A Linguistic Analysis of Mobile Games:
Verbs and Nouns for Content Estimation

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ABSTRACT

This paper outlines a linguistic approach to understanding the content of games. Understanding game verbs as the fundamental unit of interaction within game environments it provides perspective on popular play experiences. The benefits of such analysis include a scalable view of the self reported content of games and the ways in which problems are being solved in games. The content of games is contrasted with the content of books for comparison.

The findings indicate games are relatively limited in the diversity of verbs they use. The results also demonstrate greater emphasis on gender, and life or death in popular books than in popular mobile games. The occurrence of violent language like *war* and *kill* occur significantly more often in best-selling book descriptions than in best-selling mobile games. The most common game verbs from this research are *use, touch, get, have, take, like, earn, try, create* and *make*.

Author Keywords
Game verbs; game design; media violence; mobile games

ACM Classification Keywords
K.8.0.Personal Computing Games

BACKGROUND
With the growth of game jams[1], independent [2] and mobile play [3] the task of discerning game content continues to become complicated. Understanding a game's content is often left to literal review of visual elements and depicted content. The fundamental challenge with such approaches is that they fail to help people understand a game's intended meaning. This is particularly problematic

when considering abstract games or games that do not depict their subjects literally. As games aim to be a more expressive medium, supporting social impact, alternative interaction and other purpose driven goals, the ability to survey content in larger sets of games becomes increasingly important.

Understanding game content can be a tricky matter. Traditionally game content analyses focus on easily quantified or coded attributes [4]. Borrowing appropriate attributes from web design and other media analysis yields content studies that struggle to capture a game's intended meaning [5]. Useful data about the state of games can be gleaned from visual depiction methods [6], but these are non-inclusive of audio only games and other non-visual play. This paper suggests the value of systematic content analysis through game verbs.

Game design offers an approach to understanding game interactions using game verbs [7]. The game verb is the metaphorical description of how players meet their goals. If, for example a player needs to hit an object with another object to destroy it, the game verb for that interaction may be hit, kill, shoot, or send. The same collision between objects could be used to describe brick-breaking games, sports simulation, shooting games and affection games.

Such collisions and interactions are common in digital games, but the game verbs are the conceptual differentiator. That's because digital games operate on two levels. Games project their fictions through the communication and adoption of game specific representation. This representation is encoded both in the multimodal representations of the games and in the descriptions of those representations. This is particularly important when understanding the abstracted representations of game elements, commonly used in art games, newsgames and other non-literal representations.

Even popular experiences like the game Angry Birds[8], depict fairly abstracted visual representations of birds and pigs. In this case, the game's description and name provide content to help players disambiguate this representation. While it is not the case that the text based description of the game is the only way the game is disambiguated, the description does much of the framing. This includes providing backstory, context for player motivation and

game goals. This is true of narrative and non-narrative games. This same game-provided context can be encoded in other forms, such as cinematic sequences and instructions embedded within the game's code. However, much of the evolving world of games still requires a text-based description of a game to articulate the general game's situation and subsequent game verbs.

Game verbs, are the conceptual actions that players engage in to play the game [9,10]. Game verbs afford players the means to differentiate between common physical actions like clicking or tapping and their in-game meaning. In one game, a tap may destroy something; in another it may select it for manipulation. Visually such actions may be represented the same way, but conceptually the game verb is distinct. It is this second layer of operation that a textual analysis of games most benefits the researcher.

Much has been written about the preponderance of violence in games [11]. Much of this critique comments on the visual representation of such violence. While this area of research has produced much scholarly work, it has not yielded conclusive observation [12] nor alternative play solutions.

Games are at least as much about doing as they are about seeing. Unfortunately, much game content analysis is more often about sense data (e.g. seeing, hearing) than about what players are doing. Much of the interaction equation is in the doing. To further the area of game content analysis, we suggest that it is more useful to ask content questions about doing, as presented through game verbs.

Instead of selecting specific examples of particularly egregious depictions of violence or sexual content, it may be useful to ask questions about how the content is represented conceptually. In a space shooting game for example, little human violence is depicted because the game violence is captured at the scale of space ships, not interpersonal interactions. These games however, do ask players to destroy in much the way a first person shooting game might ask players to destroy an avatar. The productive question may be to ask the number and percentage of games that ask players to destroy or shoot as primary game verb.

In short, the conversation and subsequent research may benefit from asking the question, what are these games about, instead of what is depicted in these games? This disambiguates games about destruction from games about construction and liberation. It distinguishes pro-social play from its opposite, social impact from general entertainment, or rhetoric rich play from lightly rhetorical content. It interrogates a game with an emphasis on meaning, not just depiction.

