

TWO ESSAYS ON DISPLAY ORIENTATIONS,
PURCHASE TYPES, AND POWER DISTANCE
BELIEFS

By

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Abstract: Product displays are an important facet of a company's marketing strategy. With the advent of online retailing, products can now be displayed in different ways as the constraints of the shelf no longer apply. One common way is to display products horizontally or vertically. Previous research has shown that a horizontal display elicits greater perceived variety and also influences the processing style. I take this line of research forward. In a series of two essays, I explore how product displays influence the evaluation of different purchase types at the cognitive level (essay 1) and at the level of social cognition (essay 2). In essay 1, drawing on the knowledge that material products are more comparable than experiential products, I find that consumers would experience greater choice satisfaction from material purchases displayed horizontally rather than vertically, but satisfaction from experiential purchases would not differ by the display orientation. This is because consumers make relatively more attribute-based comparisons for material than experiential purchases, and the horizontal display facilitates such comparisons. This compatibility between the display orientation and processing style subsequently results in greater processing fluency and thus choice satisfaction. I validate this through four studies using different methodologies like eye tracking and experimental designs. In essay 2, I look at how display orientations are perceived through the lens of power distance beliefs and how an embodiment of verticality results in a greater fit of vertical display orientations with people higher in PDB vs. a fit for horizontal displays for those lower in PDB. In three studies, I find partial evidence that those high in PDB derive greater fluency and choice satisfaction from a vertical (vs. horizontal) display orientation and vice versa for those low in PDB. Both of these essays have some common concepts. Processing fluency plays a central mediating role, and experiential vs material purchase plays a moderating role. Where they differ is in the level of granularity. Essay one deals with the cognitive aspects like processing styles (attribute vs alternative) and relies on a biological factor (field of vision) while essay two deals with the higher level of social cognition.

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CHAPTER I

ESSAY 1. CHOICE SATISFACTION FROM EXPERIENTIAL AND MATERIAL PURCHASES: THE MODERATING ROLE OF DISPLAY ORIENTATION

1.1. Introduction

Marketers have long examined how product display layouts affect various stages of the consumer journey. Previous research pertaining to product display layouts shows that the structure of shelf display (e.g., assortment, facing allocation, shelf-positioning) influences attention (Chandon, Hutchinson, Bradlow and Young, 2009; Atalay, Onur-Bodur and Rasolfoarison, 2012), variety perception (Broniarczyck, Hoyer and McAlister, 1998), preferences and choices (Chernev 2003; Valenzuela and Raghurir, 2009) and purchase quantities (Dreze, Hoch and Purk, 1994; Kahn and Wansink, 2004). With the advent of online shopping, retailers are no longer constrained by the physical constraints of the shelf, and the flexibility of online platforms means they can now display their products in different ways. This also brings its own set of challenges for both companies and consumers. Companies have devised various strategies to deal with this. But one area which remains relatively less explored is how the display orientations (i.e. whether

products are displayed horizontally in a row or vertically in a column) may influence consumers' perception of their choice experiences.

Products can be displayed horizontally or vertically or some combination thereof. Prior research suggests that different display orientations may shape how products are perceived or evaluated. For example, a horizontal display, compared to a vertical display, can lead to greater perceived variety (Deng, Kahn, Rao and Lee 2016) or greater attribute level processing (Shi, Wedel and Pieters 2013). However, it is possible that these effects may not always hold true since different purchase types have different evaluation procedures associated with them. For example, experiential purchases are evaluated more by alternatives while material purchases are evaluated more by attributes (Gallo, Sood, Mann and Gilovich 2017). In addition, material purchases are compared more than experiential purchases (Carter and Gilovich 2010). I examine which purchase type is evaluated with greater ease and elicits greater choice satisfaction depending on the display orientation and find that there is greater choice satisfaction for material products when they are displayed horizontally (vs vertically) but this effect is mitigated for experiential purchases. This is because material products are evaluated more by comparing across the options, and these comparisons are facilitated more when the options are displayed horizontally than vertically as it is in line with the horizontally skewed human field of vision. This compatibility leads to greater fluency and thus choice satisfaction. But since experiential purchases do not require much comparisons during evaluation, the effect of display orientations on choice satisfaction is mitigated.

This has important implications for marketers as they should be more cognizant of how they display different types of products. Any purchase which is more material in nature requiring greater comparisons should have the choices arranged horizontally rather than

vertically. Theoretically, this research takes forward our understanding of how experiential vs material purchases are evaluated not only in the context of different display orientation but also at the pre-purchase stage itself. Previous research has focused more on the post purchase happiness arising out of experiential purchases (Van Boven and Gilovich 2003) but there is limited research on how these purchase types are actually evaluated at the time of purchase (Gallo et al. 2017) and I address that to some extent. Our research could also prove useful to scholars who seek to look at the impact of smartphone displays which are more vertical.

The rest of the essay is structured as follows. In the first section, I do a review of the literature and the underlying theories for this essay. I then go on to formulate my hypotheses in the second section. In the third section, I conduct four studies to validate these hypotheses. In the final section, I discuss the key findings and their implications for both theory and practice.

1.2 Review of Literature and Theoretical Background

1.2.1. Product Displays and Display Orientations

Product displays have always been an important part of marketing. Businesses spend a significant portion of their marketing budgets on displaying their products in a retail setting. Prior literature in marketing has covered this aspect extensively, whether it is the size of the assortment (Janiszewski and Meyvis 2001; Iyengar and Lepper 2001; Rozenholtz, li and Nakano 2007; Kahn and Wansink 2004; Townsend and Kahn 2014) or location of various products (Drieze, Hoch and Purk (2004); Raghurir and Valenzuela 2006; Valenzuela and Raghurir 2015; Chandon et al. 2007; Atalay, et al. 2012). However, as online shopping grows, retailers are no longer subject to the constraints of the physical shelf, and in the online space, products can be displayed in a variety of ways. One common distinction is products being displayed horizontally or vertically.

