'Looking sharp': Price typeface influences awareness of spending in mobile payment

Journal:	*Psychology & Marketing*
Manuscript ID	PM.202100655.R2
Wiley - Manuscript type:	Research Article (Direct Via EEO)
Keywords:	Price typeface, Angularity, Pain of payment, Awareness of spending, Mobile payment, Cashless payment, Profligacy
Abstract:	We investigate whether the typeface used to display the purchase amount in the context of mobile payment influences consumers' awareness of spending. The evidence suggests that prices displayed in angular (vs. round) typeface increase the awareness of spending in the context of mobile payment via the perceived harshness of the typeface and the experienced pain of payment (Studies 1-3, 5, and 6). Angular (vs. round) typeface also has downstream consequences for payment behavior, indicating that the amount displayed with the angular typeface increases the hesitation to press the "pay" button (Studies 2 and 6). Our results also demonstrate that the typeface effect on the awareness of spending is moderated by the purchase amount (Study 3). The robust typeface effect documented for Japanese participants (Studies 1-3) is not observed in North Americans (Studies 4 and 5), highlighting the role of culture. Finally, we replicate the price typeface effect (Studies 1-3) in a situation that is closer to the context of real mobile shopping and demonstrate that price typeface impact people's willingness to spend on the next grocery shop (Study 6). Our research contributes to the scarce literature on addressing the profligacy issues associated with mobile payments and broadly cashless payments.

‘Looking sharp’: Price typeface influences awareness of spending in mobile payment

ABSTRACT

We investigate whether the typeface used to display the purchase amount in the context of mobile payment influences consumers’ awareness of spending. The evidence suggests that prices displayed in angular (vs. round) typeface increase the awareness of spending in the context of mobile payment via the perceived harshness of the typeface and the experienced pain of payment (Studies 1-3, 5, and 6). Angular (vs. round) typeface also has downstream consequences for payment behavior, indicating that the amount displayed with the angular typeface increases the hesitation to press the “pay” button (Studies 2 and 6). Our results also demonstrate that the typeface effect on the awareness of spending is moderated by the purchase amount (Study 3). The robust typeface effect documented for Japanese participants (Studies 1-3) is not observed in North Americans (Studies 4 and 5), highlighting the role of culture. Finally, we replicate the price typeface effect (Studies 1-3) in a situation that is closer to the context of real mobile shopping and demonstrate that price typeface impact people’s willingness to spend on the next grocery shop (Study 6). Our research contributes to the scarce literature on addressing the profligacy issues associated with mobile payments and broadly cashless payments.

Keywords: Price typeface, Angularity, Pain of payment, Awareness of spending, Profligacy, Mobile payment, Cashless payment.

1. Introduction

With the popularity of mobile phones and the rise of mobile technology (e.g., mobile Internet), mobile payment has become a ubiquitous part of daily life for many consumers. Mobile payment refers to the use of mobile devices to initiate, authorize, and confirm payment transactions for goods and services (Au & Kauffman, 2008). Examples currently include Apple Pay, Google Pay, and AliPay. The mobile payments market was valued at USD 1,450 billion in 2020 and is expected to reach USD 5,400 billion by 2026, growing at a compound annual rate of 24.5% over the forecast period (2021 – 2026; Mordoer Intelligence, 2021). The COVID-19 pandemic has also helped to accelerate the adoption of mobile payment as a contactless method of payment that can potentially help to minimize the transmission of the virus (Liu et al., 2021).

As mobile payment systems are highly efficient and convenient in transactions, consumers and retailers have welcomed and adopted mobile payment as one of the main methods of cashless payment (Boden et al., 2020). Additionally, it has been argued that an increase in the social adoption of cashless payment systems can help to stimulate economic growth, consumption, and trade (Hasan et al., 2012; Tee & Ong, 2016).

However, emerging research suggests that the use of mobile payment may lead to unintended consequences amongst consumers, such as the possibility of profligacy or excessive spending (Boden et al., 2020; Falk et al., 2016; Liu et al., 2021; Manshad & Brannon, 2021). Adding to these findings, recent studies have suggested that an awareness of spending, which refers to the subjective perception of monetary loss associated with payment, is lower when people use mobile payments than when using other types of cashless payment (e.g., credit cards; Boden et al., 2020; Liu & Chou, 2020; Manshad & Brannon, 2021). Studies of cashless payment also suggest that the profligacy induced by cashless payment may not only result in financial problems such as indebtedness (Awanis & Cui, 2014; Stewart, 2009; Pirog & Roberts,

2007) but also to an increase in unhealthy consumption (Park et al., 2021; Soman, 2003; Thomas et al., 2011).

As mentioned above, recent studies have highlighted that the low awareness of spending in the context of mobile payment can result in problems associated with overspending. Considering the rapid growth of the mobile payments market, surprisingly little effort has been devoted to exploring how to deal with, and thereafter to solve, possible overspending issues in mobile payment. As far as we are aware, to date, only a single study has addressed the issue. In particular, focusing on the role of haptic input, Manshad and Brannon (2021) examined the influence of providing vibrotactile feedback on people's awareness of mobile spending. They expected two possibilities. One was that high-intensity vibration (vs. no vibration) would increase the awareness of spending in the context of mobile payment since high- (vs. low-) intensity vibrations are perceived as more annoying or startling. The other was that low-intensity vibration (vs. no vibration) would increase the awareness of mobile spending since low- (vs. high-) intensity vibrations are associated with more negative and low arousal emotions such as sadness. The results supported the latter suggestion demonstrating that low-intensity vibration feedback (vs. no vibration) can potentially increase people's awareness of mobile payment spending and thus reduce their willingness to spend.

The studies reported here are the first to demonstrate that, focusing on the visual design of price format, merely altering the shape of the typeface displaying the payment amount for mobile payment is sufficiently powerful to influence the consumers' awareness of spending and their intention to pay. Across six studies, we report evidence that the purchase amount displayed with an angular (round) typeface increases the awareness of spending in mobile payment via the perceived harshness of the display typeface and the experienced pain of payment (Studies 1-3, 5, and 6). We also show that the angular (vs. round) display typeface has a downstream effect on people's payment behavior, indicating the amount with angular (vs.

round) typeface display increases their hesitation when it comes to pressing the "pay" button (Studies 2 and 6). We also demonstrate that the display typeface effect on the awareness of spending is moderated by the payment amount (Study 3). We further document how the robust price typeface effect found amongst Japanese participants in Studies 1-3 is not observed amongst North American consumers (Studies 4 and 5). Finally, we replicate the price typeface effect found in Studies 1-3 in a context that is closer to real mobile shopping and demonstrate the price typeface indeed impacts the willingness to spend in the next grocery shopping (Study 6). These findings contribute to the scarce literature on dealing with the problem of profligacy in cashless payments and the effect of sensory elements of price format (e.g., price color) on price perception. Our research also adds to the understanding of the effect of shape perception on consumer behavior more generally (see Velasco & Spence, 2019).

2. Theoretical background and hypotheses

2.1. Payment methods and the awareness of spending

Previous studies have consistently highlighted the influence of payment format on people's willingness to pay (e.g., Feinberg, 1986; Liu et al., 2021; Prelec & Simester, 2001; Runnemark et al., 2015; Soman, 2003). Generally-speaking, shoppers tend to spend more when they pay with cashless methods such as credit cards and mobile payments than with cash.

The level of payment transparency negatively influences consumers' willingness to spend (Falk et al., 2016; Raghubir & Srivastava, 2008; Soman, 2003). Payment transparency refers to "the relative salience of the payment, both in terms of physical form and the amount" (Soman, 2003, p. 175). While the salience of physical form is the degree to which it is easy to experience that money is being spent, the salience of the amount refers to the degree to which it is easy to track the total amount spent (Falk et al., 2016; Soman, 2003). In general, when comparing cash, card, and mobile, transparency is highest for cash (high salience of physical

form and amount), the lowest in the case of mobile payment (low salience of physical form and low-medium salience of amount), and intermediate in the case of card (medium salience of physical form and low salience of amount) (Boden et al., 2020; Falk et al., 2016; Liu & Chou, 2020; Manshad & Brannon, 2021). Mobile payment is the least transparent of the currently available payment methods since it does not require the consumer to bring cash or card and take physical action such as handing over cash, signing a receipt, or entering a security code for card authorization.

The research that has been published to date on payment format also suggests that the experienced pain of payment, the negative emotion that consumers experience in parting with their cash, mediates the influence of payment methods on the awareness of spending (Liu & Chou, 2020; Prelec & Simester, 2001; Raghubir & Srivastava, 2008; Shah et al., 2016; Soman, 2003). Payment transparency positively influences the experienced pain of payment (independent of how much is paid for a particular purchase), and the experienced pain subsequently increases the awareness of spending. Therefore, people tend to spend more when their payment is cashless (such as using mobile phones) than when it is made with cash, since cashless (vs. cash) payment elicits less pain associated with the payment.

Relatedly, recent research suggests that the use of mobile payment may lead to unintended consequences amongst consumers, such as the possibility of profligacy or excessive spending (Boden et al., 2020; Falk et al., 2016; Liu et al., 2021; Manshad & Brannon, 2021). The possible spending problem is, of course, not a new issue in the literature on cashless payment. A number of studies have already demonstrated that people tend to spend more when they make cashless payments, such as paying by credit or debit card, rather than when paying with cash (Feinberg, 1986; Hirschman, 1979; Liu & Chou, 2020; Park et al., 2021; Prelec & Simester, 2001; Raghubir & Srivastava, 2008; Runnemark et al., 2015; Soman, 2001, 2003).

Cashless (vs. cash) payments tend to encourage lavish spending and impulse purchases

(e.g., Erasmus & Lebani, 2008; Feinberg, 1986; Raghubir & Srivastava, 2008; Soman, 2003). What is more, it has been suggested that the profligacy induced by cashless payment may result in indebtedness and even bankruptcy for some individuals (Awanis & Cui, 2014; Pirog & Roberts, 2007; Stewart, 2009). Furthermore, recent studies have demonstrated that the profligacy induced by cashless payment may not only lead to financial problems but also to an increase in unhealthy consumption (Park et al., 2021; Soman, 2003; Thomas et al., 2011).

While it is already known that payment format influences spending, there is perhaps, a more subtle way in which spending behavior is influenced, that is, by means of the sensory elements of the price format (e.g., shape, size, color). Previous studies have demonstrated that the sensory elements of price format, such as the color in which the price information is presented (e.g., Puccinelli et al., 2013; Ye et al., 2020), price font size (e.g., Coulter & Coulter, 2005), and price font clarity (Mead & Hardesty, 2018) sometimes affect consumer's price perception. In the present research, we look, in particular, at how typeface, as a potentially salient sensory element of price format may influence consumers' awareness of spending in the context of mobile payment.

2.2. Typeface shape and awareness of spending

Although the terms typeface and font are used interchangeably in daily language, considering the difference between the two is important as far as understanding type design is concerned (Brownlee, 2014, Velasco & Spence, 2019). Typeface refers to a family of related fonts which follow the same design principle. Meanwhile, font refers to specific subsets of a typeface. For example, Arial 12pt in italics is a different font than Arial 10 without italics, while Arial constitutes a different typeface than Times New Roman.

Typeface design is crucial for branding (Henderson et al., 2004) as typeface and font can convey a wide range of different brand associations and meanings such as product

attributes (Childers & Jass, 2002; de Sousa et al., 2020; Gupta & Hagtvedt, 2021; Liu et al., 2019; Schroll et al., 2018; Velasco et al., 2018; Venkatesan et al., 2020), product category (Doyle & Bottomley, 2004, 2006; Wang et al., 2020; Zhou et al., 2021), brand personality (Grohmann et al., 2013; Mackiewicz & Moeller, 2004), brand gender (Grohmann, 2016), brand premiumness (Yu et al., 2021), purchase intention (Mead et al., 2020) and even exotic, or national, associations (Celhay et al., 2015).