When one player asks another player what they are doing, they do not respond that they are moving pixels, pressing buttons, generating sound or turning one depiction into another. Instead they describe their tasks in the framing of the game's fiction. The player is selecting 3 fruits to make a match, or killing soldiers.

From the lens of a media theorist, asking what a game is about is actually far more standard. Books are not measured by the number of violent acts depicted in them, but about the themes they embody. These themes are typically produced by individual characters within the book's fiction and their actions. Literary works from authors like Edgar Allen Poe have extraordinarily violent images in them, but they are not described as violent books. That is because in such a case the book is not about violence, it is about something else, and merely depicts violent acts to make its points. George Orwell's Animal Farm [13] is not an animal book and should not be understood as such, even though it depicts animals. Similarly, games can be about things other than what they depict.

The psychology behind the appeal of games that depict elements which stimulate is well documented [14]. It could be argued that games are merely using their most effective means for communicating. Games are articulate in their actions, or game verbs, in the same way books are articulate in their production of images through text. If this is the case, the question that should be asked is what are games about and how does that compare to other media?

As such, this paper seeks to start to answer that question. The use of game verbs for design is more than 30 years old [15], but the systematic study of game verbs is rarely executed. It is important to understand game verbs as the means to achieving a goal in games. Game verbs are like any other structure in a written narrative. Game verbs can be poorly joined, making for as awkward an experience as a poorly constructed sentence. Game verbs can be unappealing in the same way a poorly constructed paragraph may seem to drag on endlessly or fail to mean anything. Game verbs are the semantic unit of games.

Analyzing the semantic unit of game interactions provides a lens into the larger question – what are games about? If in a large scale analysis it becomes clear that games are about destroying, then that may provide a new perspective from which to critique games and more importantly, move the medium in a productive direction.

This type of analysis is also useful in framing other game practices, such as critical design games [16], or critical play [17], in which designers offer new game mechanics that upend or reflect on conventions of games. At the least, it helps illuminate patterns in game designs and affords for allegorical and metaphorical play as something more than the elements the game depicts.

METHODOLOGY: IDENTIFYING GAME VERBS
The English language affords more than 30,000 verbs as estimated by the Oxford English Dictionary [18]. Despite this very large set, a relatively few number of games verbs are specifically designed into games. The purpose of this

research is to capture the verbs explicitly used by game developers to describe their game.

It is perhaps quite telling that despite this very large affordance of almost 30,000 distinct interactions, the basic analysis conducted in this research notes only 38 distinct verbs used to describe the 70 top-selling mobile games assessed in this study.

For semantic analysis it is beneficial to understand that most game descriptions are written for a wide, basic audience. In mobile games in particular, these descriptions may be a player's only means of discerning a game for which they have interest from a game for which they have no interest.

Text analysis provides a particularly useful set of limitations. Unlike their rival Google Play, the iOS store does not afford the use of video trailers as of the writing of this paper. Until recently, developers were also not allowed to provide additional instruction text on the screenshots they provided to prospective buyers. This leaves a particularly strong emphasis on the text description of a game for understanding what was to be played.

Text descriptions are also a key element in the discoverability of a game. The search algorithms for games continue to bias toward keywords and the content with the game's description. Although such a search seems antiquated in a modern world of image based search, the industry standard remains. This means that players search via specific key terms that describe the games. Player may search by specific genres, which are often defined by their game verbs. Genre's such as match-3 or first person shooter, describe both the type of game and the primary game verbs. These terms are sometimes unique from the genre classification provided by the primary distributions of these games. Apple, iOS, for example, offers categories like puzzle and dice which do not encode any specific game verb. This is also true of the universally promoted super genres of console games [19], such as sports, or action. Admittedly some super genres, such as racing do indicate the primary game verb.

This study was conducted in two parts. The first part sought to identify common game verbs through basic observation. This quick and simple observational analysis was created to provide a baseline comparator for the larger study of mobile games. The second study employed a very basic natural language processing (NLP) approach for parsing common game verbs [20]. The results of the parse were then reviewed by the researchers to improve data integrity and yield the most commonly used game verbs. Both sets of study results are provided in the following sections.

IDENTIFYING GAME VERBS THROUGH OBSERVATION

While there is no formal definition of common game verbs, it is reasonable to consider the super genres of console games and the trends of casual and mobile games.

