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Working Paper

An Exploration of the Micro-Level Impacts of Shanzhai (Copycat) Products on the Originals in China

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ABSTRACT

Shanzhai (copycat), a product imitation strategy that is ubiquitous in many emerging economies, affects firms offering the original products. This phenomenon raises an important strategic question that we address using lab and field studies: How do Shanzhai products in China affect the performance of the original products which they imitate, and why? Contrary to the belief that Shanzhai products always hurt the original, we find that the effects of Shanzhai depend on Shanzhai quality: a joint retail display with a low-quality Shanzhai product actually benefits the original, while a joint retail display with a moderate-quality one hurts the original. Further analyses suggest expectancy disconfirmation effects underlie these performance outcomes. This research deepens our understanding of imitation strategies to help firms cope with Shanzhai.

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INTRODUCTION

Copycat products are pervasive in China and some other emerging economies across many industries, including electronics, apparel, toys, beverage, and others (Qin, Shi, Song, Stöttinger and Tan, 2018). For example, HiPhone, a mobile phone once sold in China, was considered as a copycat of the iPhone because of the obvious similarity in product design. Branding itself as Uncle Martian, a Chinese apparel maker knocked off the Under Armour logo before being removed from the marketplace (See Appendix A). These copycats were believed to erode the profitability of the original products and the incentive of firms to create original products (Lippman and Rumelt, 1982; Peteraf, 1993).

A significant proportion of copycat products are clearly counterfeits that violate intellectual property law and that governments and firms vigorously seek to deter through legal means (OECD/EUIPO, 2016, 2017). However, clear boundaries between what is legal and what is illegal are sometimes difficult to draw. The challenge arises because not all copycat products are counterfeits. Many are a particular kind of imitation that includes some level of innovation, as recognized in the strategy field (Knott, Posen and Wu, 2009; Lieberman and Asaba, 2006; Lieberman and Montgomery, 1988, 1998; Nelson and Winter, 1982). For example, Francis Cabot Lowell studied British models of textile machines before developing copycats that better fit the New England environment (Posen and Martignoni, 2017), and Facebook imitated Snapchat by introducing Instagram Stories (Ingram, 2017). In such cases, while the copycat builds on the original product's idea, it does so without violating intellectual property law, and competes with the original product by lowering the cost to consumers and/or adding attractive features (Ethiraj and Zhu, 2008; Posen and Chen, 2013; Posen and Martignoni, 2017).

The complex nature of copycat products in China is vividly illustrated by what they are often called in China—*Shanzhai* (山寨) products. The literal meaning of Shanzhai is a historical mountain stockade occupied by bandits operating beyond the reach of official control (Tse, Ma and Huang, 2009). Akin to Robin Hood stories, these stockades connote the bravery of proletariat who challenge the ruling dictators. Many Shanzhai products are legally made and sold alongside the original ones in regular marketplaces in China. They compete based on lower quality and much lower cost (Tse et al., 2009; Zhu and Shi, 2010). They are less costly not only because expensive features are absent, but, more importantly, because Shanzhai producers leverage the manufacturing infrastructure that China developed while serving as the world's factory for decades (Tse, 2010).

Shanzhai producers are also quite nimble in their ability to provide innovative product features in response to local needs. In some sense, certain Shanzhai producers are not unlike disrupting firms characterized by Christensen (1997), in that they can potentially challenge established firms by introducing desirable offerings at the low end of the price-quality continuum (Chittoor, Sarkar, Ray and Aulakh, 2009; Luo, Sun and Wang, 2011; Wan and Wu, 2017). Successful emerging market multinational firms provide notable examples, such as the social media giant Tencent's QQ, which imitated AOL's ICQ, and BYD, a major electric vehicle maker, which imitated Toyota, at the very early stages of their businesses.[1]

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[1] Tencent, listed on the Hong Kong Stock Exchange, was valued over $500 billion in November 2017 (https://techcrunch.com/2017/11/20/tencent-500-billion/.) Buffett's Berkshire Hathaway invested $232 million in BYD for a 9.9% stake in September 2008. The worth of that stake rose to about $2.2 billion in December 2017 (http://money.cnn.com/2017/10/11/investing/byd-warren-buffett-china-electric-cars/index.html.)

Given the significance of the Shanzhai phenomenon to firm strategies in the global marketplace, we ask the following research question: How do Shanzhai products in China affect the performance of the original products that they imitate, and why? We do not examine issues related to Shanzhai products crossing legal boundaries because this has already been studied (Chaudhury and Walsh, 1996; Fink, Maskus and Qian, 2016; Givon, Mahajan and Muller, 1995; Green and Smith, 2002). Rather, taking a strategy perspective, we focus on the effects of legal Shanzhai products on the original products they imitate, and the mechanisms through which these effects occur. We choose this focus because Shanzhai products in China provide a useful context to explore the specific effects of and mechanisms underlying imitation, which is a central theoretical construct in the strategy field (Barney, 1991; Lieberman and Asaba, 2006; Lippman and Rumelt, 1982; Peteraf, 1993). By developing a deeper understanding of imitation as a global firm strategy, this research seeks to help firms and industry policy groups more effectively cope with copycat products in ways that can complement legal and governmental means. In undertaking this work, we follow the call by Lieberman and Asaba (2006) "…to improve our understanding of the benefits and costs of imitation *in specific contexts* in order to better anticipate situations where imitation is likely to prove detrimental." (Italics added by authors.)

More specifically, our research question led us to explore three issues: (1) The effect of a joint retail display of an original product and a Shanzhai product, relative to a separate display of the original only. (2) The impact of both low-quality and moderate-quality Shanzhai products on the originals they imitate. (3) Important imitation outcomes, including consumers' expectations about, satisfaction with, intent to purchase, and actual

purchases of the original. Our first two interests allow us to explore some unique institutional characteristics of China. First, the Shanzhai and the original product are often displayed together in retail channels. For example, of the 17,000 retail outlets that legally sell iPhones, only 12 are official Apple stores (Shen, 2013). Official Apple stores and certain non-Apple retail stores solely display Apple products, but many other retailers jointly display the original and the Shanzhai products. Also, although many Shanzhai products are of low quality, some have gradually climbed the quality ladder and have reached moderate quality levels (Tse, Ma and Huang, 2009). Given these institutional characteristics of China, joint display and heterogeneous Shanzhai quality levels play an important role in influencing imitation outcomes. Our third interest is to study the micro-level outcomes of imitation, such as consumer expectations and consumer satisfaction, which are challenging to observe empirically using secondary data. Our analyses of unique datasets that include these variables make empirical contributions to the strategy field.

We derive our research methodologies from the marketing literature, and we use multiple field and lab studies, which enable us to explore the process mechanisms underlying our observed effects, as well as maintain external validity. Our field study examines actual sales of Apple and Shanzhai iPhones in China. Our lab research of originals and Shanzhai includes three studies of consumer electronics and one study of beverages. The choice of this research methodology aligns with the need for interdisciplinary studies that can push the strategy field forward (Burbano, 2016; Elfenbein, Knott and Croson, 2017; Harmon, Kim and Mayer, 2015; Shapira and Shaver, 2014).

Our five studies provide multiple, interesting results that inform strategy on imitation products. Contrary to the general belief that copycat products always hurt the original products, we find that a joint display with Shanzhai products can either benefit or harm the originals, depending on the quality of the Shanzhai. Specifically, to our surprise, a joint display with a low-quality Shanzhai product actually benefits the original, even though a joint display with a moderate-quality Shanzhai product harms the original.

Our field and lab studies further reveal that these performance outcomes can be attributed to expectancy disconfirmation effects (Bloemer and Dekker, 2007; Spreng and Chiou, 2002; Oliver, 1980). When consumers see the low-quality Shanzhai and the original together at a retail store and compare them, because of the large quality gap, they naturally tend to look for differences (Chien, Wegener, Hsiao and Petty, 2010; Herr, 1989). This perceptually moves the original away from the low-quality Shanzhai, leading to a contrast effect that enhances the perceived quality of the original. As a result, consumers' expectations regarding the original are positively disconfirmed, in turn increasing their satisfaction with it, intent to purchase it, and actual purchase of it.

