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The Shape of Money:

The Impact of Financial Resources on Product Shape Preference

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In this study, we investigate the influence of financial resources on consumers' aesthetic product preferences. According to the U.S. Bureau of Economic Analysis (National Endowment for the Arts 2018), the arts, aesthetics, and design industries contributed US\$763.6 billion to the U.S. economy in 2015. From the grand designs of urban environments to the specific design details of products or advertisements, aesthetic design permeates many aspects of consumers' everyday lives. Unsurprisingly, research has demonstrated that the aesthetic design of the environment we live in and the products we consume have a profound effect on our well-being (e.g., Crolic et al. 2019; Schnurr 2019; Warren and Reimann 2019). For example, in the current JACR issue, Warren and Reimann (2019) suggested that coolness in product design could motivate people to change social and cultural norms for the better. Crolic et al. (2019) showed that visual design bias, such as consumer inferences between product aesthetics and functional attributes, could lead consumers to make suboptimal product choices. Moreover, Schnurr (2019) found that cute packaging designs increased consumers' preference for vice products but decreased their purchase intention for virtue products.

In this research, we examine product shape preference. As an important component of everyday consumer aesthetics, product shape is one determinant of product attractiveness and consumers' purchase intentions (e.g., Yang and Raghubir 2005; Westerman et al. 2012; Sevilla

and Kahn 2014; Romero and Craig 2017). Angular and circular shapes are fundamental geometric categories, and every product shape either mainly consists of angles or curves, or contains both angles and curves. Drawing on the literature examining the symbolic associations of angular shapes, we propose that consumers who have (or believe they have) more financial resources exhibit more favorable attitudes toward angular-shaped products than their relatively poorer peers, which we have confirmed through the findings of three studies.

This research contributes to the literature on financial resources—a construct with profound TCR implications—by documenting consumers' evaluation and appreciation of everyday consumer aesthetics as novel psychological consequences of the financial resources they (perceive themselves to) possess. We add to the recent research investigating the impact of perceived or possessed financial resources on consumer behavior (e.g., Briers and Laporte 2013; Laran and Salerno 2013; Sharma and Alter 2012; Soster, Gershoff, and Bearden 2014; Steinhart and Jiang 2019; Tully, Hershfield, and Meyvis 2015), and demonstrate that financial resources can have broader behavioral effects than previously thought, even in contexts that have no direct relevance to a person's real financial capacity. Our research also contributes to the field of aesthetic design (e.g., Buechel, Townsend, and Moreau 2018; Hoegg, Alba, and Dahl 2010; Patrick and Hagtvedt 2011; Su, Wan, and Jiang 2019; Townsend and Shu 2010; Townsend and Sood 2012; Townsend 2017; Wu et al. 2017; for a review, see Adaval, Saluja, and Jiang 2019) by illustrating that consumers' aesthetic preferences can be shaped by the socio-economic environment they live in. This has paved the way for future research on socially grounded aesthetic preferences.

FINANCIAL RESOURCES

The practical and symbolic importance of money makes it an intrinsic and influential part of modern society, and researchers from various disciplines have examined the consequences of having or lacking financial resources (Furnham and Argyle 1998). Many correlations between personal wealth and other socio-psychological indicators have been identified in this stream of research. For example, although money is considered an inexact surrogate for well-being (Diener and Seligman 2004), it can be used to buffer people's subjective well-being after the onset of disability (Smith et al. 2005). Compared with their poorer peers, richer people tend to be in much better mental health (Blaxter 1990), are less likely to experience marital hardship (Sullivan, Turner, and Danziger 2008), and face a lower risk of obesity (Wardle et al. 2002). Those with more financial resources also suffer less from "environmental shocks" such as unexpected natural disasters (Johnson and Krueger 2006). Diener and Fujita (1995) noted that the financial resources that people possess can help them achieve their personal life goals, so those with more financial resources often have higher levels of subjective well-being.

