Optimal distinctiveness in the video game industry: How do organizations combine primary and secondary schema features to position novel products in established categories?

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How can organizations successfully introduce novel products into established market categories? This question lies at the intersection between institutional theory and strategic management where scholars typically argue that products need to be optimally distinct to be perceived as acceptably novel by key audiences (Deephouse, 1999; Zuckerman, 1999). Optimally distinct products conform to category schemas to be considered legitimate competitors, but are also differentiated from competitors to capture the audience’s attention and to avoid the most crowded places in competitive markets (Deephouse, 1999; Zuckerman, 1999, 2016). Optimally distinct products are believed to be successful because they strike a middle ground between fitting into established categories schemas and offering something new in relation to competitors (Barlow, Verhaal, & Angus, 2019; Deephouse, 1999; Zhao, Fisher, Lounsbury, & Miller, 2017; Zhao, Ishihara, Jennings, & Lounsbury, 2018). The consensus in this body of work seems to be that novelty is introduced into markets through optimally distinct products which out-perform rival products which are either too conforming or too differentiated for the audience.

However, to date, most studies conceptualize optimal distinctiveness along a single dimension of features in the category schema, but ignore how organizations create optimally distinct products by combining primary and secondary product features. Primary features can be considered key markers of category membership while secondary product features modify the exact position of a product vis-à-vis all other category members (cf. Wry, Lounsbury, & Jennings, 2014). Studying how organizations combine such primary and secondary features contributes to an understanding of how organizations can successfully introduce novelty in established market categories that goes beyond the rather vague insight that new products need to be moderately differentiated from the category schema. Tracing how organizations combine primary and secondary features leads to a more precise understanding of how organizations can introduce novel products into established categories that are recognized and rewarded by audiences.

In this study, we examine how new products introduced within established market categories are received by an audience of market critics based on a product’s distinctiveness on the primary and secondary features in the category schema. We hypothesize that products conforming on primary features but differentiated on secondary features receive higher critical acclaim than rival products. Optimal distinctiveness should thus not be thought of as the middle point along one axis, but rather as a combination of conformity on primary features and differentiation on secondary features. In such a conceptualization, organizations can make novelty recognizable and acceptable for audiences by combining conforming primary features and differentiated secondary features. Audiences thus reward novel products that modify a set of highly recognizable and accepted primary features with a series of differentiated secondary features.

More specifically, we analyze the North American market for the seventh generation of console-based video games (PS3, Xbox 360, and Wii), to study how games combine conformity and differentiation on the primary features of the category schema in terms of the game world portrayed in the game and the secondary features of the schema in terms of the game mechanics through which players move through the game. We demonstrate that considered independently, games highly conforming to the primary schema features describing the game world receive higher critical acclaim, while differentiation on the core mechanics as secondary schema characteristics is unrelated to critic scores. However, considered together, games combining high conformity on primary features and high differentiation on secondary features or vice versa receive higher acclaim than games either highly conforming or highly differentiated on both primary and secondary schema features. Especially games portraying a game world closely conforming to the category schema through which gamers move with a highly novel and differentiated set of core mechanics receive high acclaim in this market. Novelty on one dimension of the category schema is thus best introduced in combination with familiarity on other features of the schema.

**Optimal distinctiveness in established market categories**

Organizations introducing novel products into markets typically need to take established market categories into account, because categories not only shape the consideration set from which audiences select products but also contour the strategic decisions available to producers (Hannan, Pólos, & Carroll, 2007; Pontikes Elizabeth & Kim, 2017; Zuckerman, 1999, 2016). Producers position their products in relation to established market categories by claiming the label associated with a category and by incorporating the key features of the category schema into their product (Hannan et al., 2007; Pontikes & Hannan, 2014). Labels function as descriptive tags and offer a shorthand for market participants to talk about the class of products categorized together (Hannan et al., 2007). Category schemas define the most salient features that determine category membership and that most category members are believed to share (Durand & Boulongne, 2017; Hannan et al., 2007; Pontikes & Hannan, 2014).

While earlier research to categorization processes mostly focused on how producers claim labels for their products (Hsu, 2006; Hsu, Negro, & Perretti, 2012; Pontikes, 2012), more recently scholars have started to directly measure category schemas to examine how producers position their products in relation to the category schema (Barlow et al., 2019; Beck, Swaminathan, Wade, & Wezel, 2019; Haans, 2019; Kovács & Johnson, 2014; Pontikes Elizabeth & Kim, 2017). Such studies typically use natural language processing algorithms to measure how a producer positioned its offering compared to the category schema (cf. Barlow et al., 2019; Haans, 2019). Through such strategic categorization, shrewd market actors position their products into market categories for which they can credibly claim an affiliation, that resonates with the relevant audiences, and that is distinct from the position of competitors (Giorgi & Weber, 2015; Haans, 2019; Pontikes Elizabeth & Kim, 2017).

To date, most research to strategic categorization argues that such advantageous positions can be found when novel products are positioned as optimally distinct from the category schema (Askin & Mauskapf, 2017; Barlow et al., 2019; Zhao et al., 2017; Zhao et al., 2018). Products positioned as too distinct from the established category schema confuse audience members who will find it difficult to understand, compare, and evaluate such highly differentiated products (Barlow et al., 2019; Zuckerman, 1999). At the same time, products that conform too closely to the category schema run the risk of being overlooked by the category audience, because such products fail to offer a sense of novelty, might be seen as cultural dupes, and occupy a crowded space in the category where it is hard to stand out among competitors as consumers have many alternative options (Askin & Mauskapf, 2017; Barlow et al., 2019; Deephouse, 1999; Zhao et al., 2017). Strategic categorization scholars thus typically argue that optimal distinctiveness is key to successfully position novel products into established market categories.

**Primary and secondary schema features**

While the theoretical ideas on optimal distinctiveness are supported by a growing body of empirical research (cf. Zhao et al., 2017), the literature so far has generally assumed that all features of the category schema are equally salient to define category membership (Durand & Paolella, 2013; Zhao et al., 2017). Typically, researchers conceptualize optimal distinctiveness along a single axis of features by measuring the overlap between the features of a product and the features of the category schema (Barlow et al., 2019; Haans, 2019; Hannan et al., 2019; Wang, Rao, & Soule, 2019; Zhao et al., 2018). Such a conceptualization essentially assumes that category schemas, conceptualized as prototype or exemplar, exist within a uniform and one-dimensional feature space where there is no consideration for how different types of product features come together to define a category schema.

Recent theoretical developments have questioned the assumption of a uniform, one-dimensional feature space to argue that category schemas can also be conceptualized to exist in a hierarchically structured feature space where some features are more important markers of category membership than others (Durand & Paolella, 2013; Wry et al., 2014). Such research points out that schemas can also be conceptualized as causal models where especially the product features that cause a certain effect are key markers of category membership or as goal-based categories where product features that allow audiences to attain certain goals are primary indicators of category membership (Durand & Paolella, 2013). What these conceptualizations of category schemas have in common is that they go beyond the uniform, one-dimensional category schemas of prototypes and exemplars by portraying a hierarchical feature space where category schemas consist of features that function as primary markers signaling category membership and other features operating as secondary markers that modify the position of a product within the category (Durand & Paolella, 2013; Wry et al., 2014).

In video games, the industry studied here, conceptualizing category schemas as existing in a hierarchical feature space might be useful to define a hierarchy of primary and secondary features that mark membership in specific genres. In this industry, primary features can be defined as the game world portrayed in the game. Game worlds display the general theme of the game, provide the setting in which the story of the game unfolds, and visualize the characters and places central in the game (Schell, 2014). More importantly, game designers typically see the game world as crucial to draw players into the game, because the game world is the most visible key element of the game that hooks players and that provides the main point of identification for gamers (Schell, 2014). As game worlds define the look and feel of a game, it is likely that game worlds function as the most visible and significant marker of category membership. As such, games are recognized by relevant audiences as First Person Shooters (FPS), because the game uses a first-person perspective, possibly with only the hands or the weapon of the protagonist displayed in the screen, the world contains enemies, and the world displays a war setting full of action.

