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**Variability: The effects of variation in power relations within the firm, in its market performance, and in the evaluations of its products**

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*“Transformers 2 boring?! Robot lasers are never boring! Megan Fox in slow motion is never boring! It needs to be seen and talked about with friends.” (Angry Joe, 2009)*

## **2. The good, the bad and the variable: How evaluations of past editions influence the success of sequels<sup>1</sup>**

### **Abstract**

The purpose of this paper is to contribute to the marketing literature and practice by examining the relationship between evaluations of previous editions and the sales performance of the sequel. A set of hypotheses was developed, based on the theory of reasoned action, and a dataset was obtained from aggregator sites to test the hypotheses by performing OLS estimation, while the two stage estimation method is followed to mitigate endogeneity. High variability of evaluation of past editions can decrease the strength of the relationships between evaluations of past editions and the success of sequels. The positive relationship between consumer evaluations of past editions and sales of the sequel is strengthened if there is a large community of users and if the product is consumed socially. This study pertains to the strategic marketing of sequentially released products; broader types of brand extensions are beyond the scope. Marketing managers can use data about the evaluations of earlier editions to assess the likelihood of success of a sequel. Likewise, managers should encourage more active interactions between consumers to improve sequel success. This paper provides a theoretical framework that helps to understand the carry over mechanism between earlier versions of a product and later versions or sequels. It illuminates the role evaluations of previous editions play in determining the success of the sequel and, for the first time, highlights the impact of variability of evaluations across the series as well as whether the product is consumed individually or socially.

*Keywords: Sequels, Consumer Evaluation, Size of User Community, Variability of Evaluations, Socially Consumed Product*

### **2.1. Introduction**

Sequel series such as James Bond or the Harry Potter books have become huge successes and have created communities of loyal followers. Most of the best-selling products in the video games industry, in publishing, and in the movie industry are sequels. For example, the latest sequel in the Call of Duty video game series sold a record of 6.5 million copies and amassed more than US\$400 million of revenue on the first day alone (data from [www.vgchartz.com](http://www.vgchartz.com)).

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Considering the significance of the sequel strategy for many industries and the creative industries in particular, it is critical to understand the factors that explain sequel success better.

In the marketing literature, sequels and their success are rarely the key focus of study; rather the fact that a product is a sequel is treated as a control in analyses of the impact of other factors (see for example, Ho et al., 2009; Karniouchina, 2011; Sunde and Brodie, 1993). This stream of literature generally shows that sequels perform better in the marketplace. The reasoning is that the original product must have created a positive image and this image is carried over to the sequel, making the sequel more attractive and also creating awareness, excitement and anticipation, which will help subsequent sales (Ho et al., 2009; Karniouchina, 2011; Keller, 2003; Moon et al., 2010; Sood and Dreze, 2006; Sunde and Brodie, 1993).

In this study, we theorize and test whether and how success is carried over from past editions to the new sequel by studying publicly available product evaluations from the present sequel and its previous editions. Before making a decision to buy any product, consumers often look for signals to assess the properties and qualities of the product. The signals that are taken into account when evaluating a product may be important cues from the product, such as observable product attributes and packaging, but also evaluations of the product by experts and other consumers. These evaluations are widely available and they may affect the level of success of new products (Eliashberg et al., 2006).

The phenomenon that the image of earlier products can color the way product extensions, or later editions in a series, are perceived is described as the 'carry over mechanism' (Hennig-Thurau et al., 2009; Sood and Dreze, 2006). With regard to sequels in a series covering multiple editions, the role of evaluations is potentially even more interesting as past evaluations of earlier editions may influence the success of the new sequel as well. This potential carry over mechanism does not necessarily mean that evaluations of previous

editions are comprehensively being consulted by consumers who consider new editions of the product. Evaluations of previous editions may have had an effect on the constitution of this image or merely reflected it, but in both cases these earlier evaluations can give information about what could be carried over.

While the existence of the carry over mechanism between earlier editions and a sequel is highlighted in studies before, there has been little in-depth attention as to how exactly this would operate or what factors affect this carry over mechanism. In addition, we argue that evaluations in a longer series of products provide an interesting arena to study the carry over mechanism as the carry over effect may stretch to multiple editions and is not straightforward for every sequel.

The general theoretical foundation to explore the relationships between past evaluations in a series of products and the success of sequels is provided by the theory of reasoned action (Fishbein and Ajzen, 1975; Miller, 2005). In this theoretical framework, a distinction is made between individual attitudes and subjective norms as co-determinants of eventual behavioral intentions. Individual attitudes reflect how favorable an individual is towards the product and subjective norms are the opinions of the community in the person’s environment. More importantly, Fishbein and Ajzen (1975) propose that individual attitudes and subjective norms can receive different weights in the formation of a person’s behavioral intentions.

Here, we do not focus on individuals and their decision to buy the new sequel but explore how evaluations by experts and consumers of past editions (signals of favorable or unfavorable qualities regarding previous products in the series) are associated with the decision making of consumers at large regarding the purchase decision of the sequel. The introduction of weighting factors allows for explaining why past evaluations may not play the same role across all sequels and communities and that there are factors that may cause

evaluation inputs to have more or less weight in the eventual sequel buying decision. This can provide new insights regarding the carry over mechanism.

A key weighting factor in this study is variability of past product evaluations in the series . Since an evaluation is a measure of quality appreciation as given by expert critics or by consumers, variability of evaluations signals a specific form of uncertainty (volatility) regarding the extent to which the quality evaluations have been consistent across editions. Variability across editions, as a result, provides additional information on the predictability of the qualities of the series and can potentially function as a (collective) weighting factor on how quality judgments of earlier editions affect the intention to buy the new sequel in the series. Other weighting factors may play a role as well such as the size of the user community and the degree of social interaction during product consumption.

The following sections discuss the theoretical framework leading up to the hypotheses. Then, the methodology and the data are described. The findings are presented in the results section followed by a series of robustness tests. Finally the implications of the findings for marketing are described as well as the limitations and possible avenues for future research.

## **2.2. Theoretical framework and hypotheses**

### **2.2.1. Theory of reasoned action**

The theory of reasoned action (Fishbein and Ajzen, 1975), and successor theories such as the theory of planned behavior (Ajzen, 1991), present an influential paradigm in social psychology and marketing (Bang et al., 2000). Its purpose is to present a coherent theoretical framework for the study of the formation of behavioral intentions. Here, we employ two core insights from the theory of reasoned action: First, we apply the notion of

individual attitudes and, more importantly in our study, subjective norms as determinants of behavioral intentions. Second, we consider factors that may have an impact on how these determinants are weighted and ultimately affect the market success of the focal product. Individual attitudes relate to what the individual beliefs about a particular action (e.g. buying a new sequel), as if this individual were a Robinson Crusoe, weighing up the available information in the light of his own feelings about the credibility of the information, the likelihood of particular outcomes and their importance to her/him. In contrast, subjective norms represent the beliefs of others, especially members of the focal individual's peer group. The normal - non-Robinson Crusoe - individual will take both individual attitudes and subjective norms into account to arrive at the eventual behavioral intention.