Financial resources have also been shown to influence self-perceptions, particularly in terms of personal capability. The possession of financial resources, as a fundamental resource in society today, can enhance a person's ability to achieve personal goals and obtain desired outcomes. Thus, as Zhou, Vohs, and Baumeister (2009, p. 700) stated, possessing financial resources leads to the perception that "problems can be solved and needs can be met." This increased perception of self-efficacy leads to the belief that one can cope in life without relying on others. Research has shown that possessing financial resources makes a person more independent and thus less willing to be restricted by others in society (Vohs, Mead, and Goode 2006; 2008), and the mere reminder of financial resources can produce this effect (e.g., Jiang, Chen, and Wyer 2014; Teng et al. 2016; Vohs et al. 2008). For example, researchers have found that activating the concept of money leads people to prefer solitary activities (e.g., reading a book) over shared ones (e.g., going out with friends) and to keep more physical distance between themselves and interaction partners (Vohs et al. 2008). Financial resources have also been found to act as substitutes for a loss of social resources. Duclos, Wan, and Jiang (2013), for example, demonstrated that consumers pursue riskier but potentially more profitable financial opportunities when they encounter failure in securing social relationships. In this study, we investigate the specific influences of financial resources on the evaluation and appreciation of everyday consumer aesthetics.

FINANCIAL RESOURCES AND CONSUMER SHAPE PREFERENCE

Geometric shapes can be broadly categorized according to the extent to which their contours and features are curved or angular (e.g., Bar and Neta 2006; Jiang et al. 2016). Circular shapes are curved and have no sharp angles (e.g., circles or ovals), whereas angular shapes consist of straight lines and sharp corners (e.g., squares or rectangles). The mental associations of

different types of shapes have been considered in the psychology literature (e.g., Jiang et al. 2016; Palumbo, Ruta, and Bertamini 2015; Zhang, Feick, and Price 2006; Zhu and Argo 2013). For example, research into food perception has revealed that angular-shaped foods lead consumers to experience the taste as more intense and richer (e.g., Becker et al. 2011). In addition, Jiang et al. (2016) demonstrated that angular and circular brand logos can elicit mental associations with "hardness" and "softness," respectively, in consumers' minds, leading to perceptions of greater product durability and comfort. Palumbo et al. (2015) found that angular polygons were associated with male names and curved ones with female names. However, the literature on shape has not examined how consumers' financial situations influence their shape preferences. We attempt to fill this research gap by investigating how financial resources can influence consumers' aesthetic product preferences. Specifically, we propose that consumers who have (or believe they have) more financial resources exhibit more favorable attitudes toward angular products than their poorer peers.

Our hypothesis is supported by extensive research. Angular and circular shapes have been found to represent different levels of confrontation with the environment. Perceptually, as a circular shape is composed of curved lines without sharp angles, there is no clash between a circular stimulus and its surroundings (Bar and Neta 2006), while the straight lines and sharp corners of angular shapes create a clear sense of confrontation between them and their surroundings (Hogg 1969). This fundamental perceptual characteristic encourages a broader mental association of angular shapes with confrontation (such as social confrontation). Zhang et al. (2006) showed that individuals with independent self-construal were more attracted to angular shapes than those with interdependent self-construal, as angular shapes represent social confrontation. As mentioned, monetary resources reinforce perceived self-efficacy, so those with greater financial resources are more likely to engage in confrontational behavior because they are less afraid of failure and/or other associated negative consequences (e.g., loss of social relationships). Thus, the possession of financial resources can lead to a greater preference for angular products, as they have confrontational connotations.

In addition, the perceptual characteristics of angular shapes may also suggest uniqueness. The seeking of uniqueness can be viewed as an anti-conformity behavior that distances the self from the crowd (Lynn and Harris 1997). In angular shapes, a perceptual distance is created between the point of a protruding angle and the rest of the shape, and may thus be conceptually associated with seeking uniqueness. Similarly, Zhu and Argo (2013) indicated that individuals are more motivated to seek uniqueness and exhibit a greater preference for products endorsed by the minority when in an angular seating arrangement. While these types of behavior facilitate the expression of individual opinions or the establishment of self-identity, expressing opinions or tastes that differ from those of others can incur social losses (Rogerson 1982; Imhoff and Erb 2009; Lee and Song 2013). For example, Imhoff and Erb (2009) illustrated that people who seek uniqueness resist the influence of the majority and ignore their opinions, and Ingram (2009) found that those who dress differently from others in an organization can feel less welcome and are perceived as "out-group" members of staff. Possessing monetary resources reinforces perceived self-efficacy and thus reduces the fear of the negative consequences of being unique, so those with greater financial resources may prefer products with connotations of uniqueness. In addition, those with more power (often associated with abundant monetary resources; Keohane and Nye 1977; Vogler 1998) have been found to be more comfortable in expressing nonconforming opinions and uniqueness (Galinsky et al. 2008). Thus, those with greater financial resources may have a greater preference for angular products than their poorer counterparts, as these products symbolize uniqueness.