Besides defining the game world as the primary schema features, the category schema also contains secondary features that set games apart from competitor games in terms of the core mechanics of the game. If the game world provides “the skin” of the game most visible to gamers, the core mechanics are like “the skeleton” of a game defining the rules of the game, the actions gamers can take in the game, and the way how the game responds to the player’s actions (Schell, 2014). Many video games, and perhaps even the large majority of games in general, are designed with the purpose for the player to complete or to win the game (Egenfeldt-Nielsen, Smith, & Tosca, 2016, but see Boellstorff, 2008 for an interesting counter-example). To achieve the conditions to win a game, players need to undertake certain basic actions which constitute the core mechanics of a video game (Egenfeldt-Nielsen et al., 2016). As these core mechanics are not directly apparent to gamers they might be less visible, secondary markers of category membership compared to the game world portrayed in the game.

When positioning products in relation to the category schema, it is likely that the point of optimal distinctiveness differs for the primary and the secondary features of products (cf. Durand & Boulongne, 2017; Durand & Paolella, 2013). Such differences in the point of optimal distinctiveness come about because the game world functions as the primary identifying markers of category membership, while the core mechanics of the game are more like secondary features that modify the position of the game in relation to other games in the category (cf. Wry et al., 2014). Primary features thus have a stronger impact on category membership, while secondary features function to modify the position games take within their category.

For the primary features, conformity might lead to more positive appraisals by market critics for two reasons. First, products conforming on primary features might be more easily recognized as legitimate category members that appeal to the tastes and preferences of the category audience (Barlow et al., 2019; Zuckerman, 1999, 2016). Game critics can more easily recognize a game with a similar look and feel to the game world as other games in the same genre, and there is already an established understanding that playing a game of a particular genre should take place in a certain taken-for-granted setting. Second, products conforming on primary features are more easily compared to similar products in the category and benefit when they come out favorably in such quality comparisons (Durand & Kremp, 2016). Conformity on the game world thus makes it possible to compare a game to rival games and assess whether the game world ‘looks and feels right’ for a game in the genre.

In contrast, products differentiated on the primary features might lead audiences to feel that a product is missing important features or that the product combines features that are perceived to be not fitting together. Such games might be overlooked by category audiences, because they feel that some key game world characteristics of the genre are missing from the game or that the game offers an unexpected and uncharacteristic combination of game world traits. Similarly, audiences might overlook products with differentiated primary features, because it is impossible to compare the quality of the product vis-à-vis competitors. For such games, game critics find it hard to assess whether the game offers a game world experience of enough quality. Whether due to the lack of credibility of the claim for category membership or due to more complicated quality comparisons, we expect that products differentiated on the primary features of the category schema receive lower evaluations from market critics.

**Hypothesis 1:** Products that differentiate on the primary features of the category schema are more negatively evaluated by market critics than products that conform to the primary features of the category schema

In contrast to how market critics value conformity on primary features, for the secondary features of products market critics might actually value differentiation. After all, primary features define category membership, while secondary features are the auxiliary features that modify the exact position that products take within the category (cf. Wry et al., 2014). As deviation on secondary features is unlikely to undermine claims for category membership, organizations have more freedom to integrate differentiated secondary features in their products (cf. Beck et al., 2019; Durand & Paolella, 2013). Such differentiated secondary features allow producers to stake out a less crowded position within the category and introduce novelty and innovation into their products.

Differentiation on secondary features is likely to lead to higher audience evaluations for two reasons. Firstly, when products differentiate on secondary features, they might occupy a less crowded position in the category with fewer rivals competing for the attention of market critics (cf. Barlow et al., 2019; Haans, 2019; Wry et al., 2014). Secondly, such products stand out as offering something new and different compared to rival products (cf. Askin & Mauskapf, 2017; Barlow et al., 2019). For example, game critics might value games with differentiated secondary features as offering a refreshing and interesting take on the genre by offering a new and innovative set of core mechanics to explore familiar themes in the game world. In contrast, games with similar core mechanics to other games in the genre might be seen as derivative games that do not give gamers the opportunity to explore new and interesting ways to play games in the genre (cf. Schell, 2014). Whether due to a less crowded position or due to the novelty of the product, it might be expected that products framed as differentiated from the secondary features of the category schema receive higher evaluations from market critics.

**Hypothesis 2:** Products differentiated from the secondary features of the category schema are more positively evaluated by market critics than products conforming more closely to the secondary features of the category schema

While primary and secondary features might have an independent effect on the critical acclaim products receive from market critics, primary and secondary features might also interact to shape critical acclaim in tandem. Game designers, for example, typically argue that while the design of both the game world and the core mechanics are important to determine the quality of a game, what is even more important is that the game world and the core mechanics are in harmony with each other so that they reinforce each other and work together to support the common theme of the game (Schell, 2014). In such a conceptualization, it is thus not necessarily conformity on primary features and differentiation on secondary features that make a game successful, but rather a combination of novelty on one dimension with familiarity on the other dimension of schema features. As such, it might be that conformity on primary features interacts with differentiation on secondary features (or vice versa), so that games that combine conformity on one dimension of the category schema with differentiation on the other category schema dimension receive higher critical acclaim than games that either conform or differentiate on both dimensions.

**Hypothesis 3:** Products that combine conformity (differentiation) on primary features with differentiation (conformity) on secondary features are more positively evaluated by market critics than games with high conformity or high differentiation on both primary and secondary features

**Data and methods**

To study how organizations combine primary and secondary features to introduce novel products into established categories, we study the console based video games industry. Since the 1990s, a taxonomy of game genres has developed in the video game industry to classify games that are perceived as similar within the same category (Kent, 2001). This taxonomy functions as a reference point for critics to understand and evaluate new games that are introduced in the market (cf. Egenfeldt-Nielsen et al., 2016; Zhao et al., 2018). We study the video game industry with data obtained from GameFAQs, a community-based database that has been used in previous academic research to the video game industry (Newman, 2008; Venkatraman & Lee, 2004). GameFAQs records information about over 200,000 video games from the rise of the arcade games in the early 1970s to the present day. From the GameFAQs data, we study all the stand-alone video games that were published in the North American market on the 7th generation of video game consoles (PS3, Xbox 360, and Wii) and that were reviewed by Metacritic. By focusing on stand-alone games, we exclude all downloadable content, expansion packs, and compilation games from the analysis. In total, we identified 2,778 stand-alone video games published in the North-American market on the PS3, Xbox 360, or Wii.

While a total of 2,778 games were published during the entire lifespan of 7th generation of video game consoles from 2005 to 2016, we focus our analysis on the 2,515 games published between 2007 and after 2013. While the 7th generation started with the introduction of the Xbox 360 in November 2005, the PS3 and the Wii came on the market in November 2006. Consequently, the library of games published for all three consoles was relatively limited in 2005 and 2006 and only started to grow substantially from 2007 onward. Similarly, we limited our analysis to games published before 2014, because both Sony and Microsoft introduced their eighth generation console in November 2013 with the PS4 and the Xbox One. As a result, the number of games published for the seventh generation of consoles declined rapidly after 2013.

**Dependent variable**

Since we are interested in understanding how audiences evaluate games differentiated on primary and secondary features of the category schema, we take the review score by Metacritic as a measurement for how a game was received and evaluated by an audience of critics. Metacritic is one of the most authoritative critics in the market for video games. Metacritic scores are calculated as a weighted average of the review scores that all critics who reviewed the game gave. Metacritic only publishes scores for games which have been reviewed by at least four critics, while they weigh critic scores based on the stature of the critic. A game’s Metacritic score thus represents a weighted average of the review score and indicates how well the game is received by an audience of game critics. Metacritic scores fall between 0 and 100 and in our data, have a minimum of 13, a maximum of 97, a mean of 66, and a standard deviation of 15.

**Independent variables**

To study how games differentiate on primary and secondary features, we examine the descriptions that producers use to explain the game content to their target audience. Such descriptions typically focus on the game world and the core mechanics of the game and have an average length of 94 words. The descriptions figure prominently in the marketing materials used by video game publishers, as the descriptions, for example, appear in a prime position on the game’s website and play an important role in the information publishers put in online platforms where the game is sold. We examine these descriptions as the organization’s attempt to position their game in the market by describing the game world and the core mechanics to their audience of gamers.

