

Simulating the Cinema Market: How Cross-Cultural Differences in Social Influence Explain Box Office Distributions

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This paper uses a mixed method approach to show how cross-cultural differences in social influences can explain differences in distributions of market shares in different markets. First, we develop a realistic agent-based model that mimics the behavior of movie visitors and incorporates the social influences visitors exert on each other before and after visiting movies. The simulation results indicate that market inequalities are determined by social influences. In particular, we find that the social influence derived from the intended behaviors of others (coordinated consumption effect) has a stronger effect on market inequalities than the social influence derived from the past behavior of others (imitation effect). Second, we empirically validate the simulation results by conducting a cross-national survey that makes use of the cross-cultural differences in Hofstede's collectivism-individualism index as a proxy for the level of social influence present in a market. The results of this field study, performed in China, the Netherlands, Italy, and Spain, empirically show that social influences differ across countries, and that these differences can explain the apparent differences in the dispersion of movies' market shares. The empirical survey further contributes to understanding the role of social influence by revealing a U-shaped relationship between Hofstede's collectivism-individualism index score and the degree of social influence.

Introduction

Social influence plays a prominent role in the diffusion of innovations (Rogers, 1995). The Bass Model shows that the diffusion of a new product is a function of spontaneous innovation of consumers (due to external influences such as mass media coverage) and cumulative adoptions (due to internal influences such as word of mouth) (Hauser, Tellis, and Griffin, 2006). Markets that are characterized by strong social influence often display great market inequalities with a few winners that dominate the market. The motion picture industry is a typical example of such an industry; it has frequently been called a “winner-take-all” market because market shares of movie pictures are very unequally distributed (De Vany, 2004; De Vany and Walls, 1996). Big mainstream movies like *Harry Potter*, *Spider Man*, and *Star Wars* dominate the market, leaving other movies far behind with very low market shares (Elberse and Oberholzer-Gee, 2006; Frank and Cook, 1995). For example, in 2006, 607 movies were released in the United States, and the top 150 highest-grossing of these accounted for \$8.77 billion (or 92%)

of the total market box office revenues (\$9.49 billion) that year.

Many researchers argue that social influences can explain these extreme market inequalities (e.g., De Vany and Walls, 1996, 1999; Moul, 2007; Salganik, Dodds, and Watts, 2006). Social influence impacts the movie's success, as people have a keen interest in watching the same movies (Frank and Cook, 1995), and as they are strongly influenced by the feedback of other consumers (Cialdini and Goldstein, 2004; Liu, 2006). This may ultimately lead to informational cascades that strongly impact movie success (De Vany and Walls, 1996). Past research has demonstrated the impact of social influence on market shares and a movie's success by using advertising budgets to estimate the amount of “buzz” created (Elberse and Eliashberg, 2003), or by using movie blog sites as a proxy for the word-of-mouth activities in a week (Liu, 2006). Other research has analyzed the box office revenues over time to detect word-of-mouth behaviors that cause auto-correlated growth among movies (De Vany and Walls, 1996; Moul, 2007). Eliashberg, Jonker, Sawhney, and Wierenga (2000) have developed yet another approach by estimating the word-of-mouth interactions based on individual-level data through a consumer clinic experiment. The extant research has used a variety of methods to provide sufficient empirical evidence that social influence is a

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driver of market inequalities, but relatively few studies have used individual-level data to test the effects of social influences on market inequalities (for notable exceptions, see Eliashberg et al., 2000, and Liu, 2006). The main reasons why so little is known are the difficulty of measuring social influences and the unpredictability of the dynamic social processes. These make it difficult to link micro-level data with market outcomes (Delre, Jager, Bijmolt, and Janssen, 2010; Eliashberg et al., 2000). Furthermore, the majority of studies tend to focus on the social influence resulting from others' past visiting behaviors, such as receiving word-of-mouth and buzz, whereas psychological research argues that consumers are also influenced by the intentions of others; for example, by conforming to group pressures to visit a movie together (Bagozzi, Wong, Abe, and Bergami, 2000; Cialdini and Goldstein, 2004). This study investigates two types of social influence: the social influence resulting from others' past behaviors (i.e., word-of-mouth interactions with others who went to the movie), and the social influence that arises from the intended visiting behaviors of relevant others (i.e., group pressure to join others that want to visit a movie).

The main purpose of this paper is to show to what degree different types of social influences impact market inequalities. A second objective is to display how agent-based modeling and empirical surveys can complement each other by using the strengths of each

method (Fagiolo, Moneta and Windrum, 2007; Garcia, Rummel, and Hauser, 2007; Morgan, 1998). The use of the two methodologies provides a deeper understanding of the complex and dynamic nature of social influence, since the results of each study can (a) be cross-validated (triangulation); (b) complement, clarify, and elaborate on the findings of the other study (complementarity); (c) shape the other subsequent method or steps in the research process (development); (d) lead to new insights (initiation); and (e) extend the breadth and range of inquiry of the other study (expansion) (Green, Caracelli, and Graham, 1989). To reach these objectives, this paper follows a sequential exploratory design in which our agent-based model is prioritized and followed by an empirical survey (cf. Hanson et al., 2005). The simulation study explores the effects of different types of social influence on market inequalities which are subsequently validated in our empirical field study. While the main purpose of the empirical survey is to validate the simulation findings (triangulation), it also seeks to complement, clarify, and elaborate the simulation findings (complementarity) and to extend our current body of knowledge on cross-cultural differences in social influences (expansion).