Both the above mechanisms provide theoretical support for our prediction that consumers who possess more financial resources will have a greater preference for angular products than their poorer counterparts. This prediction is stated formally below.

Hypothesis: Consumers with more (vs. fewer) financial resources hold more favorable attitudes toward angular-shaped products.

Three studies were conducted to test this hypothesis. First, through two field studies using real product choices, we examined the robustness and external validity of the proposed effect on product shape preference of possessed (study 1) and perceived (study 2) financial resources. Study 3 further demonstrated that this effect was driven by the more favorable attitudes toward angular products (as opposed to the less favorable attitudes toward circular products) of consumers with more financial resources. The data collection plans and stopping rules for each study were determined in advance, based on the sample sizes in published studies using similar

methods and procedures,¹ and the data were analyzed after the collection process. We disclose all data exclusions (if any), all manipulations, and all hypothesis-related measures.

STUDY 1

We tested our hypothesis in study 1 by examining whether a relationship exists between the level of financial resources and product shape preference. This was a field study conducted in Hong Kong, in which adult consumers were stopped in the street by research assistants and asked to answer a short set of demographic questions, including one measuring their monthly income. The participants were then offered either a small circular or a small angular picture frame as a free gift. We predicted that participants with more financial resources (i.e., higher monthly incomes) would be more likely than their less affluent peers to choose the angular picture frame than the circular frame.

Method

A total of 307 Hong Kong adult consumers participated voluntarily in this field study (173 males, $M_{age} = 38.09$). The participants were randomly selected by our research assistants on the street in Hong Kong. They were invited to participate in a survey purportedly for a student project measuring the demographic composition of Hong Kong citizens.

In the survey, the participants were asked to answer four simple demographic questions concerning their gender, age, marital status, and personal income. As the independent variable, each participant's monthly personal income was measured on a 12-point scale ranging from 1 = less than HKD2,000 (\approx USD258) to 12 = more than HKD60,000 (\approx USD7,735) (Hong Kong Census and Statistics Department 2015). In return for their participation, the participants were offered the choice of either a circular or an angular small wooden picture frame at the end of the survey (Web Appendix A).

Results

¹ Given the difficulty of monitoring real-time data, we set fixed time windows for the data collection in the field studies (4 days for study 1 and 5 days for study 2). For study 3 (the laboratory experiment), we set the size for each between-subjects cell to 50.

Using binary logistic regression, the participants' product choices (0 = circular, 1 = angular) were regressed on their personal monthly incomes, with the other three demographic measures (i.e., age, gender, and marital status) included as control variables (see table 1). The analysis revealed a significant effect of monthly personal income ($\beta = .12$, Wald $\chi^2 = 5.71$, p = .017). As expected, people with higher incomes were more likely to select the angular than the circular picture frame. None of the other demographic measures showed significant effects in either this or the later studies, so they were not considered further. In addition, the data pattern of personal monthly income and product choice did not change significantly after removing the control variables ($\beta = .13$, Wald $\chi^2 = 7.16$, p = .007) or after adding the interaction terms of the control variables to monthly personal income ($\beta = .27$, Wald $\chi^2 = 8.39$, p = .004).

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

Discussion

Study 1 provided initial support for our hypothesis that the level of financial resources affects product shape preferences. Using real product choices, we found that more affluent individuals (i.e., those with higher personal incomes) were more likely than their less affluent peers to select angular-shaped over circular-shaped products.