The descriptions for the 2,515 games were examined using content analysis, where three coders (the two authors and one graduate student) independently selected key words from the description that convey information about either the game world or the core mechanics. The intercoder agreement on the key words selected from the game descriptions was very high, as indicated by a Gwet’s AC of .83 (Neuendorf 2017 **SOURCE**). During the coding process, the key words were tagged for whether they convey information about the game world or the core mechanics. During this process, we were careful to distinguish homonyms where the same word can have different meanings and to group together synonyms where different words carry the same meaning (cf. Hsu & Podolny 2005 **SOURCE**). On average, we identified 17 key words for each game that describe the game world and the core mechanics to the relevant audiences. We separately record all key words used in a game description, the key words identifying the game world, and the key words describing the core mechanics in three separate vectors.

Based on the selected key words, we define the category schema of a genre as consisting of the key words of the games published within the genre in a two year period that received a Metacritic score of 75 or higher. As only 27.5 per cent of the games in our data received a score of 75 or higher, Metacritic interprets such scores as indicating that a game either received generally favorable reviews or universal acclaim[[1]](#footnote-1). Two years is takes as a relevant time frame, because it usually takes around two years to develop a game (Zackariasson and Wilson 2012 **SOURCE**). Similar to previous studies, we removed idiosyncratic words that were used in less than 1 per cent of all games from the category schema (cf. Haans 2018 **SOURCE**). We record the key words in a genre’s category schema in a given year in three separate vectors for all words, key words portraying the game world, and key words describing the core mechanics. The vectors record for each key word the percentage of highly rated games published in the previous two years that use the key word in their description.

Based on the vectors of key words for the focal game and the highly rated games published in the previous two years in the same genre, we measure the level of conformity or differentiation of a game to the category schema by calculating the cosine similarity between the game’s vector and the corresponding vector of the category schema. We calculate the cosine similarity of a game compared to its category schema for all key words, for the key words denoting the game world, and for the key words describing the core mechanics. More formally, cosine similarity is expressed as:

Where represents the vector of key words for the focal game and represents the vector of key words for the category schema. Cosine similarity takes a value between 0 and 1, where 0 represents complete differentiation of a game from the category schema and 1 indicates that a game completely conforms to the category schema. Lower levels of cosine similarity thus indicate higher levels of differentiation and lower levels of conformity. To analyze the curvilinear relation hypothesized under optimal distinctiveness between differentiation and critical acclaim, we include both cosine similarity and squared cosine similarity for all words, game world words, and core mechanics words in the models.

**Control variables**

A number of control variables are included in the models. First, we control for the number of key words that we identified in the game descriptions, because the use of a larger number of key words might signal a more complex game world or a higher number of core mechanics. We also control for the console for which a game is published by including a dummy for games published for the PS3, for the Wii, and for the Xbox 360. We include a dummy variable for games that are part of a franchise, because franchise games might be more familiar to audiences. We also include a dummy for if a game is put in the market by a game developer and a game publisher (rather than just a game developer studio), as publishers might have more resources devoted to positioning games in the competitive market place than game developers (Zackariasson and Wilson 2012 **SOURCE**).

We further control for the level of competitive crowding in a genre by calculating the number of games published in the genre on the seventh generation of consoles prior to the publication of the game. Moreover, we control for the ESRB rating of games, by including dummies for games rated as suitable for Everyone, Everyone 10 and older, Teen, and Mature. Games rated suitable for Early Childhood function as the reference category. We also control for the genre in which the game is published by including dummies for action-adventure, adventure, miscellaneous, puzzle, racing, role-playing, simulation, sports, and strategy games, while action games function as the reference category. Finally, we include dummies to control for the year in which the game is published with 2009 functioning as the reference category, and for the month in which games are published with January functioning as the reference category.

**Estimation strategy**

The Metacritic score of games functions as the dependent variable in this study. Metacritic assigns scores on a range between 0 and 100, so that Metacritic scores are both left and right censored. We thus use tobit regression to estimate our models. As some game developers develop and publish multiple games in the dataset, we cluster standard errors by developer.

**Results**

Descriptive statistics and absolute correlation coefficients are shown in Table 1. While there are no notable problems with multicollinearity, of note in Table 1 to understand how game developers combine the game world with the core mechanics relative to the category schema are the correlations between the conformity of all key words, of the words denoting the core mechanics, and of the words denoting the game world. Both conformity on the game world and conformity on the core mechanics are highly correlated with conformity on all key words at .58 and .7 respectively. However, the correlation between conformity on the game world and on the core mechanics is relatively modest at .3. These correlation coefficients indicate that both the game world and the core mechanics are an important element in the descriptions developers use to position their game in the genre. Even though both the game world and the core mechanics are important markers of the game, both are distinct features of a game and developers combine them in a wide range of possible ways to position their game as conforming to or differentiated from the category schema.

---- Insert Table 1 about here ----

To further unpack how game developers use the game world and the core mechanics to position their product relative to the category schema, Figure 1 plots the conformity of the game world and the core mechanics for all games published between 2009 and 2016. Two reference lines are added to indicate the average level of game world conformity and core mechanics conformity dividing the plot into four quadrants. Games are scattered throughout the figure across all four quadrants, which indicates that game developers combine the game world and the core mechanics in various ways to produce games highly conforming in both their game world and the core mechanics, highly differentiated in both game world and core mechanics, and conforming on the game world and differentiated on the core mechanics, or differentiated on the game world and conforming on the core mechanics. The figure thus indicates that the game world and the core mechanics are relatively distinct features of the category schema which game developers use to try to find an advantageous position for their products.

---- Insert Figure 1 about here ----

A first indication of how combinations of game world and core mechanics features are evaluated by market critics is shown in Table 2, which provides the mean Metacritic score for games located in the four quadrants of Figure 1. The table shows that games with higher than average conformity on game world features are generally more positively evaluated than games with lower than average game world conformity, while games with low conformity on both game world and core mechanics receive the lowest critic scores. Interestingly, games with high game world conformity and low core mechanics conformity receive the highest scores, while there is only a marginally significant difference between the critic scores of games highly conforming on both dimensions and games with high conformity on core mechanics and low conformity on the game world features.

---- Insert Table 2 about here ----

Taken together, the descriptive statistics and the bivariate comparisons presented so far indicate that the game world and the core mechanics are distinct dimensions of games that developers use to position their products in relation to the category schema. In this competitive market space, game developers produce games with high conformity on both dimensions, low conformity on both dimensions, and high conformity on one dimension and low conformity on the other dimension. While games combine game world and core mechanics features in various ways, not all combinations are equally valued in this competitive market space. More specifically, games with high conformity on game world features but low conformity on core mechanics receive the highest critical acclaim, while games with high conformity on both dimensions and high conformity on core mechanics and low conformity on the game world also receive positive acclaim. Such results suggest that in the competitive market space for video games, games become optimally distinct by combining game world and core mechanics features in new but recognizable ways.

**Multivariate analysis**

The estimated Tobit regression models in Table 3 examine the main hypotheses. Model I and Model II function as baseline models by including the conformity of games on all key words compared to the category schema. This operationalization thus compares optimal distinctiveness in the North American video game industry to other findings in the literature on optimal distinctiveness. Model I in Table 3 shows a positive and statistically significant coefficient for conformity, while in Model II the coefficient for both conformity and squared conformity is positive and statistically not significant. These results indicate that there is a positive linear relation between the conformity of a game compared to the category schema and the game’s Metacritic score. More specifically, a one standard deviation increase in conformity leads to an increase in Metacritic score of 1.7 points.

While an increase of 1.7 points seems modest at first sight, it is useful to compare the impact of conformity to the impact that franchises have on Metacritic scores. After all, franchise games benefit from familiarity, as audiences are already familiar with the creative content of the franchise. Moreover, franchise games are arguably of higher quality, because it is likely that game developers and game publishers only develop their highest quality and most successful games into franchises. Model I in Table 3 supports such reasoning by showing that franchise games benefit from a higher Metacritic score of around 6.3 points compared to non-franchise games. A 1.7 points increase associated with conformity is thus equal to around 25% of the higher scores that franchise games receive from game critics. Considered in this light, conformity play a non-negligible role in the Metacritic scores of games.

