other times the sets are merely a veneer. But our human love of patterns and combinations means we'll accept quite a bit of abstraction in our set collection. Coupling this activity with clever scoring and collection dynamics and you have one of the fundamental building blocks of boardgame design.

While set collection can be implemented with many different kinds of components, by far the most common components are cards and tiles. For the sake of simplicity, we will refer to set elements generically as cards, unless referring to a specific game that uses some other component.

SET-01 Set Valuation

Linear		Triangular		Square		Triple	
🍎	⭐1	🍊	⭐1	🍓	⭐1	🍌	⭐0
🍎🍎	⭐2	🍊🍊	⭐3	🍓🍓	⭐4	🍌🍌	⭐0
🍎🍎🍎	⭐3	🍊🍊🍊	⭐6	🍓🍓🍓	⭐9	🍌🍌🍌	⭐3
🍎🍎🍎🍎	⭐4	🍊🍊🍊🍊	⭐10	🍓🍓🍓🍓	⭐16	🍌🍌🍌🍌	⭐3

Description

Set Valuation is the logic or underlying mathematical model by which designers assign values to sets of game elements. Set Valuation can be in terms of currency, resources, or victory points.

Discussion

To paraphrase Jerry Seinfeld, it's one thing to *collect* the set, but something else entirely to *value* the set. Many other chapters in this book, like "Economics" (Chapter 7), "Auctions" (Chapter 8), and "Card Mechanisms" (Chapter 13), discuss how resources are allocated and acquired, but in this section we'll discuss what those resources are actually worth. Implicit in this framing is that sets are nearly always converted into some benefit and consumed, turned in, or otherwise removed from play, even if only at game-end. Sets are not typically semi-persistent: either you make them and spend or score them right

away, or they persist and are scores at game-end. However, some sets may be held, and scored when a player chooses to do so for maximal effect.

In the introduction to this chapter, we described sets as being worth more than the sum of their parts. A more precise way to say that is that sets do not increase in value in a linear fashion. However, there are many shapes that the value curve can take, and each of these shapes will incentivize different behaviors.

The simplest valuation is that set elements are worth nothing on their own, but the set, when completed, has a value. *Ticket to Ride*, and its traditional forebear, *Rummy*, value sets in this fashion. A card may fit into more than one set, but on its own it has only potential value—and often, it may be a wasting asset too. In *Ticket to Ride*, routes will get claimed over time, and cards of matching colors therefore decline in their utility. In *Rummy*, cards left in your hand at game-end typically count against your score or contribute to your opponent's score, depending on the specific variant. This scoring system creates something of a push-your-luck dynamic as to when to cash in a set for a reward, and when to hold cards to attempt to increase the set size and payout.

A less-punishing valuation provides that singleton cards have some basic value of their own. Cards may also have unequal values, so that there are more valuable and less valuable cards. *Sushi Go!* has some cards that are worth points on their own, but are worth more in a set, like the nigiri cards that have a point value that can be tripled when paired with a wasabi card.

Another aspect of Set Valuation is termination. Some games define sets strictly as some number of elements, after which the set terminates. *Catan* defines sets in this fashion: you need one wood and one clay to build a road. No further cards fit into the set in any way, though another set of wood and clay can build another road segment. Other games offer escalating sets that terminate, so they have a minimum and maximum valid size, with different payouts based on the size of the set. A similar mechanism is found In *Ethnos*, where bands—sets of the same creatures—are awarded points and allow markers to be placed on the board for area control (Chapter 11). Bands of six or more all score the same amount, no matter how large they get, but larger bands still gain their full on-board placement benefits. In *7 Wonders*, there is no maximum set size or set score for science cards of the same type, beyond the maximum number of science icons of the same type in the deck.

When sets have a maximum size and/or score, players are incentivized to diversify and collect multiple types of sets. When sets are not limited, players are wiser to specialize. However, these base dynamics can be influenced

both by the specific valuation curve, and the existence of orthogonal sets. *7 Wonders* science scoring is a great example. In *7 Wonders*, there are three types of science cards: tablets, compasses and gears. Cards of the same type score the number of matching cards raised to the power of two, which is a sharply accelerating scoring curve that incentivizes collecting only one kind of science. However, the orthogonal set—that is, one of each type of science— offers a counter-balance. A set of three compass cards is worth nine points (three to the power of two), but a set of one of each science type is worth a base of 1 point per card, and a set bonus of seven, for a total of ten points— actually outscoring the geometrically increasing set of the same size. Only when the monotype set has four cards does it begin to outscore diversity sets, sixteen points to thirteen. Players leaning into a science strategy should seek to specialize, but the most efficient scoring for three cards is a diversity set. These varying incentives create interesting decisions and behavior patterns at the table—even aside from all the other types of sets and scoring in *7 Wonders*.

When sets can increase in size and value, a designer can use a variety of progressions to score increasingly larger sets. We had discussed squaring, which is one common progression that accelerates sharply, and is most useful either for smaller sets, or for creating a shoot-the-moon or push-your-luck dynamic, where a single large set can overwhelm other scoring strategies. However, designers have overwhelmingly opted for a different sequence when trying to preserve greater balance among options: triangular numbers.

The triangular sequence, 1, 3, 6, 10, 15, 21, etc. has achieved nearly the status of a mantra or a koan among game designers. It is featured in an enormous number of games and proves incredibly versatile at providing escalating rewards for larger sets without overly incentivizing specialization to the exclusion of all other strategies. Triangular scoring also has a strongly intuitive property, which is that the second member of the set increases your marginal score by two points, the third increases that score by three, and so forth. If you're playing a game with triangular scoring and you're wondering how many additional points you'll score by adding the nth card to your set, the answer is n.

Not all scoring progressions slope up. Terminating sets are the most extreme example, but there are other possibilities too. In *Cacao* players can move up a field-watering track. The track spaces are marked -10, -4, -1, 0, 2, 4, 7, 11, 16. Setting the track to start negative is mathematically uninteresting on its own. Instead, we will calculate the difference between values, which is to say, what is the actual point gain as you move from space to space. In this progression, the increase is 6, 3, 1, 2, 2, 3, 4, 5. As you can see, the first half

is a declining sequence that scores well initially but yields sharply diminishing returns. The second half is a rising triangular sequence (you may notice that the 2, 4, 7, 11, 16 is our familiar 1, 3, 6, 10, 15, but with one added to each number). The marginal returns are highest at the beginning and the end of the curve, and the middle of the curve is least valuable. Players are incentivized to either water a little, or a lot, but not a middling amount. This incentive is similar to the one in *Animals On Board*, in which players score a few points for singleton animals on their arks, and score maximum values for sets of three or more, but don't score anything for sets of two, which must be surrendered to Noah, who evidently holds the patent on pairing animals up.

Sample Games

7 Wonders (Bauza, 2010)
Animals On Board (Sentker and zur Linde, 2016)
Cacao (Walker-Harding, 2015)
Catan (Teuber, 1995)
Ethnos (Mori, 2017)
Rummy (Unknown, ~1850)
Sushi Go! (Walker-Harding, 2013)
Ticket to Ride (Moon, 2004)

SET-02   Tile-Laying
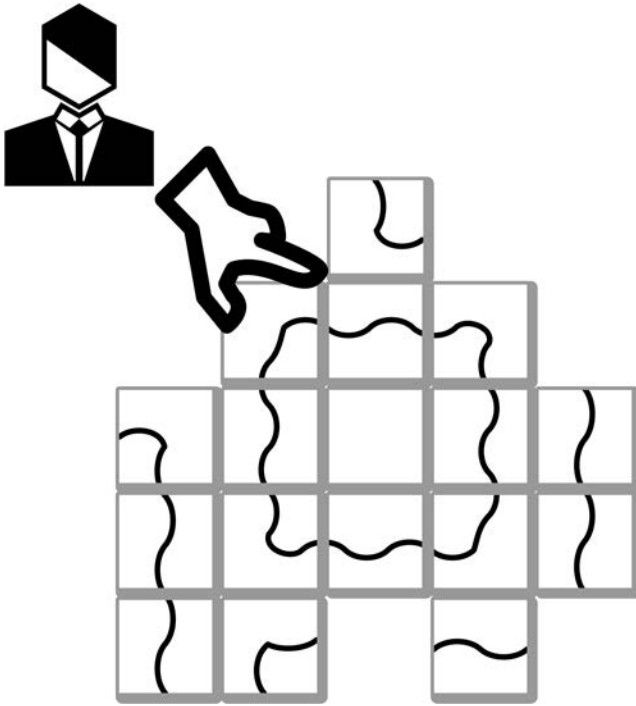
Description

Set-collection mechanisms with spatial elements. There are other aspects to Tile-Laying games like Area-Majority scoring (ARC-02) that we won't cover in this section.