The strength of agent-based models lies in their capacity to capture the individual's underlying decision process and mimic the dynamic social effects (Garcia, 2005). Our agent-based model, which is based on the individual decision making of the movie visitor, formalizes the dynamics with which moviegoers exert social influences on each other before and after visiting movies. It simulates their decisions, the movies' product life cycles, and aggregates the movies' performance in terms of box office revenues (i.e., number of visitors). The model thus links the micro decisions of the agents (moviegoers) to the macro dynamics of the industry (motion picture industry). The main results of our simulation experimental design show that social influence is the main driver of market inequalities. The simulation results provide additional insights that social influence from others' intended behavior (coordinated consumption effect) has a much stronger effect on market inequalities than the social influence from others' past behaviors (imitation effect) and than other variables like attendance frequency and movie characteristics.

To test whether the simulation results accurately display the real dynamics of the industry, we empirically corroborate our simulated findings by conducting an empirical survey in four countries: Spain, Italy,

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the Netherlands, and China. These countries differ widely in the cultural index collectivism-individualism, ensuring significant differences in social influence (Triandis, 1989). The empirical results confirm the simulation results as they show that social influences differ across nations (e.g., social influence is stronger in China and the Netherlands than in Italy and Spain), and that these cross-cultural differences can explain the magnitude of market inequalities (e.g., market inequalities in China and in the Netherlands are much greater than in Italy and Spain). The empirical study also complements the simulation study by displaying one of the major drivers of social influence. It reveals a U-shaped relationship between Hofstede's collectivism-individualism index and the degree of social influence.

The paper is organized as follows: in section 2 we describe the agent-based model for the motion picture market and present the experimental design and the simulation results; in section 3 these simulation results are verified presenting the market analysis and the empirical findings of our multi-country survey; finally, in section 4, we conclude and discuss managerial implications and research limitations.

Simulation Study

The Agent-Based Model

The purpose of this agent-based model is to gain insights on how social influences can affect the market inequalities in the motion picture market. We develop a realistic simulation model that makes use of social influences and is capable of producing the stylized market inequalities. The model is based on the widely accepted assumption that individual adoption decisions are influenced by personal characteristics (e.g., personal preferences), innovation characteristics, social influence, and marketing actions (Gatignon and Robertson, 1985). The simulation model describes a market with M movies and N agents, where agents decide which movie to see at each time step (without allowing revisits). At each time step, which corresponds to one week in the real cinema market, the simulation cycle can be summarized as follows:

(a) Agent i becomes aware of the movies available on the market either according to equation 1 (at the movie's release) or according to equation 2 (after the movie's release).

(b) With probability r_i (probability of attending a movie) agent i is selected. If selected, it computes the expected utility for each movie it is aware of (equation 3) and visits the movie with the highest utility. If not selected, it does not visit any movie.

The likelihood that agent i becomes aware of movie j depends on the buzz movie j creates. $BUZZ_{jt}$ is the buzz of movie j at time t . When movie j is released (equation 1), $BUZZ_{j0}$ is determined by the pre-release advertising budget of movie j , A_j . This assumption can be considered realistic, given that 90% of advertising expenditures are spent prior to movie release (Elberse and Anand, 2007). The relation between the advertising budget and the generated buzz is assumed to follow an S-shaped curve. Such a curve formalizes an entry barrier for very low-budget movies and a decreasing effect of the advertisement for very high budget movies (Leeftang, Wittink, Wedel, and Naert, 2000; Lilien and Rangaswamy, 2003). Here ω_1 is a parameter of the model indicating the information strength of advertising. After movie j has been released (equation 2), its buzz depends on its success at the box office (Eliashberg et al., 2000). This is simply formalized using the box office of the previous week, $Box_{j,t-1}/N$, where $Box_{j,t-1}$ is the box office movie j has obtained at the previous time step. Here δ_1 is a parameter that determines how fast the evolution of $BUZZ_{jt}$ is towards the movie's actual box office. The higher δ_1 , the more quickly agents forget the initial buzz created by advertising and the stronger their tendency to rely on the box office of the previous week.

In (b), agent i determines the utility of movie j . Equation 3 is used in order to compute this utility, which is composed by an individual utility (equation 4) and a social utility (equation 5). Individual utility and social utility are weighted by the parameter β_i . This parameter is heterogeneously distributed across the population of agents. Agents with high β_i tend to be susceptible to the behavior of other agents and are more strongly affected by social influences, while agents with low β_i tend to decide according to their own preferences. Individual utility is based on the fit between the individual preferences and the movie characteristics, where p_i stands for the preferences of agent i and m_j stands for the characteristics of movie j . Social utility is derived both from what other agents have done (imitation effect) and from what they intend to do (coordinated consumption effect) (cf. Delre, Broekhuizen, and Jager, 2008; Hidalgo, Castro, and Rodriguez-Sickert, 2006). The imitation effect