1.2.2. Horizontal vs. Vertical Displays in Marketing

The display orientation of products- whether they are displayed horizontally as in a row, or vertically as in a column- has received some, albeit limited attention in the marketing literature. Research exploring this dimension has looked at it in primarily three different ways. One is in terms of the assortment and how it is perceived overall. For example, Deng et al. (2016) found that horizontal displays elicit a greater perceived variety compared to vertical displays due to the fluency stemming from the compatibility with the horizontally oriented human field of vision. Shi et al. (2013) found that a horizontal display leads to greater attribute vs alternative based processing. Similarly, Feng et al. (2017) found that price promotion comparisons are easier for vertical displays due to the numbers being processed

more fluently when placed vertically and that price comparisons can be easier vertically depending on the handedness of the people (Barone, Lyle and Winterich 2015). Another way in which display orientations have been approached is by looking at the location of products on a horizontal or vertical shelf. For example, Raghurir and Valenzuela (2008) found that products on the top shelves are perceived to be better in quality but there was no difference between the right or left side of a horizontal display. However, Valenzuela and Raghurir (2015) found that products on the left tend to be perceived as lesser in quality. Both these studies were related to more about peoples pre-conceived notions or lay beliefs about positions. However, from an attention perspective too, research has shown that people also tend to fixate more on the centre of a horizontal array (Atalay et al. 2012) and this is called the central gaze cascade effect. Similarly, a brand placed in the center was more likely to be chosen (Chandon et al. 2009). Another way in which display orientations have been approached is how the overall display is perceived. For e.g. Romero, Craig and Kumar (2019) showed that time discounting was higher in a horizontal display as it was related to how people from western civilizations view time in a linear fashion with the right being metaphorically related to the future. Van Kerckhove and Pandalaere (2018) found that the swiping motion either left or right can be affected by the visual cues in the product itself due to congruency. Similarly, verticality cues within the product itself can facilitate feelings of luxury (Rompay et al. 2012).

In this essay, I build upon the work of Deng et al. (2016) and Shi et al. (2013) and investigate how different purchase types may elicit greater choice satisfaction when chosen from options that are displayed either horizontally or vertically.

1.2.3. Product types

Prior literature has examined the effect of product types on consumer behavior. There exist various typologies such as hedonic products which provide the consumers more experiential consumption, fun, pleasure and excitement (Dhar and Wertenbroch 2000, Hirschman and Holbrook 1982) while utilitarian goods provide instrumental and functional benefits (Dhar and Wertenbroch 2000; Strahilevitz and Myers 1998; Dubois, Laurent and Czellar 2004). Another aspect is the quality-taste where the objective quality plays a role in choice evaluation (Johansson, Douglas and Nonaka 1985; Zeithaml 1988). Quality reflects vertical differentiation and allows for ranking of choices (de Langhe et al 2016), and people may have different assessment beliefs (Spiller and Belegolova 2017). Another dimension which has gained currency in recent years is the Experiential-Material classification. While all of these typologies are interrelated (Dai et al. 2020), the experiential-material is more differentiated than the hedonic-utilitarian classification which can also be compared to overarching goals.

1.2.4. Experiential vs Material Purchases

Ever since van Boven and Gilovich's (2003) conceptualization, experiential and material purchases have gained currency in the consumer psychology and marketing literature (see Gilovich and Gallo 2020 for a review). Material purchases refer to spending with the primary intention to acquire a material possession while experiential purchases are spending for a life experience (van Boven and Gilovich 2003). Despite its inherent fuzziness (Schmitt, Brakus, and Zarantonello 2015), consumer researchers have long appreciated the theoretical and practical significance of the experiential-material distinction because of its impact on various aspects of consumer behavior (Goodman, Malkoc, and Stephenson 2016;

Bastos and Brucks 2017; Chan and Mogilner 2017; Goodman and Lim 2018, Gallo et al. 2017; Weingarten et al. 2022). For example, previous research found that consumers find greater happiness from purchasing experiences compared to material goods (van Boven and Gilovich, 2003; Bastos and Brucks 2017), prefer to choose experiential than material gifts for socially close friends (Goodman and Lim 2018), and tend to choose material purchases over experiences for honoring special life events (Goodman et al. 2016). In essence, material purchases are something to have, while experiential purchases are something to do (Guevarra and Howell 2015). Experiential purchases have been shown to elicit greater happiness than material purchases (Carter and Gilovich 2010, Carter and Gilovich 2012, Chan and Mogilner 2017; Gilovich and Kumar 2015).

Material and Experiential Purchases Differ in Comparability

While experiential and material purchases differ in many aspects like the primary intention, uncertainty or multidimensionality (Gilovich and Gallo 2020), they also differ in comparability - material goods are inherently easier to compare (or more comparable) than experiences (Carter and Gilovich 2010). This is because the attributes of material goods are generally easier to isolate and align for comparison purposes than those of experiences. For instance, it is relatively easier to align the speed, battery life, and camera quality of various drones than to align idiosyncratic features of various travel destinations like Paris and New York City. Furthermore, and germane to the present research, this differential comparability of material goods and experiences influences consumers' decision strategies and thus preferred processing styles (Carter and Gilovich 2010; Gallo et al. 2017; Gilovich and Gallo 2020).

1.2.5. Processing styles: Alternative vs Attribute Level Processing

Past literature on information acquisition strategies has generally zeroed in on two methods- alternative based processing and attribute based processing. In alternative based processing, the consumer processes a choice more holistically by combining its attributes to get an overall value for the product, while in attribute based processing, consumers compare choices across different attributes for different choices (Parducci 1965; Tversky 1969; Simonson 1989; Shafir et al. 1993; Bettman et al. 1998; Park and Kim 2005). Such strategies are used under various conditions. Attribute level strategies are thought to be less effortful and more heuristic (Bettman et al. 1998), but it is also associated with greater decision conflicts and uncertainty (Dhar 1996). Alternative level processing requires greater cognitive effort but it is also associated with greater certainty (Dhar 1996). One of the reasons for this is that attribute level processing involves more comparisons between products compared to alternative based processing which are more a holistic impression of the product (Lerouge 2009; McGill and Anand 1989; Jang and Yoon 2016). Indeed, past research has shown that there is a greater tendency for alternative processing for sequential presentations (Schmalhofer and Gertzen 1986) and lower choice deferral (Dhar 1996). There is also prior research which suggests that both strategies may be used. In fact, previous research had suggested a switching between different types of strategies (Howard and Sheth 1969; Newell and Simon 1972; Shi et al. 2013) with attribute level processing used to filter out products before using an alternative based strategy for greater deliberation.

1.2.6. Purchase Types and Processing Styles

Carter and Gilovich (2010) showed that the higher comparability (i.e., the ease of comparison) of material goods motivates people to adopt a maximization strategy while the

lower comparability of experiences encourages a satisficing strategy. So, consumers are more likely to engage in thorough and extensive comparisons of the product attributes across different options if they are motivated to objectively choose the best option (i.e., maximization strategy) (Sanbonmatsu and Fazio 1990). This so-called attribute-based processing is in contrast to alternative-based processing where consumers process information about multiple attributes of an option to form an overall evaluation before moving to another option (Bettman and Park 1980; Payne, Bettman, and Johnson 1993). Although consumers usually employ both processing styles by frequently switching between the two (Newell and Simon 1972; Bettman and Park 1980; Shi, Wedel, and Pieters 2013), either one or the other processing style is often more encouraged by various factors such as task complexity (Payne 1976), prior knowledge (Bettman and Park 1980), or time pressure (Payne et al. 1988). Along this line, Gallo et al. (2017) recently demonstrated that people prefer alternative-based processing in evaluating experiences compared to material goods. They argued that the less comparable nature of the attributes of experiences encourages a more holistic evaluation and thus alternative-based processing. In contrast, the highly comparable nature of material goods' attributes leads to more analytic and attribute-based processing. In all, attribute-based processing plays a relatively greater role in the evaluation of material goods rather than experiences.