In the first phase of the research, a simplified content analysis was conducted to determine common game verbs that may be mined from game descriptions. The top selling games from the 5 most common super genres were reviewed for commonly used game verbs. For each super genre, the 3 best-selling games [21] were played and reviewed for generalizeable game verbs. The common game verbs attributed to the 5 largest game super genres are provided in table 1.

Super Genre	Commonly Used Game Verb	% of All Games Sold
Action	run, jump, collect, avoid	19%
Shooter	shoot, run, jump, collect, avoid	18.4%
Sports Games	run, throw, kick	14.8%
Fighting	kick, punch, conjure	11%

Table 1: Console game super genres and sales percentage

This table is provided to provide a general example of the ways in which game verbs map to game genres.

From this simple analysis it is clear that the verb run likely permeates nearly half of the entire console games sold. The verb is common to action, shooter and sports games, which represent 52% of the console games sold. Conceptually, it can be understood, that movement of some sort is common to many games. The verb collect is also common to a large number of games.

From this observational analysis it is clear that there is both a superset and subset of common game verbs. The super sets observed were actions of elimination, categorization and transformation (in the computer graphics sense of transformation matrix). Elimination game verbs remove game elements, most commonly by destroying them or changing their state (e.g. from active to non-active). Transforms are synonymous with the computer graphics processes of changing object attributes in space. Transforms remap game objects typically requiring players to scale, rotate or augment existing objects (e.g. adding armor). Categorize actions require players to find difference or similarity based on object attributes.

Table 2, provides four verb super sets with example in-game verbs as described in game documentation and through game advertising on websites and video trailers.

Verb Super Set	Game Verb Subset
Elimination	shoot, kill, destroy, banish, immobilize
Categorize	match, differentiate, separate, choose
Transforms	Move, jump, Scale, rotate, dress/parent

Table 2: Verb super sets and in-game verbs witnessed

This list of game verb supersets is not exhaustive. Instead it serves to demonstrate the potential of excavating game verbs to catalog games. It could be imagined that a large scale analysis of game verbs could help describe games in more meaningful ways. Game genres could be replaced or extended by game verb couplings which indicate the intended contextual meaning of a game. A game could be described as a transforms game or categorizing game, as 40% elimination and 60% categorization. This initial

evaluation simply demonstrates potential benefits of understanding verb sets.

CONTENT ANALYSIS OF MOBILE GAMES

Although conceptually useful for categorizing the ways in which games allow players to solve problems, the game verb subsets are not practical in a large scale content analysis until a large universe of game verbs is understood. The complexity of the English language, combined with the nuances of its grammar make the effective analysis of verb forms into verb supersets a large task for meaningful exploratory research. As such a second, more substantial content analysis was conducted using word frequency to identify common game verbs in mobile games.

Instead of analyzing the content as piloted in the console game analysis, it was determined that a word frequency may yield more useful and generalizeable results. For appropriate comparison the researchers reviewed the most common distributors of digital games.

It was determined that mobile games offered an appropriately wide demographic and standardization of descriptions (when compared to console games). Of the three mobile games distributors, Amazon, Google and Apple, Apple's product offered the best resource for such analysis. Apple's App store was chosen because it has the longest history of the three retailers and the most rigid standards for developer publication (thus standardizing the set more completely than Google or Amazon). It also relies heavily on text descriptions and prevents publishers from making false claims about content. As a result, the controls enforced by the Apple store provide a slightly more reliable data source for analysis.

The descriptions of the Apple App store's best selling games in 2011, 2012 and 2013 were used as the basis for a mobile game verb frequency analysis. Data for the 10 best selling mobile gamess as reported by Apple in each of the years was collected. For 2013, data for the 50 best selling games as of August 1, 2013 were also recorded. All rankings were based on Apple's self-reported sales data and ranks.

Each mobile game's text description was digitally parsed and copied from the Apple App store and stored in a relational database table. Since the web content evolves over time, the data was stored from the same 3 day period. The content of the description was limited to the game description and did not include disclaimers, warnings, and other metadata provided in some game descriptions. Metadata about the game's developer, sales rank, rating and release date were also captured directly from the Apple App store archives.

Using the relational database of mobile game descriptions, the frequency for each word was calculated. For the years 2011 and 2012 the top 10 best selling games used 5,811 words. The mean number of words per description was 291 for the 20 mobile games analyzed. These descriptions used 1,816 unique words in total. Top selling mobile game descriptions has a word diversity score of 31%, calculated by dividing the total number of words by the total number of unique words.