Past evaluations of consumers and past evaluations of experts of the editions preceding the sequel are potential signals of quality that relate to the attitudes in the marketplace towards the series and the underlying sequel. Previous studies, for example, also conceptualized expert opinions as constituents of subjective norms (Miller, 2005). Here it is probably more accurate to consider both consumer evaluations and expert evaluations as subjective norms because they express the opinions of peers; other consumers and experts reviewers.

The key point that we take away from the theory of reasoned action is that weighting takes place in the formation of buying intentions. Given the level of analysis, we focus on factors that larger groups of (potential) consumers may take into account and they are derived from uncertainty theory and the information processing literature (Glazer and Weiss, 1993; Tellis, 1988): variability of the evaluations across editions, the size of the user community and whether the product is socially consumed or not. It should be clear that our study is not a straightforward application of the theory of reasoned action, but rather an attempt to use the general framework. Fortunately, the theory has been proven to be robust and applicable to a

broad range of settings (c.f. Sheppard et al., 1988). The individual him/herself remains a black box in our approach.

### ***2.2.2. Expert evaluations and consumer evaluations as signals***

Signaling theory (Spence, 1973) explains how decisions are being made if limited information is available by focusing on the availability of signals of quality to the decision maker. The lower the ability of the individual consumer to evaluate the product on offer, the more important the presence of signals that do not directly derive from the product or the producer will be. In the creative industry most goods are experience goods; one has to consume the product or experience to really know whether one likes it or not (Caves, 2000). Because of this, expert evaluations, such as reviews in newspapers or other media, can play an important role with respect to product performance, as has been found in many studies, especially with regard to the movie industry (Basuroy et al., 2003; Elberse and Eliashberg, 2003; Eliashberg and Shugan, 1997).

While expert reviews - historically delivered by print or broadcast media - have been available to guide purchasing decisions in many cultural industries for a long time, consumer reviews have only become generally available since the spread of Internet. Websites like Metacritic, IGN, Gamespot and online stores such as eBay and Amazon started gathering consumer reviews of their products and a few studies study the impact of consumer evaluations on sales. Liu (2006) finds that consumer evaluations affect sales positively. Liu (2006) argues that consumer evaluations of movies posted in a particular week affect the following week's sales because movie-goers often discuss their experiences and share their opinions with their friends. Zhu and Zhang (2010) provide similar evidence about the benefits of positive consumer evaluations for sales in video games and they suggest that niche or lower budget products could especially benefit from consumer reviews (see also Gemser et

al., 2007).

Sequels are brand extensions that studios use to capitalize on the success of an original product by producing another product that reprises the same characters evolving in a new situation (c.f. Sood and Dreze, 2006). Here, we take the perspective of the series and there are many sequels with three or more editions. So, the question arises whether and how past evaluations of earlier editions carry over to the latest sequel?

### ***2.2.3. The impact of evaluations of past editions on sequel performance***

Hennig-Thurau et al. (2009) show that positive evaluations of the preceding edition positively affect sequel sales. They argue that this could be explained by an image carry over effect. Theorizing and extending these ideas, one may argue that this carry-over effect from past evaluations could also result from the evaluations of all previous editions of the product. In addition, the theory of reasoned action would indicate that there are possible weighting factors at play, which we will discuss later.

Miller (2005) considers expert evaluations as an input for the formation of individual attitudes. To give one example, an individual attitude towards particular types of food can be affected by the opinion of his doctor and/or by articles about health-related matters written by experts. Similarly, the opinions of experts about previous editions could play a role in the formation of the attitudes vis-à-vis the sequel. The creative industries in general provide prime examples of markets where consumers can access the expert evaluations of catalogs of products, including past editions in a particular series. Lately, websites have become available that aggregate evaluations from expert critics as well as regular consumers around the world. As a result, one can expect that, if a new product belongs to a series that has received positive expert reviews in the past, these positive expert reviews may contribute to shaping the purchase intentions of consumers affecting sequel success positively, irrespective

of the evaluations of the sequel.

**H1a:** *Positive expert evaluations of past editions in the same series have a positive effect on the success of a sequel.*

A similar argument can be made with regard to consumer evaluations of past editions as they too can contribute to the formation of sequel buying intentions. However, in contrast to expert reviews, consumer evaluations of past editions are also a reflection of the degree to which users like the product (Liu, 2006), i.e. they directly signal consumer experiences and satisfaction with the products (Chen, Fey, and Wang, 2011). Satisfied consumers are more likely to trust and remain loyal to a brand, increasing the likelihood of future consumption (Chaudhuri and Holbrook, 2001; Selnes, 1993). The framework of the theory of reasoned action suggests that consumer evaluations of previous editions can reflect the attitudes and behaviors of consumers regarding previous editions and the series as a whole. These evaluations can therefore function as a subjective norm shaping behavioral intentions. So, positive consumer evaluations of past editions can affect behavioral intentions to buy the sequel, irrespective of the evaluations of the sequel.

**H1b:** *Positive consumer evaluations of past editions in the same series have a positive effect on the success of a sequel.*

#### **2.2.4. The effect of variability of evaluations across a series of editions**

Variability is defined as the frequency and magnitude of changes in the environment over time (Glazer and Weiss, 1993). Here, we conceptualize variability of expert evaluations across editions as a weighting factor for potential buyers of the new sequel. Consumers generally do not like uncertainty, especially regarding quality, opening the possibility that large groups of consumers weigh past evaluations lower in their purchase intention regarding

the next sequel.

One form of uncertainty that has received considerable attention in the literature is volatility. Volatility creates uncertainty because the qualities of the sequel are less predictable (March and Olsen 1975). If there is volatility in past evaluations, clearly the series qualities do not overpower the edition qualities, making consumers more careful about following the average evaluation in the series. Therefore, variability may be a negative weighting factor in the relationship between past evaluations and sequel sales.

Other research supports the notion of variability as a negative weighting factor. For example, Dacin and Smith (1994) conduct an experiment in which they expose their respondents to a product series with varying differences regarding product quality and find that, as the variability of quality between products within the same brand increases, consumer confidence in the extension of the same brand decreases. Similarly, Volckner and Sattler (2006) find that the effect of variability in quality is detrimental to brand performance. To explain the detrimental effect of variability, they argue that the strength of the brand is diluted by evaluation signals about non-stable quality, indicating increased consumer uncertainty (Dacin and Smith, 1994). Desai et al. (2008) further argue that consumers regard the information about variability of service quality to infer inferior firm quality and reliability.