Typeface curvature (which refers to the roundness or angularity of a letterform) is one of the fundamental attributes of typeface design (Henderson et al., 2004; van Leeuwen, 2006). While round typefaces are conventionally perceived to be soft and feminine, angular typefaces are perceived to be hard and masculine (Grohmann, 2016; Wang et al., 2020). In addition, round (vs. angular) typefaces generally induce feelings of pleasantness and friendliness (Henderson et al., 2004; Pombo & Velasco, 2021). Furthermore, a separate line of crossmodal research has shown that round typefaces tend to be associated with a sweet taste, whereas angular typefaces tend to be matched with bitter, sour, and salty tastes instead (Velasco et al., 2018; Velasco & Spence, 2019; Velasco et al., 2014).

People tend to associate angular shapes with attributes such as hard, harsh, and masculine while associating round shapes with attributes such as soft, mild, and feminine (e.g., Blazhenkova & Kumar, 2018; Liu & Kennedy, 1997; Lundholm, 1921). In addition, numerous studies have demonstrated a general tendency to prefer round over angular shapes (Bar & Neta, 2006, 2007, 2008; Blazhenkova & Kumar, 2018; Gómez-Puerto et al., 2016; Larson et al., 2009; Palumbo et al., 2015; Wang et al., 2020; Westerman et al., 2012). A bias to prefer round shapes has also been documented in 1 week-old infants (Fantz & Miranda, 1975) and even amongst non-human primates (Munar et al., 2015).

Of particular relevance to the aims of the present study, studies reveal that people perceive angular (vs. round) shapes as less attractive and pleasing since angular shapes may

induce a vague sense of threat (Bar & Neta, 2006, 2007, 2008; Larson et al., 2009; Palumbo et al., 2015). For example, using human neuroimaging, Bar and Neta (2007) found that everyday sharp objects (such as a sofa with sharp corners) elicit significantly greater amygdala activation, which is involved in fear processing, than do curved objects (e.g., a sofa with curved corners). Relatedly, Palumbo et al. (2015; Experiment 1) used the Implicit Association Test to demonstrate that curved shapes are associated with safe (e.g., comfort, secure) and positive (e.g., lucky, success) concepts, whereas angular shapes are associated with danger (e.g., killer, weapon) and negative (e.g., tragedy, rejected) concepts instead. Taken together, these studies suggest that angular shapes more strongly activate the amygdala and elicit negative associations and emotions as compared to shapes that are rounder.

Neuroimaging research suggests that the amygdala is also activated when people expect or experience pain and is interrelated with other cortical regions that process pain signals (Larson et al., 2009; Simons et al., 2014). Importantly, Larson and colleagues reported that an angular shape (i.e., a downward-pointing V-shape) activated pain-responsive regions such as the posterior insular cortex and the anterior cingulate cortex. These findings suggest that angular (vs. round) shapes may (explicitly and/or implicitly) induce a feeling of pain or, at the very least, activate the concept of pain.

2.3. Hypotheses

Based on the above-mentioned arguments and findings, we first hypothesize that the shape of the typeface for displaying a purchase amount will tend to influence the consumers' awareness of spending in the context of mobile payment. Therefore,

H1: Angular (vs. round) price typeface will increase the awareness of spending.

As stated above, people tend to associate angular (vs. round) shapes/typefaces with harshness, cruelty, and other feelings that are less pleasant (e.g., Bar & Neta, 2007; Blazhenkova & Kumar, 2018; Henderson et al., 2004; Liu & Kennedy, 1997; Velasco & Spence, 2019). Thus, it was predicted that an angular (vs. round) price typeface would increase the perception of harshness (broadly defined to include negative associations and feelings). In addition, neuroimaging research indicates that angular shapes activate those brain areas (e.g., amygdala, the anterior cingulate cortex) involved in the perception of fear, threat, and pain (e.g., Bar & Neta, 2007; Larson et al., 2009). Based on these findings, it is assumed that the perceived harshness (induced by the angular typeface) will increase the pain that is associated with payment. Further, research in payment methods suggests that the pain of payment increases the awareness of spending (e.g., Prelec & Simester, 2001; Raghubir & Srivastava, 2008; Soman, 2003). Thus, we predict that the pain of payment will increase the awareness of spending. The above-mentioned serial mediation predictions are formulated as follows.

H2: Angular (vs. round) price typeface will increase the awareness of spending through perceived harshness and the pain of payment.

Studies regarding payment transparency suggest that the salience of spending money induces a feeling of pain and thus negatively influences the willingness to spend and hence the actual amount purchased (e.g., Runnemark et al., 2015; Soman, 2003; Thomas et al., 2011). As an individual's behavioral system inhibits those behaviors that may lead to negative or painful outcomes (e.g., Carver & White, 1994), it was predicted that an increase in the awareness of spending would negatively influence the consumers' behavioral intention to pay via mobile payment. This leads to:

H3: The awareness of spending will positively influence an increase in hesitation to press the "pay" button.

The pain associated with payment and the awareness of spending depends on the amount to be paid (Ceravolo et al., 2019; Soman, 2003). According to cue utilization theory, high (vs. low) involvement consumers tend to adopt systematic processes and depend more on intrinsic rather than extrinsic cues for their judgments (e.g., Celsi & Olson, 1988; Lee & Lou, 1995; Olson & Jacoby, 1972). In addition, perceived risk is often viewed as a significant antecedent of involvement (Mitchell, 1999). In the current research, the amount to be paid can be considered as an internal cue and the typeface of displaying the amount as an external cue for the awareness of spending. Since the perceived risk and involvement for payment is expected to increase in proportion to the expenditure, the influence of the typeface (as an external cue) on the awareness of spending may be attenuated or disappear entirely when the purchase amount is relatively large (vs. small). Therefore:

H4: The purchase amount will negatively moderate the typeface effect on the awareness of spending.

Studies based on evolutionary psychology suggest that the preference for curvature appears to be universal and is unaffected by cultural differences (e.g., Bar & Neta, 2006; Fantz & Miranda, 1975; Gómez-Puerto et al., 2018; Munar et al., 2015). For example, Gómez-Puerto et al. have demonstrated that the preference for curved contours is also present in non-Western cultures such as in Ghana. Meanwhile, Munar et al. report that non-human great apes also prefer curved over sharp-angled contours. Contrary to the evolutionary psychological studies, some social psychological and marketing studies have demonstrated that the preference for shapes may differ as a function of culture (Chen et al., 2016; Henderson et al., 2003; Tzeng et

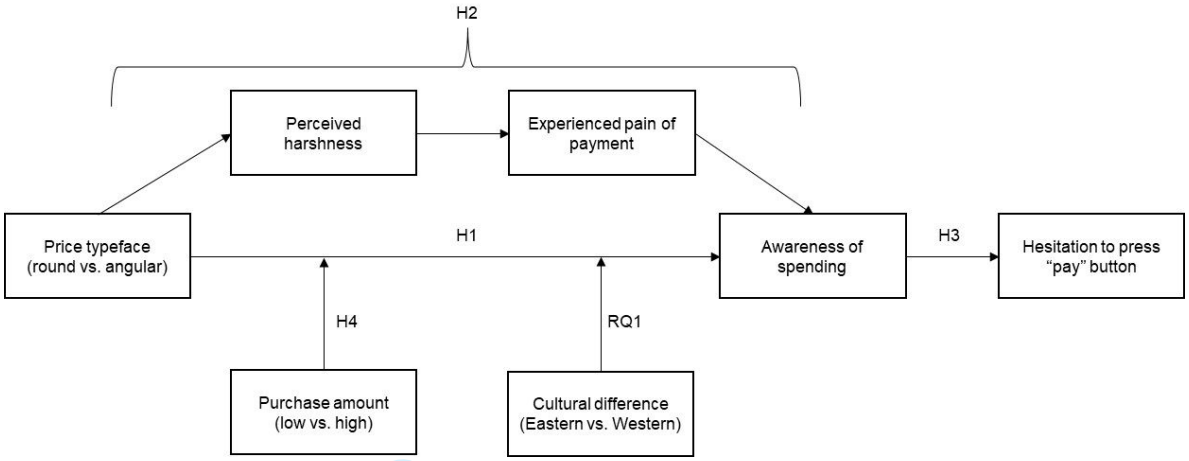
al., 1990; Velasco et al., 2018; Zhang et al., 2006). For example, Zhang et al. (2006) demonstrated that individuals with independent (vs. interdependent) self-construals perceive angular shapes as more attractive and rounded shapes as less attractive. This is because an independent self-construal is associated with conflict confrontation, whereas an interdependent self-construal is associated with conflict avoidance. Zhang and colleagues also found that corporate logos from collectivist countries (i.e., Japan, Hong Kong, South Korea) were rounder than those from individualistic countries (i.e., United States, United Kingdom, Canada, and Germany). These studies suggest that it may be possible that culture affects the typeface effect on the awareness of spending. Thus, we formulated the following research question (RQ).

RQ1: Do cultural differences (i.e., Eastern vs. Western) affect the price typeface effect on the awareness of spending?

3. Overview of Studies

The research model, which consists of four hypotheses and one RQ (see Fig 1), is tested across a series of six studies. Study 1 examines the typeface (round vs. angular) effect on the awareness of spending in the context of mobile payment (H1). Study 2 investigates the underlying mechanisms of the typeface effect on the awareness of spending (H2) and the downstream effect of the typeface used to display the payment amount on people's intention to pay (i.e., hesitation to press the "pay" button) (H3). Study 3 examines whether the payment amount (low vs. high) moderates the typeface effect on participants' awareness of spending (H4). Contrary to Studies 1-3 conducted with Japanese participants, Studies 4 and 5 explore the typeface effect on the awareness of spending with North American samples instead (RQ1). Study 6 investigates the typeface effect on consumer responses to mobile payment for Japanese participants using more realistic shopping experience stimuli (H1, H2, and H3) and another

271 downstream effect of price typeface, namely on the consumer's willingness to spend on their
272 next grocery shop (see Table 4 for the results of the hypotheses tests).



273

274 Fig. 1. Research model of the current study.

275

276 **4. Study 1**

277 The purpose of the first study is to examine whether the typeface (i.e., round vs.
278 angular) of amount display influences consumers' awareness of spending in the context of
279 mobile payment.

280

281 *4.1. Method*

282 *4.1.1. Participants*

283 One hundred and fifty-five participants (33 females, M_{age} = 46.6 years SD = 9.67) were
284 recruited for Study 1. All of the participants passed an attention check. Across all studies, we
285 recruited those participants who had used a mobile payment app. According to a priori power
286 analyses for analysis of variance (ANOVA) using G*Power 3.1 (Faul, Erdfelder, Lang, &
287 Buchner, 2007), the final sample size in all studies excepting Study 2 was sufficient to detect
288 a medium effect (f = 0.25) with 80% power at an alpha level of 0.05. Although the final sample
289 size in Study 2 (N = 96) was slightly smaller than the estimated one (N = 128), a post hoc
290 power analysis (G*Power 3.1) revealed a sufficient power (85%) to detect a medium to large

effect (f = 0.31) for an ANOVA with two groups. The Japanese participants in Studies 1-3 and 6 were recruited online from Yahoo Crowd Sourcing service (https://crowdsourcing.yahoo.co.jp/) in return for a small monetary compensation. The Yahoo service constitutes one of the largest crowdsourcing platforms in Japan. A number of marketing studies (e.g., Park et al., 2021; Sunaga et al., 2016; Youn et al., 2019) have used this platform previously. The North American participants in Studies 4 and 5 were recruited via Amazon Mturk (https://www.mturk.com/), again for a small monetary compensation. Survey Monkey was used in all studies to collect participants' responses. All of the participants provided their consent online prior to taking part in the studies.