Discussion

Tile-Laying is typically thought of as its own mechanism or family of mechanisms, and that perspective is reasonable. As we examine the patterns and relationships underlying Tile-Laying, set-collection emerges as one of the foundational mechanisms of the genre, hence its inclusion in this chapter. *Carcassonne's* city-completion scoring demonstrates the point: a completed city, which is a set of tiles arranged in a specific way, scores higher than the sum of the value of each tile. Tile-Laying introduces ideas of adjacency and

spatial relationships to sets, either as new requirements for set validity, or as buffs and nerfs to the valuation of sets.

At its simplest, tile-matching of some kind defines whether a tile may be played at all. In *Kingdomino,* players must match at least one end of the domino played to one on the table in order to make a valid play. The actual value of the tiles is determined based on a secondary mechanism of accumulating crown tiles. *Latice* requires that a tile match all of its neighbors by sharing a color or an animal type. Tiles played to match multiple tiles at the same time earn a player extra turns, a scoring mechanism, since the first player to lay all their tiles wins. Each of these plays is a set-completing play.

Qwirkle requires players to place tiles such that they match either the color or shape (but not both) of the other tiles in their row or column. Players are, in essence, forming sets of either shapes or colors in a line. *Völuspá* has a variety of tiles, and each has its own placement and scoring mechanisms, often with set collection features. For example, Fenris tiles are more powerful if in a line with other Fenris tiles, and no tiles may be placed adjacent to Troll tiles.

Alhambra has a light touch on tile placement, but incentivizes players through other means. Tile edges can either have walls or be open. Wall edges may only be placed next to walls, and open to open, but otherwise players are free to place tiles as desired. However, a bonus is given to the player who has the longest continuous wall running around the outside edge of their tiles, which can force players going for this bonus to change their valuation of certain tiles. Otherwise, *Alhambra* uses a basic area-majority system.

Isle of Skye: From Chieftain to King employs a large variety of possible sets that can be scored across the tiles that players collect. Some involve adjacencies, others look for region completion, while others are indifferent to spatial layouts. Some sets only score if they are the largest, a kind of Area-Majority concept (ARC-02) that is not uncommon to Tile-Laying games.

The idea of sets scoring regardless of spatial relationships, what we might call a global presence mechanism, is very common. *Suburbia* features buildings whose powers trigger or pay off based on adjacent tiles in some cases, and on tiles in a player's city, or even in other players' cities. *Between Two Cities* and *Quadropolis* offer similar set-scoring rules for tiles of various kinds, based on their spatial relationships to themselves, or to other tile types. Another type of set, an enclosing set, can be seen in *Rome: City of Marble*. Sets of tiles score based on enclosing and completing a hexagon, and the specific combination of colors, the flavor of the set, determines how well it scores, with sets of a

single color scoring best. The aforementioned *Alhambra* allows players to score for same-color tile sets, regardless of their adjacency.

Sample Games

Alhambra (Henn, 2003)
Between Two Cities (O'Malley, Pedersen, and Rosset, 2015)
Carcassonne (Wrede, 2000)
Galaxy Trucker (Chvátil, 2007)
Isle of Skye: From Chieftain to King (Pelikan and Pfister, 2015)
Kingdomino (Cathala, 2016)
Latice (Vincent, 2015)
Quadropolis (Gandon, 2016)
Qwirkle (Ross, 2006)
Rome: City of Marble (Myers, 2015)
Suburbia (Alspach, 2012)
Völuspá (Caputo, 2012)

SET-03   Grid Coverage
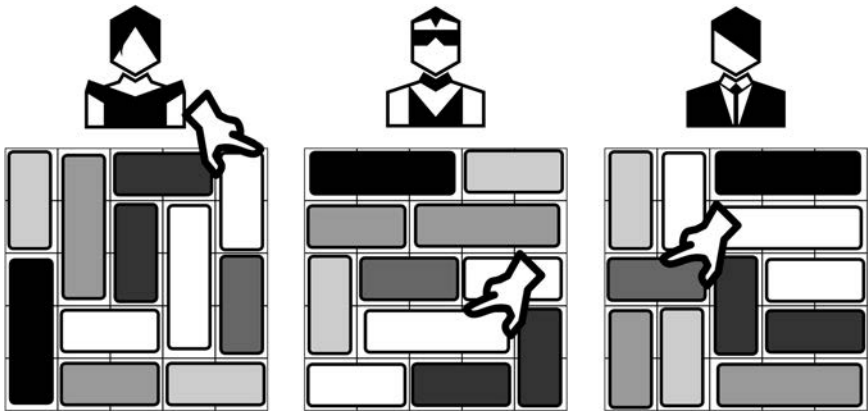
Description

A family of mechanisms in which players cover a grid or fill a space using a variety of shapes.

Discussion

There's a rich mathematical background to how different shapes can fill a two-dimensional plane or a three-dimensional volume, and as a result, many games that operate on this basic framework. Undoubtedly, many of these aren't really set-collection games, but many are. In *Patchwork*, players are trying to acquire the set of tiles that will allow them to fully tessellate their 9×9 grids. Tiles have a calculable valuation: each tile covers some number of spaces, and each uncovered space is -2 Victory Points (VPs). Tiles may also feature buttons, which are worth 1 VP per payout space that will be activated. However, simply adding up these values doesn't give the true value of the tile, because how well it fits on the board, and which other pieces it allows to still be placed is crucially important too. In this manner, the game is a set-collection game: the value of the tiles is greater than the sum of the parts.

The Princes of Florence has a similar mechanism, with players acquiring differently shaped tiles to fit into their palazzos. Since pieces can't be moved once placed, players are forced to plan ahead. It also changes the valuation

of tiles for different players, as some shapes will be more valuable for certain players.

In *A Feast for Odin,* various-shaped goods and treasures are added to grids to try to cover as many spaces as possible. The way the tiles are laid also determines income, VPs, and bonuses. All are mediated through a variety of grids. Grid-Coverage games sometimes take advantage of the underlying grid itself to create another dimension of value. In *Bärenpark,* players lay polyominoes on top of icons in a grid made of a series of square tiles. These icons allow players to draw tiles of different sizes, shapes and point values for future play. In addition, players are incentivized to fully cover each square grid tile sooner rather than later, since the value of completing a grid tile declines after each player completes one.

Admittedly, Grid-Coverage games don't always involve set-collection in any recognizable way, like *Blokus* and *Ubongo. Ubongo* is strictly a speed-puzzle game, where players are trying to solve Grid-Coverage puzzles using standard tiles faster than their opponents. *Blokus* has a placement rule that restricts where pieces may be placed: pieces of the same color may only touch at corners. Similar placement restriction rules underlie many spatial games. There may be other lenses through which to consider these games, like Area Majority/Influence (ARC-02).

Other examples of games about packing shapes into a defined space include *Pack & Stack* and *You Need Drew's Truck*. In these games, players are trying to pack Tetris-style pieces into trucks as efficiently as possible. *FITS*, *Brikks,* and *Rolltris* are more obviously based on Tetris, as players attempt to organize pieces that "drop" from the top edge of the grid. While typically leaving spaces uncovered is bad, *FITS* has special bonus spaces that score more when left open, similar to bonuses in *A Feast for Odin*.

NBMR9 extends Grid Coverage into three dimensions. Tiles are worth more as they are stacked on top of other tiles, but they may only be stacked if they are fully supported with no overhang.