Taken together, the results from the baseline models in Table 3 indicate that in the North American video game industry, game critics give higher ratings to games that conform more closely to the category schema than games differentiated from the category schema. Such a positive linear effect of conformity on critic appraisals might thus indicate that the categories in the North American video game industry are relatively heterogeneous (cf. Haans, 2019), where many games try to carve out a distinct position by offering something new to the audience of game critics and gamers.

---- Insert Table 3 around here ----

The hypotheses about the relation between conformity on the primary and secondary features of the category schema and the evaluation of market critics are examined with Model III, IV, and V in Table 3. Hypothesis 1 which suggested that games differentiated on primary features are more negatively evaluated is examined in Model III with conformity on the game world. In Model III, the estimated coefficient for game world conformity is positive, indicating that games set in a game world conforming more closely to the category schema are more positively evaluated by market critics. More specifically, a one SD increase in game world conformity is associated with a 1 point increase in Metacritic score, an increase similar to 16% of the higher scores for franchise games. Model IV adds the squared term for game world conformity. While the two terms indicate a U-shaped relation between game world conformity and Metacritic scores, the two coefficients are not statistically significant. These results are thus in line with hypothesis 1 and indicate that games portraying a game world conforming more closely to the game world in the category schema are more positively evaluated by market critics.

Hypothesis 2 expected that products differentiated from the secondary features of the category schema receive more positive evaluations from an audience of market critics. This hypothesis is examined in Model III and IV in Table 3 by adding the conformity of games on core mechanics characteristics. In Model III, the coefficient is positive, but not statistically significant, while the squared term in Model IV indicates an inverted U-shape relation so that a modest degree of similarity on core mechanics leads to more positive critical appraisal. However, the estimated coefficients for conformity on core mechanics in Model III and Model IV are not statistically significant. Taken together, these results thus provide no support for hypothesis 2.

Hypothesis 3 proposed that conformity on the game world and core mechanics interact to jointly shape the critical appraisal a game received from an audience of market critics. Model V in Table 3 examines this hypothesis by including the interaction term between game world conformity and core mechanics conformity. In this model, the coefficients for both game world conformity and core mechanics conformity are positive and statistically significant, while the interaction term is negative and statistically significant. In other words, while conformity on either the game world or the core mechanics is related to higher Metacritic scores, high conformity on both dimensions is associated with lower critic appraisal. Games that combine higher conformity on one dimension of the category schema while being more differentiated on the other dimension receive the highest critical acclaim.

To further interpret how the interaction between conformity on the game world and the core mechanics are related to Metacritic ratings, the top panel in Figure 2 plots the change in Metacritic rating for different values of core mechanics conformity for games of relatively low, average, and high game world conformity. The top panel shows that at relatively low values of core mechanics conformity, games with high game world conformity receive higher Metacritic ratings. However, as games become more conforming on core mechanics, the difference in Metacritic rating for games of low, average, and high game world conformity decreases and actually reverses for games with high conformity on core mechanics. However, it is important to keep in mind that the average core mechanics conformity is .25 with a SD of .19. This means that only games with relatively high values of more than 1 SD above the average core mechanics conformity receive higher Metacritic ratings when they portray a game world with very low conformity to the category schema.

---- Insert Figure 2 about here ----

The bottom panel of Figure 2 plots the estimated difference in Metacritic rating through changes in the game world conformity for games with low, average, and high core mechanics conformity. Similar to the top panel, at low values of game world conformity, games with high core mechanic conformity receive higher critical appraisal. However, at higher values of game world conformity, games with low core mechanics conformity are more highly valued by Metacritic. The three lines cross at a value for game world conformity of around .25, slightly above the average value of .23 for game world conformity for games in the dataset. The bottom panel of Figure 2 thus shows that games portraying a relatively differentiated game world compared to the category schema are more positively evaluated when the core mechanics are relatively conforming to the category schema. In contrast, games with a game world conforming to the category schema are more positively evaluated when they offer a relatively differentiated set of core mechanics compared to the category schema.

**Discussion and conclusion**

The goal of this study was the examine how novel products can be successfully introduced into established and taken-for-granted market categories by analyzing how products with varying degrees of conformity and differentiation on primary and secondary features of the category schema are evaluated by an audience of market critics. Results from studying 1,726 games published for the 7th generation of video game consoles in the North American market between 2009 and 2013 show that compared to all the features of the category schema, games that more closely conform to the category schema receive higher evaluations from Metacritic. Considered in isolation, conformity to the game world portrayed in the category schema is related to higher Metacritic scores, while conformity on a game’s core mechanics has no relation to Metacritic scores. However, when the game world and core mechanics are considered together, games receive higher review scores when they conform closely to the category schema on one dimension and are differentiated on the other dimension. Higher critical acclaim is especially awarded to games that introduce novelty by exploring a game world closely conforming to the category schema with a relatively innovative and novel set of core mechanics.

These results make two contributions for theories about categorization processes in markets. The first contribution is that our study provides a reconceptualization of optimal distinctiveness where previous research generally argued that products which strike a balance between conformity and differentiation are more successful than either highly conforming or highly differentiated products. While optimally distinct products are generally perceived as conforming enough to be considered legitimate category members and distinct enough to offer novelty and to stake out a position that avoids intense competition, theories of optimal distinctiveness typically assume that all product features are equally important in making products optimally distinct from competitors’ offerings. Such a theory does not take into account how different product features shape the level of legitimacy and competition around the positioning of a product relative to the category schema. Without distinguishing different features, producers are left with the relatively vague recommendation to strategically categorize their products with the ‘right’ amount of conformity and differentiation vis-à-vis rival products.

In contrast, our study argued and demonstrated that optimal distinctiveness does not result from the ‘right’ amount of differentiation on all product features, but rather results from the combination of conformity and differentiation on primary and secondary features in the category schema. We theorized and found that primary features are key markers of category membership so that a small deviation results in a sharp drop of legitimacy. In contrast, secondary features are not as critical for category membership, so that producers have more leeway to vary the secondary features of their products to stake out a distinct position in the category and to introduce novel and innovative features into their products. Results of our study demonstrate that, in the North American video game industry at least, games that combine a game world tightly conforming to the category schema with innovative core mechanics that deviate from the category schema receive higher critical acclaim. The optimal level of distinctiveness is thus not any moderately distinct combination of product features, but rather a combination of conformity on primary features and differentiation on secondary features.

A second contribution of our study is to go beyond the prototypical theory of category schemas to show that category schemas conceptualized as a hierarchical set of primary and secondary features shape how products are evaluated by an audience of market critics. While early studies to categorization processes mostly relied on category labels and left category schemas unmeasured, a recent flurry of research has worked to operationalize and measure category schemas using natural language processing algorithms. What all these studies have in common, though, is that they follow the prototypical or exemplar approach that sees schemas as consisting of a single dimension of features of the average or the exemplary products in a category. Category schemas are thus theorized as bundles of features, where each feature is equally important to determine the grade-of-membership of an offering into a category. Audiences are assumed to compare and evaluate products by considering the whole set of features without distinguishing between key and auxiliary markers of category membership.

In contrast, our study demonstrated how primary and secondary features of category schemas work in tandem to shape the cognitive frame that audiences use to interpret, compare, and evaluate novel products in established market categories. The game world, as primary feature of the category schema, is a key marker for category membership, so that products that deviate on primary features receive lower critical appraisal from an audience of market critics. Considered in isolation, conformity or differentiation on the core mechanics, as the schema’s secondary features, is not related to how products are evaluated by audiences. However, core mechanics work in tandem with the game world, so that products that conform closely to the primary features of the category schema but differ on secondary schema features receive higher critical acclaim than competitor products. Such results indicate that category schemas are not merely an undifferentiated bundle of features each with a similar impact on category membership and competition, but rather a combination of primary and secondary features that have distinct impacts on the legitimacy of claims for category membership, the social acceptance of newly introduced novel product features, and the level of competition around a given market position.