4.1.2. Stimuli and pretest

We created two versions of the confirmation screen of a mobile payment app in which a purchase amount (i.e., JPY3,300) was displayed with either round or angular typeface (see Fig. 2). The purchase amount was decided based on the average range of expenditure (i.e., from JPY3000 to JPY5000) on a grocery shopping trip provided by a survey of the Japanese Ministry of Agriculture, Forestry, and Fisheries (JMAFF, 2018). "Simply rounded" and "Jersey sharp" were used as a round and angular typeface to display the purchase amount, respectively.

A pretest (N = 110, 38 females, M_{age} = 44.2 years, SD = 9.30) was conducted to assess whether the round and angular typefaces for the displayed amount were perceived differently in terms of their shape (1 = round, 7 = angular) but perceived equivalently in terms of their legibility (1 = bad, 7 = good) and size (1 = small, 7 = large). The results of the independent *t*-tests indicated that, as expected, perceived roundness/angularity was significantly different between the two typeface conditions (M_{round} = 1.77, SD = 0.86 vs. $M_{angular}$ = 6.10, SD = 1.03; $t(108) = 24.04$, $p < .001$, Cohen's d = 4.61). Meanwhile, the perceived legibility (M_{round} = 3.56, SD = 1.50 vs. $M_{angular}$ = 3.10, SD = 1.61; $t(108) = 1.53$, $p = .129$, Cohen's d = 0.3) and size

(M_{round} = 5.08, SD = 1.11 vs. $M_{angular}$ = 5.06, SD = 1.05; $t(108) = 0.10$, $p = .921$, Cohen's d = 0.02) did not differ between the two conditions.

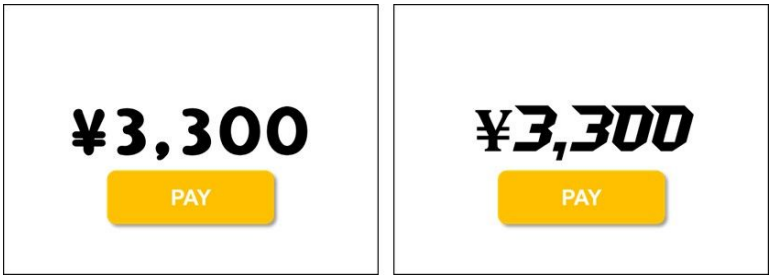


Fig. 2. Stimuli used in Study 1. Note: The purchase amount displayed with the round typeface (Simply rounded) is on the left, and the angular typeface (Jersey sharp) is on the right.

4.1.3. Procedure and measures

At the start of the experiment, it was explained to the participants that the study concerned mobile payment. They were first asked to imagine a situation in which they bought some groceries from an online store and are about to pay the purchase amount by a mobile payment app. The participants were then randomly assigned to either the round or the angular typeface conditions (78 in the round condition and 77 in the angular condition) and asked to see the displayed amount on the confirmation screen. Subsequently, they rated their awareness of spending with two items partially adapted from Manshad and Brannon (2021) ("To what extent do you feel that paying the amount displayed feels expensive?", "To what extent the payment for the displayed amount make you think about losing money?"; 1 = not at all, 7 = very much so; α = .86). Afterward, as a manipulation check, they rated the perceived shape of the display typeface with a seven-point bipolar scale (1 = round, 7 = angular). Additionally, as an attention check, the participants were required to choose the displayed amount on the screen among four options (1 = JPY1,300, 2 = JPY3,300, 3 = JPY5,300, 4 = JPY10,300). At the end of the study, the participants reported their gender, age, and income.

338

339 *4.2. Results*

340 *4.2.1. Manipulation check*

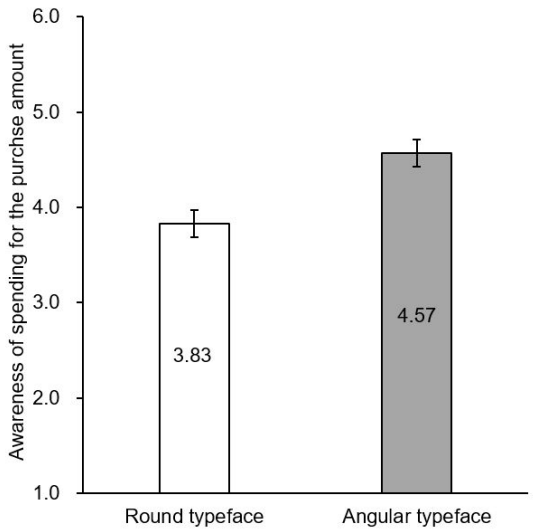
341 As expected, an independent *t*-test indicated that the participants in the angular
342 condition perceived the price typeface to be more angular than those in the round condition
343 (M_{round} = 1.90, SD = 1.00 vs. $M_{angular}$ = 5.75, SD = 1.19; $t(153) = 21.80$, $p < .001$, Cohen's d
344 = 3.50), thus confirming that the experimental manipulation was successful.

345

346 *4.2.2. Main analysis*

347 An ANOVA was performed with the type of price typeface (round vs. angular) as an
348 independent variable and the awareness of spending for the purchased amount as a dependent
349 variable. The results revealed, as expected, that the displayed amount indicated with the angular
350 typeface induced higher awareness of spending than that with the round typeface (M_{round} = 3.83,
351 SD = 1.26 vs. $M_{angular}$ = 4.57, SD = 1.22; $F(1, 153) = 13.65$, $p < .001$, $\eta_p^2 = .08$; see Fig 3).
352 Including participant gender, age, and income as covariates did not change the significance of
353 the result. Thus, H1 was supported.

354



355

Fig. 3. The effect of the price typeface on the awareness of spending for the purchase amount (i.e., JPY3,300). Note: Error bars indicate standard errors of mean.

4.3. Discussion

The results of Study 1 therefore provide initial evidence that the typeface for displaying purchase amount influences the awareness of spending in the mobile payment context. More specifically, the results show that, even though the purchase amount is identical, the amount displayed with angular (vs. round) typeface can increase the subjective perception of spending.

5. Study 2

The purpose of Study 2 is two-fold. First, the study is designed to examine the underlying mechanisms of the price typeface effect on the awareness of spending. Second, the downstream consequences of the typeface effect on the intention to pay are also investigated.

5.1. Method

5.1.1. Participants and Stimuli

Ninety-eight participants (36 females) were recruited for Study 2. As one of the participants failed an attention check item, and another one did not correctly report his age, they were removed from the analysis. Thus, the final number of participants was 96 (36 females, M_{age} = 47.74 years, SD = 9.73).

Two versions of the confirmation screen of a mobile app were created in which JPY5,300 was displayed with either round or angular typeface (see Appendix A). This amount was set by considering the following two aspects. First, as mentioned in Study 1, the average range of expenditure per grocery shopping purchase in Japan ranges from approximately JPY 3,000 to 5,000 (JMAFF, 2018). Second, we wanted to use a different amount from that used in

Study 1 while minimizing the possible influence of number differences in an amount that might induce different round/angular or price perceptions (e.g., round ending price vs. odd ending price; Choi et al., 2014). Therefore, we only changed the first digit in the displayed amounts from JPY3,300 used in Study 1 to JPY5,300.

5.1.2. Procedure and measures

The procedure was identical to that used in Study 1, except those additional measurements were obtained. At the beginning of the experiment, the participants were instructed to imagine a situation in which they bought some groceries online and were about to pay the purchase amount using a mobile payment app. Participants were then randomly assigned to either the round or angular typeface conditions (43 in the round condition and 53 in the angular condition) and asked to see the displayed purchase amount on the confirmation screen. After that, they rated a series of measurement scales. They first rated the perceived harshness of the price typeface with two seven-point bipolar items ("What do you think of the typeface used for displaying the amount?"; 1 = gentle, 7 = harsh; 1 = comfortable, 7 = anxious; α = .78). The items were created based on the relevant literature stated above, suggesting that people associate angular (vs. round) shapes more with concepts such as hardness, cruelty, and harshness (e.g., Liu & Kennedy, 1997; Lundholm, 1921). Relatedly, angular (vs. round) shapes are perceived to be more unpleasant and uneasy (e.g., Bar & Neta, 2007; Palumbo et al., 2015). The participants rated the experienced pain associated with payment with a single seven-point item ("To what extent do you feel pain for paying the displayed amount?"; 1 = not at all, 7 = very much so) adapted from Borden et al. (2020) and the awareness of spending with the two items used in Study 1 (α = .89). Subsequently, the participants reported their hesitation to press the "pay" button using a seven-point item ("To what extent do you feel hesitation to press the "pay" button?"; 1 = not at all, 7 = very much so). Afterward, they answered the

406 manipulation and attention check items used in Study 1. At the end of the study, the participants
407 once again reported their gender, age, and income.
408
409 *5.2. Results*
410 *5.2.1. Manipulation check*
411 An independent *t*-test indicated that participants in the angular condition perceived the
412 displayed typeface to be more angular than those in the round condition (M_{round} = 2.23, *SD* =
413 1.23 vs. $M_{angular}$ = 6.36, *SD* = 0.88; $t(94) = 19.13$, $p < .001$, Cohen's $d = 3.93$). Therefore, the
414 manipulation was satisfactory.
415
416 *5.2.2. Main Analysis*
417 As with Study 1, we first conducted an ANOVA with the type of display typeface
418 (round vs. angular) as an independent variable and the awareness of spending as a dependent
419 variable. The result replicated the results of Study 1. The displayed amount indicated with the
420 angular (vs. round) typeface resulted in a higher awareness of spending (M_{round} = 4.44, *SD* =
421 0.95 vs. $M_{angular}$ = 5.06, *SD* = 1.10; $F(1, 94) = 8.68$, $p = .004$, $\eta_p^2 = .09$). Once again, including
422 participant gender, age, and income as covariates did not change the significance of the result.
423 Thus, H1 (the price typeface effect on the awareness of spending) was again supported in Study
424 2 with the different purchase amount.
425 Next, we conducted a serial mediation analysis (Model 6 of the PROCESS SPSS
426 macro with 5000 bootstrap samples) to test the price typeface effect on the sense of spending
427 through the perceived harshness and the experienced pain of the payment (see Appendix B).
428 The results revealed that the amount displayed with angular (vs. round) typeface (dummy
429 coded as 0 = round, 1 = angular) increased the perceived harshness (b = 2.43, SE = 0.18, t =
430 12.87, $p < .001$). Subsequently, the perceived harshness increased the experienced pain of

payment (b = 0.51, SE = 0.13, t = 4.06, p < .001). Finally, the experienced pain also positively influenced the awareness of spending (b = 0.72, SE = 0.04, t = 16.62, p < .001). Importantly, the indirect effect of the price typeface on the awareness of spending via the two mediators was also significant at the 95% confidence interval (indirect effect = 0.90, SE = 0.29, 95% CI [0.36, 1.50]). Thus, H2 (price typeface → perceived harshness → experienced pain of payment → awareness of spending) were supported. (See Appendix B for details). Participant gender, age, and income as covariates did not influence the results. As a further check, we conducted a reverse mediation analysis with the mediators in reverse order (i.e., experienced pain of payment first and perceived harshness second). The non-significant results of the reverse mediation (indirect effect = 0.20, SE = 0.02, 95% CI [−0.002, 0.06]) supported the veracity of the proposed underlying psychological process

We then ran another serial mediation analysis (Model 6 of the PROCESS SPSS macro with 5000 bootstrap samples; the perceived harshness, the experienced pain, and the awareness of spending as mediators) to examine the downstream effect of price font on hesitation to press the "pay" button (see Fig. 4). The results indicated that the awareness of spending increased the hesitation to press the "pay" button (b = 0.64, SE = 0.22, t = 2.96, p < .004). Thus, H3 was supported. Moreover, and importantly, the indirect effect of the price typeface on the hesitation to pay through the three mediators was also significant at the 95% confidence interval (b = 0.58, SE = 0.25, 95% CI [0.18, 1.17]). Total indirect effect (b = 1.03, SE = 0.43, 95% CI [0.13, 1.83]) and total effect (b = 0.86, SE = 0.30, t = 2.86, p = .005, 95% CI [0.13, 1.83]) were also significant. Participant gender, age, and income as covariates did not influence the results.