Sample Games

Bärenpark (Walker-Harding, 2017)
Blokus (Tavitian, 2000)
Brikks (Warsch, 2018)
Cottage Garden (Rosenberg, 2016)

A Feast for Odin (Rosenberg, 2016)
FITS (Knizia, 2009)
NMBR9 (Wichman, 2017)
Pack & Stack (Eisenstein, 2008)
Patchwork (Rosenberg, 2014)
The Princes of Florence (Kramer, Ulrich, and Ulrich, 2000)
Ubongo (Rejchtman, 2003)
You Need Drew's Truck (Young, 2003)

SET-04   Network Building
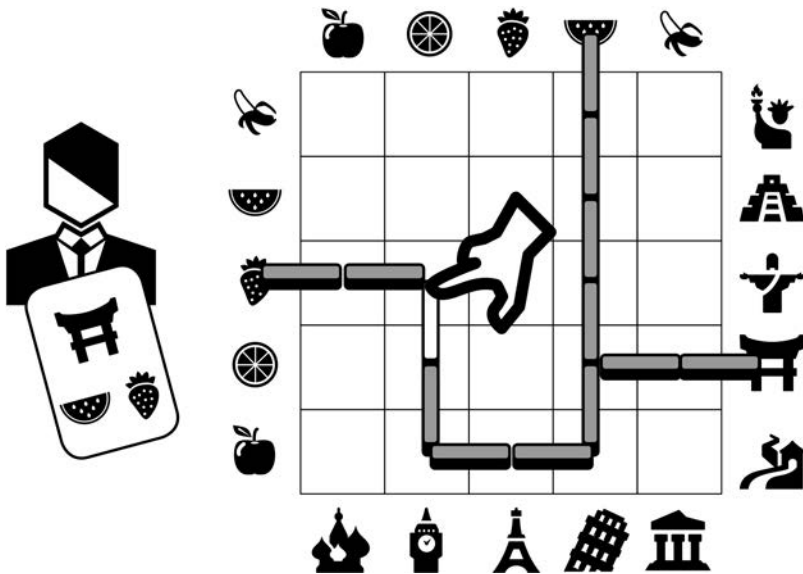
Description

Network Building is a specialized kind of set collection in which the sets collected represent ties between nodes, often represented as routes between destinations.

Discussion

Earlier in this chapter, we discussed *Ticket to Ride* as having a basic *Rummy-*like set-collection mechanism that allows players to build routes in specific places based on the color and number of train cards they collected. But there's another dimension, another kind of set that players collect in *Ticket to Ride*: the eponymous tickets themselves. A ticket can be satisfied by an enormous number of possible route combinations, or sets, that connect the two cities listed. The tickets represent a set of sets, or a super-set, a kind of telescoping set of set-collection mechanisms. *Brass* offers a similar concept in that not only are players seeking to connect certain cities, they are also seeking to ensure the availability of certain raw materials within the network created.

Considering sets in this way illuminates the issue of set element exclusivity. While some games require each set element to be part of only one set, (like in *SET*, the pattern recognition game) route-building games typically make routes permanent, and allow those routes to be reused as part of other sets, or to be subsumed entirely into a larger set. The visual representation of the set as nodes and ties makes it really easy for players to understand why this mechanism works the way it does.

Route-building games have many other elements to them beyond set collection. Blocking other players, dealing with different types of terrain, and upgrading the vehicles that run on these routes are just a few of these elements. We will look at a few of those next. Yet, underneath all of that is the core notion that by linking together a few nodes into a contiguous relationship, you create a whole that is more valuable than the sum of its parts.

There are several options available to the designer in terms of how the network is created. The three most commonly used are *Point-to-Point*, *Tile Placement*, and *Existing Network*. In a *Point-to-Point* system, the map is a regular grid of dots or connections, and players may connect any two adjacent dots. Examples of this are *Empire Builder*, where the connections are drawn with markers on a dry-erase surface, and *Transamerica*, where players place wooden sticks to connect dots, similar to roads in *Catan*. Point-to-Point connections can either be owned by a particular player (*Empire Builder, Catan*), or be neutral and usable by all (*Transamerica*).

In *Tile Placement* systems, players place (typically) square or hexagonal tiles onto a grid to form connections. *Streetcar* and *Tsuro* use square tiles, while *Age of Steam* and *1830* use hexagons. The requirement to form connections as tiles are placed can act as constraints on which tiles may be placed, as in Tile-Laying (SET-02), as edges need to match up. Tile Placement games allow for more complex tiles, including connections that go under or over each other, or branch off. It also allows for Upgrade systems (ECO-11), where tiles are replaced with more complex or valuable tiles. This is particularly used in rail games like *1830*.

The boards in *Existing Network* systems have the routes already printed on them. Players need to claim, construct, or activate them in some way. For example, in *Ticket To Ride*, all the possible rail lines are on the map, but need to be claimed by players through the playing of sets of cars. In *Rail Baron* and *Power Grid,* players pay to control connections.

Point-to-Point systems work well when there are a lot of possible connections players may want to make. The random cities that need to

be connected in *Transamerica*, or the wide variety of pick-up-and-deliver locations in *Empire Builder* make them well suited to give players ultimate flexibility on how to build their network. However, if there are stereotypical connections that are always made, an Existing Network system may work better. In *Power Grid*'s original incarnation as *Funkenshlag*, players drew power lines on the board with markers. However, build patterns were pretty standard, so when the game was released again, the switch was made to an Existing Network system, which earned a much better reception by players.

Network-Building mechanisms tend to dominate gameplay. Most games that use them do so as a centerpiece of the design. However, there are some games where the network construction is a side-show in the main game. One example is the investigative game *Android*, where players may make connections between entities on a separate Conspiracy board which can give bonuses and impact victory points.

Because of the tactile nature of building networks, a variety of other physical media have been used besides those mentioned. Some examples include *Twixt*, which uses an ingenious peg-and-link system, *String Railway*, where players lay string on the table to represent rail lines, and *Paperclip Railways*, which does something similar with paper clips, except that clips can be added to chains to represent additional rails being built.

Sample Games

Point-to-Point:
Catan (Teuber, 1995)
Empire Builder (Bromley and Fawcett, 1982)
Paperclip Railways (Boydell, 2011)
String Railway (Hayashi, 2009)
Transamerica (Delonge, 2001)
Twixt (Randolph, 1962)

Tile Placement:
1830 (Tresham, 1986)
Age of Steam (Wallace, 2002)
Android (Clark and Wilson, 2008)
Streetcar (Dorra, 1995)
Tsuro (McMurchie, 2004)

Existing Network:
Brass (Wallace, 2007)
Concordia (Gerdts, 2013)
Hansa Teutonica (Steding, 2009)
Power Grid (Friese, 2004)
Rail Baron (Erickson and Erickson, 1977)
Ticket to Ride (Moon, 2004)

SET-05   Combo Abilities
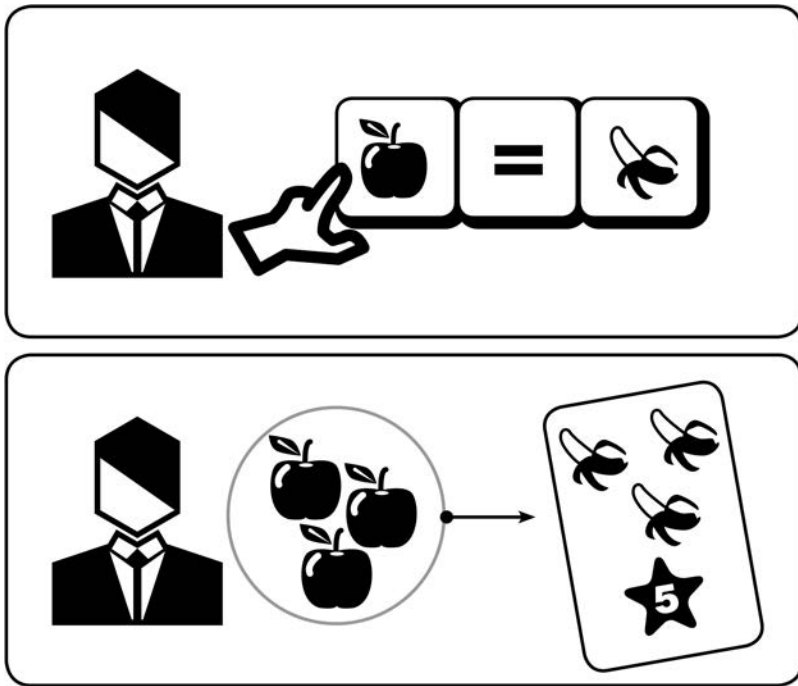
Description

A collection of Abilities that are acquired separately and synergize together.