To be sure, this study also has a number of drawbacks. The first drawback is that we only considered market critics as one type of audience, but ignored other audiences such consumers, professional e-gamers, or investors. While for an audience of market critics, games are optimally distinct through a combination of conformity to the game world and differentiation on the core mechanics, it might be that an audience of professional gamers, more casual gamers, or investors are attracted by different combinations of primary and secondary game features. For example, expert audiences like market critics might be particularly looking for innovations in the actions that gamers take in the game, while layman audiences of leisure gamers might be looking for games that are ready to pick up and play with familiar core mechanics but that still offer novelty in the setting of the game (the popularity but low critical appraisal of many games in longstanding sports game franchises come to mind here). Future studies could further examine how various audiences interpret, compare, and evaluate products differently based on their preferences for novelty or familiarity.

A related drawback of this study is that it only measured critical acclaim as an outcome, but overlooked how conformity and differentiation on primary and secondary features affect the performance of products and organizations in the North-American market for console-based video games. While Metacritic scores are not only an important indication of how a video game is evaluated in the market but also an indication for how the game will perform in terms of sales and revenues (cf. Zhao et al. 2018 **SOURCE**), this study is not able to shed light on the relation between conformity and differentiation on primary and secondary features of games and the success of games in terms of sales and revenues. Similarly, this study is unable to shed light on how a developer studio’s portfolio of games relates to its financial performance. Future research could investigate performance measures other than critical acclaim to better understand how conformity and differentiation on primary and secondary features is related to, for example, the financial success of products and producers.

Notwithstanding these drawbacks and opportunities for future research, this study examined how producers combine conformity and differentiation on primary and secondary features of the category schema to introduce novel products into established market categories. While most research to date argues that offerings striking a middle ground between conformity and differentiation along a single, undifferentiated dimension of category schema features are rewarded by audiences, we argue that optimal distinctiveness is better conceptualized as a combination of conformity and differentiation along the primary features and secondary features of the category schema. We demonstrate that in the North American console video game industry games receive high critical acclaim from an audience of market critics when they conform on one dimension and differentiate on another dimension of the category schema. Games that conform closely to the game world typically portrayed in the genre but introduce a novel and differentiated set of core mechanics are especially likely to receive high critical acclaim. Novelty on one dimension of a product is thus best introduced into markets in combination with familiarity on another dimension.

**References**

Askin, N., & Mauskapf, M. (2017). What Makes Popular Culture Popular? Product Features and Optimal Differentiation in Music. *American Sociological Review, 82*(5), 910-944. doi:10.1177/0003122417728662

Barlow, M. A., Verhaal, J. C., & Angus, R. W. (2019). Optimal distinctiveness, strategic categorization, and product market entry on the Google Play app platform. *Strategic Management Journal, 40*(8), 1219-1242. doi:https://doi.org/10.1002/smj.3019

Beck, N., Swaminathan, A., Wade, J. B., & Wezel, F. C. (2019). Industry Clusters and Organizational Prototypes: Evidence From the Franconian Brewing Industry. *Journal of Management, 45*(7), 2978-3008. doi:10.1177/0149206318773411

Boellstorff, T. (2008). *Coming of age in second life : an anthropologist explores the virtually human / Tom Boellstorff*. Princeton: Princeton University Press.

Deephouse, D. L. (1999). To be different, or to be the same? It’s a question (and theory) of strategic balance. *Strategic Management Journal, 20*(2), 147-166. doi:10.1002/(sici)1097-0266(199902)20:2<147::aid-smj11>3.0.co;2-q

Durand, R., & Boulongne, R. (2017). Advancing research on categories for institutional approaches of organizations. In R. Greenwood, C. Oliver, T. B. Lawrence, & R. E. Meyer (Eds.), *The SAGE handbook of organizational institutionalism* (2nd edition. ed., pp. 647-668). Los Angeles ;: SAGE reference.

Durand, R., & Kremp, P.-A. (2016). Classical Deviation: Organizational and Individual Status as Antecedents of Conformity. *Academy of Management Journal, 59*(1), 65-89. doi:10.5465/amj.2013.0767

Durand, R., & Paolella, L. (2013). Category Stretching: Reorienting Research on Categories in Strategy, Entrepreneurship, and Organization Theory. *Journal of Management Studies, 50*(6), 1100-1123. doi:10.1111/j.1467-6486.2011.01039.x

Egenfeldt-Nielsen, S., Smith, J. H., & Tosca, S. P. (2016). *Understanding video games : the essential introduction* (Third edition. ed.). New York ;: Routledge.

Fiss, P. C., Kennedy, M. T., & Davis, G. F. (2012). How Golden Parachutes Unfolded: Diffusion and Variation of a Controversial Practice. *Organization Science, 23*(4), 1077-1099. doi:10.1287/orsc.1110.0685

Giorgi, S., & Weber, K. (2015). Marks of Distinction: Framing and Audience Appreciation in the Context of Investment Advice. *Administrative Science Quarterly, 60*(2), 333-367. doi:10.1177/0001839215571125

Haans, R. F. J. (2019). What's the value of being different when everyone is? The effects of distinctiveness on performance in homogeneous versus heterogeneous categories. *Strategic Management Journal, 40*(1), 3-27. doi:https://doi.org/10.1002/smj.2978

Hannan, M. T., Le Mens, G., Hsu, G., Kovács, B., Negro, G., Polos, L., . . . Sharkey, A. J. (2019). *Concepts and categories: Foundations for sociological and cultural analysis*. New York: Columbia University Press.

Hannan, M. T., Pólos, L., & Carroll, G. (2007). *Logics of organization theory : audiences, codes, and ecologies*. Princeton, N.J: Princeton University Press.

Hsu, G. (2006). Jacks of All Trades and Masters of None: Audiences' Reactions to Spanning Genres in Feature Film Production. *Administrative Science Quarterly, 51*(3), 420-450. doi:10.2189/asqu.51.3.420

Hsu, G., Negro, G., & Perretti, F. (2012). Hybrids in Hollywood: a study of the production and performance of genre-spanning films. *Industrial and Corporate Change, 21*(6), 1427-1450. doi:10.1093/icc/dts011

Kent, S. L. (2001). *The ultimate history of video games : from Pong to Pokemon and beyond* (1st ed. ed.). New York: Three Rivers Press.

Kovács, B., & Johnson, R. (2014). Contrasting alternative explanations for the consequences of category spanning: A study of restaurant reviews and menus in San Francisco. *Strategic Organization, 12*(1), 7-37. doi:10.1177/1476127013502465

Newman, J. (2008). *Playing with videogames*. London: Routledge.

Pontikes, E. G. (2012). Two Sides of the Same Coin: How Ambiguous Classification Affects Multiple Audiences’ Evaluations. *Administrative Science Quarterly, 57*(1), 81-118. doi:10.1177/0001839212446689

Pontikes, E. G., & Hannan, M. T. (2014). An ecology of social categories. *Sociological Science, 1*, 311-343.

Pontikes Elizabeth, G., & Kim, R. (2017). Strategic Categorization *From Categories to Categorization: Studies in Sociology, Organizations and Strategy at the Crossroads* (Vol. 51, pp. 71-111): Emerald Publishing Limited.

Schell, J. (2014). *The art of game design: A deck of lenses* (2nd edition ed.). Amsterdam: Elsevier/Morgan Kaufmann.

Venkatraman, N., & Lee, C.-H. (2004). Preferential Linkage and Network Evolution: A Conceptual Model and Empirical Test in the U.S. Video Game Sector. *Academy of Management Journal, 47*(6), 876-892. doi:10.5465/20159628

Wang, D. J., Rao, H., & Soule, S. A. (2019). Crossing Categorical Boundaries: A Study of Diversification by Social Movement Organizations. *American Sociological Review, 84*(3), 420-458. doi:10.1177/0003122419846111

Wry, T., Lounsbury, M., & Jennings, P. D. (2014). Hybrid Vigor: Securing Venture Capital by Spanning Categories in Nanotechnology. *Academy of Management Journal, 57*(5), 1309-1333. doi:10.5465/amj.2011.0588

Zackariasson, P., & Wilson, T. L. (2012). Introduction. In P. Zackariassonm & T. L. Wilson (Eds.), *The video game industry: Formation, present state, and future* (pp. 1-14). London: Routledge.