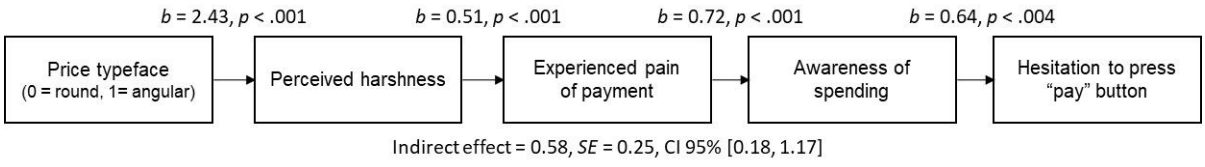


Fig. 4. The results of the serial mediation analysis in Study 2.

Finally, we conducted independent *t*-tests to compare the mean scores of the measurements in both conditions. As shown in Table 1, all mean scores were significantly higher in the angular typeface condition than in the round typeface condition.

Table 1. The mean scores of the measurements in the round and angular display typeface conditions in Study 2.

	Round typeface	Angular typeface			
	M (*SD*)	*M* (*SD*)	*t*	*p*	Cohen's *d*
Perceived harshness	3.26 (0.90)	5.69 (0.94)	12.87	<.0001	2.63
Experienced pain of payment	4.14 (1.19)	4.94 (1.25)	3.21	.002	0.65
Awareness of spending	4.44 (0.95)	5.06 (1.10)	2.95	.004	0.60
Hesitation to press "pay" button	3.93 (1.35)	4.79 (1.56)	2.86	.005	0.59

5.3. Discussion

Study 2 replicated the findings of Study 1 with the different purchase amount (i.e., JPY 5,300), indicating that the amount displayed with the angular (vs. round) typeface increased the participants' awareness of spending. In addition, and importantly, Study 2 demonstrates the underlying mechanism of the display typeface effect on the awareness of spending. We found that the type of price typeface impacts the awareness of spending via the perceived harshness of the typeface and the experienced pain of payment. Furthermore, Study 2 revealed that the awareness of spending induced by price typeface has a downstream effect on people's intention to pay. Namely, viewing the angular (vs. round) typeface increases people's hesitation when it comes to pressing the "pay" button through the perceived harshness, the pain of payment, and the awareness of spending.

6. Study 3

Studies 1 and 2 demonstrated that the typeface of a purchase amount influences the awareness of spending. Study 3 extended the findings of Studies 1 and 2 by examining whether the purchase amount (i.e., low vs. high) moderates the typeface effect on the awareness of spending.

6.1. Method

6.1.1. Participants and Stimuli

Two hundred and thirty-five adults (66 females, M_{age} = 45.02 years, SD = 10.19) participated in Study 3. Five participants failed an attention check, leaving 230 participants available for analysis. Adding to the two versions of amount stimuli used in Study 2 (i.e., JPY5,300), we also created two more versions of the confirmation screen of a mobile app in which JPY15,300 was displayed with either round or angular typeface (see Appendix A). Similar to Study 2, in this study, we only added a ten-thousands digit to the base amount (i.e., JPY15,300) to create a high purchase amount condition while minimizing the possible confounding effect of number differences in the amount.

6.1.2. Procedure and measures

The experiment involved a 2 (type of typeface: round vs. angular) × 2 (purchase amount: low vs. high) between-participants factorial design. The procedure was identical to that used in Studies 1 and 2. The participants were first asked to imagine a situation in which they bought some groceries online and were about to pay the amount using a mobile app. The participants were then randomly assigned to one of four conditions (40 in the round/low-amount condition, 59 in the round/high-amount condition, 71 in the angular/low-amount condition, 60 in the angular/high-amount condition) and asked to view the purchase amount

displayed on the confirmation screen. After that, the participants rated the awareness of spending with the two items (α = .86) used in Studies 1 and 2. They then answered the manipulation check item used in Studies 1 and 2 and were required to choose the purchase amount displayed on the screen among four options (1 = JPY1,300, 2 = JPY3,300, 3 = JPY5,300, 4 = JPY15,300). At the end of the study, the participants reported their gender, age, and income.

6.2. Results

6.2.1. Manipulation check

An independent *t*-test indicated that participants in the angular condition perceived the price typeface as more angular than those in the round condition (M_{round} = 1.87, *SD* = 1.14 vs. $M_{angular}$ = 6.21, *SD* = 0.99; *t*(228) = 30.96, *p* < .001, Cohen's *d* = 4.11). In addition, all participants in the low amount (i.e., JPY5,300) and high amount (i.e., JPY15,300) conditions correctly remembered the displayed amount on the screen. Therefore, the manipulations for the type of typeface and the purchase amount were successful.

In addition, a post *t*-test (N = 157, 74 females, M_{age} = 44.94 years, *SD* = 9.06) for a perceived amount purchased per grocery shop with a 7-point item ("How do you feel if you spend [indicated either JPY5,300 or JPY15,300] on grocery shopping?"; 1 = very low expenditure, 7 = very high expenditure) was conducted. The results confirmed that the perceived expenditure was significantly higher in the condition of JPY15,300 (N = 82) than in that of JPY5,300 (N = 75) ($M_{JPY15,300}$ = 6.52, *SD* = 0.62 vs. $M_{JPY5,300}$ = 5.74, *SD* = 1.02; *t*(136.10) = 5.82, *p* < .001, Cohen's *d* = 0.91).

6.2.2. Main analysis

An ANOVA was conducted for the awareness of spending (see Fig. 5). The results indicated the main effects of the type of typeface (M_{round} = 4.57, SD = 1.32 vs. $M_{angular}$ = 5.00, SD = 1.16; $F(1, 226) = 10.49$, $p = .001$, $\eta_p^2 = .04$) and the purchase amount (M_{low} = 4.60, SD = 1.25 vs. M_{high} = 5.00, SD = 1.22; $F(1, 226) = 10.48$, $p = .001$, $\eta_p^2 = .04$). However, as expected, these main effects were qualified by a significant interaction between the typeface factor and the purchase amount ($F(1, 226) = 4.41$, $p = .037$, $\eta_p^2 = .02$). Adding participant gender, age, and income as covariates did not impact the results. Simple contrasts revealed that in the low amount condition, the awareness of spending was significantly higher when the purchase amount was displayed with the angular typeface than with the round one (M_{round} = 4.05, SD = 1.26 vs. $M_{angular}$ = 4.92, SD = 1.13; $F(1, 226) = 13.25$, $p < .001$, $\eta_p^2 = .06$). Meanwhile, in the high amount condition, the type of price typeface did not influence the awareness of spending (M_{round} = 4.92, SD = 1.25 vs. $M_{angular}$ = 5.10, SD = 1.20; $F(1, 226) = 0.70$, $p = .403$, $\eta_p^2 = .00$). Thus, H4 (the moderating role of purchase amount on the typeface effect) was supported.

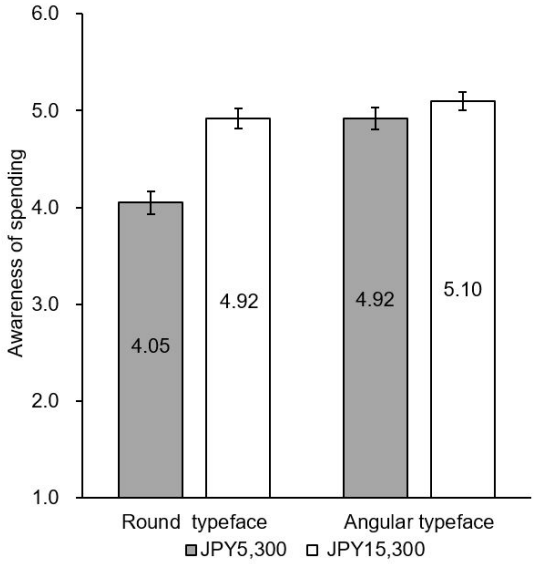


Fig. 5. Interaction between the type of price typeface and the purchase amount on the awareness of spending in Study 3. Note: Error bars indicate standard errors of mean.

543 *6.3. Discussion*

544 Study 3 demonstrates that the display typeface effect on the awareness of spending
545 found in Studies 1 and 2 was moderated by the purchase amount. The study results indicated
546 that the angular (vs. round) display typeface significantly increased consumers' awareness of
547 spending when the purchase amount was low (i.e., JPY5,300). However, the typeface effect
548 was not found in the high purchase amount condition (i.e., JPY15,300).

549

550 **7. Study 4**

551 The price typeface effect found in Studies 1-3 was observed in Asian (i.e., Japanese)
552 participants. Study 4 aims to explore whether or not the typeface effect on the awareness of
553 spending could be generalized to consumers from other Western countries. To this end, we
554 conducted a study that is identical to Study 1 but with North American participants instead.

555

556 *7.1. Method*

557 *7.1.1. Participants and Stimuli*

558 One hundred and forty-four North American participants (44 females, M_{age} = 34.79
559 years, *SD* = 8.93) were recruited for a small monetary reward. Six participants (4%) failed an
560 attention check, leaving a final sample of 138 for analysis. We created two versions of the
561 confirmation screen on which USD47.00, approximately equivalent to JPY5,300, were
562 displayed with either the round or angular typeface (see Appendix A).

563

564 *7.1.2. Procedure and measures*

565 At the beginning of the experiment, the participants were asked to imagine a situation
566 in which they bought some groceries online and were about to pay the amount using a mobile
567 app. They were then randomly assigned to either condition (73 in the round condition and 65

in the angular condition) and asked to see the displayed amount on the confirmation screen. Subsequently, the participants rated their awareness of spending with the two items (α = .87) and answered the manipulation check item used in Studies 1−3. As an attention check, they were required to choose the displayed amount on the screen from amongst four options (1 = USD7,00, 2 = USD17.00, 3 = USD47.00, 4 = USD107.00). At the end of the study, the participants reported their gender, age, and income.

7.2. Results and discussion

7.2.1. Manipulation check

An independent *t*-test indicated that participants in the angular condition perceived the price typeface as more angular than those in the round condition ($M_{round} = 4.44$, $SD = 1.91$ vs. $M_{angular} = 5.65$, $SD = 1.53$; $t(134.68) = 4.12$, $p < .001$, Cohen's $d = 0.69$). Thus, the manipulation was successful.

7.2.2. Main analysis

An ANOVA was conducted for the awareness of spending. The results indicated that the type of price typeface did not influence the awareness of spending ($M_{round} = 4.17$, $SD = 1.71$ vs. $M_{angular} = 4.03$, $SD = 1.84$; $F(1, 136) = 0.22$, $p = .643$, $\eta_p^2 = .00$). Including participant gender, age, and income as covariates did not change the pattern of results.