Discussion

Earlier, in Set Valuation (SET-01), we discussed using sets as resources or as direct point-scoring elements. Here, we focus on sets as game verbs and adverbs, as elements that provide actions (verbs) or buffs (adverbs) to actions.

Combos are an emergent aspect of gameplay, in that they aren't explicitly explained in the rules, even though effective play usually requires finding strong Combos. For designers who wish to cultivate this kind of play in their games, there are some best practices to follow.

Games with Combo potential usually have a modular, black-box approach to actions, which tend to be direct and non-contingent. It also helps to have a few types of resources, and a variety of domains within which game elements

can exist. Finally, more open turn structures, with more options for how to play help create a Combo dynamic. Card games like *Seasons* illustrate this well. Cards can exist in a deck, a hand, or in play. Actions that move cards from deck to hand create a chain that allows another play. Resources that can be converted into effects, or more resources, create the possibility of virtuous spirals. And the existence of dice opens up a whole dimension of possibilities for altering die-faces and rerolling dice.

Combos exist in many games, perhaps most famously in *Magic: The Gathering*. However, when played in constructed formats, where players build their own decks before play, the set collection aspect of the game exists largely in the purchasing of cards. In draft formats, however, players who can identify and select synergistic cards are in essence defining and collecting sets. What makes this type of set collection different from the set collection of a game like *Coloretto* is that the sets in *Magic: The Gathering* are not predefined or fixed. While the designers have certainly intended many of the powerful effects of certain card combinations, by not explicitly declaring these combinations as sets, they preserve the joy of discovery for players.

In *Kemet*, acquiring tiles that enhance your movement ability can synergize with a tile that forces your opponent to take casualties before a battle commences. Together, these two Abilities make for a potent combination that allows you to project force across the board. *Kemet* has many other synergies hiding among the power tiles that players can acquire.

Many games have these kinds of Combos, and identifying and assembling a Combo and then running it is the core of the gameplay. Many so-called engine-building games are precisely this: getting together a few elements that create a virtuous cycle of increasing productivity. Some games have you building actual engines, like *Steampunk Rally*, while in others, the engine is more metaphoric, like the combinations of Abilities and scoring that you can build in *Race for the Galaxy*. In *Orléans*, a specific set of workers is required to trigger taking an action. *The 7th Continent* has a crafting system that allows players to combine cards, and *Evolution* features a similar system to provide creatures with traits, and even to create multiple species with complementary Abilities that model symbiotic biological relationships. *Glory to Rome* and its spiritual successor, *Mottainai*, can best be described as games that challenge players to assemble a set of cards that add up to a game-breaking Combo.

We'll end by reflecting that set collection is a dynamic, a pattern common to many games that is instantiated by a number of mechanisms, including those that define acquisition, usage, and valuation. Like with Auctions (Chapter 8), at some point we begin to observe set-collection elements within

nearly every game. That observation, though interesting, may not be useful to the working designer. Set collection as a concept may be everywhere, but set collection as a mechanism exists in fewer places.

Sample Games

The 7th Continent (Roudy and Sautter, 2017)
Coloretto (Schacht, 2003)
Glory to Rome (Chudyk, 2005)
Kemet (Bariot and Montiage, 2012)
Magic: The Gathering (Garfield, 1993)
Mottainai (Chudyk, 2015)
Orléans (Stockhausen, 2014)
Race for the Galaxy (Lehmann, 2007)
Seasons (Bonnessée, 2012)
Steampunk Rally (Bishop, 2015)

13

Card Mechanisms

❧

Card games go back to the first millennium CE, possibly as early as the 800s in China, and by 1400, variations on the now-familiar 4-suit, 52-card deck are attested to in Persia, the Middle East, and Europe. All of this is to say that card games and their attendant mechanisms have been around for a long, long time.

Core concepts in card games include a face-down draw deck from which players can draw cards privately into a hand; the public table where all players can see and interact with cards; the tableau, a private, but visible play area; and the discard pile, which has varying rules for interaction. The various types of runs and sets, predicated on the ranks and suits of cards, have different implications for different games, as does the existence of "joker" or wild cards in a variety of flavors.

Overall goals of card games might include shedding cards from a hand, capturing or avoiding specific cards, collecting a larger number of cards than the opponent, winning a specified number of hands, defeating attacks from other players, and aligning outcomes to bids. Card games have rules about hand limits, how cards may be acquired, used, and discarded, how turn order may be manipulated, and what the specific composition of cards in the deck must be.

Broadly, we can speak of *trick-taking games*, *shedding games*, and *hand-comparison games*, though there is substantial hybridization. *Trick-taking games* focus on card comparison in card-by-card and turn-by-turn play, often tied to some contract or bid that players seek to make. *Shedding games* are games in which players seek to get rid of their cards first, like in *Rummy*-style games. Ladder-climbing games, a hybrid type, are a combination of trick-taking games and shedding games that are especially popular. Players shed

their hands by laying down a valid set, like in *Rummy*, but compete for the right to lead a new ladder by playing the highest-ranked cards of that set. *Hand-comparison* games often involve betting, like *Poker* and *Blackjack*, where players compare hands based on some standard ranking of hands. The action in these games is in acquiring the set, rather than grouping an existing hand into a few sets and playing them out.

Modern card games sometimes follow these models fairly closely. There are many *Rummy*, trick-taking, climbing, and even *Poker* variants, from the *Mystery Rummy* series to *Tichu* to *Pyramid Poker*. However, there is a new school of modern card games that shares basic ideas about decks and hands with classic card games, but little about the nature and meaning of the cards themselves.

It will take a better work of history to properly trace the evolution of card games and to disentangle the influence of collectible card games from the emergence of card-based versions of middle-weight European-style board games. However, modern design embraces cards as flexible game elements that function almost as rulebook additions. Cards carry a small payload of additional rules that define how they may be used, while possibly also sharing broader characteristics like suits, costs, prerequisites, bindings to other game elements, and more.

We cover many mechanisms throughout this book that are often implemented with cards, and there's probably no truly satisfying definition for the category of card games. Nonetheless, in this section, we'll explore some of the major concepts and mechanisms that feature regularly in card games and games played mostly with cards, that we haven't already addressed elsewhere in this volume.

CAR-01   Trick Taking
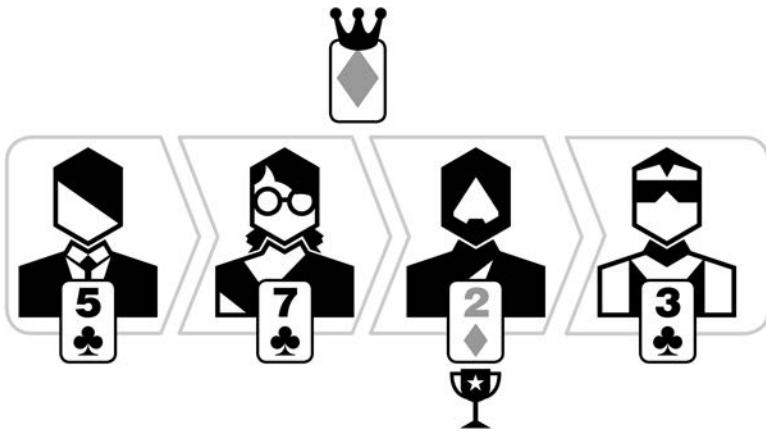
Description

Players play cards from their hand to the table in a series of rounds, or "tricks" which are each evaluated separately to determine a winner and to apply other potential effects.

Discussion

Trick-Taking games are about 1,000 years old, and as such, there many games, variations and scoring rules. Covering all those possibilities is beyond our scope, and we will instead focus briefly on the core concepts.