To provide a useful comparison, the same basic data was collected for the best selling adult fiction books of 2011 [21] and 2012 [22]. To collect data for best selling adult fiction, data was scraped from Amazon.com's online description of each book. The data was also deposited in the same relational database as a separate table. The best-selling book descriptions used 2,853 words and word forms. 1,178 unique words were used to describe these best-selling books. The mean number of words was 143 per book. Book descriptions had a word diversity score of 41%.

The 50 best selling mobile games of 2013 used 14,477 total words. 3,547 words were used uniquely. The 50 best selling mobile games have a word diversity score of 25%.

Table 3 provides the list of all mobile game verbs discovered and the number of times each verb occurred for top 10 games in 2011 and 2012.

Verb	Type	Number of times Used
Verb to be (be, is, are, it's)		98
Play / Playing	Partial	42
Use		23
Can		19
Touch		16
Features	Partial	16
Have / Has		26
Will	Partial	13
Get		13
Take		11
Like		11
Earn		9
Try		9
Review	Partial	8
Create		8
Make		8
See		7
Jump		7
Know		7
Follow		7
Score	Partial	7
Match	Partial	7
Discover		6
Doodle	Partial	6
Love		6
Played		5
Become		5
Turn	Partial	5
Purchase	Partial	5
Find		5
Makes		5
Check		5
Fly		5

Table 3 table is limited to verbs that occurred 5 times or more across the two years of best-selling mobile games.

To identify verbs from the complete set of words, game verbs were isolated and tagged. Because the English language has varied verb forms and because some verbs are ambiguously verb, noun or other forms in written language each verb had to be reviewed after it was parsed from the data. The word *help* is a common example of a verb – noun ambiguity. Other nouns were used as verbs in the sentences because authors chose not to respect grammar standards or because descriptions were poorly formed. To clarify these and provide more useful quantified results, the game descriptions were reviewed for each occurrence of the verb. If a verb was used as a noun or other form at least one time, it was labeled as a partial usage verb.

Likewise if a noun was used one or more times as a verb, it was also included in the list of verbs (e.g. to game) as a partial usage verb. If a verb form occurred more than once all forms were combined into a single result. Any trademarked or otherwise proprietary words were reported in word totals, but not included as verbs. These include proper-nouns used as verbs.

Applying the concept of game verbs to this list provides some interesting observations. Table 3 demonstrates that, excluding partial usage verbs and the verb *to be*, the most commonly articulated game verbs are *use, touch, get, have, take, like, earn, try, create* and *make*. If summarized, such words focus on acquisition (use, get, have, take), creation (create, make, earn). The focus activity of these top-ranking games might then be read as acquisition and creation.

The total number of verbs used 5 times or more in these descriptions represents 9% of the total number of words used. The proportion of verbs used to describe games is slightly higher than the proportion of verbs available in the English language [18]. If understood as frequency, the verb *use* occurs an average of 8 times per game description. Touch occurs an average of 5 times, and get 4 times per description.

Expanding the data to include the 50 best selling games in 2013 and then 10 best selling games from the 2012 and 2011 provides evidence of the importance of unique verbs. Table 4 outlines the words occurring 25 times or more in all games in the data set. As expected the most verb diversity occurs within the most unique uses. For the top mobile games more than half the distinct verbs occur fewer than 5 times. 42 unique verbs occur more than 5 times in all of the games. 110 additional unique verbs occur between 2 and 5 times in the entire data set.

This suggests that while many of the verbs used to describe games are common, it is the rarely used verbs that distinguish games from one another. This becomes clear when noting verbs at the bottom of table 3 which are more specific to individual games. The verbs, *doodle*, *find* and *fly* are distinct to a few mobile games, where *try*, *get*, and *take* are common to many.

Addressing concerns in game violence, it is useful to note that a number of violence associated verbs are noticeable absent from the table. Verbs such as *smash*, *shoot*, and *kill* all occurred fewer than 5 times across the top ranking mobile games. These verbs appeared twice, once and never respectively for top ranking games. The verb destroy was used as often as *solve*, *sort*, and *stack*, with two uses the complete list of top ranking games.

Verb	Number of Times Used
To be (is,are, be)	257
Play	113
Can	103
Have, Has	68
Touch	41
Like	37
Unlock	34
Take	33
Run	32
Help	31
Make	28
Own	28
Create	28
Earn	25
Go	25

Table 4: Verb occurrences for 70 of the top selling mobile games

For the 50 best selling games of 2013 the verb smash occurs 6 times. The verb shoot (in forms shooter, pea-shooter, and troubleshoot) occurs 8 times. The verb kill occurs 4 times for the same set. These results might imply that largely popular games are not violent, but that destructive or violent verbs are more common among less popular games.