Expert evaluations may signal a product’s quality to (potential) buyers (Eliashberg and Shugan, 1997). If such signals vary across editions in the series, one can argue that the reliability of expert evaluations - as quality signals – may be lower and uncertainty higher because consumers cannot get a clear signal whether the experts support or dislike the products and the series as a whole. Since we are interested in the performance of sequels at the market level, expert evaluation variability in the series could be an important (collective) weighting factor for consumers. The apparent lack of consistency of such a signal can effectively weaken the value of expert evaluations for the majority of consumers and reduce

its effect on sales.

**H2a:** *Variability of expert evaluations in a series moderates the effect of expert evaluations of past editions on sequel success. The effect of expert evaluations of past editions is less positive when there is a higher variability of expert evaluations.*

Again, the general argument about the effects of past expert evaluations can be applied to the effects of past consumer evaluations. Variability of consumer evaluations of past editions relates to uncertainty and may again decrease the extent to which consumers rely on them as signals of quality, shaping their individual purchase intentions, and thus have a negative effect on sequel sales in the marketplace. Moreover, a high degree of variability of consumer evaluations of products within the same series may be considered a negative quality signal in itself, because it suggests inconsistencies that consumers usually prefer to avoid (Das et al., 2005; Das and Chen, 2007). Consumer evaluations also function as a reflection of the overall satisfaction and loyalty of the community of consumers towards the series. When consumers in general like one edition much less than another, one can, at the very least, infer that these consumers are not blindly loyal to the brand.

Information processing theory states that if consumers are loyal to a brand or series, their response to exposure to signals such as past evaluations is likely to be higher (Tellis, 1988). Exposure, attention, comprehension, and retention of past evaluations are selective processes operating in favor of the products that consumers actually use. So, if there are consumers losing interest in the series, signaled by variability of evaluations across editions, this may make consumers less receptive for a positive carry over effect in the series. In addition, cognitive consistency theory (Calder, 1981) provides similar arguments as inconsistencies create tensions and thus motivate consumers to respond. If consumers decide to wait and see for example, given that new games enter the market constantly, this can lead

to considerable reductions in sales. Conceptualized as a negative weighting factor, this means that subjective norms originating from the community are given less weight in the formation of behavioral intentions for many consumers resulting in a weaker carry over effect and lower sales in the marketplace, irrespective of the evaluations of the sequel.

**H2b:** *Variability of consumer evaluations in a series moderates the effect of consumer evaluations of past editions on sequel success. The effect of consumer evaluations of past editions is less positive when there is a higher variability of consumer evaluations.*

### **2.2.5. The size of the user community**

So far we discussed expert evaluations in tandem with consumer evaluations. A key difference between expert and consumer signals is, however, that consumers may actually buy, consume and socialize around the product and that there may be thousands of them posting reviews. Whereas variability of past consumer evaluations across the series may hint towards a lower level of loyalty among consumers, the size of the user community is a direct measure of the number of knowledgeable customers. Cognitive elaboration is known to be richer for products with which consumers have more extensive experience (Cacioppo and Petty, 1985). As a result, quality information signals are more likely to be received, processed and stored into memory (Tellis, 1988).

Brand communities relate to consumer loyalty (Marzocchi et al., 2013). By discussing preferred products and sharing actual experiences, community members also add to the enjoyment of the product. The contacts with other users increase the odds for receiving information about the product and learning how to become a more proficient user and finding practical assistance. The larger the community, the more information exchange is likely to take place both online and off line. So, although the community may affect each individual

consumer differently, an argument can be made that if the community that provides and communicates all the information is larger, the link between past evaluations and behavioral intentions may be stronger (see also Moon et al., 2010). Finally, in creative goods and in information markets in general, there are always positive or negative evaluation outliers that are averaged out against the true qualities and value of the product if markets are larger. So, a larger community could also lead to more trust in the average past evaluation in the series, leading to a stronger carry over effect.

Summarizing, we argue that the size of user community will operate as a weighting factor with regard to the relationship between past consumer evaluations and sequel sales, irrespective of the evaluations of the sequel.

**H3:** *The size of the user community moderates the effect of consumer evaluations of past editions on sequel success. The effect of consumer evaluations of past editions is more positive when there is a larger sized user community.*

### **2.2.6. Social interaction and consumption**

We have discussed expert evaluations in tandem with consumer evaluations. A key difference between expert and consumer signals is, however, that consumers may actually buy, consume and socialize around the product and that there may be thousands of them posting reviews. Whereas variability of past consumer evaluations across the series may hint towards lower loyalty among consumers, the size of the user community is a direct measure of the number of knowledgeable customers. Cognitive elaboration is known to be richer for products with which consumers have more extensive experience (Cacioppo and Petty, 1985). As a result, quality information signals are more likely to be received, processed and stored into memory (Tellis, 1988).

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Summarizing, we argue that the size of user community will operate as a weighting factor with regard to the relationship between past consumer evaluations and sequel sales, irrespective of the evaluations of the sequel.

**H4:** *The type of product consumption moderates the effect of consumer evaluations of past editions on sequel success. The effect of consumer evaluations of past editions is more positive if the product is socially consumed in interaction with other consumers.*

### **2.3. Research method**

The empirical material for this study consists of the video games belonging to various sequel series released between 2000 and 2009. Our data ( $n = 479$ ) consists of solely console games with three or more sequels excluding the original title. The average number of sequels in our sample is four (excluding the original), and the largest is fourteen. Table I shows that Sporting games have the highest average number of editions per series (6). In terms of

worldwide unit sales, the most popular genres are Shooters (2.05 million copies), racing (1.87 million), and sports (1.43 million). The average sequel sells 1.36 million copies worldwide and 45 percent of the sequels obtain a Teen rating and 14 percent is rated for mature audiences.

**Table 2.1** Sales and evaluations of the most popular genres

Genre	Avg. Editions per Series	Avg. Sales (millions of copies)	Avg. Consumer Evaluation (1-10)	Avg. Expert Evaluation(1-10)
FPS	3	2.05	7.67	7.72
RACING	4	1.87	7.82	7.25
RPG	3	1.24	8.51	7.73
SPORTS	6	1.43	7.71	7.87
OTHER	4	1.02	7.89	7.31

### 2.3.1. Model specification

The hypotheses are tested by estimating a comprehensive model regarding the antecedents of the total number of video games sold worldwide of a sequel  $i$  ( $SALES_i$ ). A detailed overview of the variables is presented in Table II. Most importantly, the model takes the sequel evaluations from experts and consumers into account as well as the past evaluations in the series and their variability. The variable ( $Prob(Sequel_i)$ ) is estimated by means of a first stage Probit model described later.