7.2.3. Discussion

Study 4 shows that the effect of price typeface on the awareness of spending found in Japanese consumers in Studies 1-3 was not observed in consumers from the U.S.. This difference implies that the consumers differ in terms of their cultural orientation (e.g., such as,

592 for example, independent vs. interdependent), and that this may moderate the typeface effect.
593 We will discuss this issue in the General Discussion.
594
595 **8. Study 5**
596 The purpose of Study 5 is two-fold. The first aim is to re-examine whether or not the
597 price typeface influences the awareness of spending in American participants using a different
598 purchase amount from Study 4. In so doing, we rule out possible boundary conditions set by
599 the prices that may influence the typeface effect, at least, when it comes to the shopping context
600 of interest. The second aim consists of more closely evaluating the relationship between the
601 price typeface and the awareness of spending in North American participants by looking at
602 similarities and differences of the typeface effect in Eastern and Western consumers.
603
604 *8.1. Method*
605 *8.1.1. Participants and Stimuli*
606 One hundred and forty-four American participants (47 females, M_{age} = 34.92 years, *SD*
607 = 8.93) were recruited for a small monetary reward. Twenty-two participants (15%) failed the
608 attention check, leaving a final sample of 122 for analysis. We created two versions of the
609 confirmation screen on which USD53.00 (identical to JPY5,300 in terms of the numbers that
610 consist of purchase amount) was displayed (see Appendix A).
611
612 *8.1.2. Procedure and measures*
613 The procedure was identical to that used in Study 2. The participants were first asked
614 to imagine an online grocery shopping situation where they were about to pay the purchase
615 amount using a mobile app. The participants were then randomly assigned to either typeface
616 condition (64 in the round condition and 58 in the angular condition) and asked to see the

displayed amount presented on the confirmation screen. After that, they rated a series of items that were used in Study 2: the perceived harshness (α = .83), the experienced pain of payment, the awareness of spending (α = .82), and the hesitation to press the "pay" button. They also answered the manipulation question used in Studies 1–4 and, as an attention check, asked to choose the displayed amount on the screen from amongst the following four options (1 = USD13.00, 2 = USD33.00, 3 = USD53.00, 4 = USD103.00). At the end of the study, the participants reported their gender, age, and income.

8.2. Results and discussion

8.2.1. Manipulation check

An independent *t*-test showed that the participants in the angular condition perceived the price typeface as more angular than those in the round condition (M_{round} = 4.27, *SD* = 2.03 vs. $M_{angular}$ = 5.47, *SD* = 1.44; $t(113.80) = 3.80$, $p < .001$, $d = 0.68$). Thus, the manipulation was successful.

8.2.2. Main analysis

We first conducted an ANOVA for the awareness of spending. The results indicated that, consistent with Study 4, the type of price typeface did not affect the perceived spending (M_{round} = 4.53, *SD* = 1.76 vs. $M_{angular}$ = 4.32, *SD* = 1.76; $F(1, 120) = 0.44$, $p = .507$, $\eta_p^2 = .00$). Including participant gender, age, and income as covariates did not change the pattern of results.

To further examine the relationship between the price typeface and the awareness of spending, we conducted a serial mediation analysis (Model 6 of the PROCESS SPSS macro with 5000 bootstrap samples; see Appendix C). The indirect effect of the price typeface on the awareness of spending through the perceived harshness and the experienced pain of the payment was significant at the 95% confidence interval (indirect effect = 0.32, *SE* = .15, 95%

642 CI [0.06, 0.64]). However, the results indicated a negative direct effect of the typeface type on
643 the awareness of spending (direct effect = −0.24, *SE* = .12, 95% CI [−0.48, −0.03]). We discuss
644 a possible reason for the competitive mediation in the following section. Including participant
645 gender, age, and income as covariates did not change the results.

646 The results of independent *t*-tests indicated that, as shown in Table 2, the mean score
647 of the perceived harshness was higher in the angular condition than in round one. Meanwhile,
648 the mean scores of the experienced pain, the awareness of spending, and the hesitation to press
649 the "pay" button were not different in the two conditions.

650

651 Table 2. The mean scores of the measurements in the round and angular typeface conditions in
652 Study 5.

	Round typeface	Angular typeface			
	M (*SD*)	*M* (*SD*)	*t*	*p*	Cohen's *d*
Perceived harshness	3.87 (1.80)	4.67 (1.73)	2.52	.013	0.45
Experienced pain of payment	4.34 (2.00)	4.31 (1.93)	0.09	.926	0.02
Awareness of spending	4.53 (1.76)	4.31 (1.76)	0.67	.507	0.12
Hesitation to press "pay" button	4.73 (2.18)	4.60 (1.96)	0.35	.730	0.06

653

654

655 *8.2.3. Discussion*

656 Studies 4 and 5 consistently showed that the price typeface effect on the awareness of
657 spending, which was found for Japanese participants (Studies 1-3), did not hold for those from
658 North America. Meanwhile, the mediation analysis with two mediators (perceived harshness
659 and pain of payment) for North American participants indicated the competitive mediation (see
660 Appendix C). That is, while the angular (vs. round) typeface indirectly increased the awareness
661 of spending, the angular (vs. round) typeface directly decreased the awareness of spending.
662 Although the indirect effect was significant, its effect size (standardized indirect effect = .18)
663 was more than 4.6 times smaller than that obtained for the Japanese participants in Study 2

(standardized indirect effect = .84). The inconsistent mediation suggests that, for North American consumers, the angular (vs. round) price typeface effect is not robust and there might be a different mechanism underpinning the relationship between the shape of price typeface and the awareness of spending.

In addition, although the mean score of the perceived harshness for typeface type was higher in the angular (vs. round) condition, the effect size (Cohen's d = 0.45) was almost six times smaller than that obtained from Study 2 with Japanese participants (Cohen's d = 2.63). The mean differences of the experienced pain and the awareness of spending in both conditions found in Study 2 were not observed in Study 5. Relatedly and importantly, the effect sizes of the perceived shape differences between the two typefaces (i.e., how much did the participants perceive the typefaces as round or angular) in the North American participants (Cohen's d in Study 4 = 0.69, in Study 5 = 0.68) were approximately 5.6 times smaller than those in the Japanese (Cohen's d in Study 1 = 3.50, in Study 2 = 3.93, in Study 3 = 4.11).

To summarize, the results of Studies 1-5 collectively suggest that a cultural difference in Western and Eastern consumers may exist regarding their perception of angular and round price typefaces. We think this difference may be closely related to the difference in the price typeface effect on the awareness spending in both cultures.

9. Study 6

The purpose of Study 6 is threefold. The first aim is to test the typeface effect on consumer responses to mobile payment in more realistic purchase settings. The second aim is to test the generalizability of the angular (vs. round) typeface effect by using typefaces that are different from those used in Studies 1-5 and are not slanted. The third aim is to examine the downstream influence of the price typeface effect on the willingness to spend on the next grocery shop.

689

690 *9.1. Method*

691 *9.1.1. Participants, pretest, and stimuli*

692 Two hundred and thirty-three Japanese participants (113 females, M_{age} = 46.58 years,
693 SD = 10.25) were recruited for Study 6. All participants passed an attention check.

694 In this study, we used "Strawberry Muffins Demo" and "Aldo the Apache" as a round
695 and angular typeface to display the product prices and total price (i.e., JPY3,313), respectively
696 (see Figures 6 and 7). A pretest (N = 111, 29 females, M_{age} = 47.16 years, SD = 9.54) (with the
697 items used for the pretest in Study 1) for the typeface of the total price with Japanese
698 participants indicated that the perceived roundness/angularity was significantly different
699 between the two typeface conditions (M_{round} = 2.08, SD = 1.21 vs. $M_{angular}$ = 5.69, SD = 1.17;
700 $t(109) = 16.00$, $p < .001$, Cohen's d = 3.04). Meanwhile, the perceived legibility (M_{round} = 5.57,
701 SD = 1.50 vs. $M_{angular}$ = 5.26, SD = 1.38; $t(109) = 1.07$, $p = .288$, Cohen's d = 0.20) and size
702 (M_{round} = 4.77, SD = 1.01 vs. $M_{angular}$ = 4.97, SD = 1.09; $t(108.97) = 0.96$, $p = .990$, Cohen's d
703 = 0.18) did not differ between the two conditions.

704 Using the two typefaces, the images of an actual online grocery shopping app, and
705 actual food products with real retail prices, we created two versions of mobile shopping
706 experience stimuli (see Figures 6 and 7). To avoid any influence of prior knowledge for the
707 app, we deleted all of the brand information from the app images and added fictitious brand
708 information to the stimuli (i.e., shop.foods.com). The shopping experience stimuli consisted of
709 six screenshots of item choices and one order confirmation screen. In the series of shots, six
710 food items (i.e., beef, milk, eggs, bread, beers, chilled pizza) were sequentially added to the
711 shopping cart. The order confirmation screen displayed the total price with either round or
712 angular typeface and a pay button.

713

714

715 Fig. 6. The round version of the shopping experience stimuli used in Study 6.

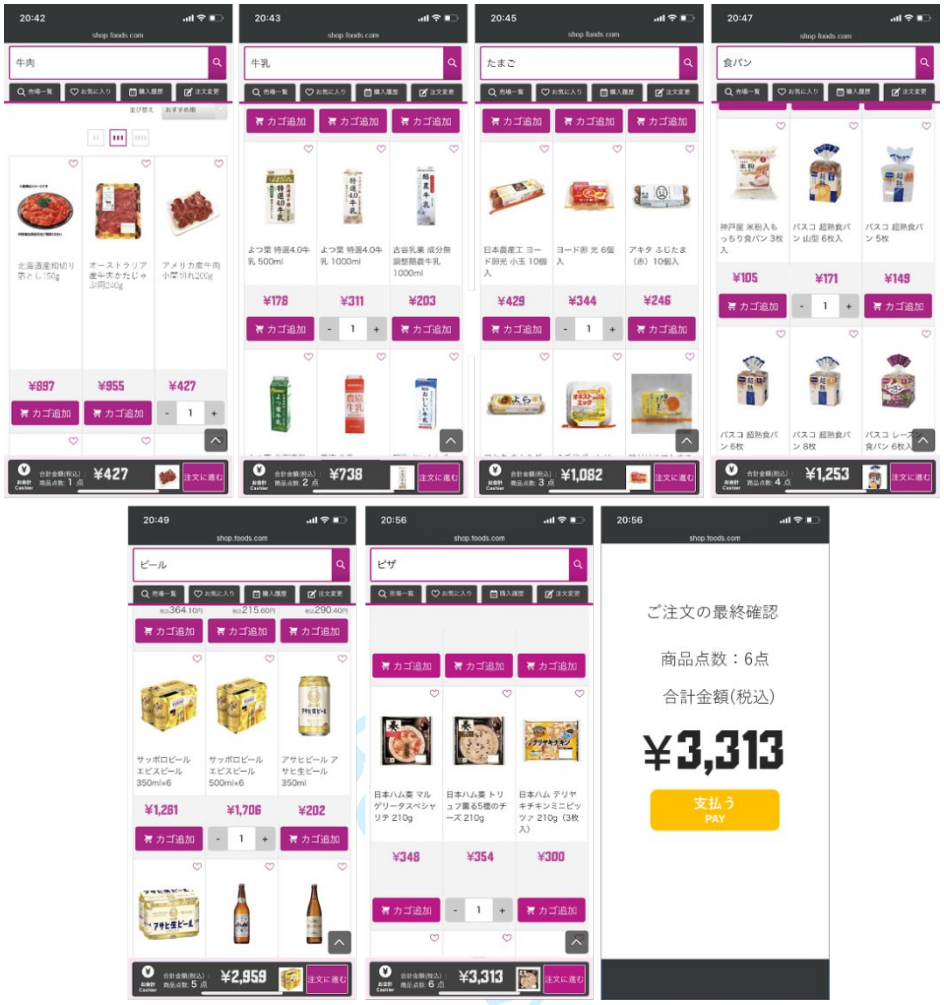


Fig. 7. The angular version of the shopping experience stimuli in Study 6.