SIMPLE CONTENT ANALYSIS OF BOOK DESCRIPTIONS

A comparison of book descriptions to mobile game descriptions is apt for a few unique reasons. Book descriptions, like mobile games are subject to review by their retail outlets. Best selling charts have strong bearing on their visibility to consumers and ultimately their popularity for both mediums. In both mediums, descriptions directly effect rankings. The mere fact that the major retail distributors of media have chosen to offer books, music and games as their primary products also indicate their affinity. Lastly, as the research method uses linguistic attributes to analyze games, it is appropriate to evaluate the two medium's content under a somewhat neutral but shared criteria. Both have their content summarized, without

giving away the entire experience, through brief descriptions meant to outline the overall content of their subjects. For comparison, an analysis of book descriptions yielded the following results shown in table 5.

Verb	Type	Number of Times Used
Is,be, are, been	V	87
Has	V	19
Realize	V	12
Love	Partial	7
Find	V	6
Can	V	6
Would	V	5
Like	V	5

Table 5: Verb occurrences for 2011-2012 top selling books

Table 5 lists words occurring five or more times in the 2 years of top-selling books. Of note for understanding books' use of verbs, is the relatively high ranking of two complex and specific verbs, *love* and *realize*. The use of the word *realization* may indicate narrative conventions of storytelling commonly employed in novels such as a denouement precipitated from a realization.

Unlike game descriptions, which describe themselves self-referentially (i.e. game, play), books don't. If they did, the verb read, for example, would be much more commonly used (as the verb play is). Instead, *realize*, *love*, and *find* are high frequency words. It is also important to note that while the verb *play* is prevalent in game descriptions, the verb *read* is not.

Games are played, and books are read, but games seem to assert the action of playing far more often than books assert reading. This may be an artifact of marketing linguistics, a user focus in description of games, or other social factors unique to games or books. It is useful to not that games reference themselves as played more significantly than books describe themselves as being read.

Game Verb	Number of # Times Used	Book Verb	Number of # Times Used
Use	23	Has	19
Can	19	Realize	12
Touch	16	Find	6
Have / Has	26	Can	6
Get	13	Would	5
Take	11	Like	5
Like	11	Made	4
Earn	9	Do	4
Try	9	Wants	4
Create	8	Know	3

Table 6: Comparison of top ranking verbs used to describe games and books

If the highest ranking, non-partial use verbs are compared between the two mediums the results are listed in table 6. From table 6 it is clear that top selling games and top selling books employ different verbs. Game verbs seem to have a clearer physicality (e.g. use, touch, get, take) while book verbs are more conceptual (find, realize, want, know). This dichotomy is not particularly pronounced, but it hints at a potential differentiate in framing. It is noteworthy that unlike books, popular games rarely describe realization, wanting, or knowing.

THE RELATIONSHIPS OF NOUNS

Understanding game nouns may also provide insight into the designed activities of games. The fundamental challenge with nouns however is that nouns vary far more greatly than verbs. There are far more nouns than verbs in the English language. Nouns are the product of adjective modifiers which also change them greatly. If the game verb is kill, the response to killing ants, differs from soldiers, which differs from zombie soldiers. The analysis of game nouns greatly complicates this framing of analyzing games because the games are actually far more varied in their representation of nouns. They are also artificially limited in their choice of nouns, as the nouns are the most common point of critique. Players respond very differently to a game about reproducing rabbits, versus reproducing humans. This is further complicated by existing agencies which limit depiction of specific nouns (e.g. naked human versus naked animals), but are not nearly as critical of game verbs.

Such policies result in the transformation between platforms of military soldier into zombies to avoid semantic representation issues of depicted violence. While both games may be about killing something, technically a zombie is not killed as a zombie is already dead. It does not matter that a zombie, as a noun, is the subset of a human superset (because a zombie was once human). The noun relationship to its superset is very different, unlike verbs. It is for this reason that noun analysis is likely to be far less fruitful in understanding what a game is about. It is also important to understand that nouns have dual meanings which may be easily lost. Noun analysis expands this research to a considerably larger scale.

It is valuable however to note that a few nouns occurred more often in one medium over the other. The word *war* appears 17 times in the top selling books of 2011 and 2012. It occurs 5 times in all best-selling game descriptions from 2011-2013. In short, despite their reputation, the 20 top selling fiction books mention war 3 times more often than the 70 top selling games.