$$\begin{aligned}
 SALES_i = & \beta_0 + \beta_1 \cdot PCEA_i + \beta_2 \cdot PCEV_i + \beta_3 \cdot PEEA_i + \beta_4 \cdot PEEV_i + \beta_5 \cdot SoUC_i + \beta_6 \cdot ToUC_i \\
 & + \beta_7 \cdot CE_i + \beta_8 \cdot EE_i + \beta_9 \cdot TEEN_i + \beta_{10} \cdot MATURE_i + \beta_{11} \cdot FPS_i \\
 & + \beta_{12} \cdot RACING_i + \beta_{13} \cdot RPG_i + \beta_{14} \cdot SPORTS_i + \beta_{15} \cdot CHANGE_i \\
 & + \beta_{16} \cdot MULTI_i + \beta_{17} \cdot PCEA_i \cdot PCEV_i + \beta_{18} \cdot PEEA_i \cdot PEEV_i \\
 & + \beta_{19} \cdot PCEA_i \cdot SoUC_i + \beta_{20} \cdot PCEA_i \cdot MULTI_i + \beta_{21} \cdot Prob(Sequel_i) + \varepsilon_i
 \end{aligned}$$

**Table 2.2** Overview of the variables

Variable name	Description
$SALES_i$	The worldwide unit sales (million copies) of video game sequel $i$ .
$SoUC_i$	The size of the user community, measured as past unit sales average of all editions in the same series before the focal edition $i$ .
$ToUC_i$	The trend in the size of the user community, measured as past unit sales trend (slope) across all editions in the same series before the focal edition $i$ .
$EE_i$	Expert evaluations of sequel $i$ .
$CE_i$	Consumer evaluations of sequel $i$ .
$PEEA_i$	Past expert evaluations (average) given to all editions in the same series before the focal edition $i$ .
$PCEA_i$	Past consumer evaluations (average) given to all editions in the same series before the focal edition $i$ .
$PEEV_i$	Past expert evaluations (variance) of all editions in the same series before the focal edition $i$ .
$PCEV_i$	Past consumer evaluations (variance) of all editions in the same series before the focal edition $i$ .
$MULTI_i$	Video game with multiplayer option. Dummy variable.
$COMP_i$	Competition pressure that the sequel faces, measured as the number of other games with the same genre in the same year. For Probit model.
$CHANGE_i$	Attribute changes of sequel $i$ . Measured as any change in ESRB rating, developer, or genre of the sequel compared to the previous edition. Dummy variable.
$TEEN_i$	ESRB rating of sequel $i$ is Teen. Dummy variable.
$MATURE_i$	ESRB rating of sequel $i$ is Mature. Dummy variable.
$FPS_i$	Genre classification of sequel $i$ is FPS (First Person Shooter). Dummy variable.
$RACING_i$	Genre classification of sequel $i$ is Racing. Dummy variable.
$RPG_i$	Genre classification of sequel $i$ is RPG (Role Playing Game). Dummy variable.
$SPORTS_i$	Genre classification of sequel $i$ is Sports. Dummy variable.

*Expert evaluations* and *consumer evaluations* are obtained from the *Metacritic.com* video games database, a widely used online site for evaluation scores and content information (e.g. Hennig-Thurau *et al.*, 2009; Luan and Sudhir, 2010; Plucker *et al.*, 2009). For each type of evaluation, the past average evaluation score is calculated across editions in the same series (excluding the latest sequel) and labeled Past Expert Evaluations Average ( $PEEA_i$ ), and Past Consumer Evaluations Average ( $PCEA_i$ ). In addition, we collected evaluation data related to the latest sequel itself, both from experts  $EE_i$  and from consumers  $CE_i$ .

*Variability of past expert evaluations and variability of past consumer evaluations*

were calculated by taking the variance of the evaluation scores of past editions in the same series. These variables are labeled as Past Expert Evaluations Variability ( $PEEV_i$ ) and Past Consumer Evaluations Variability ( $PCEV_i$ ). Variance is commonly used in the marketing literature to measure variability and uncertainty (e.g. Dacin and Smith, 1994; Desai *et al.*, 2008; Volckner and Sattler, 2006). Alternative variability measures will be discussed and applied in our robustness checks.

*The size of the user community* is measured by the number of legal discs in the marketplace ( $SoUC_i$ ). Here the focus is on console games and the community size is measured across editions by averaging community sizes across editions in the series that were released before the sequel. Console gaming requires users to have the discs to play, so - despite possible second hand disc re-sales – the number of legal copies can be a good measure that represents the size of the user community at large. This approach also allows for users to drop out and others to take their place. We also developed a validation measure previously used by Hennig-Thurau *et al.* (2009). This measure only uses data from one edition before the focal sequel as a proxy for the user community size. The average number of copies across editions, however, seems to be more appropriate here as consumers may skip editions in the product series and come back to the series at a later stage. *Trend of the User Community* ( $ToUC_i$ ) is used to control for the direction of the changes in the user community size. This variable is calculated by using the *Linest* function in *Excel* that estimates the slope of the trend line in terms of the number of disks sold across all editions before the focal sequel.

The other variables such as multiplayer functionality ( $MULTI_i$ ), age rating ( $TEEN_i$  and  $MATURE_i$ ) and the genre dummies are obtained from *metacritic.com* and *vgchartz.com*. See Table 2.1.

### 2.3.2. Endogeneity of the sequel development decisions

Before we estimate the comprehensive model, we need to control for the fact that not all editions are succeeded by a new sequel. In other words, our estimation procedure must address the complex nature of the endogenous decision to develop a sequel or not. Ho *et al.* (2009) suggest a two stage equation system to tackle a similar problem. First we estimate a Probit model to approximate the developers' strategic decision to release a sequel into the market using a set of exogenous variables. In the second stage, the estimated probabilistic scores are included in the main model. This variable captures endogenous factors, which would otherwise be embedded in the error term of the main model.

The exogenous variables used in the first stage Probit model relate to the edition preceding the focal sequel only. The model is specified as follows:

$$\begin{aligned} & \textit{Probability}(\textit{releasing a new sequel } i) \\ &= \Phi(\alpha_0 + \alpha_1 \cdot \textit{SALES}_{i-1} + \alpha_2 \cdot \textit{COMP}_{i-1} + \alpha_3 \cdot \textit{MULTI}_{i-1} + \alpha_4 \cdot \textit{TEEN}_{i-1} \\ &+ \alpha_5 \cdot \textit{MATURE}_{i-1} + \alpha_6 \cdot \textit{FPS}_{i-1} + \alpha_7 \cdot \textit{RACING}_{i-1} + \alpha_8 \cdot \textit{RPG}_{i-1} \\ &+ \alpha_9 \cdot \textit{SPORTS}_{i-1} + \varepsilon_i) \end{aligned}$$

Table 2.3 presents the Probit regression results.  $\Phi(\cdot)$  is the cumulative distribution function of the standard normal distribution. The Probit estimation shows that two determinants are significant at  $p < .05$ , namely  $SALES_{i-1}$  and  $MATURE_{i-1}$ . This indicates that a successful game in terms of worldwide units sold, has a higher probability of getting a sequel (as expected) and games designed for mature audiences are also more likely to get a sequel compared to games for younger audiences. More importantly, the Probit estimation provides estimated values of the probability of having a sequel and this additional variable is included in the main model as a control.