refers to the degree to which consumers are influenced by the *past* behaviors of others. The higher the number of people that have visited a given movie, the more likely consumers receive recommendations from others to visit that movie and the greater their tendency to copy this type of social influence. Coordinated consumption refers to the degree to which consumers are influenced by the *intended* behaviors of others. The more people intend to visit a given movie, the more likely consumers find somebody else to go to visit a movie with and the stronger are the social pressures to join. Our agent-based model includes these two kinds of social influences: the imitation effect a_{jt} , given by the fraction of agents that have already seen movie j (equation 6, where $TotBox_{jt}$ is the movie's accumulated box office) and the coordinated consumption effect b_{jt} , given by the proportion of agents that are informed about the movie j but have not seen it yet (equation 7, where $BUZZ_{jt}$ is the probability of knowing about movie j and $1 - TotBox_{jt}/N$ is the fraction of agents that have not seen the movie yet). The two different social effects are weighed by two parameters of the model, c_1 and c_2 , which indicate the importance attributed to imitation and coordinated consumption in generating social utility. Finally, our simulation model formalizes two relations between the susceptibility to social influence and two other parameters of the model. On the one hand, equation 8 shows the negative relationship between the susceptibility to social influence, β_i and the attendance frequency of agent i , r_i . The rationale behind this relation is that movie visitors who have stronger social motivations and are more susceptible to social influence visit cinemas less often (Cuadrado and Frassetto, 1999; Delre et al., 2008; Möller and Karppinen, 1983). In our formalization (equation 8), high values of w_1 imply a stronger negative relationship between social influence and frequency of attendance. On the other hand, equation 9 relates the susceptibility to social influence of agent i , β_i to the characteristics of movie j , m_j : the higher the value of β_i , the more m_j moves to the center of its distribution, and the higher the movie's theme or genre acceptability (Eliashberg et al., 2000). The rationale behind this is that consumers who are more susceptible to social influence tend to visit movies with characteristics that meet the preferences of a general audience (comedy, action, adventure, etc.), whereas consumers that follow their individual tastes tend to select movies whose characteristics meet the preferences of a particular audience (documentary, biography, sport, etc.) (Möller and Karppinen, 1983). Here,

high values of w_2 imply a stronger relationship between social influence and genre acceptability.

$$BUZZ_{j0} = e^{-\frac{\omega_j}{A_j}} \quad (1)$$

$$BUZZ_{jt} = BUZZ_{j,t-1} + \delta_1 \cdot (Box_{j,t-1}/N - BUZZ_{j,t-1}) \quad (2)$$

$$E[U_{ijt}] = \beta_i \cdot x_{jt} + (1 - \beta_i) \cdot y_{ij} \quad (3)$$

$$y_{ij} = 1 - |m_j - p_i| \quad (4)$$

$$x_{jt} = \frac{c_1 \cdot a_{jt} + c_2 \cdot b_{jt}}{a_{jt} + b_{jt} + c_1 + c_2} \quad (5)$$

$$a_{jt} = \frac{TotBox_{jt}}{N} \quad (6)$$

$$b_{jt} = BUZZ_{jt} \cdot \left(1 - \frac{TotBox_{jt}}{N}\right) \quad (7)$$

$$r_{it} = \begin{cases} \bar{\beta} > \beta_i \rightarrow r_t + w_1 \cdot (\bar{\beta} - \beta_i) \cdot (1 - r_t) \\ \text{otherwise} \rightarrow r_t + w_1 \cdot (\bar{\beta} - \beta_i) \cdot r_t \end{cases} \quad (8)$$

$$m_{ij} = m_j + w_2 \cdot \beta_i \cdot (\bar{m} - m_j) \quad (9)$$

At the end of the simulation run, we calculate each movie's total cumulative box office by collecting each movie's attendance at each time step. We calculate the market shares by dividing each movie's total cumulative box office by the total annual market box office. Finally, we study the overall market inequality of market shares computing the Gini coefficient. The Gini coefficient is frequently used as a measure for the inequality of income or wealth distribution, but can also be applied to the movie industry (De Vany and Walls, 1996). The values range between 0 and 1: when the Gini coefficient is 0 it corresponds to perfect equality of market shares; when the Gini coefficient is 1 it corresponds to perfect inequality where a single movie obtains the revenues of the whole market.

Experimental Design and Simulation Results

The agent-based simulation model has 13 free parameters: M , N , r_i , A_j , ω_j , δ_1 , β_i , p_i , m_j , c_1 , c_2 , w_1 , w_2 . Some of these parameters do not directly relate to the focus of this paper, and will not be used for sensitivity analysis. The inputs of these parameters are either theoretically driven or directly calibrated (Garcia et al., 2007). A_j , r_i , and M are calibrated, since their values are imported from real data of the U.S. cinema market; A_j is randomly plugged with the advertising budgets of real movies (data about marketing

expenditures were obtained from www.the-numbers.com and from www.imdb.com); r_t is determined by the seasonal effect of the real market, that is, the weekly attendance at the cinema theaters (Ainslie, Drèze, and Zufryden, 2005; Elberse and Eliashberg, 2003; Vogel, 1998); and M is fixed to 480, which is the number of movies released in the U.S. market in 2006 (MPAA, 2006). The number of movies introduced at each time step is also determined on the basis of the seasonal effect. The values of ω_I and δ_I are theoretically driven: their values are set respectively to 50,000,000 and 0.5. In this way we mimic the strong prerelease informative effect and its fast decay that is present in the movie industry (Elberse and Anand, 2007; Elberse and Eliashberg, 2003). With this setting, on average, more than 80% of the agent population is aware of the movie prior to release and on average the information effect decays after about 5 time steps (weeks) from release.

Concerning movie characteristics and consumers' preferences we avoid making strict theoretical assumptions, and let both p_i and m_j vary from 0 to 1. Finally, we set N equal to 5000 in order to simulate a population that is large enough to permit a minimal initial penetration for almost all released movies.

The remaining five parameters are the objects of our sensitivity analysis because they directly involve the social concepts under investigation: social influence, imitation effect, coordinated consumption effect, frequency of attendance, and movie characteristics (respectively β_i , c_1 , c_2 , w_1 , and w_2). Table 1 displays the factorial experimental design.