1.2.7. The Human Field of Vision

The human field of vision is oriented horizontally, due to the placement of our eyes. Hence our binocular field is skewed more horizontally than vertically, and this enables us to have a greater span of vision horizontally than vertically. So TV screens were also designed to be compatible with this. In addition, the perceptual span i.e. the area from which an

individual acquires information is greater in the horizontal than vertical direction (Rayner 1975, 1998). Also, we scan more easily, rapidly and efficiently in the horizontal direction (Bejan 2009). This results in greater fluency for horizontal scanning. In addition, the eye muscles which control horizontal movement are stronger (Cogan 1956). Horizontal Eye movements require only one pair of muscles while other movements such as vertical require more than one pair of muscles (Viviani et al. 1977). Given the position of the eyes horizontally, when we scan horizontally, one eye can take over where the other left, and as a result, we can scan five times faster left to right than up to down (Viviani et al. 1977). Also, the spatial density of rods and cones in the retina is higher on the horizontal axis than the vertical axis (Curcio et al. 1990). This results in greater fluency in scanning information presented horizontally (Gilchrist and Harvey 2006). This also results in greater processing fluency for products in the horizontal plane (Deng et al. 2016).

1.3. Hypothesis Development

1.3.1. Horizontal (vs Vertical) Display Facilitates Attribute-based Processing

Although attribute-based comparison is the preferred processing style for material (vs. experiential) purchases, processing styles can be either facilitated or inhibited by how the purchase options (and thus their attributes) are displayed (Bettman and Kakkar 1977; Johnson, Payne and Bettman 1988; Shi et al. 2013; Jang and Yoon 2016). This is because product information is visually sensed first, and our brain processes the information in a given order each piece of information is received (Wedel and Pieters 2008). Therefore, processing styles are, to some extent, influenced by how people move (or navigate) their eyes. The horizontally skewed human field of vision makes it easier to process information which is presented in the horizontal vs vertical plane.

Consistent with this idea, Shi et al. (2013) demonstrated that consumers are more likely to compare products by attribute when various options are displayed horizontally (and their attributes across options are aligned horizontally too) while they are less likely to do that when options are displayed vertically (and attributes across options are aligned vertically too). Their eye-tracking study results lend support to the idea that humans prefer to move their eyes and process information in the horizontal rather than vertical direction. Thus, when the attributes of purchase options are arranged horizontally (vs. vertically), attribute-based processing is facilitated to a greater extent. Based on this, I argue that display orientations (i.e., whether the purchase options are arranged horizontally or vertically) would influence the degree to which consumers are able to employ attribute-based processing for evaluating

material goods. Specifically, I propose that consumers would engage in relatively more attribute-based processing when material goods are displayed horizontally rather than vertically. However, for experiential purchases where attribute-based processing plays a less significant role, consumer's processing style would not vary by display orientations. This is formally hypothesized as follows:

H1: Display orientations would moderate the effect of purchase types on the compatibility with preferred processing styles such that a horizontal display would facilitate attribute-based processing for material products to a greater extent compared to a vertical display

1.3.2. Fluency from the Compatibility of Processing Style and Display Orientation

If a certain decision environment (e.g., horizontal display) facilitates the preferred processing strategy (e.g., attribute-based processing), what consequences would follow? I argue that processing fluency will ensue. Processing fluency refers to the subjective feeling of ease associated with any type of mental processing (Schwarz 2004; Kahn 2017; Graf, Mayer and Landwehr, 2018). Such metacognitive experiences arise independent of the content as long as certain characteristics of decision contexts facilitate cognitive processing (Schwarz 2004; Alter and Oppenheimer 2009). For example, processing fluency can be triggered by various factors such as visual priming (Lee and Labroo 2004), visual clarity (Reber, Winkielman and Schwarz 1998), readability (Novemsky, Dhar, Schwarz, and Simonson 2007; Song and Schwarz 2009), pronounceability (Alter and Oppenheimer 2006), or exposure (Ferraro, Bettman, and Chartrand 2009).

Importantly, prior research has shown that, when a certain characteristic of the decision context is compatible with the way in which a person achieves their decision goal, the person experiences greater processing fluency (Lee and Aaker 2004; Mourali and Pons 2009). For instance, promotion-focused people reported higher fluency when persuasive appeals were gain- rather than loss-framed (Lee and Aaker 2004). Similarly, Mourali and Pons (2009) showed that prevention-focused people who are focused on decision accuracy reported higher ease of processing when a brand choice was made in attribute rather than alternative processing formats.

Along this line, I propose that consumers will experience greater processing fluency when they make a choice among options displayed in a way compatible with the preferred processing strategy. Specifically, for material purchases where relatively attribute-based comparisons are preferred, consumers would feel greater fluency in their processing when choice options are displayed horizontally rather than vertically. On the other hand, for experiential purchases where options are more likely to be compared by alternative, consumers' processing fluency would not be influenced by the display orientations because they would neither facilitate nor inhibit the preferred alternative-based processing. In sum, greater fluency would ensue for the evaluation of material products displayed horizontally than vertically, while this effect of display orientations on processing fluency would be dissipated for the evaluation of experiential products. This is formally hypothesized as follows:

H2: Greater processing fluency would ensue when the display orientation is compatible with the preferred processing style.

1.3.3. Processing Fluency and Consumer Outcomes

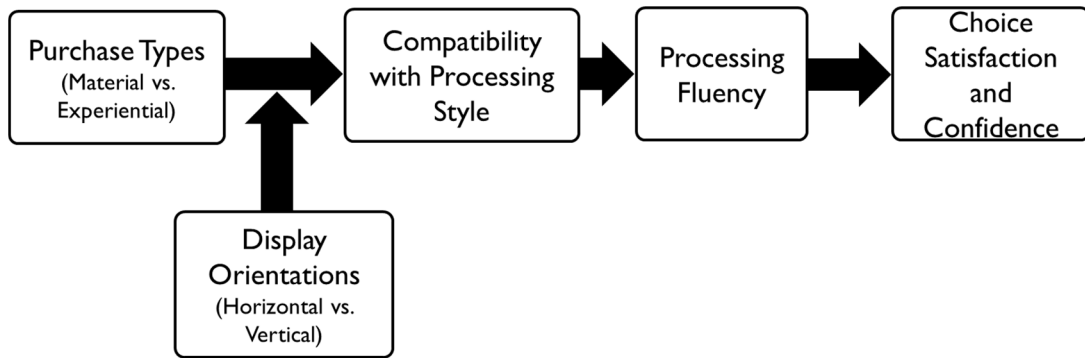
It is well-documented that processing fluency positively influences a broad array of human judgments such as truth, liking, or confidence (for a review, see Alter and Oppenheimer 2009). Building on this, researchers have demonstrated that fluency influences various consumer outcomes. For example, greater processing fluency leads to more positive product and brand attitudes (Janiszewski and Meyvis 2001; Novemsky et al. 2007; Schwarz 2015), greater liking (King and Janiszewski 2011; Labroo et al. 2008; Lee and Labroo 2004), increased sales (Landwehr, Labroo and Hermann 2011), choice satisfaction (Mosteller, Donthu and Eroglu 2014), and choice confidence (Schwarz 2015).