However, when consumers see the moderate-quality Shanzhai and the original side-by-side and compare them, because of the relatively small quality gap, they naturally tend to look for product similarities (Chien, Wegener, Hsiao and Petty, 2010; Herr, 1989). This perceptually moves the original closer to the moderate-quality Shanzhai, causing an assimilation effect that reduces the perceived quality of the original. Thus, consumers' expectations regarding the original are negatively disconfirmed. This negative disconfirmation diminishes consumers' satisfaction with the original, intent to purchase it, and actual purchase of it.

This research adds to a growing body of work that recognizes the beneficial strategic effects of imitation, despite the harm to the original firm's profitability under certain circumstances. Imitation can help the original firm establish its technology as the industry standard (Givon and Muller, 1995; Katz and Shapiro, 1985) or create positive network effects (Raustiala and Sprigman, 2009). Even counterfeits can create positive advertising effects for high-end authentic products (Qian, 2014; Raustiala and Sprigman, 2009) or serve as trial versions before consumers can purchase the authentic products (Gosline, 2009, 2010). At the industry level, imitation helps to preserve and diffuse useful attributes throughout the industry (Posen and Martignoni, 2017).

While this past research stream has substantially moved our knowledge in a promising direction, previous work has mainly relied on individual case studies, mathematical models, or secondary data. Lacking are primary data from lab and field studies that more directly reveal the specific effects of imitation on the original products' performance in the marketplace, and the causal mechanisms underlying these performance effects. In an effort to obtain a more comprehensive picture of imitation, we borrow the lab and field study approach from the marketing field to collect primary data from the perspective of end customers. In doing so, we shed new light on the beneficial and detrimental effects of imitation and the mechanisms that lead to these effects.

Our study also provides insights into how the original producers can deal more effectively with copycats in emerging markets. Rather than treating all copycats as equal threats, the original producers may want to adopt different strategies when targeting copycats of different quality levels. Based on our findings, a firm may want to consider these strategic questions: (1) Should I strongly discourage retailers from carrying

Shanzhai copycat products or sometimes allow or even encourage some of them? (2) Should I make an all-out effort to challenge Shanzhai products? And (3) How can I best compete against low-quality and moderate-quality Shanzhai products? The current findings indicate that a joint retail display of a low-quality Shanzhai along with the original product, versus the original displayed alone, may positively disconfirm consumers' expectations regarding the original, increasing their satisfaction with the original and elevating sales. This suggests that companies may want to think twice before spending resources battling low-quality Shanzhai products.

In the case of moderate-quality Shanzhai products, however, firms should adopt a stronger stance. Moderate-quality Shanzhai products pose a bigger threat, not only because they are closer on the quality ladder, but also because their joint retail display with an original may cause consumers to negatively disconfirm their expectations regarding the original, despite its strong brand name. This may lower consumers' satisfaction with the original and decrease its sales. Consequently, it may be insufficient for the original producers to solely adjust the price in response to the threat posed by moderate-quality Shanzhai products. Original producers may benefit from all-out challenges to moderate-quality Shanzhai, such as forbidding licensed retailers from carrying them. They may also want to launch marketing campaigns, so consumers maintain their positive expectations regarding the original, and focus on enhancing the quality and innovativeness of their products. By taking into account customer perceptions, our findings broaden our understanding of the micro-foundations of product imitation and more generally competitive advantage.

LAB AND FIELD STUDIES

Study 1. Effects of a Low-Quality Shanzhai Product

Overview

In Study 1, we use a one-factor between-subjects design to examine whether displaying a low-quality Shanzhai (copycat) product jointly with the original product, rather than the original alone, affects participants' satisfaction with and intent to purchase the original. Participants in the study were 60 college students from a public university in China, aged 20–30, and 62 percent were female. Participants were randomly assigned to view a retail display with the original Apple iPad only, or both the original Apple iPad and a low-quality Shanzhai, a FlyTouch Pad.

When we conducted our study, the original Apple iPad had just been released in the Chinese market and the Shanzhai FlyTouch Pad appeared soon thereafter. One participant owned an Apple iPad that had been bought abroad and another one owned a Shanzhai FlyTouch Pad. The other participants had not tried these products but, as Chinese consumers, they knew about Apple and its reputation for high quality, as well as the reputations of the Shanzhai products. The original Apple iPad (16G) brand was priced at 3,988 yuan (US $649). The low-quality Shanzhai product, the FlyTouch Pad, was priced at 999 yuan (US $163) (See Appendix B).

Methods

Procedure. Data were collected in a simulated retail environment. In the separate display condition, participants saw only the original Apple iPad and were invited to use it. In the joint display condition, participants saw both the original Apple iPad and the low-quality Shanzhai and were invited to try both. Participants could clearly distinguish the original

product from the Shanzhai based on their brand names, logos, prices, and other product information, just as in the real marketplace. In addition, participants were told which product(s) they were evaluating.

In the joint display condition, for example, participants were instructed that the Pad on the left was the Shanzhai product and the Pad on the right was the Apple product. Further, the left and right sides were counterbalanced and participants were instructed to try the product on the left (right) first, which was also counterbalanced. The separate and joint displays were set up in similar booths. Participants were randomly assigned to only one booth and given about 10–15 minutes to try the product(s). After the product trial(s), they completed a questionnaire composed of outcome measures, personality measures as potential covariates, and demographic measures. Finally, participants were thanked and dismissed.

Outcome Measures. The questionnaire measured participants' intent to purchase the original: "How likely are you to purchase an Apple iPad?" (1 = very unlikely, 7 = very likely). Then, it measured their satisfaction with the original using five scaled items which were later averaged (Phillips and Baumgartner, 2002): "To what extent are you satisfied with Apple iPad's outward appearance? To what extent are you satisfied with Apple iPad's touchscreen sensitivity? To what extent are you satisfied with Apple iPad's audio-visual performance? To what extent are you satisfied with Apple iPad's data transmission speed? To what extent are you satisfied with Apple iPad's software support?" (1 = extremely dissatisfied, 7 = extremely satisfied; α = .92). The correlation between intent to purchase and satisfaction was .39.

Analyses. We use one-factor between-subjects analyses of variance to test the effects of a separate versus joint retail display. We measure two personality traits as potential covariates: brand consciousness (α = 0.81) (Nelson and McLeod, 2005) and price consciousness (α = 0.95) (Alford and Biswas, 1999). However, these were not significant as covariates, nor did they moderate any effects, so they were excluded from the final analyses.

Results

The results show that display type affected intent to purchase the original. Participants in the joint display condition, who tried both the original and the low-quality Shanzhai product, exhibited a higher intent to purchase the original, relative to participants in the separate display condition, who tried only the original (means = 4.77 versus 3.17; F (1, 58) = 17.19, p = .0001, η_p^2 = .229). The findings are parallel for satisfaction with the original. There is a significant display type effect. Participants in the joint display condition were more satisfied with the original compared to participants in the separate display condition (means = 5.83 versus 5.33; F (1, 58) = 4.43, p =.04, η_p^2 = .07). See Figure 1.

[INSERT FIGURE 1 HERE]

Discussion

Study 1 examined the effects of jointly displaying a low-quality Shanzhai (copycat) with the original product, compared to displaying the original product only. Displaying both products together enhanced satisfaction with and intent to purchase the original product. These findings are consistent with our theory that jointly displaying a low-quality Shanzhai with a high-quality original would cause a contrast effect and thus

positively disconfirm consumers' expectations regarding the original. In other words, the original looked better than expected, in contrast to the low-quality Shanzhai, so consumers were more satisfied with it.