However, the correlational nature of study 1 made it difficult to establish a causal relationship between financial resources and product shape preference. Personal income level can usually indicate the level of financial resources a person possesses, and in this study it measured the absolute level. In the second field study, we further investigated whether the effect would be replicated for perceived financial well-being compared with others (e.g., Diener and Oishi 2000; Festinger 1954; Hsee et al. 2009).

STUDY 2

In study 2, we replicated the previously observed effect of financial resources on product shape preferences in a different field setting. The participants' perceived levels of financial

resources were manipulated to establish a causal relationship between financial resources and product shape preference.

Method

A total of 179 hotel guests (81 males, $M_{age} = 32.63$) of a medium-sized hotel in China voluntarily participated in this field study. The participants were randomly assigned to one of two between-subjects conditions (financial resources: low vs. high).

While the guests were waiting to check out, the hotel's front desk receptionist invited them to complete a survey, which comprised a series of questions regarding how much money they had spent on various aspects of their trips. These questions were actually used to manipulate participants' perceived level of financial resources. We used the same questions as those in previous research (e.g., Dillehay and Jernigan 1970; Nelson and Morrison 2005), but developed different ordinal measurement scales for the high and the low financial resource conditions (Web Appendix B). In the high condition, the values on the response scale for each question were constructed so that the participants were more likely to rate themselves at the higher end of the scale, and thus infer that their financial well-being was better than that of their peers. Conversely, those in the low financial resources condition were more likely to rate themselves at the lower end of each scale, and therefore to perceive themselves as having fewer financial resources than others.

As a manipulation check, the participants' perceived financial well-being compared to that of others was then measured using the Financial Resources Index (adopted from Sharma and Alter 2012; $\alpha = .78$; Web Appendix C). As compensation for completing the survey, each participant was offered a drawstring backpack and was asked to choose between one with a diamond (angular) pattern and one with a circular pattern (Web Appendix A). The choice of backpack served as the dependent variable in this study.

Results

Manipulation Check. The participants in the high financial resources condition reported higher levels of financial well-being ($M_{high} = 4.64$, SD = 1.11) than those in the low financial resources condition ($M_{low} = 4.11$, SD = 1.18; F(1,177) = 5.54, p = .002).

Product Choice. The analysis of the participants' backpack choices revealed that financial resources had a significant effect ($\beta = .77$, Wald $\chi^2 = 6.07$, p = .014, $\eta^2 = .05$) and thus replicated the results of study 1. As expected, the participants in the high financial resources condition were more likely (47.7%) than those in the low financial resources condition (29.7%) to choose the backpack with the angular pattern.

Discussion

In study 2, the consumers who perceived themselves as having more financial resources were more likely to select the angular-pattern backpack than the circle-pattern backpack. The low likelihood of choosing the angular-pattern backpack across conditions (i.e., 47.7% and 29.7% in the high and low financial resources conditions, respectively) does not explain the observed effects, but suggests that in general participants may have had more favorable attitudes toward the circle-patterned than the angular-patterned backpack. We conducted a posttest on a separate group of participants from the same population (N = 43) to verify this, using a 7-point scale (1 = not attractive at all, 7 = very attractive) and found that the circle-pattern backpack was indeed rated as more attractive ($M_{circular} = 3.80$, SD = 1.28) than the angular-pattern backpack ($M_{angular} = 3.28$, SD = 1.50; F(1,42) = 5.07, p = .030).

The field settings and real product choices in studies 1 and 2 together provided strong support for the external validity of the effect of financial resources on product shape preference. The financial resources possessed by individuals both in terms of absolute levels (i.e., personal income, as measured in study 1) and relative/comparative levels (i.e., perceived financial well-being, as manipulated in study 2) affected their real choices of product shape.

STUDY 3

The first two studies provide evidence that financial resources influence consumers' product shape preferences, and the participants were asked to indicate their preferences for angular- versus circular-shaped products. However, it is unclear whether high levels of financial resources increased participants' preference for angular-shaped products, or reduced their preference for circular-shaped products, or both. In study 3, we utilized between-subjects evaluations of angular-shaped versus circular-shaped products to address this.