Therefore, I propose that the perceived fluency resulting from the fit between the purchase type and display orientation would influence an individual's feeling about their choice. For material purchases, people would be more satisfied with and confident in their choice when options are displayed horizontally than vertically. However, such differences would be attenuated for experiential purchases. This is formally hypothesized as follows.

H3: Display orientations would moderate the effect of purchase types on choice satisfaction and confidence.

H4: The interactive effect of product types and display orientations on choice satisfaction and confidence would be mediated by consumer's processing fluency.

Figure A1. Conceptual Model

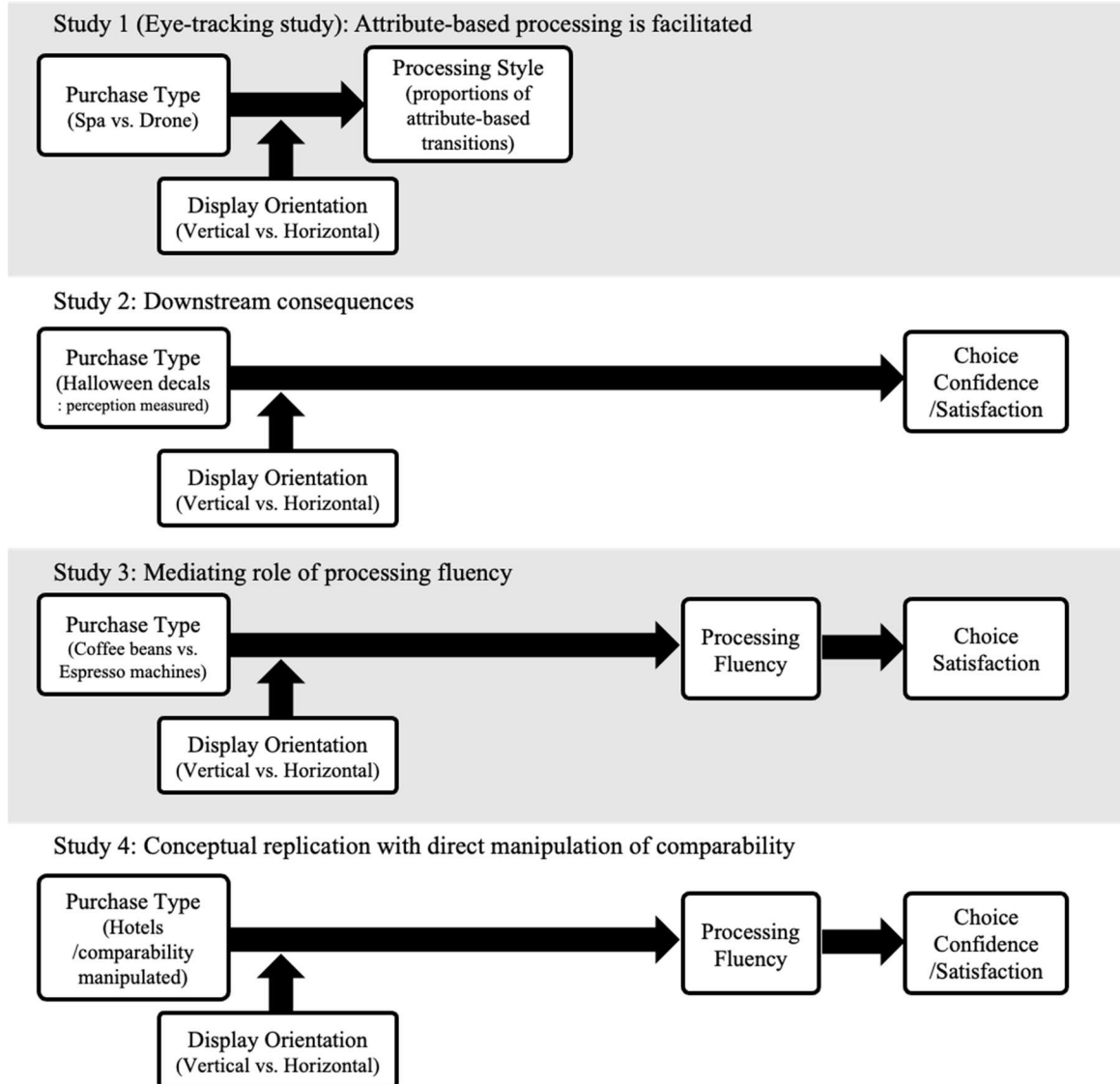


1.4. Methodology and Findings

1.4.1. Overview of Studies

I test the hypotheses across four studies. In Study 1, I use eye tracking to investigate whether display orientations and purchase types interactively influence consumer's processing styles. In Study 2, I examine the downstream consequences in terms of choice satisfaction and confidence while ruling out the confounding in the position of the text and image. In Study 3, I test the mediating role of processing fluency while replicating the results of Study 2 for choice satisfaction. In Study 4, I conceptually replicate Study 2 and 3 by directly manipulating comparability while holding the purchase category constant (see Figure A2).

Figure A2. Overview of Studies



1.4.2. Study 1

The purpose of Study 1 is to test the first hypothesis that the effect of purchase types on participants' processing styles (i.e., attribute-based comparison) would be moderated by display orientations. I record participant's eye movement data with an eye-tracking device

(Tobii XT-60) to measure their processing styles (Wedel and Pieters 2008; Shi et al. 2013). I predict that, for material purchases, consumers would make relatively more attribute-based comparisons when purchase options are arranged horizontally rather than vertically. In contrast, for experiential purchases, such differences by display orientations would not be observed.