Trick-Taking games begin with dealing cards out. In classic games, like *Bridge* and *Spades*, all cards are dealt out evenly to the players. Some games have a betting phase in which players declare the number of tricks they intend to take. After this, players play in turn order, starting with the first player, called the lead. Many games require that players "follow the lead" or "follow suit," which means playing a card of the same suit as the lead, if possible. The player playing the highest card of the lead suit wins the trick, and becomes the lead for the next round. Often, one suit is the "trump" suit, and cards of that suit outrank cards of the lead suit, no matter their numerical value. Finally, players score for the number of tricks they've won.

Designers have created variations of all of these core rules. In *Diamonds*, rather than dealing the entire deck, a subset of the deck is dealt out, which

creates uncertainty and lowers the impact of memory and card counting. In *Sticheln*, players do not have to follow the lead suit, and unlike most games, where off-suit cards are disregarded when determining the winner of the trick, here, they are considered trump! In *The Bottle Imp*, trump isn't tied to suit at all. Instead, only a single card may be trump at any given time: the card closest to, but not exceeding, the value of the bottle, which begins at 19. As lower numbers are played, the bottle takes on the value of those cards. A related approach is featured in *Little Devils*, where the second card played to the trick will set the rule for the trick: if the card is lower, all proceeding players must play lower, and if it is higher, they must play higher. The game also features the variation that winning tricks is a negative outcome. Going back to *Sticheln*, players want to win tricks, but every round all players choose a "pain" suit whose cards will count against them, and try to win tricks while avoiding taking cards from their pain suit.

Betting can also feature variations. In *Bridge*, for example, the bid for a contract includes the right to determine which suit will be trump. Only the team that wins the bidding can score points for making its contract. Trick-Taking games are often played in partnership, and the bidding phase will typically have players taking turns bidding, alternating between the two teams. In some games, like *Wizard*, the sum total of tricks that players bid cannot equal the number of tricks in the hand. This guarantees that at least one player or partnership will miss their bid. Another common variant is the impact of "over-booking" or "over-tricking," which is collecting more tricks than the contract called for. Whether over-booking is more valuable, equal in value, or less valuable than the tricks contracted for varies from game to game. In "exact bid" games like *Sluff Off*, over-tricking may even be penalized.

Trick-Taking games share many features and dynamics with both Once-Around Auction (AUC-07) and Sealed-Bid Auction (AUC-04), as unintuitive as that may sound. Readers curious about this should study *Trick of the Rails*, a card game that models *18xx*-style games and uses Trick Taking in place of auctions. A Trick-Taking game is similar to an auction in that players hold a hand of currency, and bid that currency to win the trick. The currency is not consistent in relative value, because the exact same trick might be won by different cards depending on which card was led, and what suit is trump. In addition, the lot up for bid—the cards of the trick—is also what's being used to bid. This kind of dynamic is how a wager usually works; you commit money to the pot, hoping to win the pot, which is composed of all the bids. Trick-Taking games may be described as highly specialized auctions, at least mathematically speaking. From a game-design perspective, however,

Trick-Taking games typically emphasize hand-management and planning skills, rather than valuation skills, and the experiential difference between a series of auctions and a hand of tricks is substantial as well.

Sample Games

18xx (Tresham, 1974)
The Bottle Imp (Cornett, 1995)
Bridge (Vanderbilt, 1908)
Diamonds (Fitzgerald, 2014)
Little Devils (Feldkotter, 2012)
Sluff Off (Dorra, 2003)
Spades (Unknown)
Sticheln (Palesch, 1993)
Trick of the Rails (Hayashi, 2011)
Wizard (Fisher, 1984)

CAR-02   Ladder Climbing

Description

Players play one card, or a set of related cards. Subsequently, players must play cards of an equal or higher value of the same set already played. The last player to successfully play wins the right to start a new round of Climbing.

Discussion

Ladder Climbing games, or simply Climbing games, are closely related to trick-taking games. The two began to differentiate geographically, with Western games in Europe developing around winning tricks and trump suits, and Eastern games in China, Korea, and Japan developing around shedding hands and playing sets.

    The simplest Climbing games, like *President* (also known as *Scum, Bum, Landlord*, and *Capitalism* among many others), have players playing single cards, doubles, triples, or quads. Subsequent plays must follow the set, but be of an equal or higher rank, for example, following three 8s with three 10s. More complex sets, like in *Haggis*, include runs, or sequences of consecutive

cards, or runs of paired cards. Bombs, unbeatable combinations that can be played no matter what set preceded them, are another wrinkle in this genre.

Shedding all your cards, also called "going out" is generally a goal in Climbing games, and in many classic shedding games it is the win condition. In some games, like *The Great Dalmuti*, play continues until all but one player has gone out, and players are ranked in order of going out. Going out isn't necessarily the win condition. Some games, like *Tichu*, reward the player who goes out first with points for doing so, while also granting points for the specific contents of tricks won.

Climbing games offer many of the same kinds of variations as trick-taking games. Bidding, partnerships, and wild cards are all common. Another popular variation is the pyramidal deck, as in *The Great Dalmuti*, which is a deck of ranked cards with a quantity of cards in each rank equal to the value of the rank. Thus, there are eight 8s, nine 9s, etc. Taking this idea even further, *Custom Heroes* introduces plastic cards that are placed in sleeves. Adding more cards to a sleeve can change the card's value or introduce special abilities to the card.

Sample Games

Custom Heroes (Clair, 2017)
The Great Dalmuti (Garfield, 1995)
Haggis (Ross, 2010)
President (Unknown)
Tichu (Hostettler, 1991)

CAR-03   Melding and Splaying
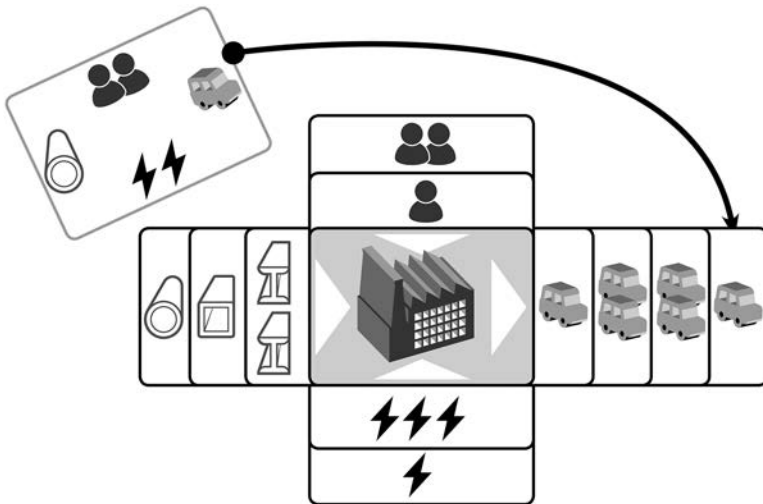
Description

A set of cards in a specific relationship to one another that allows them to be played to a table or scored is a meld. When laying these cards down, the way the cards splay, or overlap one another, may sometimes reveal or conceal certain abilities or attributes.

Discussion

Melds are a kind of Set Collection (Chapter 12) that are very common in card games. Classic card games typically allow melds of identical cards, sometimes called a set, or melds containing cards in a fixed series, for example, ascending by one, usually called a run. *Rummikub* is one example of a game that includes both types of melds.

Commonly, players must assemble a meld in their hands and only then play the melds out onto the table. In *Rummy* and its many variants, melds played out on the table can be added to by other players, sometimes called "laying off"—but only if they have already played a meld themselves. In *Rummikub*, players may disassemble and reassemble any melds on the table, as they seek to lay off more tiles from their hands into these new arrangements.

Splaying is an unusual mechanism that takes advantage of the physicality of cards. *Innovation* is probably the best-known game with this mechanism. A meld, when played, must be splayed in a specific fashion, so that certain icons on cards will be covered by their neighbor. Later effects may allow players to splay out further horizontally, revealing another set of icons, or even splay vertically, revealing icons on the bottom of the cards. In *…and then, we held hands.*, players must resplay their entire tableau to match their position on the board: if they are on the left side of the board, they may only see and use the left side of their tableau, and vice versa. In *Lotus*, cards are splayed in sets to look like flowers, which achieves a beautiful visual effect, albeit without any gameplay effects.