Table 1. Experimental Design

	Values	Implications
β_i	[0.0, 0.5]	Low social influence
	[0.5, 1.0]	High social influence
c_1	0.1	Low weight imitation effect
	0.9	High weight imitation effect
c_2	0.1	Low weight coordinated consumption effect
	0.9	High weight coordinated consumption effect
w_1	0.0	Low correlation between social influence and attendance frequency
	0.5	Medium correlation between social influence and attendance frequency
	1.0	High correlation between social influence and attendance frequency
w_2	0.0	Low correlation between social influence and movie characteristics
	0.5	Medium correlation between social influence and movie characteristics
	1.0	High correlation between social influence and movie characteristics

Table 2. The Effects of β_i , c_1 , c_2 , w_1 , and w_2 on the Gini Coefficient

	Sum of Squares	F	Sig.	Partial Eta Squares
Intercept	2.248	49250.7	.000	.999
β_i	.055	1197.3	.000	.948
c_1	.001	11.4	.001	.147
c_2	.003	75.3	.000	.533
w_1	.000	4.6	.036	.065
w_2	.001	26.5	.000	.287

Note: (R Squared = .952; Adjusted R Squared = .949).

We investigate to what degree the parameters influence the Gini coefficients by conducting an analysis of variance (ANOVA). Such analysis allows for an estimation of the relative effect of the variables of the experimental design by means of Partial Eta Squared estimations (Delre et al., 2010; Goldenberg, Libai, and Muller, 2001). We find that all five parameters of the experimental design positively affect market inequalities. However the strength of these effects varies to a great extent. Table 2 presents the results of our simulation runs and shows that β_i , corresponding to the susceptibility to social influence, is the strongest driver of market inequality. This indicates that in markets with higher social influence market shares tend to be more dispersed.

Next, c_1 and c_2 (respectively the weight of the imitation effect and the weight of the coordinated consumption effect) positively contribute to market inequalities. It is interesting to note that the effect of coordinated consumption is almost four times stronger than the effect of imitation. The effect of the coordinated consumption on market inequalities is straightforward. The more agents tend to coordinate their choices, the more they will direct their visits to the movies that many other agents are aware of and intend to visit. Coordinated consumption is most likely to occur at the movie release for movies that are heavily advertised, or immediately after launch when the advertising effects remain strong. This convergence of coordinated decisions towards the most advertised movies stresses the typical reinforcing mechanism where the most famous movies become the most visited and the most visited movies become the most famous. Consequently, for higher values of coordinated consumption, at the aggregate level the differences in box office success between highly advertised and visited movies on the one hand, and less advertised and less visited movies on the other hand, increase. The effect of imitation on market

inequalities is less straightforward. Similar to the coordinated consumption effect, the imitation effect allows agents' choices to converge because it directs them towards highly advertised and visited movies that obtain success when they are launched (agents tend to visit movies that have been highly visited in the previous time steps). However, the imitation effect also attenuates this reinforcing mechanism because it permits low-advertised movies to grow after the opening week. Some movies, although entering the market with a low advertising budget, have characteristics (m_j value) that closely meet agents' preferences (p_i distribution) determining high utilities (equation 4). Setting a high imitation effect allows these movies to grow substantially in the following weeks because other agents are more likely to imitate those agents that have visited them. Attendance to these movies increases in the first weeks, the buzz around them increases as well, and they are more able to face the competition against the new highly advertised movies that are about to be launched. In this sense the imitation effect plays a role that contrasts with the typical reinforcing mechanism ignited by the strong prerelease advertising campaigns because it lets low-advertised movies compete against the big ones. In fact, with a stronger imitation effect, visitors become more hesitant to visit movies in the opening week, as they first want to evaluate the success of a movie and then imitate others by visiting that movie. These two alternative forces created by the imitation effect, which have an opposite impact on market inequalities, are the cause of the limited effect of c_1 on the Gini coefficient.

Finally, the effects of w_1 and w_2 are also estimated. While the effect of w_1 only marginally contributes to market inequalities (i.e., a stronger negative relation between social influence and attendance marginally increases market inequalities), the effect of w_2 substantially increases market inequalities. The latter effect implies that if susceptibility to social influence (agents' β_i) more strongly correlates with popular movie themes and genres, market inequalities considerably increase.

Cross-National Field Study

The purpose of the cross-national field study is to test whether the degree of social influence visitors exert on each other varies systematically across countries and whether these differences can explain the apparent

differences in the dispersion of market shares across countries.

After reviewing the literature on cross-cultural differences in social influence, we present the survey approach and its findings. Following previous research (Dawar and Parker, 1994; Steenkamp, 2001; Steenkamp, ter Hofstede, and Wedel, 1999), we use nationality as a proxy of culture. Members of the same nation tend to share a similar language, history, religion, understanding of institutional systems, and a sense of identity (Dawar and Parker, 1994; Hofstede, 1980). Nations "are the source of [a] considerable amount of common mental programming [for] their citizens" (Hofstede, 1991, p. 12) that account for cultural differences in the consumers' susceptibility to social influence (Dawar, Parker, and Price, 1996; Prins, 2008).

Social Influence and Cross-Cultural Differences

Social influence has long been recognized as an important force shaping consumers' product evaluations and purchase decisions (Arndt, 1967; Cialdini and Goldstein, 2004); especially for publicly consumed, conspicuous products like movies (Bearden and Etzel, 1982). Consumers receive valuable information and adjust their behaviors to match the expectations of other people or a reference group (Cialdini and Goldstein, 2004). As such, they make choices different from the ones they would have made in the absence of public scrutiny (Ariely and Levav, 2000; Belk, 1988).