9.1.2. Procedure and measures

The procedure was similar to that of Studies 2 and 5. At the beginning of the experiment, the participants were instructed to imagine a situation in which they were about to buy some groceries online using a mobile shopping app. Participants were then randomly allocated to either the round (N = 93) or angular (N = 101) typeface condition. In each condition, the participants were asked to view the series of screenshots carefully and informed that they chose six items shown in the shots and added them to the shopping cart. Subsequently, they were asked to view the confirmation screen carefully and informed that the following order confirmation page was displayed when they pressed the "Proceed to Confirm" button. After

the instructions stated above, the participants were asked to rate a series of items that were used in Studies 2 and 5: the perceived harshness (α = .74), the experienced pain of payment, the awareness of spending (α = .91), and their hesitation when it came to pressing the "pay" button. In addition, although we did not propose a hypothesis, we were interested in whether the typeface in which the price was presented would influence the willingness to spend in the next grocery shopping. To this end, referring to Manshad and Brannon (2021), we asked the participants to indicate how much money they would be willing to spend (from JPY0 to JPY10,000) on their next grocery shop using the same app. As the manipulation check, they answered the perceived shape of typeface with an item used in Studies 1-5. As an attention check, they were asked to choose the displayed amount on the screen among four options (1 = JPY1,313, 2 = JPY3,313, 3 = JPY5,313, 4 = JPY7,313). At the end of the study, the participants reported their gender, age, and income.

9.2. Results and discussion

9.2.1. Manipulation check

An independent *t*-test revealed that the participants in the angular condition perceived the typeface in which the price was presented as more angular than those in the round condition (M_{round} = 1.84, *SD* = 0.97 vs. $M_{angular}$ = 5.93, *SD* = 1.26; $t(186.33) = 25.47$, $p < .001$, $d = 3.62$). Thus, the manipulation of typeface shape was successful.

9.2.2. Main analysis

We first conducted an ANOVA for the awareness of spending. The results replicated those of Studies 1-3 and revealed that the angular (vs. round) price typeface increased the perceived spending (M_{round} = 3.44, *SD* = 1.49 vs. $M_{angular}$ = 4.00, *SD* = 1.35; $F(1, 231) = 9.14$, $p = .003$, $\eta_p^2 = .04$). Thus, H1 (price typeface → awareness of spending) was again supported. Including participant gender, age, and income as covariates did not change the results.

We then conducted a serial mediation analysis (Model 6 of the PROCESS SPSS macro with 5000 bootstrap samples) for the price typeface effect on the hesitation to press "pay" button with three mediators (i.e., perceived harshness, experienced pain of payment, awareness of spending). The results replicated the significant indirect effect found in Study 2 (indirect effect = 0.17, SE = 0.05, 95% CI [0.09, 0.27]). Thus, H2 (price typeface → perceived harshness → experienced pain of payment → awareness of spending) and H3 (awareness of spending → hesitation to press "pay" button) was again supported.

Subsequently, another serial mediation analysis (Model 6 of the PROCESS SPSS macro with 5000 bootstrap samples) was conducted for the price typeface effect on the willingness to spend on the next grocery shopping with three mediators (i.e., perceived harshness, experienced pain of payment, and awareness of spending). The results indicated a significant indirect effect and revealed that the angular (vs. round) typeface indeed decreased the willingness to spend on the next grocery shop through the perceived harshness, experienced pain of payment, and awareness of spending (see Figure 8). Including participant gender, age, and income as covariates did not change the results.

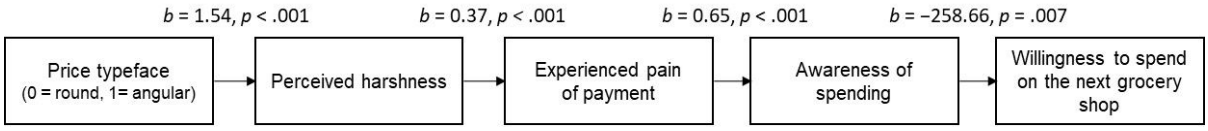


Fig. 8. The results of the serial mediation analysis in Study 6.

Finally, we conducted independent *t*-tests to compare the mean scores of the measurements in both conditions. The results indicated that all mean scores were significantly higher in the angular typeface condition than in the round typeface condition (see Table 3). As shown in Figure 9, the willingness to spend in the next grocery shopping was significantly lower in the angular (vs. round) price typeface condition.

Table 3. The mean scores of the measurements in the round and angular display typeface conditions in Study 6.

	Round typeface	Angular typeface			
	M (*SD*)	*M* (*SD*)	*t*	*p*	Cohen's *d*
Perceived harshness	2.46 (1.07)	5.53 (1.10)	19.69	<.001	2.83
Experienced pain of payment	2.82 (1.44)	4.33 (1.35)	7.53	<.001	1.08
Awareness of spending	3.51 (1.46)	4.28 (1.22)	3.99	<.001	0.58
Hesitation to press "pay" button	3.28 (1.56)	4.20 (1.48)	4.21	<.001	0.61
Willingness to spend in the next grocery shopping	2900.63 (1480.06)	2292.18 (1185.66)	3.17	.002	0.46

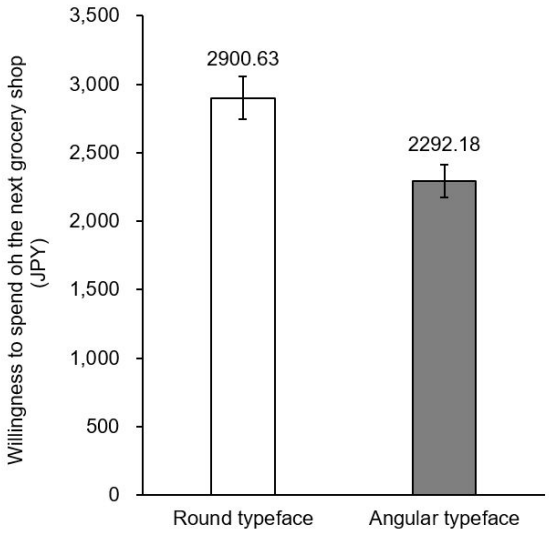


Fig. 8. Willingness to spend on the next grocery shop using the same mobile app in the round and angular typeface conditions (Study 6). Note: Error bars indicate standard errors of mean.

9.2.3. Discussion

By using round and angular typefaces that were different from those used in Studies 1-5 and stimuli that more closely matched a realistic shopping experience, Study 6 replicated the price typeface effect on the awareness spending found in Studies 1-3. In addition, the results also replicated the downstream effect of the awareness of spending induced by price typeface on the hesitation to press the "pay" button found in Study 2. What is more, and importantly,

792 the results also revealed the downstream effect of the typeface in which the price was presented
793 on the willingness to spend in the next grocery shop. The results of Study 6 therefore support
794 the robustness of the price typeface effect on the awareness of mobile spending for Japanese
795 consumers.

796 Table 4. Summary of the hypotheses and results of all the experiments.

Hypotheses and research question	Studies	Results
H1: Angular (vs. round) price typeface will increase the awareness of spending.	Studies 1–3, 5, and 6	Supported
H2: Angular (vs. round) price typeface will increase the awareness of spending through perceived harshness and the pain of payment.	Studies 2 and 6	Supported
H3: The awareness of spending will positively influence an increase in hesitation to press the "pay" button.	Studies 2 and 6	Supported
H4: The purchase amount will negatively moderate the typeface effect on the awareness of spending.	Study 3	Supported
RQ1: Do cultural differences (i.e., Eastern vs. Western) affect the price typeface effect on the awareness of spending?	Studies 1–6	The typeface effect was stronger and more robust for Japanese participants than North American participants.

797

798

799 **10. General discussion**

800 Across six studies, the present research finds evidence that the purchase amount
801 displayed with an angular (vs. round) typeface can increase the awareness of spending in the
802 context of mobile payment via the perceived harshness of the typeface in which the price is
803 presented and the experienced pain associated with payment (Studies 1-3, 5, and 6). We also
804 show that the angular (vs. round) price typeface has a downstream effect on the intention to
805 pay, indicating the amount displayed in the angular (vs. round) typeface increases the hesitation
806 to press the "pay" button (Studies 2 and 6). The research outlined here also demonstrates that
807 the price typeface effect on the awareness of spending is moderated by the purchase amount,
808 showing that the typeface effect is found when the purchase amount is relatively low but not
809 when it is considered high (Study 3). We further show that the robust typeface effect found in
810 Studies 1-3 with Japanese consumers is not observed for North American consumers (Studies
811 4 and 5). Finally, we replicate the price typeface effect on awareness of spending found in

Studies 1-3 with different typefaces in a more close-to real mobile shopping context and demonstrate the price typeface indeed impacts the willingness to spend on the next grocery shop (Study 6).

9.1. Theoretical implications

The present research makes three distinct theoretical contributions to the literature. First, our research contributes to the scarce literature on addressing the profligacy issues associated with mobile payment and broadly cashless payments. A number of studies have identified that consumers tend to spend more when they pay with cashless methods than with cash since cashless payments are less transparent and thus entail less pain of payment and less awareness of spending (e.g., Raghubir & Srivastava, 2008; Soman, 2003). Relatedly, and importantly, a growing body of research points out the negative consequences of cashless payments such as encouraging lavish spending (e.g., Erasmus & Lebani, 2008), unhealthy consumption (e.g., Park et al., 2021), and even resulting in personal bankruptcy for some individuals (e.g., Awanis & Cui, 2014). Regardless of these findings, little effort has been devoted to the question of how to deal with and mitigate the profligacy issues around cashless payments.

As far as the authors are aware, the only study to have explored the profligacy issue was reported by Manshad and Brannon (2021). Their results suggest that low-intensity (vs. no) vibration feedback can increase the awareness of spending and therefore reduce the willingness to spend in the context of mobile payment. However, the latter researchers did not provide evidence of why the haptic input could affect the awareness of spending. While Manshad and Brannon (2021) focus on the haptic input, the present study highlights the importance of visual design and demonstrates that angular (vs. round) price typeface can contribute to intensifying the awareness of spending and subsequently decrease the intention to pay (i.e., press “pay”

837 button). Our research also demonstrates the underlying mechanism of the typeface effect that
838 an angular (vs. round) price typeface increases the awareness of spending via an increase in
839 perceived harshness for the typeface and the experienced pain of payment. We further elucidate
840 the boundary condition of the typeface effect, indicating that its impact on the awareness of
841 spending works when the purchase amount is relatively small (vs. high). These findings
842 therefore provide valuable insight concerning how to deal with the possible profligacy issues
843 in mobile spending and cashless payments by providing a unique visual approach to manage
844 the issue.

845 Second, the present research adds to our understanding of consumer shape perception
846 and preference. Psychological studies have consistently shown that people prefer curvature
847 shapes to angular shapes (e.g., Bar & Neta, 2006; Blazhenkova & Kumar, 2018; Liu &
848 Kennedy, 1997). The preference for curvature is also found in the consumer evaluation of
849 product design (e.g., Leder & Carbon, 2005), packaging design (e.g., Westerman et al., 2012),
850 and typeface design (e.g., Wang et al., 2020). While a series of studies suggest that the
851 curvature preference seems universal across different cultures (e.g., Fantz & Miranda, 1975;
852 Gómez-Puerto et al., 2018), another series of studies has shown that shape preference can also
853 be influenced by culture (e.g., Tzeng et al., 1990; Zhang et al., 2006). According to Zhang et
854 al. (2006), individuals in individualistic countries (e.g., United States, United Kingdom)
855 perceive angular shapes as somewhat more attractive and rounded shapes as less attractive, and
856 vice versa for those living in collectivistic countries (e.g., Japan, South Korea). The results of
857 our study support the latter view. Although the participants in both countries perceived the
858 angular (vs. round) typeface as harsher than the round one, the effect size of harshness
859 perception for the angular (vs. round) typeface was almost six times greater in the Japanese
860 participants (Study 2) than in the American participants (Study 5). In addition, and interestingly,
861 while both groups of participants in our studies perceived the angular (vs. round) typeface as

more angular, the effect size of perceived angularity for the angular type was about 5.6 times greater amongst the Japanese participants (Studies 1-3) than in the North American participants (Studies 4-5). These results indicate that the Japanese participants perceived the angular (vs. round) typeface as sharper and harsher than did the North Americans who took part in our studies. These findings may provide additional support for the cultural difference in shape perception and emphasize the need for further research examining the cultural influence on the effect of shape design over consumers' product/brand evaluations.