This kind of card overlapping exists in both *Honshu* and *Circle the Wagons*, in which players play cards to construct territories, using the current card to overlap some of the previous cards. However, there are no mechanisms for changing how the cards splay once they have been laid down.

Sample Games

…and then, we held hands. (Chircop and Massa, 2015)
Circle the Wagons (Aramini, Devine, and Kluka, 2017)
Honshu (Malmioja, 2016)
Innovation (Chudyk, 2010)
Lotus (Goddard and Goddard, 2016)
Rummy (Unknown, ~1850)
Rummikub (Hertzano, 1977)

CAR-04   Card Draw, Limits and Deck Exhaustion
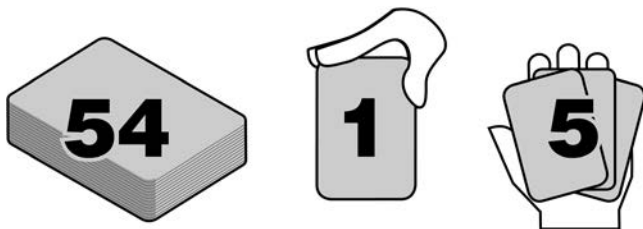
Description

Games frequently limit the number of cards that may be held in a given container, whether that is a hand, a deck, or something else. Similarly, various game effects trigger when a deck, draw pile, or hand becomes exhausted.

Discussion

Hand Limits are a critical part of the superstructure of a game. Cards represent options, and the more cards are held in hand, the more choices a player must consider. In modern games, where cards are not simply members of a set, but instead provide actions or other benefits, more cards mean more power.

In many games, there is no possibility of card advantage because card plays and Card Draws are symmetrical and metered. In *Diamonds*, as in most trick-taking games, all the cards that will be in play are dealt at the beginning, and players each play one card per turn. In *Mystery Rummy: Jack the Ripper*, as in most *Rummy*-style games, players draw a card into their hands at the start of their turns, and discard one card to end their turns. Similarly, cooperative card games tend to tightly limit card economies because of how closely coupled those economies are with game difficulty. *Forbidden Island*, for example, if played without a hand limit of artifact cards, is a substantially easier game. Whenever a game involves collecting sets of cards, it will be easier for players to collect sets when they can draw and keep larger numbers of cards. Cooperative games can tweak these settings to change the challenge level presented to the players.

This one-in-one-out static card economy is overturned by many modern designs, and players routinely have more agency over their draws and discards.

In *Memoir '44*, scenario-specific rules set the draws, discards and hand limits for each faction, which allows the designer to model military concepts like surprise, supply lines and operational capacity. Individual cards, like "Recon," allow players to draw additional cards, at the cost of taking a less powerful action on the map. In *Evolution: The Beginning*, players always receive the same number of cards each turn, but they may play as many or as few cards as they wish, and carry over all their cards from turn to turn. Intentionally or not, this evokes the idea of punctuated equilibrium, in which long periods of limited speciation is punctuated by moments of great activity, evolutionarily speaking.

Ticket to Ride similarly doesn't encumber players with a hand limit, but imposes a draw limit of two (one if you draw a face-up wild train from the display). Players may lay down melds of any size though, so long as a matching route in size and color is available on the board. Thus, player hand-size fluctuates throughout the game, and skilled players will consider the potential moves their opponents can make based on the number of cards in their hands. *Bohnanza* requires players to draw, and either plant or trade, a fixed number of cards from the deck each turn. These cards can then be supplemented by any number of cards in hand.

Some games treat Card Draw as similar to any other resource. In *Deus*, players choose to either play a card or to discard some number of cards. Players may discard any number of cards, but one discarded card, and its suit, determines which discard ability is triggered. The discard abilities include gaining money, resources, buildings, or additional card draws. In *Race for the Galaxy*, players must explicitly choose whether to convert goods, represented by cards, into victory points or additional card draws.

At the other end of the spectrum from this more permissive approach to card economies is *Through the Ages*, which sorely restricts card movement from the market row into hand. Players must spend precious actions to acquire cards from the market row, and may never exceed their hand limit—unlike many other games that allow players to temporarily exceed hand limits and then discard down at the end of the phase or turn. In fact, *Through the Ages: A Story of Civilization* has no player-triggered discard mechanism at all, and taking a card into hand comes with an enormous opportunity cost. The hand limit is itself determined by a civilization's government type, and more advanced governments increase the player's hand-size, and thus, fairly directly, the power and possibilities of that player's civilization.

Sample Games

Power Grid (Friese, 2004)
Bohnanza (Rosenberg, 1997)
Deus (Dujardin, 2014)
Diamonds (Fitzgerald, 2014)
Evolution: The Beginning (Crapuchetts, 2016)
Forbidden Island (Leacock, 2010)
Memoir '44 (Borg, 2004)
Mystery Rummy: Jack the Ripper (Fitzgerald, 1998)
Race for the Galaxy (Lehmann, 2007)
Through the Ages: A Story of Civilization (Chvátil, 2006)
Ticket to Ride (Moon, 2004)

CAR-05 Deck Building
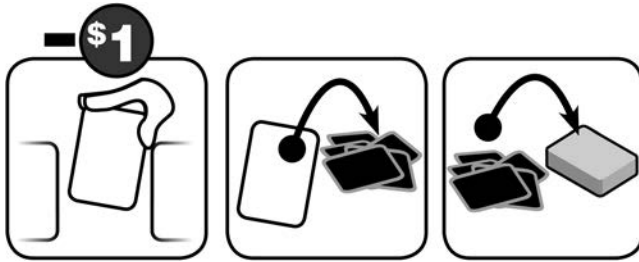
Description

Players play cards out of individual decks, seeking to acquire new cards and to play through their decks iteratively, improving them over time through card acquisition.

Discussion

Deck Building isn't a single mechanism, and throughout this book we discuss mechanisms that are also present in Deck-Building games. Nevertheless, a core structure has emerged in deck-building games that we'll consider here. Though Deck Building is a relatively new mechanism and genre, having appeared first in 2008's *Dominion*, follow-ups have often mimicked *Dominion's* basic structures. The basic idea is that cards can provide actions, currency for use only in the current turn, or victory points. In base *Dominion*, nearly all the cards provide only one of each of these uses, but many deck builders that followed combined these and offered players a choice for how to use each card. Some games have also expanded beyond these boundaries, like the bases that persist in players' tableaus until they are destroyed in *Star Realms*.

   In many deck builders, players will dispose of their whole hand of cards each turn. Commonly, players have a limit on the number of cards they can play as actions, but no limit on the cards that can be played as money, though not all cards will have a money value. While *Dominion* limits the number of buy actions players can take, most follow-ups limit players to what they can afford. Some cards allow players to draw, and then play, even more cards. At the conclusion of their turn, players will draw back to the full hand, usually five cards. While *Dominion* provided for a static, open market for cards, later

deck builders like *Ascension: Deckbuilding Game* and *Star Realms* offer players a market row that is replenished from a randomized deck.

Acquisition methods are a good place to evoke theme, while also addressing the inherent variability of laying out cards for purchase at random. *Valley of the Kings* has a pyramidal market that allows players to buy only the three cards at the base, after which higher level cards will drop down into lower levels as the pyramid crumbles. This mechanism gives players foresight, and a bit of control, over which cards will be available to their opponents. In *Eminent Domain*, basic cards are acquired at no cost from a central display, but powerful tech cards are acquired by being able to play the requisite number of technology icons. Though there are no dependencies and prerequisites as in an actual Tech Tree (ACT-16), the effect of making players show a greater number of technology icons for the more powerful cards offers a similar scaling effect. The synergies of certain combinations of cards create more viable and powerful branches through this tiered collection of technologies.