Previous research distinguished between informational influence and normative social influence (Burnkrant and Cousineau, 1975). Informational influence occurs through a process of internalization, where information from others is accepted as evidence about reality (Deutsch and Gerard, 1955). Here, consumers can make more informed and accurate decisions with the help of others (Burnkrant and Cousineau, 1975). Normative influence is an influence to comply with the expectations of others (Cialdini and Goldstein, 2004). Consumers can conform to the expectations of others because of two main reasons: to receive rewards or avoid punishments (i.e., utilitarian value), or to maintain or enhance their self-image (i.e., value-expressive value) (Bearden and Etzel, 1982; Childers and Rao, 1992). This study investigates the normative influences rather than informational influences, because the study's focus is on in-group

influences. While reference groups with high credibility, such as those having presumed expertise (e.g., movie critics) often serve as sources of information-based influence for uncertain or uninformed consumers (Childers and Rao, 1992), family and peers tend to be sources for utilitarian and value-expressive functions (Johar and Sirgy, 1991). Normative influences appear when relevant others recommend consumers to visit a movie, and as these consumers conform to the opinions and evaluations of others by going to see that movie.

These normative influences are “universal” and are observed in all cultures, but the extent and manner with which consumers practice them may vary from country to country and from culture to culture (Bagozzi and Lee, 2002; Chu, 1979; Dawar and Parker, 1994; Dawar et al., 1996; D’Rozario, 2001; Hofstede, 2001; Sistrunk, Clement, and Guenther, 1971; Soares, Farhangmehr, and Shoham, 2007; Triandis, 1989).

In this respect, the collectivism-individualism cultural characteristic (Triandis, 1996) has been most frequently used to explain the differences in cultures’ susceptibility to social influences (Bond and Smith, 1996; Hofstede, 1980; Kim et al., 1994; Murali, Laroche, and Pons, 2005). Collectivism is defined as a social pattern that consists of individuals who see themselves as an integral part of one or more collectives or in-groups, such as family and co-workers (Triandis, 1995). People who are more collectivist are often motivated by norms and duties imposed by the in-group, give priority to the goals of the in-group (e.g., friends, family, and colleagues), and try to emphasize their connectedness with the in-group (Kacen and Lee, 2002). Collectivists are therefore more likely to conform to group pressures than individualists in order to mediate social punishments and rewards (Cialdini and Goldstein, 2004; Triandis, 1995). Individualism is defined as a social pattern that consists of individuals who see themselves as autonomous and independent. Individualists are motivated by their own preferences, needs, and rights, give priority to their personal goals, and emphasize a rational analysis of their relationships with others (Triandis, 1995). For them, the importance of group conformity and harmony is less important, making them less responsive to group pressures than collectivists.

Empirical evidence has been found for the attenuating effect of individualism on the susceptibility to social influence (D’Rozario, 2001; Murali et al., 2005). Past research has found that the more collec-

tivistic Chinese are more conforming and more socially dependent than Americans in multiple settings (Huang and Harris, 1973; Meade and Barnard, 1973), and that the influence of others on attitudes and purchase intentions is stronger for collectivists than for individualists. Finally, several authors show, by applying the Theory of Reasoned Action (Ajzen and Fishbein, 1980), that subjective norms are stronger in collectivistic countries and that attitudes are particularly strong in individualistic countries when consumers form their behavioral intentions (Bagozzi et al., 2000; Lee and Green, 1991; Trafimow and Finlay, 1996).

Despite the empirical evidence for the negative relationship between individualism and susceptibility to normative influence, recent research challenges the validity of this relationship based on inconsistent findings (Prins, 2008; Singh, 2006). Recent research shows that normative social influence can also be particularly strong for members of highly individualistic countries. An explanation for this finding is derived from the distinction between utilitarian and value-expressive normative influence. Prins (2008) finds that in their adoption of value-added mobile services, individualistic American consumers are consistently more strongly influenced by normative influences than collectivistic Japanese consumers. He explains that consumers in more individualistic countries will generally be less susceptible to normative influence than consumers in more collectivist countries (Van den Bulte and Stremersch, 2004) except when they attach much importance to the value-expressive component: the improvement of social image. These individualistic consumers try to “stick out from the crowd” and consume socially visible products that are congruent with their self-image (Bagozzi and Lee, 2002; Chao and Schor, 1998; Prins, 2008). Conversely, consumers in collectivist countries experience normative influence since they are strongly affected by its utilitarian component; they conform to group norms and values of friends and family members in order to avoid social punishments and to obtain social rewards (Cialdini and Goldstein, 2004). However, they experience a much smaller amount of value-expressive influence, as they are less concerned about personal goals (Steenkamp et al., 1999).

Based on these arguments, we expect that social influence is weakest for members of a country with medium levels of individualism, whereas it is strongest for members of countries that score at the extremes of the collectivism-individualism index.

The Survey

Country selection. Countries were selected based on their level of individualism (Hofstede, 1980). China was chosen as it is an extreme case where individualism scores low with a score of 20. The European countries score higher on individualism, but still vary widely. Individualism scores are medium for Spain (51), and relatively high for Italy (76) and the Netherlands (80).

Participants. The sample of our survey consists of movie visitors. A questionnaire was submitted to them in the cinema. In total, the respondents visited 72 different movies. In each country, consumers were selected in cinemas that were located in middle-sized and large cities. After discarding questionnaires containing incomplete responses, the final sample size included 1396 respondents: 429 in China, 313 in Spain, 231 in Italy, and 423 in the Netherlands.

Questionnaire. The questionnaire solicited cinema visitors to give their information about the degree to which they were influenced by relevant others, such as family, friends, and colleagues. The back-translation procedure was used to prepare the questionnaire (Brislin, 1986). Questionnaire items were first developed in English. Next, bilingual persons translated the items into Chinese, Spanish, Italian, and Dutch. Then different bilingual persons translated the Chinese, Spanish, Italian, and Dutch versions back into English. The few inconsistencies that resulted between translations were reconciled.