Zhao, E. Y., Fisher, G., Lounsbury, M., & Miller, D. (2017). Optimal distinctiveness: Broadening the interface between institutional theory and strategic management. *Strategic Management Journal, 38*(1), 93-113. doi:10.1002/smj.2589

Zhao, E. Y., Ishihara, M., Jennings, P. D., & Lounsbury, M. (2018). Optimal Distinctiveness in the Console Video Game Industry: An Exemplar-Based Model of Proto-Category Evolution. *Organization Science, 29*(4), 588-611. doi:10.1287/orsc.2017.1194

Zuckerman, E. W. (1999). The categorical imperative: Securities analysts and the illegitimacy discount. *American Journal of Sociology, 104*(5), 1398-1438.

Zuckerman, E. W. (2016). Optimal distinctiveness revisited: An integrative framework for understanding the balance between differentiation and conformity in individual and organizational identities. In M. G. Pratt, M. Schultz, B. E. Ashforth, & D. Ravasi (Eds.), *The Oxford handbook of organizational identity* (pp. 183-199). New York: Oxford University Press.

Figure 1 Level of similarity on the game world and the core mechanics to the category schema for games published on PS3, Wii, and Xbox 360 in North America 2009-2013



Figure 2 Estimated coefficients for the relation between core mechanics conformity, game world conformity, and the Metacritic score of games

|  |
| --- |
| Impact of core mechanics conformity on Metacritic scores for games with low, average, and high game world conformity |
|  |
| Impact of game world conformity on Metacritic score for games with low, average, and high core mechanics conformity |
|  |

Table 1 Descriptive statistics and correlation coefficients

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Avg. | S.D. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 | All word conformity | .29 | .13 | . |  |  |  |  |  |  |  |  |
| 2 | Core mechanics conformity | .25 | .19 | .58 | . |  |  |  |  |  |  |  |
| 3 | Game world conformity | .23 | .13 | .70 | .30 | . |  |  |  |  |  |  |
| 4 | All key words | 11.84 | 5.70 | .22 | .31 | .31 | . |  |  |  |  |  |
| 5 | Core mechanic key words | 3.75 | 2.48 | .14 | .34 | .15 | .73 |  |  |  |  |  |
| 6 | Game world key words | 7.39 | 4.24 | .11 | .20 | .31 | .90 | .42 | . |  |  |  |
| 7 | PS3 | .60 | .49 | .10 | .05 | .10 | .05 | .06 | .09 | . |  |  |
| 8 | Wii | .39 | .49 | .08 | .10 | .07 | .06 | .03 | .09 | .43 | . |  |
| 9 | Xbox 360 | .37 | .48 | .07 | .08 | .06 | .00 | .03 | .00 | .01 | .42 | . |
| 10 | Franchise game | .60 | .49 | .20 | .02 | .07 | .06 | .15 | .04 | .17 | .00 | .03 |
| 11 | Publisher | .70 | .46 | .08 | .06 | .07 | .09 | .01 | .11 | .14 | .15 | .13 |
| 12 | Games in genre | 371.8 | 306.1 | .08 | .06 | .02 | .01 | .06 | .02 | .17 | .19 | .09 |
| 13 | ESRB EC | .00 | .05 | .07 | .03 | .06 | .03 | .01 | .03 | .01 | .04 | .01 |
| 14 | ESRB E | .35 | .48 | .01 | .09 | .04 | .16 | .04 | .21 | .23 | .26 | .14 |
| 15 | ESRB E10 | .20 | .40 | .05 | .02 | .05 | .06 | .08 | .03 | .02 | .12 | .04 |
| 16 | ESRB T | .27 | .45 | .01 | .03 | .03 | .02 | .02 | .03 | .09 | .13 | .06 |
| 17 | ESRB M | .18 | .38 | .05 | .06 | .04 | .13 | .01 | .19 | .19 | .31 | .14 |
| 18 | Action | .41 | .49 | .04 | .07 | .02 | .05 | .02 | .07 | .06 | .10 | .04 |
| 19 | Action adventure | .11 | .31 | .00 | .01 | .06 | .13 | .09 | .15 | .10 | .06 | .01 |
| 20 | Adventure | .03 | .17 | .13 | .06 | .11 | .03 | .03 | .02 | .04 | .07 | .02 |
| 21 | Miscellaneous | .08 | .27 | .20 | .19 | .24 | .15 | .06 | .16 | .14 | .13 | .08 |
| 22 | Puzzle | .07 | .25 | .06 | .03 | .03 | .01 | .06 | .07 | .10 | .05 | .04 |
| 23 | Racing | .06 | .24 | .26 | .35 | .17 | .01 | .03 | .01 | .03 | .02 | .01 |
| 24 | Role-playing | .05 | .22 | .04 | .00 | .00 | .05 | .02 | .08 | .06 | .10 | .01 |
| 25 | Simulation | .04 | .18 | .19 | .10 | .15 | .03 | .04 | .03 | .01 | .01 | .00 |
| 26 | Sports | .11 | .32 | .09 | .15 | .19 | .14 | .10 | .14 | .00 | .12 | .03 |
| 27 | Strategy | .05 | .21 | .02 | .06 | .05 | .08 | .08 | .05 | .04 | .03 | .05 |
| 28 | Published in 2009 | .29 | .46 | .01 | .02 | .01 | .05 | .06 | .02 | .29 | .31 | .12 |
| 29 | Published in 2010 | .25 | .43 | .04 | .03 | .02 | .02 | .02 | .03 | .10 | .10 | .03 |
| 30 | Published in 2011 | .20 | .40 | .01 | .00 | .01 | .05 | .06 | .03 | .12 | .11 | .01 |
| 31 | Published in 2012 | .14 | .35 | .03 | .04 | .02 | .01 | .01 | .03 | .18 | .19 | .11 |
| 32 | Published in 2013 | .11 | .31 | .01 | .02 | .01 | .00 | .02 | .02 | .20 | .24 | .09 |
| 33 | Published in January | .05 | .22 | .02 | .00 | .01 | .00 | .02 | .00 | .03 | .01 | .03 |
| 34 | Published in February | .07 | .26 | .01 | .00 | .03 | .03 | .01 | .04 | .01 | .06 | .01 |
| 35 | Published in March | .10 | .30 | .02 | .01 | .02 | .01 | .03 | .00 | .02 | .00 | .01 |
| 36 | Published in April | .06 | .23 | .03 | .01 | .02 | .03 | .02 | .04 | .01 | .05 | .04 |
| 37 | Published in May | .08 | .26 | .01 | .03 | .02 | .02 | .00 | .01 | .03 | .00 | .01 |
| 38 | Published in June | .09 | .29 | .01 | .02 | .01 | .03 | .01 | .03 | .01 | .03 | .02 |
| 39 | Published in July | .06 | .23 | .01 | .01 | .01 | .02 | .02 | .02 | .01 | .03 | .02 |
| 40 | Published in August | .07 | .25 | .00 | .00 | .00 | .01 | .00 | .01 | .00 | .02 | .03 |
| 41 | Published in September | .10 | .31 | .01 | .03 | .04 | .02 | .01 | .02 | .01 | .00 | .01 |
| 42 | Published in October | .14 | .35 | .02 | .02 | .02 | .01 | .01 | .00 | .03 | .02 | .05 |
| 43 | Published in November | .13 | .34 | .03 | .01 | .04 | .05 | .01 | .08 | .01 | .06 | .03 |
| 44 | Published in December | .05 | .21 | .00 | .00 | .01 | .01 | .00 | .02 | .03 | .02 | .06 |