Method

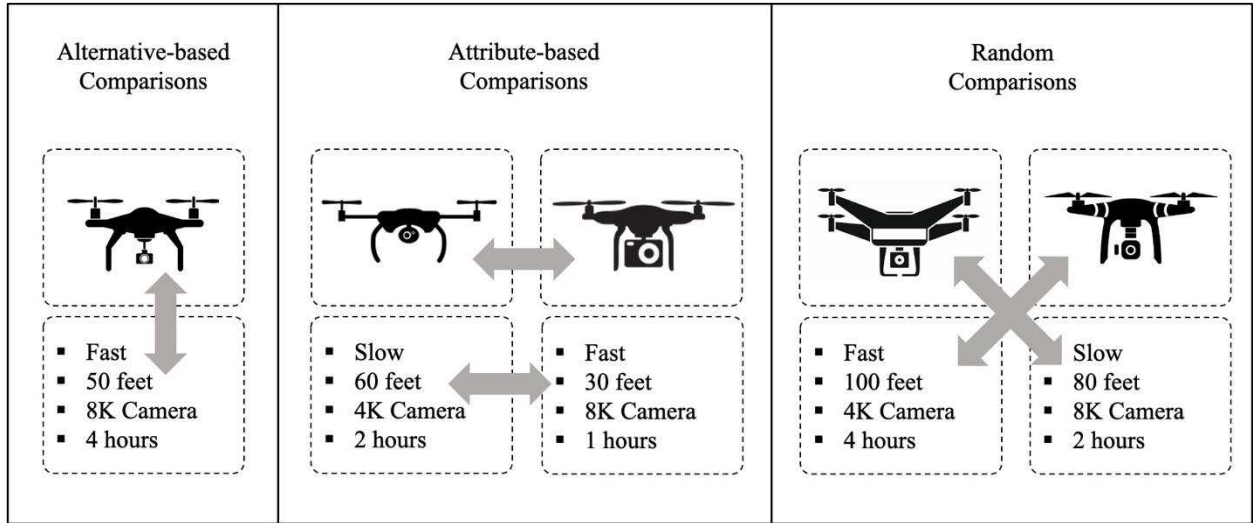
Participants and Design. A total of 138 undergraduate students from a large US University (50% Female, $M_{\text{age}} = 20.44$) participated in the study for course credit and were randomly allocated to one of four conditions of a 2 (Purchase Type: Experiential vs Material) x 2 (Display Orientation: Horizontal vs Vertical) between-subjects design.

Procedure. Participants were randomly selected from a larger pool and sent to another room next to the behavioral lab in the middle of their 1-hour survey session. All participants had been originally informed that they could be required to complete some parts of the studies in a separate room. Thus, it came as no surprise. After a brief introduction to the eye-tracking study, participants underwent a calibration procedure. Then, they were presented with five options of either experiential (i.e., vacation destinations) or material purchases (i.e., drones). Each option was depicted with an image and corresponding textual information. The five purchase options were displayed either horizontally or vertically depending on the assigned experimental conditions (see Web Appendix A for details). I rotated the monitor to portrait mode for the vertical display condition because five options, if displayed vertically, exceed the screen's display range, and participant's scrolling may add some noise to the eye-tracking data. I, however, kept the monitor to landscape mode for the

horizontal condition. Participants were asked to choose one option that they wanted (to buy) the most. After the choice task, participants completed other unrelated eye-tracking studies and returned to the behavioral lab.

I defined a total of ten areas of interests (AOIs) a priori. Specifically, two AOI's per each option, one for the product picture and the other for the corresponding product description, were generated. The recorded eye-fixation data was automatically assigned to one of the ten AOI's. Participants' processing styles were measured with saccades data - eye-gaze movements between adjacent fixation points. Following Shi et al. (2013), I classified participants' saccades data into three categories. I categorized transitions 1) between the picture and product description *within* a product as alternative-based comparisons, 2) transitions between either the pictures or product descriptions across different options as attribute-based comparisons, and 3) the rest (i.e., between the picture of one product and product descriptions of another) as random comparisons (see Figure 2). My interest lies in the relative proportion of the second category (i.e., attribute-based comparisons). Thus, I created the dependent variable by dividing the number of attribute-based transitions with the total number of transitions.

Figure A3. Three categories of processing styles by eye-movement directions



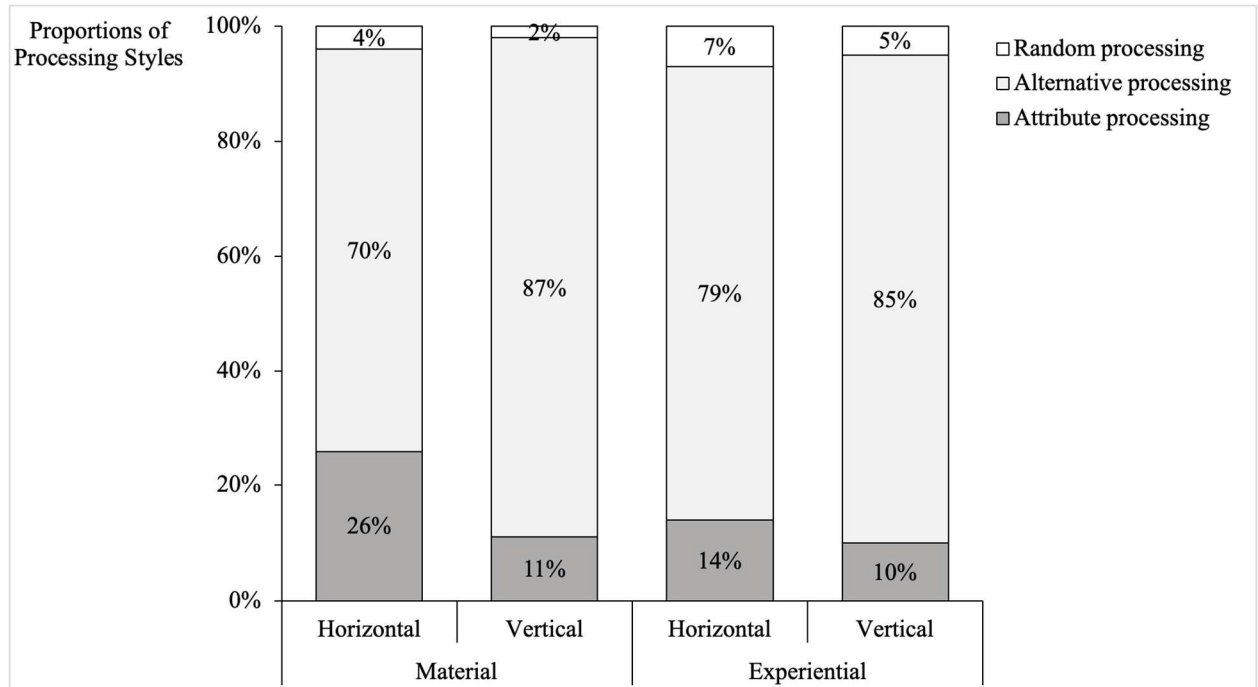
Results

A 2-way ANOVA yielded only a significant interaction between purchase type and display orientation on the proportion of attribute-based comparisons ($F(1, 134) = 10.07, p = .002$). Planned contrasts revealed that, for material purchases, the proportion of attribute-based transitions was significantly higher in the horizontal ($M = 26\%$; $SD = .08$) than vertical condition ($M = 11\%$, $SD = .09$; $F(1, 134) = 34.19, p < .001$). This suggests that participants who chose from material options made relatively more attribute-based comparisons if the options were displayed horizontally rather than vertically. In contrast, for experiential purchases, the proportion of attribute-based comparisons did not differ by display orientations ($M_{\text{Horizontal}} = 14\%$, $SD = .14$; $M_{\text{Vertical}} = 10\%$, $SD = .08$; $F(1, 134) = 2.62, p = .11$; see Figure 3). This means that participants who chose from experiential options made about the same proportion of attribute-based comparisons regardless of whether the options were displayed horizontally or vertically. Taken together, these results are consistent with the