For readers interested in fully exploring Deck-Building mechanisms, *Dominion's* expansions are an instructive journey. *Intrigue* introduces negative player interactions like forced discards. *Alchemy* introduces a second currency type, and cards that can only be purchased with that currency. *Seaside* introduces the ability to carry over cards from turn to turn. *Prosperity* adds treasures, a new kind of resource that can be spent to trigger abilities without using up actions. *Dark Ages* focuses on interactions with the discard pile, while *Adventures* adds persistent cards that can be played in a future hand. *Cornucopia* rewards players for collecting varieties of cards, while *Guilds* introduces persistent money and reasons to spend it.

Dominion represents one approach to Deck Building, which is part of a larger category called pool building, which includes pools built from items other than cards. This can be entirely isomorphic to Deck Building, as in *Puzzle Strike*, in which cards are replaced with custom *Poker* chips that are drawn from a bag. The *Poker* chip component is easier to shuffle as often as deck builders require, and is more durable when subjected to frequent shuffling. *Orléans*, on the other hand, has players drawing workers out of a bag, who can then be assigned to a variety of actions on a player's board.

Andy Parks, designer of the deck builder *Core Worlds*, describes the distinction between these games as being between drafting verbs, that is, actions, as in most deck builders, versus drafting nouns, as in *Orléans.* In a deck builder like *Dominion*, most cards represent an action that players can take simply by playing the card, which is what Parks means by drafting verbs.

In *Orléans*, players pull workers out of a bag and assign them to different actions. However, actions require some specific combination of worker types in order to trigger—a kind of Set Collection ([Chapter 12](#))—rather than each worker type having a specific type of action associated with it. Parks refers to this as drafting nouns. His own *Assault of the Giants* game features drafting adjectives—modifiers that provide bonuses and additional abilities, but that must attach to existing cards and characters—out of the pool, presenting yet another possible way to construct a pool builder.

Pools work well as resolution mechanisms, where they're called chit-pull systems. There are also games that don't have true pool-building mechanisms, but come very close.

In *Machi Koro*, players purchase numbered cards whose abilities are triggered based on die rolls. Players can buy cards, representing the pool, and they can buy cards that trigger on the same numbers, to increase the payouts of specific numbers. However, players have limited impact on the overall probability of numbers being rolled. They can choose to roll one die, or two dice, but that's all. In a deck builder, players can assure themselves of a zero probability of not drawing certain cards, simply by not acquiring them. *Machi Koro* doesn't provide quite that level of control to players.

Going farther out on this mechanical limb, we can consider the placement of settlements in *Catan* as a pool-building-adjacent mechanism. Even the selection of runners in *Can't Stop* shares something of this flavor. In *Roll for the Galaxy* players acquire worker dice that have different faces, and different values as goods. Players may shape their overall pool both based on which dice they acquire, but also which dice they place back into their pool each turn. As deck builders and collectible card games show, there is an enormous amount of design space outlined by cards and some tokens. In addition to the games discussed above, cooperative deck builders like *Shadowrun: Crossfire*, *Gloomhaven*, and *Pathfinder Adventure Card Game* continue to blur the line between card, board, and role-playing games. There are also variants like no-shuffle deck builders like *Aeon's End* and build-the-enemy's deck games like *Tiny Epic Defender*.

Sample Games

Aeon's End (Riley, 2016)
Ascension: Deckbuilding Game (Fiorillo and Gary, 2010)
Assault of the Giants (Parks, 2017)
Can't Stop (Sackson, 1980)

Catan (Teuber, 1995)

Core Worlds (Parks, 2011)

Dominion (Vaccarino, 2008)

Dominion and Expansions (Vaccarino, 2008)

Eminent Domain (Jaffee, 2011)

Gloomhaven (Childres, 2017)

Intrigue (Dorra, 1994)

Machi Koro (Suganuma, 2012)

Orléans (Stockhausen, 2014)

Pathfinder Adventure Card Game (Selinker, Brown, O'Connor, Peterson, and Weidling, 2013)

Puzzle Strike (Sirlin, 2010)

Roll for the Galaxy (Huang and Lehmann, 2014)

Shadowrun: Crossfire (Elliot, Heinsoo, Lin, Marques, McCarthy, Schneider, and Watkins, 2014)

Star Realms (Dougherty and Kastle, 2014)

Valley of the Kings (Cleaver, 2014)

CAR-06   Drafting
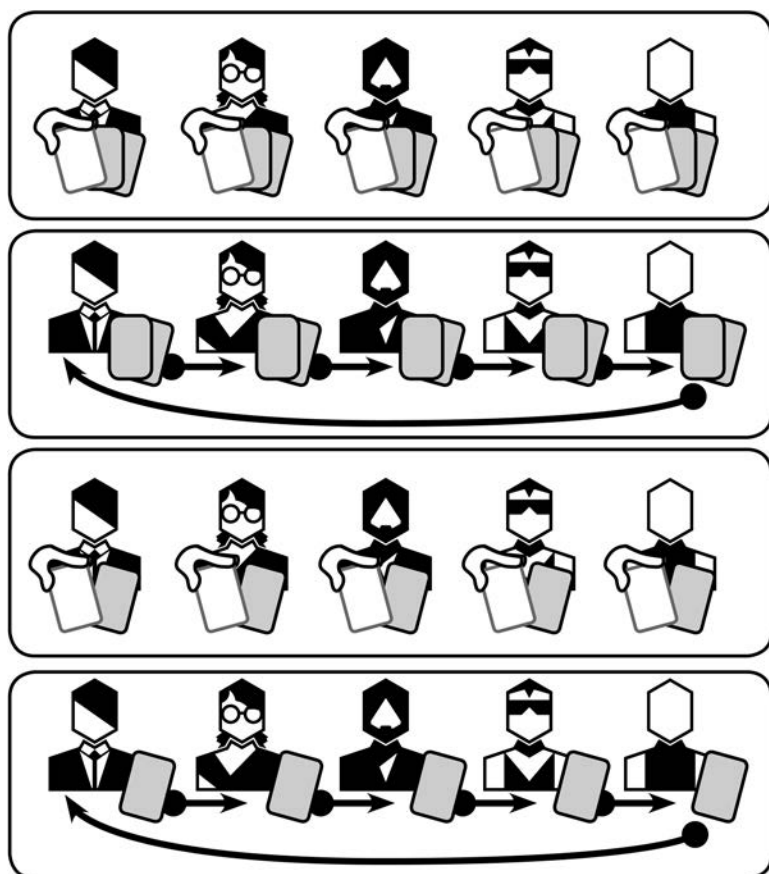
Description

Drafting is a means of distributing cards or other game elements to players through an ordered selection process.

Discussion

Many games can be described as a process of acquiring, manipulating, and spending resources. One of the main distinctions between modern and classic card games is the move away from random deals and draws and towards more agential means of acquiring cards. Auctions are one popular method (Chapter

8), but they can be cumbersome, mathy, and intimidating to many players. Drafting represents a quicker alternative. One way to think of a draft is that instead of precisely valuing each lot and bidding accordingly in an auction, players can instead ask: What do I want most right now? Do I have to take it now, or will it be here for me next turn too?

Drafting cards is closely related to Action. Drafting (ACT-02) and Worker Placement (Chapter 9). The core concept is the same in all of these: players select, in turn order, something for their exclusive use. What makes card Drafting different is the variety of design options afforded by the physicality of the card.

The draft variant most similar to worker placement is the Rochester draft, as exemplified in *The Networks*. All available cards are laid on the table, and players each take one card on their turns. Play continues until all the cards have been taken, or all players pass their turn. Like a worker placement game, Rochester drafts make all options visible and available at the same time. This can be overwhelming for players and can lead to analysis paralysis, just like in a worker placement game. By physically removing cards from the display, Rochester drafts simplify visually as the draft continues. Consequently, each card is also exclusive to the player who selects it, though designers can include multiple copies of a card if they wish for an action to be available to multiple players. In addition, for games in which cards are taken in hand and played in a later phase, Rochester drafts test players' ability to recall what cards their opponents took. In a worker placement game, the players' pawns encode that information visually, and everyone can see where each pawn was played.

Another simple draft mechanism is pick-and-pass. In *Lords of Waterdeep*, a game effect calls for the active player to draw a hand of cards equal to the number of players at the table, select one to keep, and pass the rest. Each player does this in turn, until the last player is left with the last card. Some games call for drawing one more card than the number of players, so the last player also has a choice. This mechanism is tightly coupled to turn order. *Lords of Waterdeep* leverages this coupling to provide the greatest return to the player who triggered the effect, but designers should take care not to overly advantage players based on turn order when using this mechanism.