In order to facilitate comparisons between the simulation study and the empirical study, the measures of social influence used in our questionnaire should closely resemble the conceptualizations used in our simulation study. The imitation effect, referring to the degree to which consumers are influenced by the past behaviors of others, is measured by the frequency and impact of recommendations of others. We used rating scales to measure the imitation effect because they are easy for respondents to understand (Munson and McIntyre, 1979). This is a desired property in cross-national studies in order to minimize non-desired sources of variance. Next, it avoids researcher misinterpretation of verbal answers coming from people from other cultures (Brislin, 1983). The coordinated consumption effect, referring to the degree to which consumers are influenced by the intended behaviors of others, is measured by the number of visitors that

joined to see the movie. A greater number of companions corresponds to a greater amount of people within a social network that intends to visit the movie. As such, we chose a relatively strong measure of normative social influence that refers to the movie visitor's actual conformation to social pressures by visiting a movie together (Bagozzi et al., 2000). We used a relatively simple question as a proxy, as it was deemed too complex for consumers to estimate and articulate the influence that arises from the intended behaviors of others.

Differences in response styles across nations may influence scale validity and hamper meaningful comparisons in cross-national research (Steenkamp and Baumgartner, 1998). In this respect, Chen, Lee, and Stevenson (1995) tested how cross-cultural differences affect response style (extreme values, midpoint evaluations) according to the collectivism-individualism characteristic for leisure activities; their results show that there exists little evidence giving support to the idea that differences in response style affect the cross-cultural differences in mean ratings between members of individualistic versus collectivistic countries. Since our study uses mean ratings, we believe that the measures allow us to make meaningful cross-national comparisons.

Results. Table 3 shows the respondents' profile. The results show that the three samples do not differ in terms of gender ($\chi^2(3) = 2.5, p > .4$), but that they do differ in terms of age ($F(3, 1415) = 84.8, p < .001$) and education ($\chi^2(9) = 298.0, p < .01$). Given the research focus, it is necessary to take into account the potential sample bias. To examine the sample effects, we investigate how social demographics altered the degree of social influence. We find that, for the complete data set, age was only mildly negatively correlated with the number of recommendations received ($r = -.11, p < .001$) and the influence of these recommendations on the decision ($r = -.07, p < .05$). Next, with increasing age the group size of the movie visit decreased ($r = -.17, p < .001$). Education was only negatively correlated with group size ($r = -.21, p < .001$), but not with recommendation frequency or recommendation influence.

As we randomly picked respondents on various days of the week, the differences found are expected to be the result of differences in the cinema population of each country, and not the result of a self-selection bias.

Table 4 presents the results of the social influences. Based on ANOVA tests we find support that cross-

Table 3. Respondent Characteristics

	China	Spain	Italy	Netherlands
Gender				
Male	179 (42%)	141 (45%)	103 (45%)	181 (40%)
Female	250 (58%)	172 (55%)	127 (55%)	271 (60%)
Age (SD)	25.2 (7.0)	40.0 (15.6)	32.5 (13.7)	32.4 (13.5)
Education				
Primary school	3 (1%)	10 (3%)	19 (8%)	5 (1%)
High school	56 (13%)	63 (20%)	110 (48%)	105 (23%)
College	88 (21%)	47 (15%)	46 (20%)	202 (45%)
Graduate	282 (66%)	190 (60%)	52 (23%)	140 (31%)
Number of yearly movie visits (SD)	9.6 (7.9)	23.1 (15.1)	22.6 (15.7)	10.5 (9.5)

national differences exist (all *F*-tests produced *p*-values smaller than .001). Table 4 shows that social influence resulting from others' past behaviors (imitation) significantly varies among countries. Concerning the social influence that arises from others' intended behaviors (coordinated consumption) the only significant differences appear between Spain and the other countries.

In line with previous studies, we find that, compared with individualistic consumers, collectivistic consumers are more strongly influenced by normative influences. Chinese respondents experience stronger normative influence than their European counterparts resulting from others' past behaviors (imitation); both in terms of the number of recommendations received and the degree to which consumers are influenced by them. Nonetheless, the highly individualistic Dutch consumers appear to be more strongly socially influenced than the less individualistic Italians and Spanish consumers. These results support the expected U-shaped relationship between individualism and social influence, in which social influence is the least strong in countries characterized by medium levels of individualism.

When relating the cross-cultural differences in social influences to the apparent differences in market inequalities (Figure 1 and Table 5), we observe that they are in line with the results of the simulation experiment: the stronger the social influence, the greater the market inequalities in the cinema industry. Chinese respondents experience the strongest social influence, followed by the Dutch, Italians, and Spanish respondents. The Gini coefficients also follow the same pattern; it is highest for China and lowest for Spain. The Gini coefficients appear to correspond strongly with the degree of social influence. The Gini coefficient of China (.77) is much stronger than those of the Netherlands (.55), Italy (.50), or Spain (.44). These results can be explained by the imitation effect (in China it is stronger than in the three European countries) and the coordinated consumption effect (in China it is much stronger than in Spain). Next, the differences in the Gini coefficients between the Netherlands and Italy, on one side, and Spain, on the other side, can be explained by the lower Spanish scores on coordinated consumption and imitation. Finally the relatively small difference in the Gini coefficients between the Netherlands and Italy can be

Table 4. Social Influences across Countries

	Question/Item	a = China	b = Spain	c = Italy	d = Netherlands
Social influence from past behaviors of others (imitation)	How many people had recommended you to see this movie?	2.11 ^{b,c,d} (3.59)	.28 ^{a,c,d} (.67)	1.21 ^{a,b} (2.28)	1.27 ^{a,b} (2.68)
	How much did those recommendations influence your decision to see this movie? (1 = not at all – 5 = very strongly)	2.62 ^{b,c,d} (1.33)	1.61 ^{a,d} (1.25)	1.83 ^{a,d} (1.30)	2.10 ^{a,b,c} (1.49)
	With how many people are you going to see the movie?	1.93 ^b (1.32)	1.38 ^{a,c,d} (1.17)	2.02 ^b (1.60)	1.99 ^b (1.53)

Note: Means with standard deviations between parentheses are displayed. Superscripts represent significant mean differences with another country based on LSD posthoc tests (*p* < .05).