**Table 2.3** Probit regression results for developing a sequel  $i$  after edition  $i-1$

Variables	Parameter estimates	
$SALES_{i-1}$	.639	***
$COMP_{i-1}$	.018	
$MULTI_{i-1}$	.014	
$TEEN_i$	.293	*
$MATURE_i$	1.450	***
$FPS_{i-1}$	.539	**
$RACING_{i-1}$	.013	
$RPG_{i-1}$	.161	
$SPORTS_{i-1}$	.515	**
Pseudo $R^2$	.142	

Note 1: Dependent variable: developing a sequel a sequel (1) or not (0)

Note 2:  $i-1$  relates to the edition before the focal sequel  $i$

Table 2.4 Descriptive statistics and correlation matrix

Variable Name	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1 SALES <sub>i</sub>	1.360	1.521																	
2 SoCC <sub>i</sub>	1.637	1.835	.602**																
3 ToUC <sub>i</sub>	.1154	.682	.187**	.090*															
4 EE <sub>i</sub>	7.471	1.254	.394**	.252**	.136**														
5 CE <sub>i</sub>	7.860	1.419	.116**	.014	.148**	.348**													
6 PEEA <sub>i</sub>	7.597	2.150	3.01**	.401**	2.00**	.472**	.137**												
7 PCEA <sub>i</sub>	8.029	1.086	.076	.101*	.137**	.085	.162**	.295**											
8 PEEV <sub>i</sub>	.492	1.855	-.018	-.018	-.178**	-.029	-.014	-.044	-.025										
9 PCEV <sub>i</sub>	.966	1.963	-.093*	-.142**	-.266**	-.071	-.173**	-.169**	-.247**	.042									
10 TEEN <sub>i</sub>	.450	.498	-.051	-.066	-.075*	-.079*	.076*	-.025	.148**	-.005	-.100*								
11 MATURE <sub>i</sub>	.140	.349	.152**	.134**	.049	.178**	.063	.121**	.052	-.042	-.143**	-.369**							
12 MULLI <sub>i</sub>	.250	.434	.034	.046	.083*	.025	.055	-.097*	.006	.023	.038	.051	.221**						
13 FPS <sub>i</sub>	.030	.184	.027	.034	-.076*	.003	.056	.028	.033	-.042	-.063	.001	-.204**	.094**					
14 RACING <sub>i</sub>	.080	.277	.005	.079	.002	-.055	-.025	-.067	-.076	2.63**	.049	-.144**	.129**	.141**	-.054				
15 RPG <sub>i</sub>	.060	.240	-.055	-.040	.071*	.062	.137**	-.038	.123**	-.025	-.109**	.159**	-.050	-.346**	-.050	-.086*			
16 SPORTS <sub>i</sub>	.180	.397	.062	.055	.091*	.210**	-.037	-.041	-.041	-.067	.070	-.296**	.196**	.255**	-.082*	-.142**	-.131**		
17 COMPI <sub>i</sub>	29.510	16.909	.033	.005	-.029	.045	-.152**	.102*	-.121**	-.045	.192**	-.154**	-.083*	.097**	-.296**	-.190**	-.425**	.478**	

\* Significant at  $p < 0.05$   
 \*\* Significant at  $p < 0.01$   
 Sales in million units

## 2.4. Empirical results

Table 2.4 presents the correlation matrix and the descriptive statistics of the study's key variables. The correlation analysis provides preliminary evidence that expert evaluations and consumer evaluations have a positive and significant correlation with worldwide unit sales ( $r = .394, p < .001$ , and  $r = .116, p < .01$  respectively). There is a significant correlation between worldwide unit sales and the average past expert evaluation ( $r = .301, p < .001$ ), but not between worldwide unit sales and the average past consumer evaluation ( $r = .076, p > .05$ ). It is also interesting to note that the variability of expert evaluations is only weakly correlated with the variability of consumer evaluations ( $r = .042, p > .05$ ), hinting at a low level of shared variance between the different types of evaluations.

### 2.4.1. Test of the hypotheses

The results of the two stage regression estimation are presented in Table 2.5. The variables that are included in an interaction are mean centered to reduce multicollinearity and the VIF values show that multicollinearity is not a major concern here. A total of up to 69% of variance in unit sales of sequels is explained. This level of explained variance is quite high and somewhat higher than a comprehensive study on sequel fit and success in the motion picture industry (Hennig-Thurau *et al.*, 2009). In their study, the number of screens, which is known to explain most of the variance in box office performance, is included in the model while in a game setting such a variable is not available.

**Table 2.5** The estimation results of the main regression models

Variable Name	MODEL 1		MODEL 2	
	$\beta$	VIF	$\beta$	VIF
<i>Series Evaluations:</i>				
$PCEA_i$	.299 ***	1.643	.283 ***	2.336
$PCEV_i$	-.084 *	1.538	-.081 *	1.663
$PEEA_i$	.172 ***	1.724	.162 ***	1.521
$PEEV_i$	-.016	1.170	-.010	1.538
<i>User Community:</i>				
$SoUC_i$	.501 ***	1.408	.514 ***	1.789
$ToUC_i$	.086 *	1.525	.089 *	1.702
<i>Sequel Evaluations:</i>				
$CE_i$	.086 *	1.597	.068 *	1.735
$EE_i$	.118 **	1.717	.115 **	1.831
<i>Sequel Characteristics:</i>				
$TEEN_i$	.039	1.813	.022	1.833
$MATURE_i$	.295 ***	1.891	.296 ***	1.919
$FPS_i$	.012	1.223	.019	1.236
$RACING_i$	.040	1.139	.043	1.164
$RPG_i$	.046	1.201	.043	1.219
$SPORTS_i$	.098 **	1.123	.101 *	1.133
$CHANGEATTR_i$	.041	1.142	.041	1.133
$MULTI_i$	.091 *	1.089	.082 *	1.887
<i>Interactions:</i>				
$PCEA_i \times PCEV_i$	N/A		-.184 ***	2.127
$PEEA_i \times PEEV_i$	N/A		-.096 **	1.578
$PCEA_i \times SoUC_i$	N/A		.083 *	2.266
$PCEA_i \times MULTI_i$	N/A		.141 ***	2.187
n	479		479	
$R^2$	.667		.694	
Adj $R^2$	.656		.682	
F Change	61.787 ***		10.535 ***	