Also notable is the use of personal pronouns. The word *her* occurred 40 times in books, but only 5 times in the top ranking games. Likewise, she, which occurred 18 times in the book's data, occurred only twice in best selling mobile games. For all games descriptions reviewed between 2011-2012 the pronoun *he* occurred 4 times. The *he* pronoun occurred 17 times in the 70 best selling mobile games set.

The words *death* and *life* occur 8 times in best-selling books. In best selling mobile games from 2011-2012, *life* occurs twice and *death* does not occur once. When expanded to the best selling games of 2013, the word like

occurs 24 times. The word death occurs 3 times, and the hyphenated phrase life-or-death occurs 1 time. This may indicate that while the most popular games are not concerned with life or death scenarios, second tier popular games are concerned with life and death scenarios.

As mentioned some of the difference in language in description precipitates from retailer decisions about appropriate content. Apple does limit the content and descriptions of games. However, death, a common concept in games is not prohibited. Death, as a key describing concept does not occur in the top 10 best selling games. The word appears 3 times in top 50 best-selling games of 2013. The 50 best-selling games of 2013 use the word life 18 times, the same number of times as the 20 best-selling books of the prior two years.

These differences may indicate content biases between the two mediums. Some developers of book and game content question the appropriateness of large concepts like life and death in games. Others might see gender bias or gender neutrality in the use or, lack thereof, for gender pronouns. It is at the least useful to notice these difference between the two mediums.

Conclusions:

From this analysis it is tempting to state that books are perhaps more violent or more grave than games. It is also tempting to state that books are far more explicit in their gender orientation than mobile games. However, to make such claims would be a gross generalization and as inaccurate as labeling all digital games as violent or misogynistic. While it is not the researchers aim to make such sweeping observations it is clear that this approach to understanding game content yields noteworthy patterns.

It is interesting to see that by these metrics, popular games are not particularly violent, as actions like play, having and touching are the top ranking game verbs in mobile play. Books, in contrast, favor having, realizing and loving.

Word diversity is greater in mobile game descriptions than in book online descriptions by 10%. Both marketplaces are diverse, with a wide set of products for consumers to choose from. Notably, games were described through more articulations (as number of words) than books, despite the word bias in the book medium.

Future study would benefit from more comprehensive linguistic analysis. Additional study is complicated by the fact that parsing whole book texts have few compliments for comparison in games. A previous, preliminary study of game manuals conducted as part of this research indicated the decline of manual production in wake of digital content. Likewise, package descriptions which once lined the back of printed copies of games have been replaced by downloadable versions which are typically offered via video trailers. This preliminary analysis then serves as an example of a linguistic analysis of games awaiting more detailed application.

In compliment, questions can be raised about who constructs theses descriptions and whether that effects their content. Despite popular consumer misunderstanding, mobile games are marketed, and their descriptions are constructed by individuals trained in the same skill sets as those who market and author book descriptions. Both seek to make their product distinct, noteworthy and curiosity inspiring.

If researchers want to understand the trends of game design and development on a larger scale it is clear that systems must be derived to understand the content of these games. Instead of employing subject matter experts to evaluate each game on a case-by-case basis this research demonstrates some utility in description analysis of games. This is particularly important when considering the value of game verbs in the meaning and problem solving prescriptions in games.

The research does not claim to offer a one-sized fits all solution for understanding content. Instead what is offered is a demonstrative example of how large scale analysis of diverse games may be understood. This method is particularly useful for understanding the content of games as a set of interactions, not just objects. In games players are tasked with accomplishing goals with the few verbs allowed them within the game. These affordances are the heart of the game's interactions and provide much context about game content. Even though two games may have war as a setting, if one game requires players to shoot and the other requires players to heal, the games are quite different. This difference is important regardless of the graphical depiction. Distinction by game verb is what differentiates conventional entertainment from social impact or an educational game from a match-3 game.

Such methods support the continued growth of diverse play experiences and research. It is clear that game researchers have struggled with an appropriate way to catalog and analyze large sets of varied play experiences. A linguistic approach, in conjunction with other approaches seems an appropriate way to capture unique aspects of games.

It is clear that such research does have short fallings. Descriptions may not always be accurate and are often designed to attract. However, this is true of all descriptions related to marketed media. Allowing for the apparent short fallings of any approach, linguistic analysis of games demonstrates forward-thinking opportunities to increase our understanding of game content.

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