Study 2. Effects of a Moderate-Quality Shanzhai Product

Overview

In Study 2, we examined a moderate-quality Shanzhai (copycat) product rather than a low-quality one. We conducted a field study of actual adults shopping for the product in a retail store. Due to the strong sales performance of Shanzhai cell phones, we used cell phones (Apple iPhone 4) in both Study 2 and Study 3. To begin, we conducted a separate manipulation check where we asked real shoppers to view and rate the Apple iPhone 4, a moderate-quality Shanzhai product, and a low-quality Shanzhai product (for use in this study and our future studies). This check verified that shoppers recognized the quality difference between the low-quality Shanzhai product and the moderate-quality Shanzhai product (means = 2.96 versus 3.54; $F(1, 58) = 4.08$, $p = .048$, $\eta_p^2 = .066$) and also clearly recognized the quality difference between the moderate-quality Shanzhai and the original product (means = 3.54 versus 5.98; $F(1, 59) = 113.07$, $p = .00024$, $\eta_p^2 = .657$).

Participants in Study 2 were 65 shoppers at a Chinese electronics center where hundreds of small electronics stores sell both original and Shanzhai electronic products. The center is in a medium-sized city. The shoppers in our study were aged 16–55, and 67 percent were male. A one-factor between-subjects design was used to study the effects of a separate versus joint retail display, and we used a moderate-quality Shanzhai product.

Shoppers were randomly assigned to try only the original Apple iPhone 4 priced at 4,600 yuan (US $730), or in the joint display condition to try both the original Apple iPhone and the moderate-quality Shanzhai phone priced at 800 yuan (US $128).

Methods

Procedure. Data were collected from participants at the electronics center on a Saturday. As in Study 1, the separate and joint displays were set up in similar booths and shoppers were randomly assigned to a booth and given 10–15 minutes to try the product(s). The other procedures were identical to those in Study 1, e.g., the shoppers were told which phone was the original Apple product and which was the Shanzhai product. After trying the phone(s), the shoppers completed a questionnaire with the outcome measures, demographic measures, and added questions about their ownership of Apple products. Each shopper was then thanked and given a small gift.

Outcome Measures. The questionnaire measured shoppers' intent to purchase the original product: "How likely is it that you will purchase an iPhone?" (1 = very unlikely, 7 = very likely). Then, it measured their satisfaction with the original product using three items, which were later averaged (Phillips and Baumgartner, 2002): "To what extent are you satisfied with iPhone's outward appearance? To what extent are you satisfied with iPhone's touchscreen usability? To what extent are you satisfied with iPhone's picture vividness?" (1 = extremely dissatisfied, 7 = extremely satisfied; α = .70). The correlation between intent to purchase and product satisfaction was .50.

Analyses. We use one-factor between-subjects analyses of variance to test the effects of a separate versus joint display. We initially include ownership of Apple products as a

covariate, but it was not significant as a covariate or as a moderator and so it was dropped from the final analyses.

Results

Shoppers who saw and tried both the moderate-quality Shanzhai and the original product had a lower intent to purchase the original, relative to shoppers who saw and tried only the original (means = 4.85 versus 5.57; $F(1, 63) = 2.99$, $p = .08$, $\eta_p^2 = .045$). Parallel results were found for satisfaction with the original. Shoppers who saw and tried both products were less satisfied with the original compared to those who saw and tried only the original (means = 5.86 versus 6.31; $F(1, 63) = 4.39$, $p = .04$, $\eta_p^2 = .065$). See Figure 2.

[INSERT FIGURE 2 HERE]

Discussion

Study 2 found that jointly displaying a moderate-quality Shanzhai (copycat) with the original product compared to displaying the original only, diminished shoppers' satisfaction with the original and their intent to purchase the original. These findings are consistent with our theorizing that juxtaposing a moderate-quality Shanzhai with a high-quality original would cause an assimilation effect and thus negatively disconfirm consumers' expectations regarding the original. The original looked worse than expected, in contrast to the moderate-quality Shanzhai, and therefore consumers were less satisfied with it.

Study 3. Field Study Replication that Measured Actual Sales

Overview

Study 3 was a field study in which we manipulated the display of a Shanzhai product in an actual electronics store that carried both the Shanzhai product and the original product, and then we measured daily unit sales of the original product. We conducted the study in a medium-sized city in China and obtained the cooperation and assistance of the store manager and the salespeople. We use a one-factor between-subjects design with three levels: Shoppers were randomly assigned to a separate display condition where they saw only the original Apple iPhone 4, a joint display condition where they saw the original Apple iPhone 4 and a low-quality Shanzhai phone, or a joint display condition where they saw the original Apple iPhone 4 and a moderate-quality Shanzhai phone. The phone quality manipulation check was the same as described in Study 2.

Methods

Procedure. At our request, for one continuous month (30 days), every three days in sequence the store sold the original Apple iPhone (4,600 yuan, US $750), followed by the moderate-quality Shanzhai phone (800 yuan, US $131) alongside the original Apple iPhone, and then the low-quality Shanzhai phone (600 yuan, US $98) alongside the original Apple iPhone. We trained the salespeople to remove both Shanzhai products, or to place the designated Shanzhai product and the original product side-by-side on the sales counter, with the side being counterbalanced, on the specified days, and to let shoppers try both products, which they did for about 10 minutes on average. We also trained the salespeople to record unit sales of the original brand at the end of each day for thirty days.

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Measures and Analyses. Average daily unit sales of the original product served as the dependent measure, and sales were analyzed using one-factor analyses of variance. One analysis compared the effect of a separate display of the original versus a joint display with the low-quality Shanzhai on the original's sales. Another analysis compared the effect of a separate display of the original versus a joint display with the moderate-quality Shanzhai on the original's sales.

Results

Average daily unit sales of the original were higher when shoppers saw the joint display of the original and the low-quality Shanzhai product compared to a separate display of just the original (means = 3.8 versus 2.9; $F(1, 18) = 2.98$, $p = .10$, $\eta_p^2 = .142$). Average daily unit sales of the original were significantly lower when shoppers saw a joint display of the original and the moderate-quality Shanzhai compared to a separate display of the original only (means = 1.9 versus 2.9; $F(1, 18) = 4.55$, $p = .047$, $\eta_p^2 = .202$). See Figure 3.

[INSERT FIGURE 3 HERE]

Discussion

This field study measured actual sales of the original product and found that jointly displaying a low-quality Shanzhai (copycat) with the original increased sales of the original, but jointly displaying a moderate-quality Shanzhai with the original decreased sales of the original. These results are consistent with our theory that jointly displaying the low-quality (moderate-quality) Shanzhai product causes a positive (negative) disconfirmation of expectations regarding the original (Spreng and Chiou 2002; Bloemer and Dekker 2007). The low-quality Shanzhai made the original look

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better, while the moderate-quality Shanzhai made the original look worse. In Studies 4 and 5, we directly explored the theorized process mechanisms using mediation analyses.

Study 4. Disconfirmation of Expectations Regarding the Original

Overview

In Study 4, we examined whether jointly displaying a low-quality Shanzhai product with the original product would cause a positive disconfirmation of expectations regarding the original and increase satisfaction with the original; with the reverse occurring for a moderate-quality Shanzhai causing negative disconfirmation regarding and dissatisfaction with the original. We used the original Apple iPhone and the low- and moderate-quality Shanzhai phones from Studies 2 and 3. Participants were 60 shoppers at an electronics center in a medium-sized city in China. They were ages 15–45, and 60 percent were female. We used a one-factor between-subjects design that varied Shanzhai quality. All shoppers saw both the Shanzhai phone and the original Apple iPhone on display but the Shanzhai phone was either of low or moderate quality.

Methods

Procedure. Data were collected from shoppers on a Saturday and Sunday. We randomly assigned shoppers to one of two booths where they could try either the low- or moderate-quality Shanzhai phone along with the original Apple iPhone for about 10–15 minutes. Shoppers then completed a questionnaire with the outcome measures, demographic questions, and Apple product ownership questions. Finally, shoppers were thanked and given a small gift.

Outcome Measures. The questionnaire first measured shoppers' satisfaction with the original using five questions (Phillips and Baumgartner, 2002): "To what extent are you satisfied with Apple iPhone's outward appearance? To what extent are you satisfied with Apple iPhone's touchscreen sensitivity? To what extent are you satisfied with Apple iPhone's audio-visual performance? To what extent are you satisfied with Apple iPhone's usability? To what extent are you satisfied with Apple iPhone's picture resolution?" (1 = extremely dissatisfied, 7 = extremely satisfied; α = .89). Then, we measured the level of disconfirmation of expectations regarding the original (Phillips and Baumgartner, 2002): "Overall, to what extent is the Apple iPhone that you just viewed and played with close to your prior expectations of an Apple iPhone?" (1 = far worse than expected, 7 = far better than expected).