Table 1 Continued

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 10 | . |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11 | .12 | . |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 | .03 | .04 | . |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 13 | .04 | .05 | .04 | . |  |  |  |  |  |  |  |  |  |  |  |  |
| 14 | .08 | .16 | .23 | .04 | . |  |  |  |  |  |  |  |  |  |  |  |
| 15 | .01 | .02 | .02 | .02 | .36 | . |  |  |  |  |  |  |  |  |  |  |
| 16 | .03 | .05 | .09 | .03 | .45 | .31 | . |  |  |  |  |  |  |  |  |  |
| 17 | .08 | .17 | .15 | .02 | .34 | .23 | .28 | . |  |  |  |  |  |  |  |  |
| 18 | .01 | .03 | .89 | .04 | .23 | .03 | .10 | .14 | . |  |  |  |  |  |  |  |
| 19 | .04 | .09 | .23 | .02 | .21 | .02 | .02 | .27 | .29 | . |  |  |  |  |  |  |
| 20 | .02 | .03 | .19 | .01 | .06 | .05 | .04 | .02 | .15 | .06 | . |  |  |  |  |  |
| 21 | .02 | .06 | .22 | .16 | .16 | .01 | .09 | .12 | .24 | .10 | .05 | . |  |  |  |  |
| 22 | .14 | .12 | .21 | .01 | .29 | .08 | .14 | .11 | .22 | .09 | .05 | .08 | . |  |  |  |
| 23 | .00 | .02 | .20 | .01 | .16 | .01 | .08 | .11 | .21 | .09 | .05 | .08 | .07 | . |  |  |
| 24 | .06 | .07 | .23 | .01 | .15 | .03 | .13 | .08 | .19 | .08 | .04 | .07 | .06 | .06 | . |  |
| 25 | .04 | .02 | .18 | .01 | .01 | .00 | .04 | .06 | .16 | .07 | .03 | .06 | .05 | .05 | .04 | . |
| 26 | .07 | .01 | .14 | .02 | .24 | .06 | .07 | .16 | .30 | .12 | .06 | .10 | .10 | .09 | .08 | .07 |
| 27 | .01 | .01 | .21 | .01 | .06 | .05 | .08 | .08 | .18 | .08 | .04 | .06 | .06 | .06 | .05 | .04 |
| 28 | .03 | .01 | .31 | .02 | .20 | .01 | .13 | .09 | .07 | .05 | .00 | .08 | .07 | .00 | .07 | .03 |
| 29 | .02 | .02 | .06 | .00 | .02 | .02 | .04 | .06 | .01 | .05 | .02 | .02 | .02 | .02 | .01 | .03 |
| 30 | .05 | .02 | .08 | .02 | .05 | .02 | .05 | .01 | .00 | .02 | .01 | .01 | .00 | .01 | .04 | .03 |
| 31 | .01 | .03 | .17 | .01 | .11 | .03 | .02 | .09 | .02 | .03 | .00 | .03 | .07 | .02 | .01 | .00 |
| 32 | .01 | .03 | .26 | .02 | .14 | .01 | .05 | .14 | .06 | .08 | .02 | .05 | .05 | .01 | .02 | .05 |
| 33 | .09 | .01 | .05 | .01 | .03 | .03 | .00 | .01 | .02 | .01 | .00 | .00 | .06 | .04 | .03 | .02 |
| 34 | .01 | .00 | .00 | .01 | .01 | .06 | .01 | .07 | .03 | .02 | .01 | .01 | .04 | .01 | .03 | .04 |
| 35 | .04 | .01 | .08 | .02 | .04 | .05 | .02 | .03 | .08 | .01 | .00 | .02 | .00 | .01 | .03 | .04 |
| 36 | .01 | .03 | .01 | .04 | .01 | .01 | .02 | .03 | .01 | .03 | .00 | .01 | .05 | .01 | .03 | .02 |
| 37 | .00 | .00 | .02 | .01 | .03 | .03 | .02 | .02 | .01 | .01 | .00 | .00 | .00 | .04 | .01 | .00 |
| 38 | .01 | .01 | .05 | .02 | .00 | .01 | .00 | .00 | .03 | .02 | .00 | .03 | .03 | .01 | .02 | .01 |
| 39 | .05 | .03 | .03 | .01 | .01 | .00 | .04 | .04 | .03 | .05 | .02 | .03 | .04 | .01 | .01 | .01 |
| 40 | .05 | .01 | .04 | .01 | .00 | .04 | .03 | .02 | .02 | .06 | .02 | .01 | .03 | .01 | .02 | .00 |
| 41 | .02 | .02 | .01 | .06 | .01 | .02 | .01 | .03 | .03 | .00 | .03 | .00 | .02 | .01 | .00 | .01 |
| 42 | .06 | .04 | .03 | .02 | .03 | .04 | .00 | .01 | .00 | .01 | .06 | .01 | .06 | .03 | .00 | .01 |
| 43 | .07 | .04 | .06 | .02 | .03 | .06 | .03 | .06 | .02 | .01 | .03 | .05 | .04 | .03 | .05 | .03 |
| 44 | .04 | .08 | .04 | .01 | .02 | .00 | .01 | .02 | .05 | .01 | .01 | .03 | .04 | .02 | .04 | .03 |

Table 1 Continued

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 |
| 26 | . |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 27 | .08 | . |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 28 | .05 | .02 | . |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 29 | .02 | .01 | .38 | . |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 30 | .01 | .02 | .32 | .29 | . |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 31 | .02 | .03 | .27 | .24 | .21 | . |  |  |  |  |  |  |  |  |  |  |  |  |
| 32 | .06 | .01 | .22 | .20 | .17 | .14 | . |  |  |  |  |  |  |  |  |  |  |  |
| 33 | .00 | .02 | .02 | .06 | .00 | .01 | .04 | . |  |  |  |  |  |  |  |  |  |  |
| 34 | .04 | .01 | .03 | .02 | .02 | .01 | .03 | .07 | . |  |  |  |  |  |  |  |  |  |
| 35 | .06 | .00 | .02 | .01 | .00 | .03 | .01 | .08 | .09 | . |  |  |  |  |  |  |  |  |
| 36 | .07 | .00 | .03 | .02 | .01 | .02 | .03 | .06 | .07 | .08 | . |  |  |  |  |  |  |  |
| 37 | .03 | .00 | .00 | .03 | .03 | .01 | .01 | .07 | .08 | .10 | .07 | . |  |  |  |  |  |  |
| 38 | .00 | .04 | .03 | .00 | .01 | .03 | .03 | .08 | .09 | .11 | .08 | .09 | . |  |  |  |  |  |
| 39 | .02 | .04 | .00 | .02 | .00 | .01 | .04 | .06 | .07 | .08 | .06 | .07 | .08 | . |  |  |  |  |
| 40 | .04 | .04 | .01 | .04 | .01 | .02 | .07 | .06 | .07 | .09 | .07 | .08 | .09 | .07 | . |  |  |  |
| 41 | .08 | .01 | .04 | .04 | .00 | .01 | .00 | .08 | .10 | .12 | .09 | .10 | .11 | .08 | .09 | . |  |  |
| 42 | .05 | .01 | .02 | .05 | .03 | .01 | .00 | .09 | .11 | .14 | .10 | .12 | .13 | .10 | .11 | .14 | . |  |
| 43 | .01 | .00 | .04 | .07 | .04 | .04 | .03 | .09 | .11 | .13 | .10 | .11 | .12 | .10 | .10 | .13 | .16 | . |
| 44 | .06 | .04 | .08 | .02 | .06 | .01 | .06 | .05 | .06 | .07 | .06 | .06 | .07 | .05 | .06 | .08 | .09 | ,09 |

Table 2 Comparison of Metacritic scores for video games with various combinations of conformity on core mechanics and game world features

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Type | Core mechanics | Game world | Games | Mean | S.D | t-test compared to type | | |
|  |  |  |  |  |  | 2 | 3 | 4 |
| 1 | Low conformity | Low conformity | 602 | 64.0 | 15.3 | -1.0 | -3.7\*\* | -2.8\*\* |
| 2 | High conformity | Low conformity | 327 | 65.1 | 14.7 | . | -2.5\*\* | -1.4† |
| 3 | Low conformity | High conformity | 303 | 68.1 | 15.5 |  | . | 1.3† |
| 4 | High conformity | High conformity | 494 | 66.6 | 14.8 |  |  | . |