Method

A partial course credit was offered to Hong Kong undergraduate students if they participated in this study, and 190 students in total took part (57 males; $M_{age} = 21.35$). Participants were randomly assigned to conditions in a 2 (financial resources: high vs. low) × 2 (product shape: circular vs. angular) between-subjects factorial design. We eliminated the data from eight participants who did not follow the instructions for the episodic recall task (e.g., Lee, Shrum and Yi 2017). Thus, the final valid sample of this study consisted of 182 participants.

Participants first completed an episodic priming manipulation of financial resources disguised as a "memory task" (Sharma and Alter 2012). Specifically, they were asked to recall and write down a past experience in which they felt relatively better off (i.e., with higher financial resources) or worse off (i.e., with lower financial resources) than their peers. Then, in an ostensibly unrelated decision-making task, they were presented with either a circular or an angular ornament (see Web Appendix A) and asked to evaluate it in terms of its pleasantness, attractiveness, and likability, all on 7-point scales (1 = not at all, 7 = very much). Finally, as a manipulation check, the participants were rated along the same Financial Resources Index used in study 2 ($\alpha = .74$).

Results

Manipulation Check. As expected, those in the high-resources condition (M = 3.99, SD = 1.25) reported higher levels of perceived financial well-being than those in the low-resources condition (M = 3.49, SD = 1.31; F(1,180) = 6.78, p = .010).

Product Attitude. The three product evaluation items were averaged ($\alpha = .94$). The 2 (financial resources: high vs. low) × 2 (product shape: circular vs. angular) ANOVA revealed a significant resources × shape interaction (F(1,178) = 4.41, p = .037). Planned comparisons showed that participants in the high-resources condition evaluated the angular ornament more favorably (M = 2.62, SD = 1.04) than those in the low-resources condition (M = 2.09, SD = 0.89; F(1,178) = 5.66, p = .018), while no significant difference was found in their evaluations of the circular ornament ($M_{high} = 2.10$, SD = 1.13 vs. $M_{low} = 2.21$, SD = 1.06; F(1,178) < 1, NS) (see Figure 1).

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

Discussion

In addition to replicating the previously found effect of financial resources on consumers' product shape preference, study 3 revealed the direction of this effect. Consistent with our prediction, the results suggest that higher levels of financial resources increase the preference for angular products instead of decreasing the preference for circular products.

GENERAL DISCUSSION

In a recent review of consumer aesthetics research, Patrick (2016) suggested that the effects of product design elements (e.g., product shape and packaging) on consumer behavior should be assessed. Following this call, research published in the current JACR issue looked at the impact of the aesthetic design of products/packages (e.g., Crolic et al. 2019; Huang et al. 2019; Koo, Oh, and Patrick 2019; Schnurr 2019; Warren and Reimann 2019), business and community communications (e.g., Bublitz et al. 2019; Butler 2019; Gilkey 2019; Hagtvedt 2019; Mourey and Elder 2019), and attires (Carvalho, Hildebrand, and Sen 2019; Cutright, Srna, and Samper 2019) on consumer behavior and welfare. Contributing to this collective effort, in the current research, we investigate the effect of financial resources, an important socio-economic factor, on consumers' product shape preferences. Through two field studies and one laboratory experiment, we provide convergent evidence that higher (vs. lower) levels of financial resources,

both perceived and possessed, make consumers more favorable toward angular-shaped products. However, this effect was not found for circular-shaped products.

This research contributes to the marketing literature by suggesting that consumers' product shape preference is a novel psychological consequence of the financial resources they possess or perceive themselves to possess. We thus extend the research that recognizes the psychological consequences of perceived or possessed financial resources (e.g., Briers and Laporte 2013; Laran and Salerno 2013; Sharma and Alter 2012; Soster et al. 2014; Steinhart and Jiang 2019; Tully et al. 2015) by demonstrating that financial resources can have broader behavioral effects than previously thought, even in contexts that are not relevant to a person's real financial capacity. Our study is the first to demonstrate that financial resources affect product shape preference, and we hope that our findings will stimulate further research into the effects financial situations have on consumption behavior and well-being. Our studies demonstrate that the association between financial resources are earned or gifted, but future research can examine whether the effect size differs when money is either earned or gifted.