Analyses. We use one-factor between-subjects analyses of variance to examine the effects of the low- versus moderate-quality Shanzhai product on the original product. We initially included age, gender, and Apple product ownership as covariates, but the effects were insignificant, so they are dropped in the final analyses. We also conduct regression analyses to test for mediation, as discussed below.

Results

Tests. Satisfaction with the original was higher when shoppers jointly examined the low-quality Shanzhai compared to examining the moderate-quality Shanzhai (means = 6.28 versus 5.89; $F(1, 58) = 3.81$, $p = .05$, $\eta_p^2 = .062$). Also, disconfirmation of expectations regarding the original was more positive when shoppers jointly examined the low- rather than the moderate-quality Shanzhai (means = 5.70 versus 4.86; $F(1, 58) = 14.14$, $p = .0004$, $\eta_p^2 = .199$).

Mediation Analyses. Mediation analyses were conducted to test whether the effect of Shanzhai quality on satisfaction with the original was mediated by disconfirmation of expectations regarding the original. We used the regression approach recommended by Hayes (2013) in Model 4. The results showed that low versus moderate Shanzhai quality led to a positive disconfirmation of expectations regarding the original (a path: $b = .84$, $SE = .22$, $p = .0004$) and increased satisfaction with the original (c path: $b = .38$, $SE = .20$, $p = .06$). Positive disconfirmation of expectations regarding the original raised satisfaction with the original (b path: $b = .30$, $SE = .11$, $p = .011$). A 5,000 sample bootstrap revealed an indirect effect of Shanzhai quality on satisfaction with the original that was mediated by disconfirmation of expectations regarding the original (a x b path: $b = .25$, $SE = .12$, 95%, CI .07, .58). Moreover, the direct effect of Shanzhai quality on satisfaction with the original became non-significant once disconfirmation of expectations regarding the original was included in the model, indicating full mediation (c' path: $b = .14$, $SE = .21$, $p = .50$). See Figure 4.

[INSERT FIGURE 4 HERE]

Discussion

This study further investigated why jointly displaying a Shanzhai product and an original product might affect the original. This study obtained direct evidence that the Shanzhai products affected disconfirmation of expectations regarding the original. When a low-quality Shanzhai product was displayed jointly with the original, shoppers indicated the original exceeded their expectations, and they reported higher satisfaction with the original. When a moderate-quality Shanzhai was displayed jointly with the

original, shoppers indicated the original failed to meet their expectations, and they were more dissatisfied with it.

Study 5. Replication Study using a Beverage Taste Test

Overview

In Study 5 we continued to study how a joint display of an original product with a low- or moderate-quality Shanzhai product might elicit disconfirmation of expectations regarding the original. Instead of studying Shanzhai (copycat) electronics, we studied a consumer packaged good, Kangshifu bottled red tea, which is a very popular drink in China. Participants were 85 college students from a public university in China. They were ages 21 to 34, and 70% were male. We used a one-factor between-subjects design with three levels: participants were randomly assigned to drink the original product only; the original product and a moderate-quality Shanzhai product; or the original product and a low-quality Shanzhai product.

The high-quality original bottled red tea, Kangshifu, priced at 3 yuan (US$0.48), entered the Chinese market in 1996 and has the highest market share within the ready-to-drink tea category in China (Euromonitor International, 2017). Local Shanzhai products priced at about 2–2.5 yuan (US$0.32–0.40), are offered in small retail stores and also in rural retail stores, and are displayed jointly with the high-quality original one. The moderate-quality Shanzhai products use natural tea leaves, as does the original, whereas the low-quality Shanzhai products use tea flavor additives. We conduct a manipulation check of the low- and moderate-quality Shanzhai products that were locally available to

us, and the low-quality one was indeed perceived as lower in quality (means = 1.65 and 3.98; $F(1, 38) = 83.29$, $p = .0004$, $\eta_p^2 = .687$).

Methods

Procedure. Participants were randomly assigned to taste the original red tea only, the original tea and the low-quality Shanzhai tea, or the original tea and the moderate-quality Shanzhai tea. When participants were assigned to taste both the original and the Shanzhai products, we poured the drinks into two identical cups, and told participants the original was on the left and the Shanzhai was on the right or vice versa, with the side counterbalanced. When participants were assigned to taste just the original, we poured only this drink into the cup. Participants could see the empty bottle(s) adjacent to the cup(s). Participants were given a few minutes to drink the product(s). Afterward, they completed a questionnaire with the outcome measures, demographic measures, and questions to assess their current thirst and prior use of the tea. Finally, participants were thanked and dismissed.

Outcome Measures. First, we measured satisfaction with the original red tea using two items, which were later averaged (Phillips and Baumgartner, 2002): "How do you perceive the taste of the original red tea? How do you like the original red tea?" (1 = extremely bad or dislike, 7 = extremely good or like; α = .90). Then, we measured disconfirmation of expectations regarding the original (Phillips and Baumgartner, 2002): "Overall, to what extent is the original red tea that you just drank and tasted close to your prior expectations of it?" (1 = far worse than expected, 7 = far better than expected).

Analyses. We used one-factor analyses of variance to assess satisfaction with the original. One analysis compared tasting the original alone versus tasting it along with the low-

quality Shanzhai tea. The second analysis compared tasting the original only versus tasting it along with the moderate-quality Shanzhai tea. We initially included current thirst and prior use of the tea as covariates; however, these were not significant covariates or moderators and so they were excluded from the final analyses.

Results and Discussion

Tests. Participants who drank both the original product and the low-quality Shanzhai were more satisfied with the original compared to those who drank only the original (means = 5.38 versus 4.84; $F(1, 53) = 4.62$, $p = .036$, $\eta_p^2 = .08$). Participants who drank both the original and the moderate-quality Shanzhai tea were less satisfied with the original compared to those who drank only the original (means = 4.22 versus 4.84; $F(1, 53) = 10.52$, $p = .002$, $\eta_p^2 = .166$). See Figure 5.

[INSERT FIGURE 5 HERE]

Moreover, when consumers tasted both the original and the low-quality Shanzhai product, there was a positive disconfirmation of expectations regarding the original compared to when they tasted the original only (means = 4.67 versus 4.16; $F(1, 53) = 5.15$, $p = .027$, $\eta_p^2 = .089$), or when they tasted both the original and the moderate-quality Shanzhai product (means = 4.67 versus 4.00; $F(1, 58) = 10.00$, $p = .002$, $\eta_p^2 = .147$). However, when consumers tasted the original and the moderate-quality Shanzhai product, there was no significant negative disconfirmation of expectations regarding the original compared to when they tasted the original only (means = 4.00 versus 4.16; $F(1, 53) = 1.07$, $p = .307$, $\eta_p^2 = .020$).

Mediational Analyses. As in Study 4, the meditation analyses involved a series of regressions using Hayes' Model 4 (Hayes, 2013). First, we found that trying a low-

quality Shanzhai with the original, versus the original only, caused a positive disconfirmation of expectations regarding the original (a path: $b = .33$, $SE = .15$, $p = .0315$) and increased satisfaction with the original (c path: $b = .36$, $SE = .16$, $p = .029$). Positive disconfirmation of expectations regarding the original increased satisfaction with the original (b path: $b = .66$, $SE = .13$, $p = .000$). Furthermore, a 5,000 sample bootstrap analysis revealed a significant indirect effect of the low-quality Shanzhai on satisfaction with the original that was mediated by disconfirmation of expectations regarding the original (a x b path: $b = .22$, $SE = .12$, 95%, CI .09, .40). Finally, the direct effect of the low-quality Shanzhai on satisfaction with the original was reduced to non-significance once disconfirmation of expectations was included in the model, indicating full mediation (c' path: $b = .14$, $SE = .13$, $p = .31$). In sum, the findings indicate that the low-quality Shanzhai caused a positive disconfirmation of expectations regarding the original that increased satisfaction with the original. See Figure 6.