To mitigate turn-order imbalances, designers can implement a snake draft, in which the order of Drafting in round 1 is inverted in round 2, so that the last player in the first round becomes the first player in the last round. Snake Drafting mitigates, but does not resolve, turn-order imbalance. Assuming a level drop-off in the values of cards, the value of the first choice in round 1 and last choice in round 2 is greater than the value of the last choice in round

1 and first choice in round 2. In cases where values don't drop off in a level fashion, the problem remains: some positions are superior to others. Games where the difference in value is negligible, or in which different selections have different values for each player, may be the best place to implement snake drafts. Most games will use a snake draft as part of some larger system, or in setup, as in *Catan's* placement of initial settlements.

One game to cleverly address this issue is *Kingdomino*, in which players draft dominoes with two terrain squares on them, and add them to their kingdom. Some squares feature crowns, which make all connected squares of the same terrain worth one point per crown in the combined region. The tiles are numbered, with the lowest-numbered tiles being the least valuable. To draft the tiles, they are laid out in numbered order in a vertical display. The player who chooses the most valuable tiles, the bottom tile in the display, will claim that tile, but will go last in the following turn. Conversely, the player selecting the least-valuable top tile will go first in the next round. While the tiles have some absolute value, they will differ in relative value to each player based on the exact terrains featured on them, and what is in each player's tableau already. In some cases, a player will gladly take a weaker tile, and its better place in turn order, because of how well the tile fits in his or her own board.

Another approach to balancing the turn-order issue of Drafting is to have parallel pick-and-pass drafts happening simultaneously. This method, featured in *7 Wonders, Sushi Go!*, and *Among the Stars*, is executed by dealing each player a hand with a number of cards equal to or greater than the number of players playing. Each player picks a card from his or her hand to keep, then passes the hand to the left, and receives a hand from the player to the right. Play continues until all cards are selected. This kind of draft accelerates gameplay because all players are choosing at the same time. However, unlike a Rochester draft, where all choices are visible at all times, and where players have nearly equal access to every card, in a parallel draft, each player will only see some fraction of the cards—as few as half in a 7-player game of *7 Wonders*—and will simply not ever have the option of taking those cards. Another consideration is if one player is particularly slow, he or she can create a bottleneck, which often leads to confusion about which player is up to which round of Drafting.

As mentioned earlier, Drafting, in nearly all its formats, presents two questions. The first is what does the player value most. Many players will stop their analysis here and select the card they like best. But, more skilled players will ask whether they need to take that card right away, or whether,

when turn order wheels back around to them, that card will still be there. This technique, called "wheeling," adds tension and skill to Drafting.

Wheeling is particularly important to booster drafts of *Magic: The Gathering* and other Collectible Card Games (CCG). What's unique about these styles of draft is that the pool of cards in the draft is unknown to any player, since they come out of sealed booster packs. Moreover, in many CCGs, card synergies are tightly coupled, such that once you begin drafting towards some strategy or deck type, other cards drop to little or even negative value. The extremes in valuation for cards between players make wheeling much more likely to succeed, since the card that one player values the most may have little use to the other players. When that disparity is large enough, it might make sense to take a card that's useless to you, simply to deny it to other players, a move called hate-drafting.

Wheeling and hate-drafting are not mechanisms, they are behaviors that emerges from the Drafting mechanism, and the underlying card distributions and overall game system. They are part of what makes the Drafting mechanism so engaging, and designers should evaluate their prototypes with these behaviors in mind.

A few other variants on the parallel Drafting structure include whether cards are played immediately after Drafting, as in *Best Treehouse Ever*, or in turn order during a play phase, like in *Medieval Academy.* Sometimes, not all cards drafted are played, as in *Fairy Tale* where only three of the five cards drafted each round are played, and the other two are discarded. Another variant is to allow players to mix their hand with the hand of cards being passed. In this kind of setup, players may take as many cards as they wish from the new hand, as long as they pass the correct number of cards to the next player. Having players play a card immediately after drafting can also help keep the draft on schedule, and avoids bottlenecking and confusion by forcing all players to play at roughly the same cadence.

Drafting games can sometimes be played at 2 players, like in *Seasons*, but they tend to be a little flat. *Tides of Madness* is a drafting game limited to 2 players only, and among its innovations is that players can be forced to collect cards with madness symbols on them, and can even lose the game if they collect too many.

7 Wonders Duel is a 2-player drafting game with quite a few mechanical twists to ratchet up tension. Players can only draft cards on the bottom-most revealed level of a structure, but by taking a card, they can reveal face-down cards higher in the structure that become available for drafting. Cards can be used for multiple purposes, including selling off for money, which incentivizes

hate-drafting. In addition, there are three possible win conditions, including two in-game sudden-death wins. One win condition is tied to a tug-of-war contest that requires both players to take enough military cards to prevent being overrun by the other player. Another instant-win condition is subject to a set-collection contest in which players must draft wisely to at least prevent their opponents from assembling the winning set. These during-game concerns, and the possibility of forcing certain lines of play because of them, add richness to the Drafting choices.

Sample Games

7 Wonders (Bauza, 2010)
7 Wonders Duel (Bauza and Cathala, 2015)
Among the Stars (Bagiartakis, 2012)
Best Treehouse Ever (Almes, 2015)
Catan (Teuber, 1995)
Fairy Tale (Nakamura, 2004)
Kingdomino (Cathala, 2016)
Lords of Warterdeep (Lee and Thompson, 2012)
Magic: The Gathering (Garfield, 1993)
Medieval Academy (Poncin, 2014)
The Networks (Hova, 2016)
Seasons (Bonnessée, 2012)
Sushi Go! (Walker-Harding, 2013)
Tides of Madness (Čurla, 2016)

Game Index

Note: This Game Index shows what mechanisms used a particular game as an example. It is not intended to be a full cross-reference of all mechanisms that each of these games includes.

…and then, we held hands., Chircop and Massa, 2015: CAR-03 Melding and Splaying

6 Nimmt, Kramer, 1994: RES-22 Kill Steal

The 7th Continent, Roudy and Sautter, 2017: MOV-16 Map Addition, SET-05 Combo Abilities, STR-08 Scenario/Mission/Campaign Games

7 Wonders, Bauza, 2010: ACT-02 Action Drafting, CAR-06 Drafting, ECO-10 Discounts, SET-01 Set Valuation

7 Wonders Duel, Bauza and Cathala, 2015: CAR-06 Drafting, VIC-15 Circuit Breaker/Sudden Death, VIC-19 Tug of War

13th Age, Heinsoo and Tweet, 2013: RES-19 Dice Selection

1830, Tresham, 1986: ACT-15 Gating and Unlocking, ECO-03 Market, ECO-11 Upgrades, ECO-14 Ownership, SET-04 Network Building, VIC-04 Victory Points as Resource, VIC-10 Exhausting Resources

1960: The Making of the President, Leonhard and Matthews, 2007: ACT-04 Action/Event, ARC-04 Territories and Regions

4000 AD, Doherty, 1972: MOV-24 Hidden Movement, RES-01 High Number

Abalone, Lalet and Levi, 1987: RES-11 Static Capture

Above and Below, Laukat, 2015: ACT-18 Narrative Choice

Abracada…What?, Kim, 2014: UNC-05 Roles with Asymmetric Information

Acquire, Sackson, 1964: ECO-03 Markets, ECO-13 Investment, ECO-14 Ownership, STR-01 Competitive Games

Action Castle, Soren 2009: ACT-18 Narrative Choice

Advanced Squad Leader, Greenwood, 1985: ARC-08 Line of Sight, RES-03 Critical Hits and Failures, STR-08 Scenario/Mission/Campaign Games

The Adventurers: The Temple of Chac, Blossier and Henry, 2009: MOV-14 Bias

Aeon's End, Riley, 2016: CAR-05 Deck Building

Age of Empires III: The Age of Discovery, Drover, 2007: TRN-05 Claim Turn Order