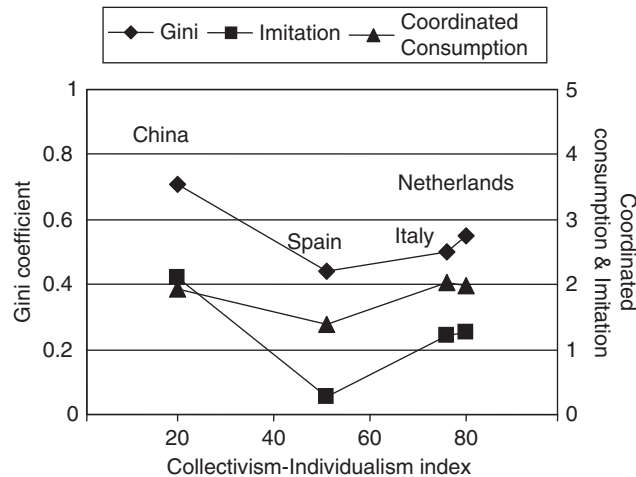


Figure 1. Gini Coefficients, Imitation Effect, and Coordinated Consumption Effect According to the Collectivism-Individualism Index

Note: The Gini coefficients are calculated based on each country's actual market inequalities. The collectivism-individualism index scores are derived from Hofstede (1980). The imitation and coordinated consumption effect are calculated based on the item means in our empirical survey. We only use the first item of imitation to represent the imitation effect, as this can be comparable to the coordinated consumption's item. An index score of imitation comprised of both items, however, yields very similar results.

explained by the somewhat stronger imitation effect of the Netherlands vis-à-vis Italy.

Conclusion and Discussion

This paper demonstrates that social influences affect the diffusion of innovations and determine market share distributions. By associating the results of a realistic agent-based model with cross-cultural individual-level and market-level data, we triangulate the findings of the simulation results with those of the field study. Both methodologies contribute to the

understanding of the impact of social influences on market inequalities because in both social influence is used as explanatory variable for the distributions of market shares. The findings of both studies show compelling evidence that markets that are characterized by stronger social influences display a greater dispersion of market shares.

The overall results of our study are in line with those of previous research (De Vany and Walls, 1996, 1999; Elberse and Eliashberg, 2003), by showing the important influence of relevant others in explaining market inequalities in the motion picture industry. It contributes to this literature by distinguishing the relative effects of two types of social influences: imitation and coordination consumption. According to the simulation results, both social influences, imitation and coordinated consumption, positively affect the degree of market inequalities, with the latter effect having a much stronger impact. These results provide an explanation for why a few movies dominate the market. Most movie producers adopt a wide release strategy in which they advertise heavily to inform a substantial part of the market about the new movie. They benefit greatly from the coordinated consumption effect as consumers join others to visit the movie in the opening weekend. Furthermore, the results of our field study complement the simulation study, giving support to a U-shaped relationship between a country's level of collectivism-individualism and members' susceptibility to social influence. Members of highly individualistic countries appear to be susceptible to social influence, as they are driven by the value-expressive benefits of adopting these innovations.

Finally, by taking a cross-cultural validation approach, this paper also contributes to the emergent literature of validation approaches for agent-based models (Brenner and Werker, 2007; Fagiolo, Birchenhall, and Windrum, 2007). Developing such validation techniques is necessary for the agent-based methodology because agent based models can gain legitimacy by confronting their simulation results with real-world micro- and macro-level data (Garcia et al., 2007). Cross-cultural differences may systematically explain consumers' innovativeness (Clark and Goldsmith, 2006; Steenkamp and Gielens, 2003), their risk and information seeking tendencies (Soares et al., 2007), their degree of product involvement (Garcia and Kandemir, 2006), and likely other potentially important adoption influencers, which make them ideal for agent-based models in the field of global product innovation management.

Table 5. Gini Coefficients for Motion Picture Box Office Data across Countries

	Average	Min.	Max.	SD
China	.71	.71	.71	.00
Netherlands	.55	.51	.60	.04
Italy	.50	.48	.54	.02
Spain	.44	.40	.48	.03

Note: Gini coefficients are calculated using yearly box office data (from 2002–2007) for the top 110 movies. The top 110 movies are chosen as it was the minimum of movies introduced in a country for any given year. Each country has six Gini observations, except for China that has only one observation (year 2007). Box office data are retrieved from www.boxofficemojo.com.

Managerial Implications

Understanding how social influence shapes the diffusion of innovations and determines market inequalities is important for innovation managers. First, for innovation managers, it is important to understand the drivers of market inequalities, as market inequality corresponds directly with the degree of risk involved in new product launches. Greater market inequalities correspond to fewer hits and more flops, and coincide with greater returns on the hits. In general, our findings stress the importance of developing effective marketing strategies that promote social contagion in markets with strong social influences in order to increase the product's success (Kretschmer, Klimis, and Choi, 1999).

Second, the degree of social influence present in a market also has consequences for the release of new products and portfolio management. In markets that are characterized by strong social influence and where extreme *ex ante* uncertainty prevails (De Vany, 2004), it seems wise to produce a great number of “failures” in order to increase the success of one product that offsets all failure costs (Hirsch, 1972). Our findings seem to justify the current strategy of Hollywood movie producers to release a portfolio of many new products into the market to hedge their risks.