[INSERT FIGURE 6 HERE]

Trying the moderate-quality Shanzhai tea with the original, as opposed to the original only, had a non-significant effect on disconfirmation of expectations regarding the original (a path: $b = -.15$, $SE = .10$, $p = .13$), but had a significant negative effect on satisfaction with the original (c path: $b = -.39$, $SE = .09$, $p = .003$). Disconfirmation of expectations was directly related to satisfaction with the original (b path: $b = .74$, $SE = .10$, $p = .000$). Furthermore, a 5,000 sample bootstrap analysis revealed a marginally significant indirect impact of the moderate-quality Shanzhai on satisfaction with the original that was mediated by disconfirmation of expectations regarding the original (a x b path: $b = -.11$, $SE = .07$, 90%, CI -.25, -.01). Finally, the direct effect of the moderate-

quality Shanzhai on satisfaction with the original was reduced once disconfirmation of expectations regarding the original was included in the model, indicating partial mediation (c' path: $b = -.28$, $SE = .10$, $p = .01$). In sum, there is partial evidence that the moderate-quality Shanzhai caused a negative disconfirmation of expectations regarding the original that lowered satisfaction with the original.

DISCUSSION AND CONCLUSION

Using multiple lab and field studies, we explore a strategic global phenomenon that plays out daily in China and other emerging economies: retailers jointly display both original products and Shanzhai (copycat) products on their retail store shelves and in their retail lots. Contrary to the widely held belief that Shanzhai products always hurt the original products, we found that a joint retail display with a low-quality Shanzhai actually benefitted the original, while a joint retail display with a moderate-quality Shanzhai hurt the original, in terms of consumers' satisfaction with, intent to purchase, and actual purchase of the original. Our mediation analyses show expectancy disconfirmation effects as the underlying causal mechanism that altered sales performance of the original.

Widespread in some emerging economies, Shanzhai products can significantly affect the market performance of original products. While the Shanzhai phenomenon presents many research opportunities, we contribute to the literature by examining it from the lens of imitation, which is a theoretical construct of central interest to the strategy field (Barney, 1991; Lieberman and Asaba, 2006; Lippman and Rumelt, 1982; Peteraf, 1993). By copying ideas from the leading firm, imitators can increase market competition

and lower profit margin of the originals, and in turn erode the leading firm's competitive advantage (Barney, 1991).

This negative impact of imitation has been the primary focus of prior literature, but a small number of studies have investigated the potential benefits that imitations may create. Imitations can help establish the leading firm's technology as the industry standard, create positive network effects and advertising effects for the original product, and diffuse valuable product knowledge throughout the industry (Katz and Shapiro, 1985; Givon and Muller, 1995; Raustiala and Sprigman, 2010; Qian, 2014; Posen and Martignoni, 2017). Although prior work has deepened our understanding of imitation, it has primarily used individual case studies, mathematical models, and secondary archival data. Extending this work, we shed new light on imitation strategies by using lab and field studies to collect primary data, which allows us to pinpoint disconfirmation of expectations as a channel through which copycats can benefit or harm the original products (Bone, Shimp and Sharma, 1990; Chien, Wegener, Hsiao and Petty, 2010; Horen and Pieters, 2012).

Specifically, we demonstrate that Shanzhai products can influence the market performance of the original, by affecting consumers' perceptions of the original's quality despite its strong preexisting brand image. A low-quality Shanzhai product can, surprisingly, benefit the original by causing a positive disconfirmation of expectations regarding the original, i.e., making the original look better than consumers expected, which in turn enhances evaluations of the original. Our findings also enable us to disentangle how exactly a moderate-quality Shanzhai product may negatively affect the market performance of the original product. While negative effects can be attributed to

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the moderate-quality Shanzhai product's lower price, they can also arise because the imitation causes a negative disconfirmation of expectations regarding the original, i.e., it makes the original look worse than expected in comparison to the reasonable-quality copycat, leading to a diminished evaluation of the original. To summarize, our research explores the micro-level effects of imitation, including effects on consumer expectations and consumer satisfaction, which impact product sales, and so it deepens our understanding of imitation and competitive advantage in the marketplace.

By revealing the specific theorized mechanisms underlying how Shanzhai products affect the original ones, our study has practical implications for the producers of the originals. We suggest that they tailor their strategies to combat Shanzhai products of different quality levels. That is, rather than considering all Shanzhai products as equal threats, the original producer should focus on taking measures against those closer to them in terms of quality, but cultivate a symbiotic relationship with low-quality ones. Interestingly, this approach is consistent with an ancient Chinese military strategy called "Yuan Jiao Jin Gong" (远交近攻), in which a country befriends the distant enemy while attacking the nearby one.

For example, instead of exerting considerable effort to exclude all Shanzhai products, the original producers could even encourage certain retailers to carry low-quality Shanzhai products and display them alongside the originals. This strategy can benefit a firm because the target customers (e.g., wealthy individuals) of the original product (e.g., iPhone X) are unlikely to purchase a low-quality Shanzhai product, despite its lower price. However, viewing a low-quality Shanzhai product alongside the original product will likely strengthen their prior positive expectations and in turn their intent to

buy the original. In the case of moderate-quality Shanzhai products, however, producers of the originals have a clear interest in preventing retailers from carrying the Shanzhai, not to mention jointly displaying them. Furthermore, producers of the originals would be wise to monitor the Shanzhai market and study emerging consumer needs that are addressed by Shanzhai. To maintain their competitiveness, producers of the originals should continuously invest in innovations, and launch marketing campaigns to proactively ensure consumer perceptions remain positive toward the originals.

Our research has some limitations, which may open opportunities for further work. First, to concentrate on the imitation dimension of Shanzhai products, we examine only legal Shanzhai products. Future work can examine illegal Shanzhai products or those operating in grey markets. Second, even though we conducted multiple studies, they are limited to only two product categories, electronics and consumer packaged goods, in China. Future research can test the generalizability of our findings to other product categories, such as apparel and cosmetics, where copycat products are also prevalent. Future research can seek to replicate our studies in other emerging economies to determine whether any institutional or cultural differences exist. Furthermore, while our lab and field studies help to unpack specific underlying mechanisms, it remains to be examined whether these mechanisms are manifest in large-scale secondary data on sales. Finally, our research focuses on how original products are affected by Shanzhai products. To gain a complete understanding, future work can also investigate how Shanzhai products are affected, i.e., how they can legitimately imitate the originals, while also developing their own innovative elements.

References

Alford BL, Biswas A. 2002. The effects of discount level, price consciousness and sale proneness on consumers' price perception and behavioral intention. *Journal of Business Research* 55(9): 775–783.

Barney J. 1991. Firm resources and sustained competitive. *Journal of Management* 17(1): 99–120.

Bloemer J, Dekker D. 2007. Effects of personal values on customer satisfaction: An empirical test of the value-percept and expectation-disconfirmation model. *International Journal of Bank Marketing* 25 (5): 276–291.

Bone PF, Shimp TA, Sharma S. 1990. Assimilation and contrast effects in product performance perceptions: Implications for public policy. *Journal of Public Policy & Marketing* 9: 100–110.

Burbano VC. 2016. Social responsibility messages and worker wage requirements: Field experimental evidence from online labor marketplaces. *Organization Science* 27(4): 1010–1028.

Chien Y, Wegener DT, Hsiao C, Petty RE. 2010. Dimensional range overlap and context effects in consumer judgments. *Journal of Consumer Research* 37 (3): 530–542.

Chittoor R, Sarkar MB, Ray S, Aulakh PS. 2009. Third-world copycats to emerging multinationals: Institutional changes and organizational transformation in the Indian pharmaceutical industry. *Organization Science* 20(1): 187–205.

Christensen CM. 1997. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Harvard Business School Press: Boston, MA.

Chaudhury PE, Walsh MG. 1996. An assessment of the impact of counterfeiting in international markets: The piracy paradox persists. *Columbia Journal of World Business* 31(3): 34–48.