contention that attribute-based processing is the preferred mode of evaluation for material (vs. experiential) purchases, and is more facilitated in the horizontal (vs. vertical) display.

Thus, H1 was supported.

Figure A4. Proportions of three processing styles by conditions.



Although I did not formulate any hypotheses regarding alternative-based or random transitions, I conducted ad hoc analyses for those two categories to ensure that the above results were not driven by random spurious correlations. When I ran the same analyses with the proportion of alternative-based transitions, the two-way interaction between the purchase types and display orientations was significant ($F(1,134) = 4.33, p = .039$). More importantly, planned contrasts yielded a pattern complementary to the results of attribute-based transitions. Specifically, for material purchases, the proportion of alternative-based transitions was significantly lower in the horizontal ($M = 70\%$; $SD = .10$) than vertical

condition ($M = 87\%$, $SD = .10$; $F(1, 134) = 19.14$, $p = .001$). However, for experiential purchases, the proportion of alternative-based transitions did not differ between the two orientations ($M_{\text{horizontal}} = 79\%$, $SD = .22$; $M_{\text{vertical}} = 85\%$, $SD = .10$; $F(1, 134) = 2.70$, $p = .103$). Finally, for random-based transitions, no significant differences emerged in any of the comparisons between conditions (all p 's $> .16$). The complementary patterns between attribute- and alternative-based processing along with the equally low proportion of random transitions (3%~7%) together suggest that 1) participants compared options by switching primarily between the two processing styles, and 2) the relative proportion of the one over the other processing style was influenced by purchase types and display orientations.

Discussion

The results of Study 1 showed that participant's processing style is affected not only by the purchase types they consider but also by the way in which purchase options are displayed. In Study 1, participants in the material conditions did relatively more attribute-based comparisons when purchase options were displayed horizontally rather than vertically. This result is conceptually consistent with Shi et al. (2013)'s findings if I consider their stimuli (i.e., laptop computers) as material purchases although they used the matrix format to display options. However, the significant difference in the relative proportion of attribute-based comparisons did not hold for experiential purchases. To the best of my knowledge, this is the first empirical evidence to establish the interactive impact of display orientations and purchase types on information processing styles.

Some may argue that the portrait orientation in the vertical condition is unusual and thus might have created demand artifacts; participants unconsciously interpreted the screen

orientation as a cue for eye movements, so they inhibited the more natural, horizontal eye movements. Although it is not clear how that could have led to our results, I ran a follow-up study ($n = 102$, 54% Female, $M_{\text{age}} = 21.48$) to address this issue. The study was almost identical, except that I used different stimuli and kept the screen orientation to landscape mode for all conditions (see Online supplementary material for details). The results of the follow-up study yielded the same pattern. The 2-way interaction between the purchase types and display orientations on the proportion of attribute-based comparisons was significant ($F(1, 98) = 6.92, p < .01$). Planned contrasts showed that participants in the material condition made relatively more attribute-based comparisons if the options were displayed horizontally ($M = 27\%$, $SD = .15$) rather than vertically ($M = 17\%$, $SD = .11$; $F(1, 98) = 9.25, p < .01$). However, those in the experiential condition did not differ in their proportion of attribute-based comparisons regardless of whether the options were displayed horizontally ($M = 17\%$, $SD = .10$) or vertically ($M = 19\%$, $SD = .11$; $F(1, 98) = 0.54, p = .462$). These together suggest that the results in Study 1 were not driven by the different screen orientations.

One limitation in Study 1 was that I varied not only the display orientations but also the structure of the stimuli. That is, the product description was shown at the right hand side of the product picture in the vertical condition but below the picture in the horizontal condition. While this is how products are usually displayed in online shopping environments, and thus reflects reality more precisely, the relative position of the product description and product picture was systematically confounded with the display orientation. So, I address this issue in the next study.

1.4.3. Study 2

The purpose of Study 2 is to examine the downstream consequences of the facilitated processing by the purchase types and display orientations. I investigate how the compatibility between purchase types and display orientations interactively influences consumer's choice satisfaction and confidence (H3). To address the confounding issue in Study 1, I created stimuli without the picture-text structure; each of the options was just an image of the product that illustrates various features and attributes of the product (see Web Appendix B). Additionally, I held the purchase category constant and measure participants' perceptions of it in terms of experiential and material. I took this approach because "the material-experiential distinction is not always clear-cut" (Gilovich and Gallo 2020, p.22), which means that people may perceive the same product as more experiential or material. I predict that consumers who perceive choice options as more material than experiential would be more confident in and satisfied with their choice if the choice decision is made in the horizontal rather than vertical display. In contrast, such differences by display orientations would not be observed for those who perceive choice options more experiential than material.

Method

Stimuli. I ran this study two weeks before Halloween, and used Halloween decoration decals as the stimuli. On one hand, they are tangible goods that people can physically possess and apply on the walls and windows. On the other hand, they are seasonal products that people can experience and use for a limited period of time. Therefore, some may perceive

them as more material while others more experiential. I developed two replicates in each of which the options vary in features but share the same theme.

Participants and Design. Four hundred and four mTurkers participated in the study. I used a Continuous (Purchase Type) x 2(Display Orientation: Horizontal vs. Vertical) x 2(Product Replicates) between-subjects design.

Procedure. Participants read a scenario about their online shopping of Halloween decoration decals and were asked to choose one from a set of four options displayed either horizontally or vertically (see Appendix D). Following the choice task, participants were then asked to rate the product as material or experiential on a nine-point semantic differential scale (1 = purely material, 9 = purely experiential). I then measured their choice confidence using a two item scale (“*I feel confident about the choice I made*” and “*I feel certain about the choice I made*”; 1 = strongly disagree, 9 = strongly agree; Andrews 2013; Cronbach’s alpha = .956). I measured choice satisfaction using a three item scale (“*I am happy with the choice I made*”, “*I am satisfied with the choice I made*” and “*I am confident that my choice will satisfy me*”; 1 = strongly disagree, 7 = strongly agree; Deng et al. 2016; Cronbach’s alpha = .955). Finally, I measured several potential covariates including gender, marital status, political affiliation, and perceived similarity. I included the perceived similarity measure for two reasons. First, I developed our stimuli in a way that options share the same theme. Second, prior research shows that perceived similarity has to do with choice difficulty (Xu, Jiang, and Dhar 2013).