\* Significant at  $p < .05$

\*\* Significant at  $p < .01$

\*\*\* Significant at  $p < .001$

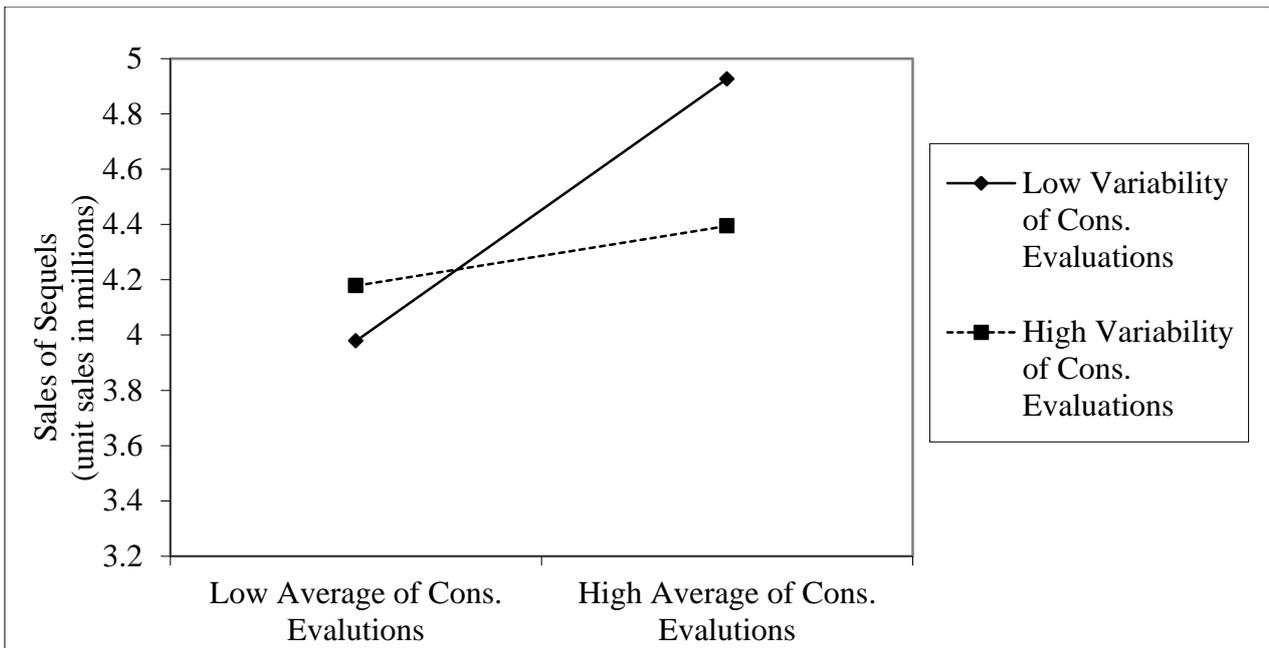
Note 1: The dependent variable is unit sales (in millions)

Note 2: We estimated the model with the first stage parameter (Prob(Sequel<sub>i</sub>)). In Model 1:  $\beta_{21} = .316^{***}$ ; Model 2:  $\beta_{21} = .310^{***}$

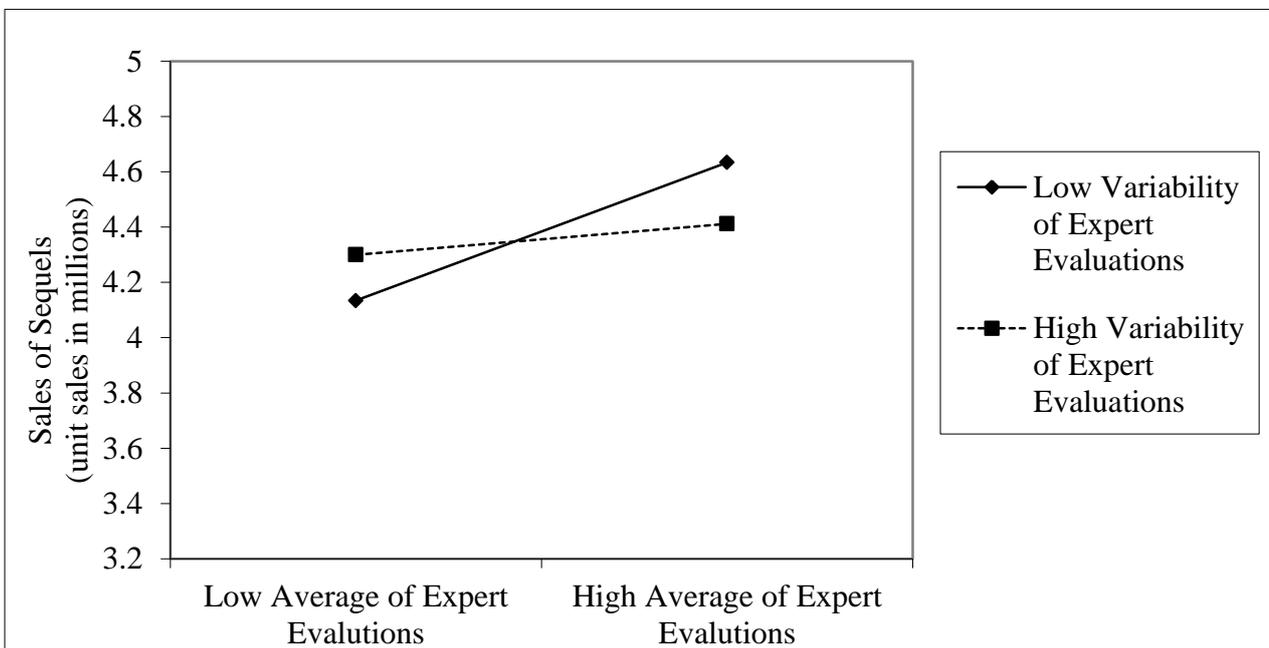
Our results show that there is a significant improvement in explained variance between our simple Model 1 and the comprehensive Model 2 ( $\Delta R^2 = .027$ ;  $\Delta F = 10.535$ ;  $p < .001$ ). We use the standardized results of our comprehensive model (Model 2) to test the hypotheses because we use different response scales to measure different constructs. The

relationship between consumer evaluations and worldwide sequel unit sales is significant and positive ( $\beta = .068$ ;  $p < .05$ ), as is the case for expert evaluations ( $\beta = .115$ ;  $p < .01$ ). The results also show that the average past expert evaluation in the series has a significant and positive relationship with unit sequel sales ( $\beta = .162$ ;  $p < .001$ ), and this positive relationship is also found for past consumer evaluations in the series ( $\beta = .283$ ;  $p < .001$ ). To interpret these relationships, the nature of the interaction has to be taken into account. We note that the coefficient related to variability of past consumer evaluations is negative and significant ( $\beta = -.081$ ;  $p < .05$ ) and the same direction is observed regarding the variability of past expert evaluations, however, the significance level is lower ( $\beta = -.010$ ;  $p > .05$ ).