Elfenbein DW, Knott AM, Croson R. 2017. Equity stakes and exit: An experimental approach to decomposing exit delay. *Strategic Management Journal* 38(2): 278–299.

Ethiraj S, Zhu DH. 2008. Performance effects of imitative entry. *Strategic Management Journal* 29(8): 797–817.

Euromonitor International. 2017. *RTD Tea in China – Datagraphics.* Euromonitor International.

Fink C, Maskus K, Qian Y. 2016. The economic effects of counterfeiting and piracy: A review and implications for developing countries. *The World Bank Research Observer* 31(1): 1–28.

Givon M, Mahajan V, Muller E. 1995. Software piracy: Estimation of lost sales and the impact on software diffusion. *Journal of Marketing* 59 (1): 29–37.

Gosline R. 2009. *Simultaneous Distinction, Democratization and Omnivorism Effects: A Longitudinal Analysis of Dynamic Symbolic Boundaries in Counterfeit Consumption Networks*. Dissertation, Harvard Business School.

Gosline R. 2010. Counterfeit labels: Good for luxury brands? *Forbes*. http://www.forbes.com/2010/02/11/luxury-goods-counterfeit-fakes-chanel-gucci-cmo-network-renee-richardson-gosline.html [25 January 2018].

Green RT, Smith T. 2002. Countering brand counterfeits. *Journal of International Marketing* 10(4): 89–106.

Harmon DJ, Kim PH, Mayer KJ. 2015. Breaking the latter vs. spirit of the law: How the

interpretation of contract violations affects trust and the management of relationships. *Strategic Management Journal* 36(4): 497–517.

Hayes AF. 2013. *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach.* Guilford Publications: New York, NY.

Herr P. 1989. Priming price: Prior knowledge and context effects. *Journal of Consumer Research* 16 (1): 67–75.

Horen F, Pieters R. 2012. When high-similarity copycats lose and moderate-similarity copycats gain: The impact of comparative evaluation. *Journal of Marketing Research* 49 (1): 83–91.

Ingram M. 2017. Will Facebook's imitation of snapchat work this time? *Fortune.* http://fortune.com/2017/03/28/facebooks-imitation-of-snapchat/ [January 27 2018.]

Katz ML, Shapiro C. 1985. Network externalities, competition, and compatibility. *American Economic Review* 75(3): 424–440.

Knott AM, Posen HE, Wu B. 2009. Spillover asymmetry and why it matters. *Management Science* 55(3): 373–388.

Lieberman MB, Asaba S. 2006. Why do firms imitate each other? *Academy of Management Review* 31(2): 366–385.

Lieberman MB, Montgomery DB. 1988. First-mover advantages. *Strategic Management Journal* 9: 41–58.

Lieberman MB, Montgomery DB. 1998. First-mover (dis)advantages: Retrospective and link with the resource-based view. *Strategic Management Journal* 19(12): 1111–1125.

Lippman SA, Rumelt RP. 1982. Uncertain imitability: An analysis of interfirm differences in efficiency under competition. *The Bell Journal of Economics* 13(2): 418–438.

Luo Y, Sun J, Wang SL. 2011. Comparative strategic management: An emergent field in international management. *Journal of International Management* 17(3): 180–200.

Nelson MR, McLeod LE. 2005. Adolescent brand consciousness and product placements: Awareness, liking and perceived effects on self and others. *International Journal of Consumer Studies* 29(6): 515–528.

Nelson R, Winter S. 1982. *An Evolutionary Theory of Economic Change.* Harvard University Press: Cambridge, MA.

OECD/EUIPO. 2016. *Trade in Counterfeit and Pirated Goods: Mapping the Economic Impact.* OECD Publishing: Paris.

OECD/EUIPO. 2017. *Mapping the Real Routes of Trade in Fake Goods.* OECD Publishing: Paris.

Oliver RL. 1980. A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research* 17(4): 460–469.

Peteraf MA. 1993. The cornerstones of competitive advantage: A resource-based view. *Strategic Management Journal* 14(3): 179–191.

Phillips DM. Baumgartner H. 2002. The role of consumption emotions in the satisfaction response. *Journal of Consumer Psychology* 12 (3): 243–252.

Posen HE, Chen JS. 2013. An advantage of newness: Vicarious learning despite limited absorptive capacity. *Organization Science* 24(6): 1701–1716.

Posen HE, Martignoni D. 2017. Revisiting the imitation assumption: Why imitation may increase, rather than decrease, performance heterogeneity. *Strategic Management Journal* (Forthcoming).

Qian Y. 2014. Counterfeiters: Foes or friends? How counterfeits affect sales by product quality tier. *Management Science* 60(10): 2381–2400.

Qin Y, Shi L, Song L, Stöttinger B, Tan K. 2018. Integrating consumers' motives with suppliers' solutions to combat Shanzhai: A phenomenon beyond counterfeit. *Business Horizons* (Forthcoming).

Raustiala K, Sprigman C. 2009. The piracy paradox revisited. *Stanford Law Review* 61(5): 1201–1225.

Shapira Z, Shaver JM. 2014. Confounding changes in averages with marginal effects: How anchoring can destroy economic value in strategic investment assessments. *Strategic Management Journal* 35(10): 1414–1426.

Shen J. 2013. Apple's sales in China jump 67% last quarter http://www.chinadaily.com.cn/business/2013-01/25/content_16173754.htm [28 January 2018].

Spreng R, Chiou, J. 2002. A cross-cultural assessment of the satisfaction formation process. *European Journal of Marketing* 36(7/8): 829–839.

Tse E. 2010. *The China strategy: Harnessing the power of the world's fastest-growing economy.* Basic Books: Philadelphia, PA.

Tse E, Ma K, Huang Y. 2009. *Shan Zhai: A Chinese Phenomenon*. Booz & Company (Ed.).

Wan Z, Wu B. 2017. When suppliers climb the value chain: A theory of value distribution in vertical relationships. *Management Science* 63(2): 477–496.