Results

Two subjects who failed the attention check were removed, leaving a total sample of 402 (43% Female; $M_{\text{age}} = 40.72$). No higher-order interaction with product replicates was significant. Therefore, I collapsed them for further analyses.

While tangential to the initial predictions, analyses showed that perceived similarity, one of the covariates, is negatively associated with choice confidence ($\beta = -.19$, $SE = .03$; $t(399) = -5.75$, $p < .001$) and satisfaction ($\beta = -.16$, $SE = .03$; $t(399) = -5.18$, $p < .001$). Thus, I included perceived similarity as a covariate in all analyses. I also reverse coded the experiential-material scale to make the coefficients consistent with other studies where experiential condition was coded as 0 and material condition as 1.

Choice confidence. When I regressed choice confidence on display orientation, perception of product types and its interaction using PROCESS Model 1 (Hayes 2017), the main effect of display orientation was significant ($\beta = .71$, $SE = .33$; $t(397) = 2.18$, $p = .029$) and the main effect of perceived product types was significant ($\beta = .09$, $SE = .04$; $t(397) = 2.53$, $p = .012$). Importantly, the two-way interaction of Display Orientation and Perceived Product Types was significant ($\beta = -.14$, $SE = .06$, $t(397) = -2.43$, $p = .016$), suggesting that the display orientation and purchase type interactively influence choice confidence.

Choice Satisfaction. When I ran the same Hayes' PROCESS Model 1 with choice satisfaction as a dependent variable, the main effect of display orientation was not significant ($\beta = .42$, $SE = .30$; $t(397) = 1.36$, $p = .17$) but the main effect of perceived purchase types was significant ($\beta = .07$, $SE = .04$; $t(397) = 2.09$, $p = .037$). More importantly, the two-way interaction was marginally significant ($\beta = -.09$, $SE = .05$, $t(397) = -1.79$, $p = .073$) such that

as the product was perceived as more material, satisfaction increased in a horizontal display compared to vertical display. The results are consistent with H3.

Discussion

The results suggest that consumer's satisfaction from material purchases may be reduced when the choice is made from the vertical (vs. horizontal) displays while that for experiential purchases is less influenced by the display orientation. This study ruled out the possibility that the confounding of the position of the text and picture elements of the product has an effect. Even after controlling for that by having the visual elements at the same location, I still got the predicted result for choice confidence and satisfaction. In addition, I used how material or experiential the stimuli were perceived to be as our independent variable, thereby controlling for individual differences in perception.

However, the results for choice satisfaction were only marginally significant while that for choice confidence was fully significant. I conjecture that this was possibly because the options were quite similar to each other and hence I reached a ceiling effect for choice satisfaction. So I did not find a strong difference when the purchase was perceived as experiential or material. Participants had a high degree of satisfaction with their choice all across. However, given the high perceived similarity, being confident in their choice would be important for the participants, and here I find that the horizontal display orientation facilitated those who perceived the decals as more material to choose an option with greater confidence. Having shown that the relative position of the text and image does not have a bearing on decision outcomes. In the next study, I choose the more conventional layout. I

also manipulate the purchase type directly and focus on choice satisfaction as the outcome variable and test the mediating role of fluency.

1.4.4. Study 3

Study 3 aims to replicate Study 2 and test the mediating role of processing fluency. In Study 3, I additionally explore consumer's choice deferral - another potential downstream consequence from the interaction of purchase types and display orientations. Extant literature suggests that people tend to defer their choices when choice difficulty increases (Dhar 1996; Novemsky et al. 2007). Based on the definition of processing fluency and our previous theorizing, I posit that people may be more likely to defer their choices when material goods are displayed vertically rather than horizontally. Thus, I included the no-choice option in the choice set. Additionally, I used different products (i.e., espresso machines or coffee beans) in the same category (coffee) to manipulate purchase types. I predict that material products displayed horizontally would lead to greater choice satisfaction due to the increased processing fluency.

Method

Participants and Design. Two hundred mTurkers were randomly assigned to one of the four conditions of a 2 (Purchase Type: Experiential vs. Material) x 2 (Display Orientation: Horizontal vs. Vertical) between-subjects design.

Stimuli and Procedure. Participants were instructed to imagine that they were at home doing online shopping and had received a discount coupon from a large online retailer to shop for some coffee related products. Then, they were presented with four choices of

either an espresso machine (material product) or coffee beans (experiential product) displayed horizontally or vertically. For each condition, a no-choice option labelled as “I will choose later” was displayed as the fifth choice (see Web Appendix C). After making their choice, participants were provided with a brief definition of experiential and material purchases and asked to rate their perceptions of the products on a nine-point semantic differential scale (1 = purely material, 9 = purely experiential). I measured their choice satisfaction using the same three item scale as in Study 2 (Cronbach’s alpha = .949) and fluency using three items adopted and modified from previous research (“*I found it easy to choose an option*”, “*I found the process of choosing smooth*” and “*Making this decision was difficult for me* (R)”; 1 = strongly disagree, 7 = strongly agree; Cronbach’s alpha = .866; Lee and Aaker 2004, Graf et al. 2018). I predict that material options would elicit greater fluency when presented horizontally than vertically and this would result in greater choice satisfaction, but for experiential products this effect would be attenuated.

Results

Five participants who failed to pass the attention check, and two mobile participants in the horizontal condition were excluded from analyses, leaving 193 participants (Female= 38.3%, $M_{age}=38.27$).

Manipulation Check. Validating the purchase type manipulation, a one-way ANOVA revealed a significant difference between the experiential and material conditions ($F(1,189) = 23.74, p < .001$). As expected, participants rated the espresso machine as more material ($M = 3.72, SD = 2.33$) and the coffee beans as more experiential ($M = 5.67, SD = 2.39$).

Choice Deferral. One dummy variable was created for choice deferral (choice = 0, choice deferral = 1). When I performed a binary logistic regression on choice deferral with purchase type (experiential = 0, material = 1), display orientation (horizontal = 0, vertical = 1) and the interaction term as the predictors, neither the two-way interaction ($B = .108$, $SE = .919$, $Wald = .014$, $p = .907$, $Exp(B) = 1.11$) nor main effects ($B_{purchase_type} = -.85$, $SE = .65$, $Wald = 1.72$, $p = .189$, $Exp(B) = .427$; $B_{display_orientation} = .050$, $SE = .55$, $Wald = .008$, $p = .927$, $Exp(B) = 1.05$) were significant, suggesting that the moderating effect of display orientations is not strong enough to make people defer their choices.