Past research into product shape in marketing has primarily focused on either its effect on the aesthetic preferences of consumers (e.g., Berkowitz 1987; Landwehr, McGill, and Herrmann 2011; Westerman et al. 2012) or the volume perception bias it induces (e.g., Raghubir and Greenleaf 2006; Sevilla and Kahn 2014; Wansink and Ittersum 2003). Researchers have only recently begun to consider the symbolic meanings consumers derive from various product shapes (e.g., Becker et al. 2011; Jiang et al. 2016; Palumbo et al. 2015; Zhang et al. 2006). For example, Jiang et al. (2016) demonstrated that angular shapes activate associations with product durability. While we propose that the effect of financial resources on the preference for angular shapes may result from the symbolic associations of such shapes with confrontation and uniqueness, we do not directly test these mechanisms. This can be addressed in future research, along with other mechanisms that may contribute to the observed effect. For example, the relationship between financial resources and a preference for angular-shaped products may be due to more importance being placed on competence among people with more financial resources. Self-enhancing motivation (e.g., Alicke and Sedikides 2009) drives people to value the qualities they think they possess (Rosenberg 1967). As richer people are more likely to perceive themselves as competent, those who perceive themselves as possessing more (vs. less) monetary resources are likely to

attach greater importance to competence. Angular products may be more likely to symbolize advanced personal characteristics related to competence than circular shapes, and subsequently angular shapes are preferred by consumers with more financial resources.

Angular-shaped products are common in consumption contexts, and our research is the first to explore the effect they may have on consumers' social well-being. As previously stated, the symbolic associations of angular shapes with confrontation and uniqueness lead to possible negative consequences such as social loss. This is consistent with the finding in the literature on empirical aesthetic perceptions that angular shapes are associated with toughness (e.g., Berlyne 1971; Westerman et al. 2012). For example, researchers in the field of psycholinguistics have found that angular shapes are linked with the adjectives "hard," "harsh," and "cruel" (Liu and Kennedy 1993; Lundholm 1921). Palumbo et al. (2015) demonstrated that angular polygons activate perceptions of threat due to their association with danger. However, the symbolic associations of angular shapes with confrontation and uniqueness may also increase the individualistic aspect of consumer welfare, facilitating self-expression. Along these lines, future research could explore the various implications of angular shapes for consumer well-being.

While this research focuses on angular products, consumers' preference for angular versus circular shapes has a much broader significance in areas such as brand logo design, elements of advertisement design, and even public construction. Thus, our findings have broad practical implications for TCR. They indicate that shapes in creative artworks can be designed to strategically match consumers' or viewers' psychological needs. For example, if the target customers of a product are more affluent, more angular elements (e.g., straight lines and sharp angles) should be embedded in the product's design to maximize its attractiveness. In creative placemaking projects, which aim to animate public and private spaces, designers should consider the financial resources of local residents, as this can make the art in these projects more attractive to them. The marketing approach may also need to be different for different shaped products. For example, an advertisement for a product that has an angular shape could be purposely designed to make viewers feel financially confident (e.g., through favorable comparison with their lower-income counterparts). The triggered feelings of affluence or resourcefulness may increase the audience's preference for the angular-shaped product.

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Variable	В	Wald	р
Personal Monthly Income	.124	5.711	.017
Age	025	2.645	.104
Gender ^a	.364	1.977	.160
Marital Status ^b		4.684	.196
Single but in a Serious Relationship	.654	.584	.445
Married	.163	.033	.857
Divorced/Separated/Widowed	083	.010	.918
Intercept	.247	.051	.822

Table 1. The Impact of Personal Monthly Income on Preference for Angular-shaped PictureFrame over Circular-shaped One in Study 1

^a Male = 1; Female = 2

^bReference Category: "Single"

Figure 1. Interaction between financial resources and product shape on product attitude in Study 3. Participants in the high financial resources condition evaluated the angular ornament more favorably than those in the low financial resources condition, while no significant difference was found in their evaluations of the circular ornament.