Third, our findings also contribute to the scarce literature on the effect of sensory elements of price format on price perception. Although some studies have revealed that visual features such as price color (e.g., Puccinelli et al., 2013; Ye et al., 2020), price font size (e.g., Coulter & Coulter, 2005), and price font clarity (Mead & Hardesty, 2018) may affect the consumer's response to price, the literature in this field is still largely limited. Our study provides new insight into the literature on pricing and price format by demonstrating that price typeface has a significant effect on consumers' price perception.

9.2. Practical implications

The findings of our research offer clear implications for mobile spending and broadly for online spending. Our study demonstrates that angular (vs. round) price typeface elicits a stronger awareness of spending and thus may contribute to regulating people's mobile spending behavior. Mobile shopping apps and other online shopping platforms for computers and tablets have very similar systems and procedures for payment. For example, purchased items and their prices are displayed on the screen, and users are required to confirm and pay for the total purchase amount on the screen. Therefore, we believe that the price typeface strategy ought to be broadly applicable to various online shopping systems. For example, retailers or mobile service providers may provide their customers with a payment application or system that is

887 equipped with price typeface display options (e.g., default or angular). By so doing, customers
888 who hope to regulate their spending can choose "angular typeface mode" in mobile or other
889 online payment, and this may help and encourage sound spending amongst consumers.
890 Meanwhile, our research results also suggest that the typeface effect on the awareness of
891 spending may be more prominent in collectivist countries than individualistic countries.
892 Therefore, our research offers valuable insights for retailers and mobile/online service
893 providers interested in implementing the typeface function in their payment systems by
894 highlighting the possible cultural influence on the typeface effect on consumer awareness of
895 spending. According to our findings, retailers and online service providers who operate in
896 Eastern rather than Western countries should expect to see more prominent price typeface
897 effects amongst their customers.
898
899 *9.3. Limitations and future research*
900 Our study has some limitations that we hope to address in future research. The first
901 limitation is about the ecological validity of our findings. Our research found a robust effect of
902 price typeface on the awareness of mobile spending. However, the research findings were
903 obtained from hypothetical scenario experiments. Therefore, future studies should examine
904 whether the price typeface effect on the awareness of spending occurs in the actual mobile
905 payment context. A purchase experiment in a more natural setting will be an option to test those
906 effects. For example, future research could conduct a shopping experiment whereby the
907 participants purchase a certain number of target products using either a round or angular
908 typeface version of a mobile payment app.
909 Second, although we demonstrate that culture may moderate the typeface effect on the
910 awareness of spending, we did not directly test what cultural factor and mechanism might
911 explain the difference in the typeface effect between Japanese and North American participants.

912 Our expectation is that the angular typeface effect on the awareness of spending will be less
913 prominent for Western consumers than for Eastern consumers. At this point, we speculate that
914 this difference might occur because of cultural differences in consumer's self-construal or/and
915 processing style. From the point of view of self-construal, the angular typeface effect in
916 Western (vs. Eastern) consumers is expected to be weaker since independent (interdependent)
917 self-construal is associated with conflict confrontation (avoidance) and therefore individuals
918 with independent (vs. interdependent) self-construal perceive angular shapes as more attractive
919 and less harsh (Zhang et al., 2006). Meanwhile, from the perspective of processing style, the
920 typeface effect itself may be weaker for Western (vs. Eastern) consumers. This might be
921 because, while Eastern individuals tend to process information holistically, Western
922 individuals tend to pay more attention to focal information, less attention to contextual
923 information, and process information analytically (e.g., Masuda & Nisbett, 2001). In this
924 respect, Western (vs. Eastern) consumers may be more susceptible to the purchase amount
925 itself and less susceptible to price typeface when they are aware of how much is spent in the
926 situation of mobile payment. Cultural priming methods (e.g., Torelli, 2006; Zhang et al., 2006)
927 would be useful for further investigating these possible cultural influences on the typeface
928 effect. For instance, if priming North American (Japanese) participants' self-concept as
929 interdependent (independent) or holistic (analytic) results in a significant (null) typeface effect
930 on awareness of spending, we can assure that culture moderates the price typeface effect.
931 Meanwhile, although we expect that culture is a significant moderator for the typeface effect
932 in both countries, this does not rule out other possible moderators (e.g., differences in the usage
933 rate and familiarity of mobile payment in both countries). Thus, future research could examine
934 those unexamined factors to understand more nuanced aspects of typeface effect on consumer
935 awareness of mobile spending.

Third, while our study focuses on the effect of typeface shape (i.e., round vs. angular) on the awareness of spending, it would be intriguing and important to explore possible interactions with other visual elements (e.g., color and size) and other sensory inputs (e.g., sounds). For example, given findings that colors of prices (e.g., Puccinelli et al., 2013; Ye et al., 2020) and the size of the font in which the price is presented (e.g., Coulter & Coulter, 2005) affect consumer's price perception, price typefaces may interact with price colors (e.g., red vs. black) or the size of price fonts (i.e., small vs. large) on consumers' awareness of spending. In addition, given that angular typeface matches with high pitched sound on inducing harshness perception (e.g., Velasco et al., 2014), an angular price typeface combined with high-pitched beep sound may induce a strong awareness of spending in mobile payment. We hope that our research stimulates future work on this topic.

948 Appendix A. The stimuli of payment confirmation screen used in Studies 2-5.

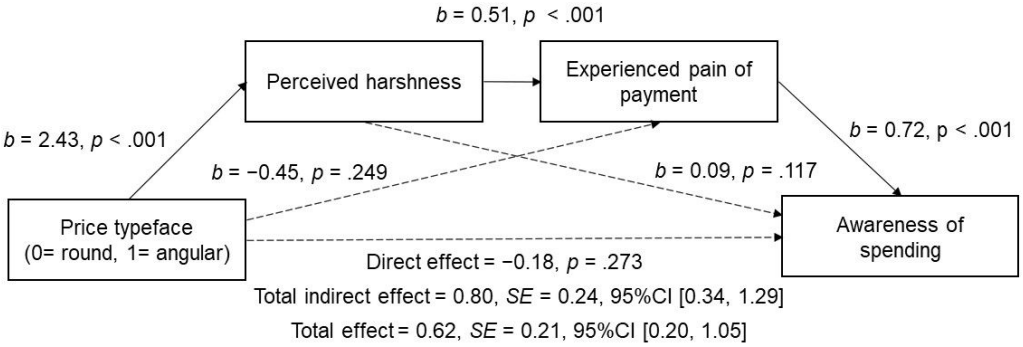
949 Note: (a): Study 2, (b): Study 3, (c): Study 4, (d): Study 5.

950

951

952 Appendix B. The results of the serial mediation analysis (two mediators) for Japanese

953 participants in Study 2.

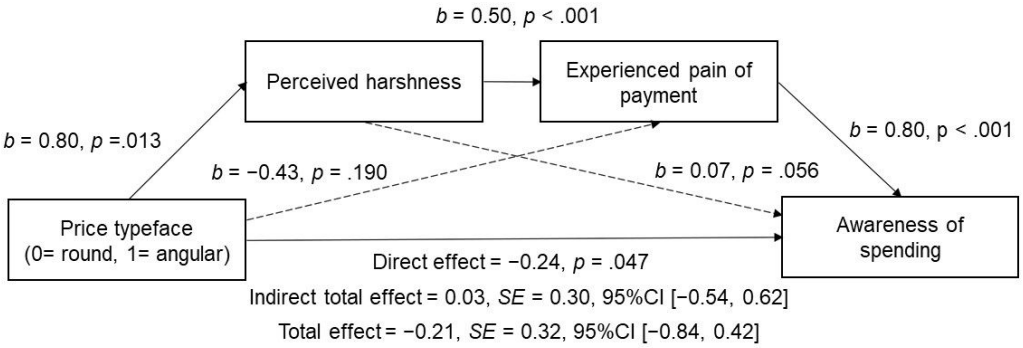


954

955

956 Appendix C. The results of the serial mediation analysis (two mediators) for the North

957 American participants in Study 5.



958

959

References

Au, Y. A., & Kauffman, R. J. (2008). The economics of mobile payments: Understanding stakeholder issues for an emerging financial technology application. *Electronic Commerce Research and Applications*, *7*(2), 141–164.

Awanis, S., & Chi Cui, C. (2014). Consumer susceptibility to credit card misuse and indebtedness. *Asia Pacific Journal of Marketing and Logistics*, *26*(3), 408–429.

Bar, M., & Neta, M. (2006). Humans prefer curved visual objects. *Psychological Science*, *17*(8), 645–648.

Bar, M., & Neta, M. (2007). Visual elements of subjective preference modulate amygdala activation. *Neuropsychologia*, *45*(10), 2191–2200.

Bar, M., & Neta, M. (2008). The proactive brain: Using rudimentary information to make predictive judgments. *Journal of Consumer Behaviour*, *7*(4–5), 319–330.

Blazhenkova, O., & Kumar, M. M. (2018). Angular versus curved shapes: Correspondences and emotional processing. *Perception*, *47*(1), 67–89.

Boden, J., Maier, E., & Wilken, R. (2020). The effect of credit card versus mobile payment on convenience and consumers' willingness to pay. *Journal of Retailing and Consumer Services*, *52*, 101910.

Brownlee, J. (2014, May 6). What's the difference between a font and a typeface? The Fast Company. Retrieved from https://www.fastcodesign. com/3028971/whats-the-difference-between-a-font-and-a-typeface.

Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology*, *67*(2), 319–333.

Celhay, F., Boysselle, J., & Cohen, J. (2015). Food packages and communication through typeface design: The exoticism of exotypes. *Food Quality and Preference*, *39*, 167–175.

Celsi, R. L., & Olson, J. C. (1988). The role of involvement in attention and comprehension processes. *Journal of Consumer Research*, *15*(2), 210–224.

Ceravolo, M. G., Fabri, M., Fattobene, L., Polonara, G., & Raggetti, G. (2019). Cash, card or smartphone: The neural correlates of payment methods. *Frontiers in Neuroscience*, *13*, 1188.

Chen, Y.-C., Huang, P.-C., Woods, A., & Spence, C. (2016). When "Bouba" equals "Kiki": Cultural commonalities and cultural differences in sound-shape correspondences. *Scientific Reports*, *6*, 26681.

Childers, T. L., & Jass, J. (2002). All dressed up with something to say: Effects of typeface semantic associations on brand perceptions and consumer memory. *Journal of Consumer Psychology*, *12*(2), 93–106.

Choi, J., Li, Y. J., Rangan, P., Chatterjee, P., & Singh, S. N. (2014). The odd-ending price justification effect: The influence of price-endings on hedonic and utilitarian consumption. *Journal of the Academy of Marketing Science*, *42*(5), 545-557.

Coulter, K. S., & Coulter, R. A. (2005). Size does matter: The effects of magnitude representation congruency on price perceptions and purchase likelihood. *Journal of Consumer Psychology*, *15*(1), 64–76.

de Sousa, M. M. M., Carvalho, F. M., & Pereira, R. G. F. A. (2020). Do typefaces of packaging labels influence consumers' perception of specialty coffee? A preliminary study. *Journal of Sensory Studies*, *35*(5), e12599.

Doyle, J. R., & Bottomley, P. A. (2004). Font appropriateness and brand choice. *Journal of Business Research*, *57*(8), 873–880.

Doyle, J. R., & Bottomley, P. A. (2006). Dressed for the occasion: Font-product congruity in the perception of logotype. *Journal of Consumer Psychology*, *16*(2), 112–123.

Erasmus, A. C., & Lebani, K. (2008). Store cards: Is it a matter of convenience or is the facility used to sustain lavish consumption? *International Journal of Consumer Studies*, *32*(3), 211–221.

Falk, T., Kunz, W. H., Schepers, J. J. L., & Mrozek, A. J. (2016). How mobile payment influences the overall store price image. *Journal of Business Research*, *69*(7), 2417–2423.