Third, the results of our simulation study suggest that coordinated consumption is the main influencer of inequalities at the box office distribution. Knowing that greater market inequalities correspond to excessive returns and that coordinated consumption often originates from big prereleased advertising campaigns has implications for the distribution strategy of blockbuster movies. These movies benefit most strongly from coordinated consumption at the launch of the movie when adopting a wide-release strategy (i.e., intensive distribution and promotion at the launch) rather than a platform strategy (i.e., low or medium promotion and a gradual buildup of distribution intensity) (Sawhney and Eliashberg, 1996). Conversely, niche products, such as artistic and/or independent movies, face difficulties in markets with strong social influences such as coordinated consumption. In reality, this also occurs as independent movie productions often do not succeed to create a competitive substantial pre-launch buzz with their limited advertising budgets. They simply cannot compete against big movie producers and distributors and they have to rely on platform strategies and direct their efforts to stimulating the imitation effect after movie release.

These movies with limited advertising budgets should aim at igniting imitation effects in the post-launch phase and focus on noncostly quality indicators such as prizes and awards, positive reviews, and emergent debates linked to the characteristics of the movie.

Fourth, a better understanding of cultural differences in social influences may help marketers to improve the launch of their worldwide movie introductions. For example, our findings also provide useful input regarding the launch of new movies in multiple countries. Previous research argues that consumers who are highly susceptible to social influence, especially those in collectivistic countries (Clark and Goldsmith, 2006; Singh, 2006; Steenkamp and Gielens, 2003; Steenkamp et al., 1999), are more likely to be imitators rather than innovators. This stream of research argues that collectivists are more hesitant to visit movies that just have been released and that a critical mass of consumers should have already visited the movie before they are convinced to visit that movie (Clark and Goldsmith, 2006; Singh, 2006). Our findings contradict these findings. We find that in collectivist cultures, such as China, people strongly rely on the intended behaviors of others (coordinated consumption) in their decision making. If managers heavily advertise their movies, they can increase the movie's success by convincing the audience that others will approve their actions (i.e., utilitarian value) and visit the same movie just after release.

Fifth and finally, our findings regarding the cross-cultural differences in social influence may provide lessons for advertising (Albers-Miller and Gelb, 1996). Apart from the perceived direct effects of consumption (e.g., fun, learning about a topic), movies offer symbolic value for customers. For value-expressive products such as movies, the degree to which advertising campaigns persuade customers depends on the fit between the product image, on the one hand, and the image of the individual or social self on the other hand (Johar and Sirgy, 1991). Our results indicate that members of individualist countries are susceptible to social influence particularly because they seek value-expressive benefits (i.e., self-image improvements), whereas members in collectivistic countries mainly seek utilitarian benefits (i.e., social rewards). Individualists find it important that the movie characteristics are coherent with the individual self-image, so that they can express to others who they are and what they stand for. For collectivists it is important that the movie is congruent with the groups' social self-image, and to stress that the movie

is accepted by a large group of in-group members (Johar and Sirgy, 1991). For collectivistic countries, an effective advertising strategy would be to organize thematic events exhibiting movies that appeal to a specific audience. For example, cinemas can attract audiences by organizing a “ladies’ night” or similar events that serve to reinforce group norms, reduce potential social risks, and allow for an enjoyable evening with in-group members.

Limitations and Future Research

The generalizability of our findings is limited in several ways. First, our study’s focus is on the motion picture industry, and caution is required when translating these findings to other markets. Our results are most likely to generalize to fads and fashion product innovations such as conspicuous products (e.g., women’s cosmetics, mobile telephones, sneakers, luxury cars) and to products that appeal to the social group’s identity (e.g., music, books, magazines, club parties). For these highly visible and fashionable products, consumers tend to strongly incorporate the opinions and evaluations of others for their adoption decision. More research is needed to assess the role of social influence in explaining market inequalities in related industries.

Regarding the field study, our study is limited as we did not measure actual scores of individualism (Triandis, 1995) but used an Indirect Values Inference (IVI) approach by relying on Hofstede’s individualism scores (Soares et al., 2007). This raises concerns with the potential measurement error arising from the extrapolation of cultural values from Hofstede’s sample (Lenartowicz and Roth, 1999). As the hypothesized consequences of the cross-cultural differences (i.e., differences in social influences) are in line with the expectations, we do not consider this as a strong limitation. However, the items measuring social influence could be refined, for example, by using validated scales, such as the consumers’ susceptibility to interpersonal influence (CSII) scale (Bearden, Netemeyer, and Teel, 1989). This will greatly enhance the comparability with other cross-cultural studies (e.g., D’Rozario, 2001). Still, we believe that the items used in the field study capture the essence of our intended constructs.

Concerning the simulation experiment, our results show that coordinated consumption has a much stronger impact than imitation on market inequali-

ties. In this study, we cannot empirically support this result, as our respondents did not display a substantial variation in coordinated consumption (China, the Netherlands, and Italy display no significant difference in coordinated consumption). Future empirical research could investigate this issue in detail and test for the relative effect sizes of coordinated consumption and imitation using a larger multi-country study. Such future research avenues can contribute to our understanding of how consumers are exactly influenced by others, and what market consequences they yield for the motion picture industry and similar winner-take-all industries.

Although the outcomes of the dynamic effects of social influences in the movie industry are extremely difficult to predict, this research indicates that it is possible to estimate the degree of market inequalities based on social influences. Understanding the hidden forces behind a complex system enables researchers to more meaningfully interpret the impact of random events and anticipate final outcomes. As such, this paper contributes to our understanding of how social processes influence the behaviors of customers and lead to market inequalities.

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