†p<.1 \*p<.05 \*\*p<.01 \*\*\*p<.001

Table 3 Tobit regression models estimating the relation between the optimal distinctiveness of games relative to the category schema and the Metacritic rating of games

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Model I | Model II | Model III | Model IV | Model V |
| *Similarity* |  |  |  |  |  |
| All word conformity | 12.85\*\*\* (3.15) | 12.33 (10.11) |  |  |  |
| Sq. all world conf. |  | .88 (16.52) |  |  |  |
| Game world conformity |  |  | 7.79\*\* (2.94) | -3.45 (7.66) | 16.02\*\* (4.69) |
| Game world conf. sq. |  |  |  | 20.95 (13.13) |  |
| Core mechanic conformity |  |  | .70 (2.20) | 7.35 (6.23) | 8.32\* (3.64) |
| Core mechanic conf. sq. |  |  |  | -10.70 (10.23) |  |
| Core mech. \* game world conf. |  |  |  |  | -32.68\* (14.19) |
|  |  |  |  |  |  |
| All key words | -.14\* (.07) | -.14\* (.07) |  |  |  |
| Game world key words |  |  | -.10 (.10) | -.08 (.10) | -.10 (.10) |
| Core mechanic key words |  |  | -.29† (.16) | -.33\* (.16) | -.29† (.16) |
|  |  |  |  |  |  |
| *Game characteristics* |  |  |  |  |  |
| PS3 | 1.77† (.99) | 1.77† (.99) | 1.73† (1.00) | 1.68† (.99) | 1.68† (.99) |
| Wii | -5.78\*\*\* (1.04) | -5.78\*\*\* (1.04) | -5.79\*\*\* (1.05) | -5.79\*\*\* (1.04) | -5.74\*\*\* (1.05) |
| Xbox360 | -1.36 (.85) | -1.36 (.85) | -1.34 (.84) | -1.34 (.84) | -1.32 (.84) |
| Franchise | 6.30\*\*\* (.86) | 6.30\*\*\* (.86) | 6.70\*\*\* (.85) | 6.71\*\*\* (.85) | 6.73\*\*\* (.85) |
| Publisher | .66 (.98) | .66 (.98) | .71 (.98) | .67 (.98) | .64 (.99) |
| Games in genre | -.00 (.00) | -.00 (.00) | -.00 (.00) | -.00 (.00) | -.00 (.00) |
|  |  |  |  |  |  |
| *Game rating* |  |  |  |  |  |
| ESRB EC (ref.) | -- | -- | -- | -- | -- |
| ESRB E | -12.33\*\* (4.39) | -12.32\*\* (4.40) | -11.55\* (4.68) | -11.04\* (4.42) | -11.75\* (4.58) |
| ESRB E10 | -12.86\*\* (4.45) | -12.85\*\* (4.47) | -12.02\* (4.74) | -11.54\* (4.48) | -12.16\*\* (4.64) |
| ESRBT | -14.01\*\* (4.44) | -13.99\*\* (4.45) | -13.11\*\* (4.72) | -12.54\*\* (4.47) | -13.28\*\* (4.63) |
| ESRB M | -14.00\*\* (4.53) | -13.98\*\* (4.54) | -13.11\*\* (4.80) | -12.60\*\* (4.55) | -13.33\*\* (4.70) |
|  |  |  |  |  |  |
| *Genre* |  |  |  |  |  |
| Action (ref.) | -- | -- | -- | -- | -- |
| Action adventure | .89 (2.83) | .90 (2.84) | 1.05 (2.83) | 1.10 (2.84) | .79 (2.85) |
| Adventure | .40 (3.51) | .39 (3.51) | .23 (3.50) | .21 (3.51) | -.02 (3.52) |
| Miscellaneous | -5.55\* (2.71) | -5.56\* (2.70) | -5.35† (2.73) | -5.45\* (2.75) | -5.27† (2.73) |
| Puzzle | -.32 (2.80) | -.32 (2.70) | .48 (2.81) | .38 (2.81) | .26 (2.81) |
| Racing | -.39 (2.92) | -3.40 (2.93) | -2.33 (2.97) | -1.68 (3.10) | -1.63 (2.99) |
| Role-playing | .41 (3.43) | .41 (3.43) | .45 (3.43) | .50 (3.43) | .31 (3.43) |
| Simulation | -7.42\* (3.39) | -7.43\* (3.37) | -7.74\* (3.42) | -7.92\* (3.42) | -7.63\* (3.40) |
| Sports | -2.66 (2.43) | -2.66 (2.44) | -2.52 (2.48) | -3.01 (2.50) | -2.96 (2.46) |
| Strategy | 1.65 (3.12) | 1.64 (3.11) | 2.16 (3.13) | 2.35 (3.15) | 2.07 (3.13) |
|  |  |  |  |  |  |
| *Release year* |  |  |  |  |  |
| 2009 (ref.) | -- | -- | -- | -- | -- |
| 2010 | .95 (.97) | .95 (.96) | .79 (.97) | .79 (.97) | .81 (.97) |
| 2011 | 1.36 (1.20) | 1.36 (1.19) | 1.17 (1.19) | 1.07 (1.20) | 1.14 (1.19) |
| 2012 | 3.20\* (1.50) | 3.19\* (1.50) | 3.01\* (1.50) | 2.94† (1.51) | 3.15\* (1.50) |
| 2013 | -.38 (1.95) | -.39 (1.96) | -.68 (1.95) | -.71 (1.96) | -.60 (1.96) |
|  |  |  |  |  |  |
| *Release month* |  |  |  |  |  |
| January (ref.) | -- | -- | -- | -- | -- |
| February | 3.89\* (1.95) | 3.90\* (1.95) | 3.81† (1.97) | 3.82† (1.98) | 3.77† (1.97) |
| March | 2.92 (1.89) | 2.93 (1.90) | 2.91 (1.91) | 2.84 (1.91) | 2.88 (1.90) |
| April | 2.47 (2.02) | 2.48 (2.03) | 2.37 (2.06) | 2.34 (2.05) | 2.25 (2.05) |
| May | 1.23 (1.92) | 1.23 (1.92) | 1.25 (1.94) | 1.33 (1.94) | 1.17 (1.94) |
| June | 1.41 (1.88) | 1.42 (1.88) | 1.33 (1.90) | 1.35 (1.90) | 1.18 (1.90) |
| July | .72 (2.17) | .73 (2.17) | .65 (2.19) | .62 (2.19) | .51 (2.17) |
| August | 3.22 (2.03) | 3.22 (2.03) | 3.23 (2.05) | 3.20 (2.05) | 3.11 (2.04) |
| September | 3.83\* (1.85) | 3.83\* (1.85) | 3.67\* (1.86) | 3.66\* (1.86) | 3.51† (1.86) |
| October | 3.38† (1.78) | 3.39† (1.78) | 3.30† (1.80) | 3.24† (1.80) | 3.22† (1.79) |
| November | .30 (1.88) | .31 (1.87) | .45 (1.88) | .43 (1.88) | .46 (1.87) |
| December | 2.13 (2.05) | 2.13 (2.04) | 2.05 (2.08) | 2.08 (2.08) | 1.97 (2.07) |
|  |  |  |  |  |  |
| Constant | 73.58\*\*\* (5.56) | 73.62\*\*\* (5.57) | 74.09\*\*\* (5.85) | 74.16\*\*\* (5.67) | 72.90\*\*\* (5.78) |
|  |  |  |  |  |  |
| *Model fit* |  |  |  |  |  |
| Observations | 1726 | 1726 | 1726 | 1726 | 1726 |
| Log pseudo likelihood | -6999 | -6999 | -7003 | -7001 | -7000 |
| F-value | 8.23\*\*\* | 8.01\*\*\* | 7.53\*\*\* | 7.19\*\*\* | 7.86\*\*\* |
| Pseudo R-squared | .02 | .02 | .02 | .02 | .02 |

1. See https://www.metacritic.com/about-metascores for a more detailed explanation of how Metacritic interprets its Metacritic scores for games [↑](#footnote-ref-1)