Fantz, R. L., & Miranda, S. B. (1975). Newborn infant attention to form of contour. *Child Development*, *46*(1), 224–228.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175–191.

Feinberg, R. A. (1986). Credit cards as spending facilitating stimuli: A conditioning interpretation. *Journal of Consumer Research*, *13*(3), 348–356.

Gómez-Puerto, G., Munar, E., & Nadal, M. (2016). Preference for curvature: A historical and conceptual framework. *Frontiers in Human Neuroscience*, *9*, 712.

Gómez-Puerto, G., Rosselló, J., Corradi, G., Acedo-Carmona, C., Munar, E., & Nadal, M. (2018). Preference for curved contours across cultures. *Psychology of Aesthetics, Creativity, and the Arts*, *12*(4), 432–439.

Grohmann, B. (2016). Communicating brand gender through type fonts. *Journal of Marketing Communications*, *22*(4), 403–418.

Grohmann, B., Giese, J. L., & Parkman, I. D. (2013). Using type font characteristics to communicate brand personality of new brands. *Journal of Brand Management*, *20*(5), 389–403.

Gupta, T., & Hagtvedt, H. (2021). Safe together, vulnerable apart: How interstitial space in text logos impacts brand attitudes in tight versus loose cultures. *Journal of Consumer Research*, *48*(3), 474–491.

Hasan, I., De Renzis, T., & Schmiedel, H. (2012). Retail payments and economic growth. *ECB Working Paper*, No. 1572, European Central Bank.

Henderson, P. W., Cote, J. A., Leong, S. M., & Schmitt, B. (2003). Building strong brands in Asia: Selecting the visual components of image to maximize brand strength. *International Journal of Research in Marketing*, *20*(4), 297–313.

Henderson, P. W., Giese, J. L., & Cote, J. A. (2004). Impression management using typeface design. *Journal of Marketing*, *68*(4), 60–72.

Hirschman, E. C. (1979). Differences in consumer purchase behavior by credit card payment system. *Journal of Consumer Research*, *6*(1), 58–66.

JMAFF (2018). Survey on grocery shopping and dining. Retrieved from https://www.maff.go.jp/j/finding/mind/attach/pdf/index-12.pdf.

Larson, C. L., Aronoff, J., Sarinopoulos, I. C., & Zhu, D. C. (2009). Recognizing threat: A simple geometric shape activates neural circuitry for threat detection. *Journal of Cognitive Neuroscience*, *21*(8), 1523–1535.

Leder, H., & Carbon, C.-C. (2005). Dimensions in appreciation of car interior design. *Applied Cognitive Psychology*, *19*(5), 603–618.

Lee, M., & Lou, Y.-C. (2011). Consumer reliance on intrinsic and extrinsic cues in product evaluations: A conjoint approach. *Journal of Applied Business Research*, *12*(1), 21–28.

Liu, C. H., & Kennedy, J. M. (1997). Form symbolism, analogy, and metaphor. *Psychonomic Bulletin & Review*, *4*(4), 546–551.

Liu, H., & Chou, H. (2020). Payment formats and hedonic consumption. *Psychology & Marketing*, *37*(11), 1586–1600.

Liu, S. Q., Choi, S., & Mattila, A. S. (2019). Love is in the menu: Leveraging healthy restaurant brands with handwritten typeface. *Journal of Business Research*, *98*, 289–298.

Liu, Y., Luo, J., & Zhang, L. (2021). The effects of mobile payment on consumer behavior. *Journal of Consumer Behaviour*, *20*(3), 512–520.

Lundholm, H. (1921). The affective tone of lines: Experimental researches. *Psychological Review*, *28*(1), 43–60.

Mackiewicz, J., & Moeller, R. (2004). Why people perceive typefaces to have different personalities. In *International Professional Communication Conference, 2004. IPCC 2004. Proceedings.* (pp. 304–313). IEEE.

Manshad, M. S., & Brannon, D. (2021). Haptic-payment: Exploring vibration feedback as a means of reducing overspending in mobile payment. *Journal of Business Research*, *122*, 88–96.

Masuda, T., & Nisbett, R. E. (2001). Attending holistically versus analytically: Comparing the context sensitivity of Japanese and Americans. *Journal of Personality and Social Psychology*, *81*(5), 922–934.

Mead, J. A., & Hardesty, D. M. (2018). Price font disfluency: Anchoring effects on future price expectations. *Journal of Retailing*, *94*(1), 102–112.

Mead, J. A., Richerson, R., & Li, W. (2020). Dynamic right-slanted fonts increase the effectiveness of promotional retail advertising. *Journal of Retailing*, 96(2), 284–296.

Mitchell, V. (1999). Consumer perceived risk: Conceptualisations and models. *European Journal of Marketing*, *33*(1/2), 163–195.

Mordoer Intelligence (2021), Mobile payment market: Growth, trends, Covid-19 impact and forecasts (2021-2026). Retrieved from https://www.mordorintelligence.com/industry-reports/mobile-payment-market.

Munar, E., Gómez-Puerto, G., Call, J., & Nadal, M. (2015). Common visual preference for curved contours in humans and great apes. *PLOS ONE*, *10*(11), e0141106.

Olson, J. C., & Jacoby, J. (1972). Cue utilization in the quality perception process. In M. Venkatesan (Eds.), *SV - Proceedings of the Third Annual Conference of the Association for Consumer Research* (pp. 167–179).

Palumbo, L., Ruta, N., & Bertamini, M. (2015). Comparing angular and curved shapes in terms of implicit associations and approach/avoidance responses. *PLOS ONE*, *10*(10), e0140043.

Park, J., Spence, C., Ishii, H., & Togawa, T. (2021). Turning the other cheek: Facial orientation influences both model attractiveness and product evaluation. *Psychology & Marketing*, *38*(1), 7–20.

Park, J., Lee, C., & Thomas, M. (2021). Why do cashless payments increase unhealthy consumption? The decision-risk inattention hypothesis. *Journal of the Association for Consumer Research*, *6*(1), 21–32.

Pirog, S. F., & Roberts, J. A. (2007). Personality and credit card misuse among college students:

The mediating role of impulsiveness. *Journal of Marketing Theory and Practice*, *15*(1), 65–77.

Pombo, M., & Velasco, C. (2021). How aesthetic features convey the concept of brand premiumness. *Psychology and Marketing*, *38*, 1475–1497.

Prelec, D., & Simester, D. (2001). Always leave home without it: A further investigation of the credit-card effect on willingness to pay. *Marketing Letters*, *12*(1), 5–12.

Puccinelli, N. M., Chandrashekaran, R., Grewal, D., & Suri, R. (2013). Are men seduced by red? The effect of red versus black prices on price perceptions. *Journal of Retailing*, *89*(2), 115–125.

Raghubir, P., & Srivastava, J. (2008). Monopoly money: The effect of payment coupling and form on spending behavior. *Journal of Experimental Psychology: Applied*, *14*(3), 213–225.

Runnemark, E., Hedman, J., & Xiao, X. (2015). Do consumers pay more using debit cards than cash? *Electronic Commerce Research and Applications*, *14*(5), 285–291.

Schroll, R., Schnurr, B., & Grewal, D. (2018). Humanizing products with handwritten typefaces. *Journal of Consumer Research*, *45*(3), 648–672.

Shah, A. M., Eisenkraft, N., Bettman, J. R., & Chartrand, T. L. (2016). " Paper or plastic?": How we pay influences post-transaction connection. *Journal of Consumer Research*, *42*(5), 688–708.

Simons, L. E., Moulton, E. A., Linnman, C., Carpino, E., Becerra, L., & Borsook, D. (2014). The human amygdala and pain: Evidence from neuroimaging. *Human Brain Mapping*, *35*(2), 527–538.

Soman, D. (2001). Effects of payment mechanism on spending behavior: The role of rehearsal and immediacy of payments. *Journal of Consumer Research*, *27*(4), 460–474.

Soman, D. (2003). The effect of payment transparency on consumption: Quasi-experiments from the field. *Marketing Letters*, *14*(3), 173–183.

Stewart, N. (2009). The cost of anchoring on credit-card minimum repayments. *Psychological Science*, *20*, 39–41.

Sunaga, T., Park, J., & Spence, C. (2016). Effects of lightness-location congruency on consumers' purchase decision-making, *Psychology & Marketing*, *33*(11), 934–950.

Tee, H. H., & Ong, H. B. (2016). Cashless payment and economic growth. *Financial Innovation*, *2*, 4.

Thomas, M., Desai, K. K., & Seenivasan, S. (2011). How credit card payments increase unhealthy food purchases: Visceral regulation of vices. *Journal of Consumer Research*,

38(1), 126–139.

Torelli, C. J. (2006). Individuality or conformity? The effect of independent and interdependent self-concepts on public judgments. *Journal of Consumer Psychology*, *16*(3), 240–248.

Tzeng, O. C. S., Trung, N. T., & Rieber, R. W. (1990). Cross-cultural comparisons on psychosemantics of icons and graphics. *International Journal of Psychology*, *25*(1), 77–97.

van Leeuwen, T. (2006). Towards a semiotics of typography. *Information Design Journal*, *14*(2), 139–155.

Velasco, C., Hyndman, S., & Spence, C. (2018). The role of typeface curvilinearity on taste expectations and perception. *International Journal of Gastronomy and Food Science*, *11*, 63–74.

Velasco, C., Salgado-Montejo, A., Marmolejo-Ramos, F., & Spence, C. (2014). Predictive packaging design: Tasting shapes, typefaces, names, and sounds. *Food Quality and Preference*, *34*, 88–95.

Velasco, C., & Spence, C. (2019). The role of typeface in packaging design. In C. Velasco, & C. Spence (Eds.), *Multisensory Packaging* (pp. 79–101). Cham: Springer International Publishing.

Velasco, C., Woods, A. T., Wan, X., Salgado-Montejo, A., Bernal-Torres, C., Cheok, A. D., & Spence, C. (2018). The taste of typefaces in different countries and languages. *Psychology of Aesthetics, Creativity, and the Arts*, *12*(2), 236–248.

Venkatesan, T., Wang, Q. J., & Spence, C. (2020). Does the typeface on album cover influence expectations and perception of music?. *Psychology of Aesthetics, Creativity, and the Arts*. Advance online publication. https://doi.org/10.1037/aca0000330

Wang, L., Yu, Y., & Li, O. (2020). The typeface curvature effect: The role of typeface curvature in increasing preference toward hedonic products. *Psychology & Marketing*, *37*(8), 1118–1137.

Westerman, S. J., Gardner, P. H., Sutherland, E. J., White, T., Jordan, K., Watts, D., & Wells, S. (2012). Product design: Preference for rounded versus angular design elements. *Psychology & Marketing*, *29*(8), 595–605.

Ye, H., Bhatt, S., Jeong, H., Zhang, J., & Suri, R. (2020). Red price? Red flag! Eye - tracking reveals how one red price can hurt a retailer. *Psychology & Marketing*, *37*(7), 928–941.

Youn, N., Park, J., & Eom, H. J. (2019). Reactions to nonconformity imagery in advertising among Chinese and Japanese consumers: The effect of personal and national cultural

tightness. *Journal of Advertising*, *48*(5), 532–554.

Yu, Y., Zhou, X., Wang, L., & Wang, Q. (2021). Uppercase premium effect: The role of brand letter case in brand premiumness. *Journal of Retailing*. https://doi.org/10.1016/j.jretai.2021.03.002

Zhang, Y., Feick, L., & Price, L. J. (2006). The impact of self-construal on aesthetic preference for angular versus rounded shapes. *Personality and Social Psychology Bulletin*, *32*(6), 794–805.

Zhou, S., Chen, S., & Li, S. (2021). The shape effect: Round shapes increase consumers' preference for hedonic foods. *Psychology & Marketing*, *38*(11), 2051–2072.