Zhu S, Shi Y. 2010. Shanzhai manufacturing – An alternative innovation phenomenon in China. *Journal of Science and Technology Policy in China* 1 (1): 29–49.
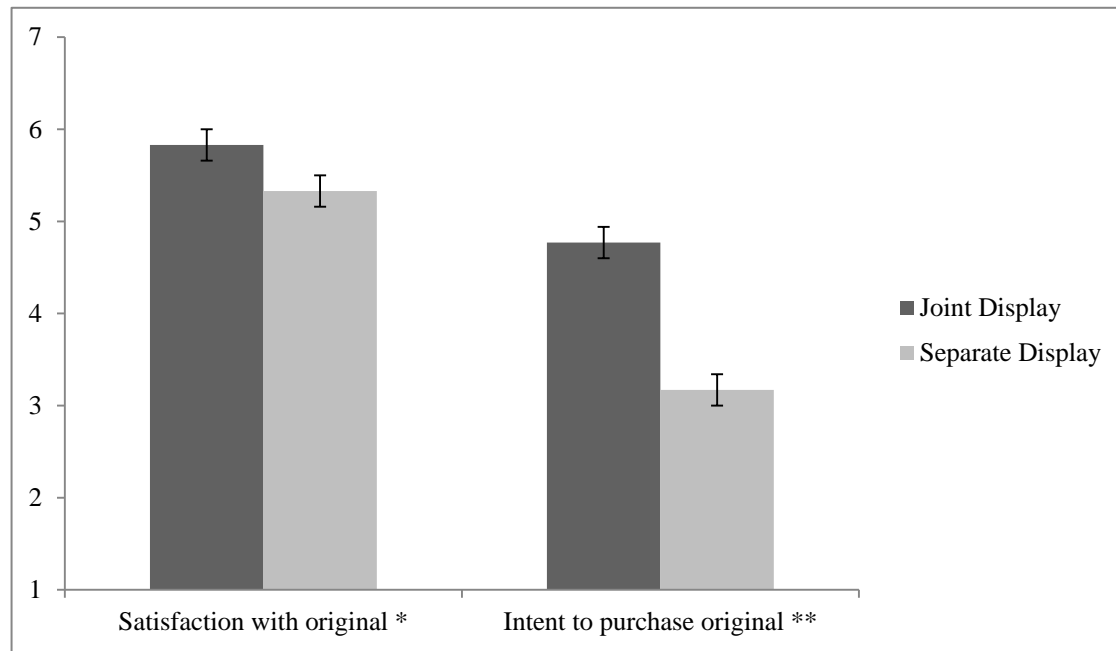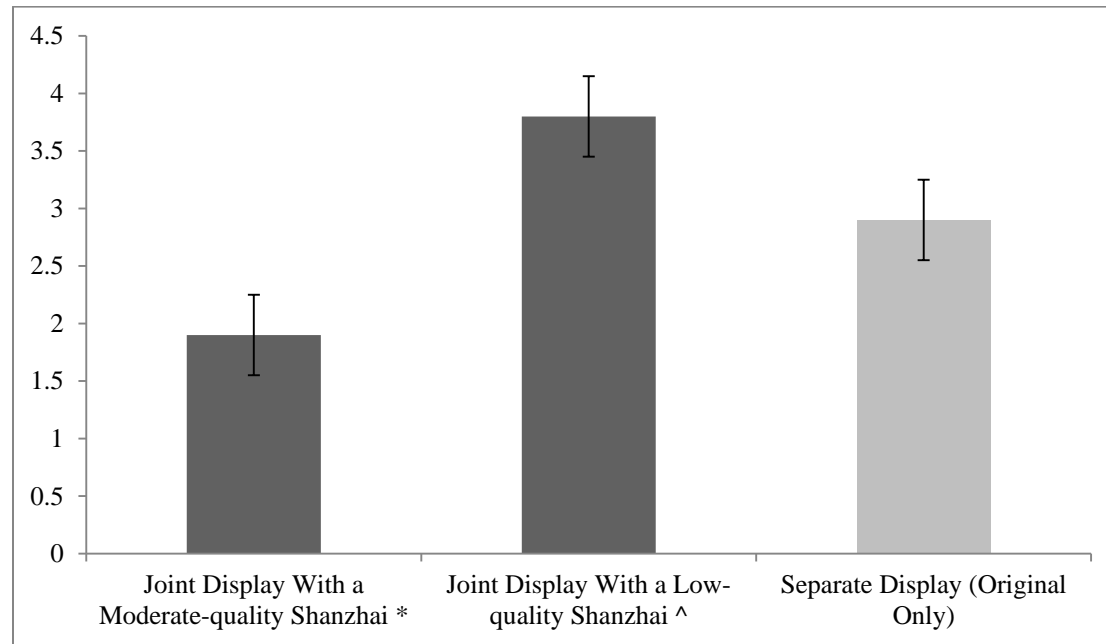
Note — Joint versus separate display [*] $p = 0.04$, [**] $p = 0.0001$

FIGURE 1: **Effects of a low-quality Shanzhai product on intent to purchase the original observed in Study 1**
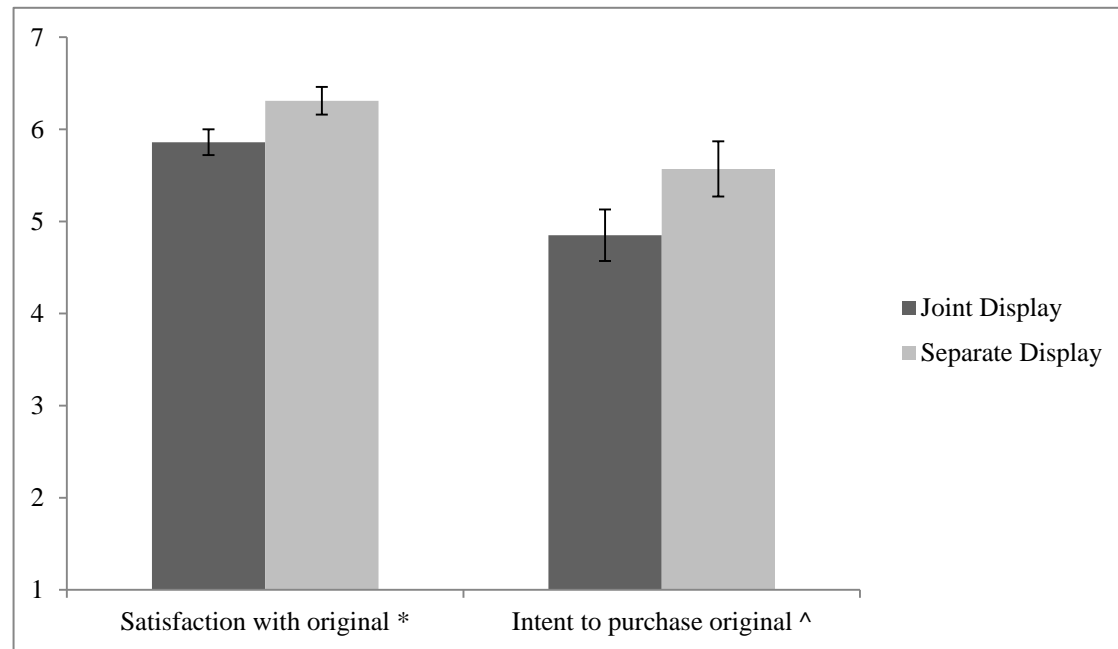
Note — Joint versus separate display $^*p = 0.04$, $^\wedge p = 0.08$

FIGURE 2:   Effects of a moderate-quality Shanzhai product on intent to purchase the original observed in Study 2

Note — Joint versus separate display [*]$p = 0.047$, [^]$p = 0.10$

FIGURE 3:   Effects of Shanzhai products on daily unit sales of the original observed in Study 3

a path: b=0.84, p=0.0004

Disconfirmation of Expectations about Original

b path: b=0.30, p=0.011

Shanzhai Quality: Low versus Moderate

c path: b=0.38, p=0.06

Satisfaction with Original
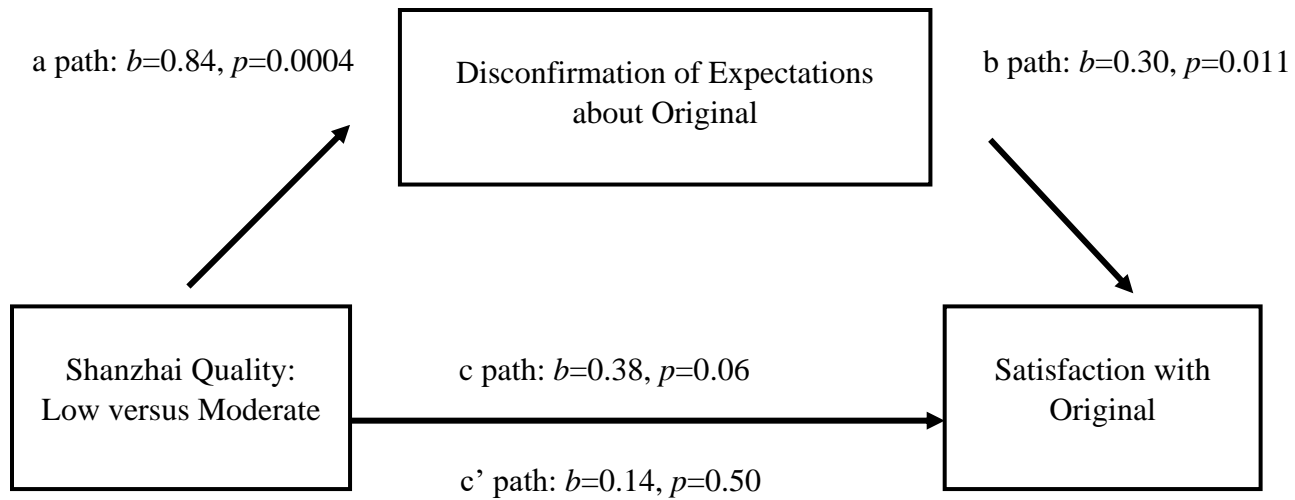
c' path: b=0.14, p=0.50

FIGURE 4:   Disconfirmation of expectations regarding the original as a process mechanism observed in Study 4