The interactions between past evaluations in the series and their variability obtain negative and significant coefficients (consumers:  $\beta = -.184$ ;  $p < .001$ ; experts:  $\beta = -.096$ ;  $p < .01$ ). The relationships are visualized in Figure 2.1. for past expert evaluations and in Figure 2.2. for past consumer evaluations. For the purpose of visualization, the evaluation scores are split based on a median split. Figure 2.1. and 2.2. show that positive past evaluations are generally associated with higher levels of sequel success (supporting H1a and H1b), even after controlling for the evaluations of the sequel itself. The positive slopes in both figures show that positive evaluations of past editions are positively associated with sequel unit sales but that this relationship is more positive if variability across editions is low supporting H2a and H2b.



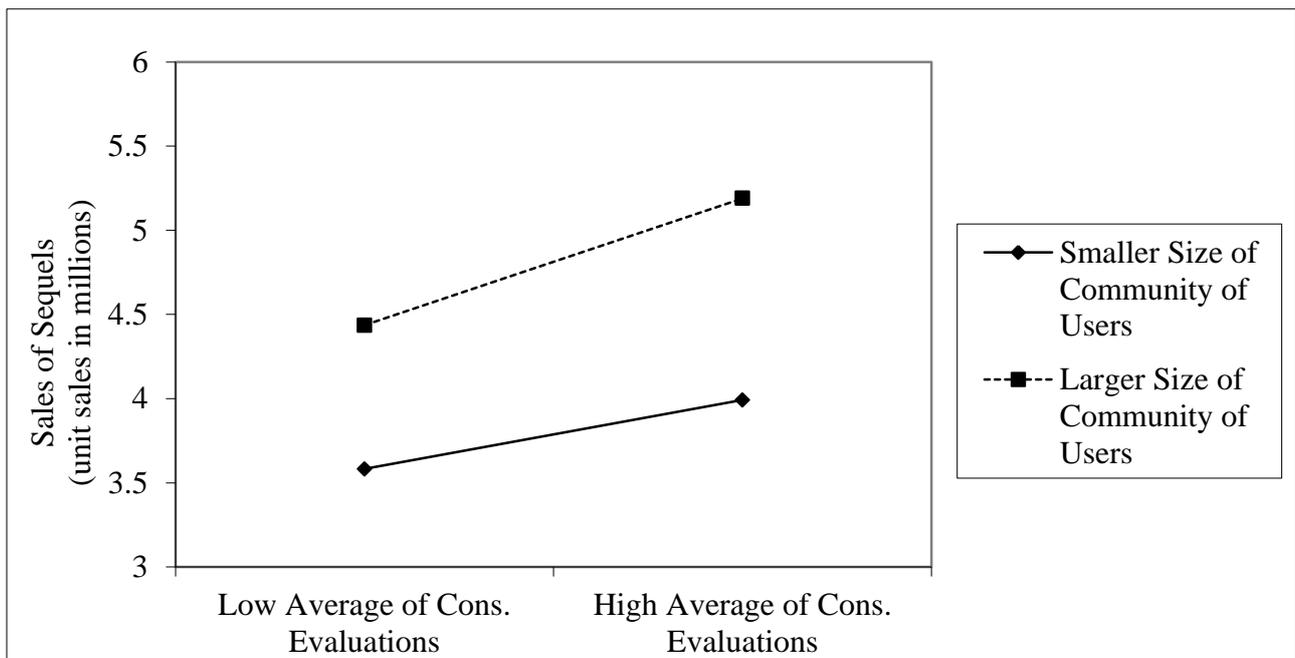
**Figure 2.1** Sequel sales and past consumer evaluations in the series (low versus high variability across editions)



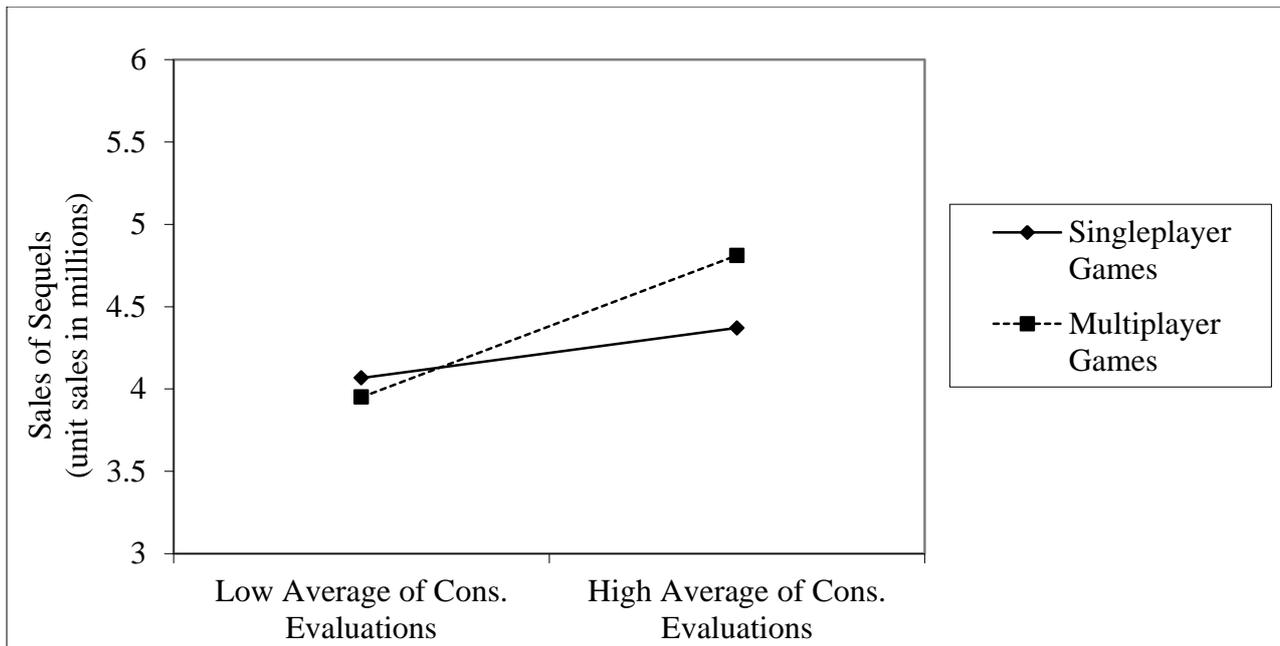
**Figure 2.2** Sequel sales and past expert evaluations in the series (low versus high variability across editions)

The size of the user community plays an important role in the unit sales of the sequel ( $\beta = .514$ ;  $p < .001$ ). The interactions between this variable and the average past consumer evaluation in the series is significant ( $\beta = .083$ ;  $p < .05$ ). The nature of this interaction is visualized in Figure 2.3 showing that the relationship between positive consumer evaluations

of past editions and worldwide unit sales of the sequel is more positive for larger communities supporting H3. We also find a significant interaction between consumer evaluations of past editions and whether the product is a multiplayer game enabling social interaction while consuming the product ( $\beta = .141$ ;  $p < .001$ ). Figure 2.4 shows that positive consumer evaluations of past editions are positively related to unit sales of the sequel. This relationship is more positive for series with multiplayer functionality such as *Pro Evolution Soccer* from *Konami*. This supports H4.



**Figure 2.3** Sequel sales and past consumer evaluations in the series (larger versus smaller communities of users)



**Figure 2.4** Sequel sales and past consumer evaluations in the series (single player versus multiplayer games)

#### 2.4.2. Robustness tests

We first test the robustness of our results using alternative measures of variability and community size. The first alternative variability measure takes the number of products in the series into account by dividing the variance across evaluations of past editions by the number of editions before the focal sequel (c.f. Desai *et al.*, 2008). Using this new operationalization in our model, we find similar relationships, including the moderating effect of past consumer variability ( $\beta = -.173, p < .001$ ), and the moderating effect of past expert variability ( $\beta = -.081, p < .05$ ).

The second alternative measure of variability is based on the volatility index from finance where this measure is used to measure the relative volatility of a stock compared to the overall portfolio (Levinson, 2006). Again, we find the same results. The moderating effect of variability (volatility approach) of consumer evaluations is negative and significant ( $\beta = -.131, p < .001$ ), and the coefficient of expert variability is negative but not significant ( $\beta = -.043, p > .05$ ).

As an alternative measure of the size of the user community, the number of disks sold of the edition immediately preceding the sequel is used (Hennig-Thurau, Houston, and Heitjans, 2009). As with our original findings, the coefficient of the size of the user community is positive and significant ( $\beta = .453, p < .001$ ), and the interaction variables are also very similar. Also, using logged variables for user community size and unit sales does not alter our findings.

The model obtains a high fit and we are also interested in the performance of our model in terms of predicting the success of future sequels. For this, we collected new data on 27 video game sequels released between January 2010 and March 2011. The model estimates are used to compute predicted worldwide sequel sales in units and compare it with the realized worldwide sequel sales. The correlation between the predicted and real values are high and the t-statistic of the difference between actual versus real performance is not significant ( $r = .647, p < .01$ ), with a t-value of 1.155 ( $p > .05$ ). Table 2.6 gives some examples of sequel series and their predicted and actual sales in million units. These numbers show that the two sets of values (predicted and actual) are quite similar.

**Table 2.6** Example sequels released in 2010-2011 and their predicted and actual sales (million units worldwide)

Title	Genre	Release Date	Predicted	Actual
MotoGP 10	Racing	7-Dec-10	.25	.19
Dynasty Warriors 7	Action	29-Mar-11	.79	.71
Tiger Woods PGA Tour 11	Sports	29-Mar-11	.61	.77
Dragon Ball Z: Burst Limit	Fighting	2-Nov-10	.79	.89
Fight Night Round 4	Sports	1-Mar-11	1.23	1.41
Pro Evolution Soccer 2010	Sports	19-Oct-10	1.51	1.57

## **2.5. Discussion and conclusions**

The starting point of this study was that sequels, because they form part of a recognizable series, are considered to benefit from a ‘carry over’ effect of the positive image of previous editions (c.f. Hennig-Thurau et al., 2009). This study adds to the discussion, by showing that the carry over effect is active across the whole series and that the impact of the carry over effect depends on observable weighting factors as suggested by a broader framework derived from the theory of reasoned action.

Our findings offer an in-depth perspective on the role of consumer (and expert) evaluations, i.e. not just as a signal of consumer (expert) appreciation towards the product but also as input for the consumer attitude formation towards the series as a whole and as a constituent of subjective norms that have an effect on behavioral intentions towards the product and the series as a whole. More importantly, we conclude that every edition in a series of products matters because if there is a poor quality edition in the series, it will hurt the success of later sequels through two mechanisms. First, the lower evaluation will carry over to the sequels that follow. Second, the variation that results from inconsistent evaluations across editions creates uncertainty (volatility) and a less favorable weighting of past qualities in the series.

There is a broader debate in the creative industries that creative products are different. “The very act of consumer choice in creative industries is governed not just by the set of incentives described by conventional consumer demand theory, but by the choices of others” (Potts et al. 2008). This study shows that the general framework behind the theory of reasoned action is particularly useful in the creative product arena because it focuses on individual attitudes and external subjective norms that are weighted. So, apart from the substantive findings on sequels in an important industry, we show the applicability of the theory of reasoned action as a framework in the creative industries.

### **2.5.1. Implications, limitations, and future research**

The results have several implications for marketing research and marketing practice. First, this study is the first attempt to apply the theory of reasoned action to the discussion of sequels. The theory of reasoned action offers a comprehensive framework for studying the impact of evaluations on consumer behavior even when, as in this study, the individual consumer remains a black box.

Second, the comparison of the effects of expert and consumer evaluations contributes to the ongoing discussion about the impact of consumer reviews on performance of the product, which has obtained mixed findings so far (e.g. Liu, 2006; Gemser et al., 2007). The impact of consumer evaluations may not lie only in their role as a quality signal but also - and as our study suggests, in some cases even more strongly – in their role as subjective norms that co-determine individual intentions and resulting behavior.

Third, this study points the way towards further research on the effects of variability across editions and time, especially as a moderator of other signals of quality. Variability can be conceptualized and operationalized differently from the way we have done. Variability relates to volatility and more research is needed on ambiguity and noise regarding evaluations. More research is also needed regarding fake evaluations and how they affect consumer decision making behavior regarding sequels.

Fourth, the focus on the type of community of users points towards the need for more in-depth research of the particular mechanisms through which communities have more or less impact on the success of the new product. With respect to the behavior of their members, this study has paid specific attention to the extent to which products are consumed while interacting with other consumers, but, while this study only distinguished between single

player and multiplayer games, other products may offer more opportunities to characterize relationships and interaction during consumption.

Inevitably, this study has several limitations. First, the empirical relationships found in this study come from the video game industry. More research is needed to validate our findings and analyze other types of products, especially non-creative products, such as automobiles where communities and past reviews may also influence sales of product extensions. Second, the relatively high level of anonymity of online consumer evaluations means that with the current approach, one cannot determine the actual repurchasing behavior of individual consumers who post online reviews, nor can the contacts between real consumers be directly observed. Future studies may use data that reflect the behavior of individual consumers, as well as their contacts within the community. Third, in this study we did not control for the success of the original franchise outside the video game industry – such as Batman or Spiderman comics and films. Where video games are derived from movies – the Harry Potter video games for example, are built on and released together with the movies – the current approach does not account for how the original movies' or books' popularity might affect the performance of the associated video games. Fourth, OLS is used to test the main models, which is common in this area (c.f. Hennig-Thurau et al., 2009) but one may argue that a multilevel approach could better suit the data as editions in a series are related. When more series become available with a long history of editions, this approach becomes feasible.