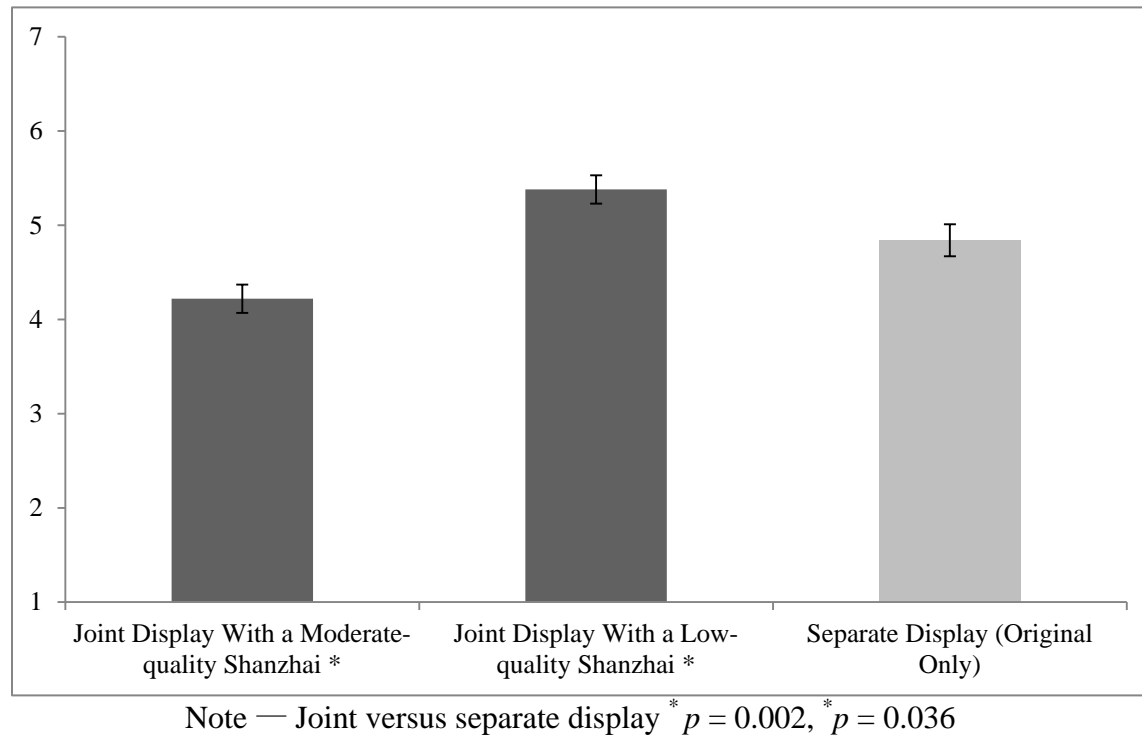Note ― Joint versus separate display $^*p = 0.002, ^*p = 0.036$

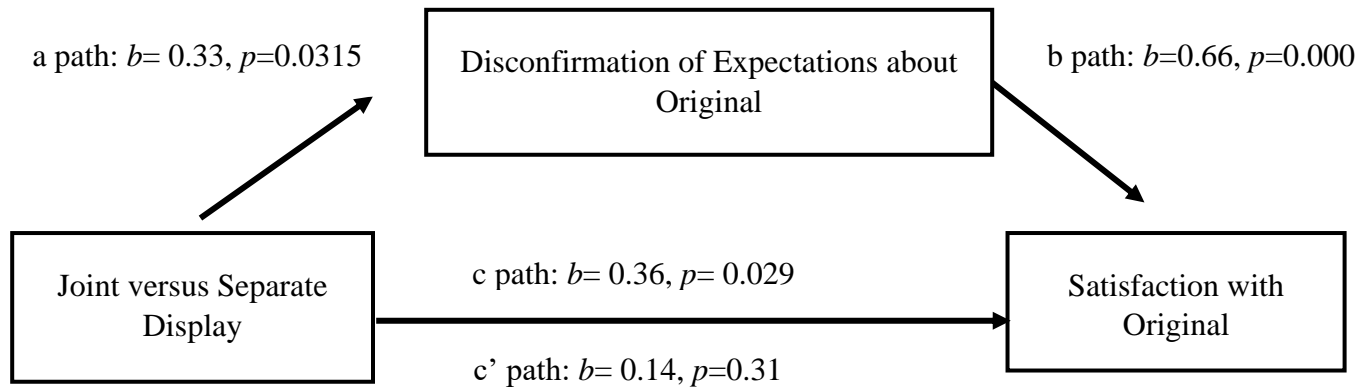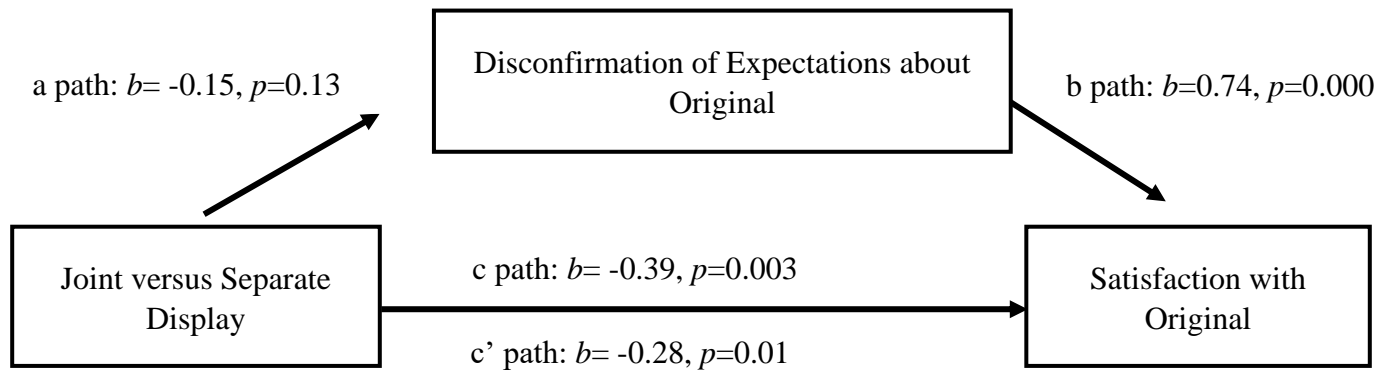**FIGURE 5:   Effects of Shanzhai products on satisfaction with the original observed in Study 5**

6A. Effects of a low-quality Shanzhai product

a path: *b*= 0.33, *p*=0.0315

Disconfirmation of Expectations about Original

b path: *b*=0.66, *p*=0.000

Joint versus Separate Display

c path: *b*= 0.36, *p*= 0.029

c' path: *b*= 0.14, *p*=0.31

Satisfaction with Original

6B. Effects of a moderate-quality Shanzhai product

a path: *b*= -0.15, *p*=0.13

Disconfirmation of Expectations about Original

b path: *b*=0.74, *p*=0.000

Joint versus Separate Display

c path: *b*= -0.39, *p*=0.003

c' path: *b*= -0.28, *p*=0.01

Satisfaction with Original

FIGURE 6: Disconfirmation of expectations regarding the original as a process mechanism observed in Study 5

APPENDIX A: Examples of copycat products

A-1: HiPhone (left) vs. iPhone (right)

A-2: Uncle Martian (left) vs. Under Armour (right)

Source:
A-1: HiPhone (left) vs. iPhone (right)
http://i3.sinaimg.cn/IT/mobile/n/2008-05-12/2e26175b01dad2d8b78c83a6b8e97658.jpg
 (Accessed on January 28, 2018)

A-2: Uncle Martian (left) vs. Under Armour (right)
https://i.amz.mshcdn.com/tN14Q-qus7UCSQLR6KORHVSX5QY=/fit-in/1200x9600/https%3A%2F%2Fblueprint-api-production.s3.amazonaws.com%2Fuploads%2Fcard%2Fimage%2F74546%2Funclemartian.jpg
(Accessed on January 23, 2018)

APPENDIX B: Study 1 product stimuli

FlyTouch Pad (left) vs. Apple iPad (right)

Source: Photos taken by one of the co-authors.