Fluency. I predicted that perceived processing fluency would be higher for material products chosen in the horizontal than vertical condition, while for experiential products, there would be no significant difference. Consistent with the prediction, a 2-way ANOVA yielded a significant two-way interaction effect between the display orientation and product type ($F(1,189) = 4.04$, $p = .046$). Planned contrasts revealed that participants in the material condition felt their choice process more fluent when options were presented horizontally ($M = 4.83$, $SD = 1.48$) rather than vertically ($M = 4.33$, $SD = 1.59$; $F(1,189) = 5.45$, $p = .084$)¹. However, for experiential purchases, no significant difference emerged between the horizontal ($M = 5.07$, $SD = 1.32$) and vertical condition ($M = 5.38$, $SD = 1.10$; $F(1,189) = 1.23$, $p = .269$). Thus, H2 was supported.

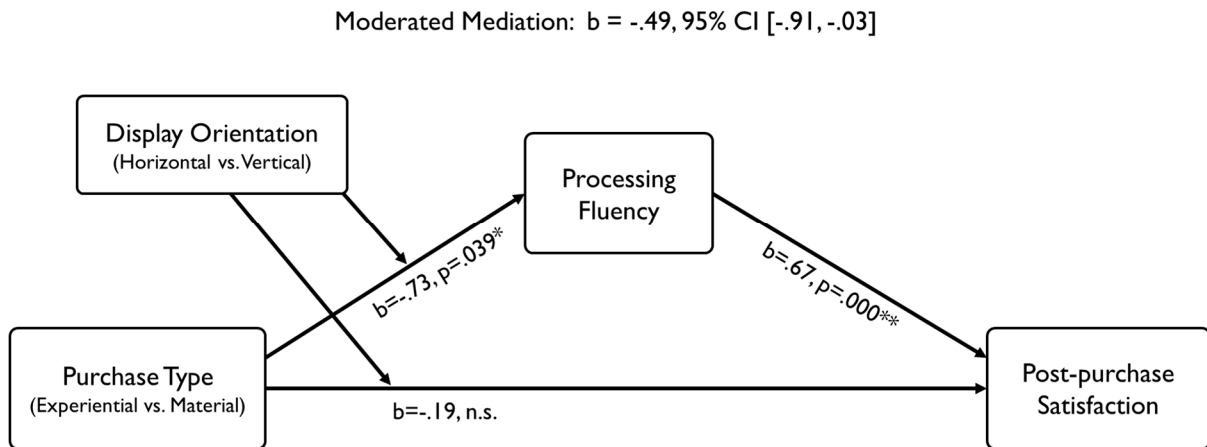
Choice Satisfaction. To better examine choice satisfaction, I excluded 24 participants who chose the ‘no-choice’ option. When I ran a 2-way ANOVA with the remaining 169 participants (Female = 37.9%, $M_{age} = 37.58$), I found a significant interaction

¹ It is possible that our fluency results were marginal because of the nature of the ‘no choice option’ as presented in the stimuli. See discussion.

effect between the display orientation and product type ($F(1,165) = 4.50, p = .035$). There was a significant main effect of purchase types ($F(1,165) = 6.41, p = .012$) but not for display orientation ($F(1,165) < 1, ns$). Planned contrasts revealed that participants in the material condition were more satisfied with their choice when options were presented horizontally ($M = 5.83, SD = 1.22$) than vertically ($M = 5.42, SD = 1.28; F(1,165) = 3.19, p = .076$). However for experiential products, the difference between the horizontal ($M = 5.89, SD = .70$) and vertical condition ($M = 6.16, SD = .87$) was not significant ($F(1,165) = 1.45, ns$). Thus, H3 was supported.

Mediation. To test the mediating role of fluency, I conducted a mediated moderation analysis using Hayes (2017) PROCESS Model 8 with 5,000 bootstrapped samples. When I used purchase types as the independent variable, display orientation as a moderator, fluency as a mediator, and choice satisfaction as the dependent variable, the results showed that the interaction effect of the display orientation and purchase types on choice satisfaction was fully mediated by fluency ($\beta = -.49, SE = .23, 95\%, CI [-.91, -.03]$). More importantly, and consistent with our hypothesis, fluency mediates the above relationship only for material purchases ($\beta = -.40, SE = .19, 95\%, CI [-.76, -.01]$) but not for experiential purchases ($\beta = .09, SE = .14, 95\%, CI [-.19, .34]$). Thus, H4 was supported.

Figure A5. Moderated mediation results in Study 3.



Discussion

This study demonstrated the downstream consequences of the compatibility of processing type and display orientation for experiential and material purchases on choice satisfaction and the mediating role played by processing fluency. I found that for material products, there was greater choice satisfaction when the options were displayed horizontally rather than vertically, but this difference was mitigated for experiential products. This effect was in turn mediated by processing fluency. In this study, the fluency results for the material contrast was marginal, and I speculate it could be because the no choice option presented as a picture (see Web Appendix C) was different from the other four options of espresso machine or coffee beans and hence may have reduced the fluency of choosing especially in the horizontal display where it is directly in the field of vision. In addition, the fluency item related to the ease of actually choosing an option, which was not the case for those who chose to defer. When I used the sample of 169 removing the choice deferrals, I got stronger interaction results ($F(1, 165) = 4.34, p = .039$), with the material contrast as significant ($M_{\text{Horizontal}} = 5.15$; $SD = 1.18$; $M_{\text{Vertical}} = 4.56$; $SD = 1.39$; $F(1, 165) = 5.48, p = .021$) but not

the experiential contrast ($M_{\text{Horizontal}} = 5.34$; $SD = .97$; $M_{\text{Vertical}} = 5.48$; $SD = .98$; $F(1, 165) = .325$, $p = .569$). Overall, this study lends further credence to the effects I found in the previous studies.

In the previous studies, I found that material purchases displayed horizontally (vs. vertically) lead to greater fluency and choice satisfaction but this is mitigated for experiential purchases. I had theorized that this is driven by the inherent comparability of the purchases. In the following experiment, I try to isolate the effect of comparability by directly manipulating the attributes of the options such that they are either idiosyncratic or more comparable. In addition, from a practical perspective, our findings across three studies suggest that the brand managers of material goods can enhance customer experience by displaying their products horizontally rather than vertically. However, given the pervasiveness of the vertical display in the mobile devices along with the growth of mobile shopping behavior (Meola 2020), how would the brand managers overcome this challenge? This final study is also designed to test a potential intervention so that I can provide a possible remedy.

1.4.4. Study 4

The purpose of Study 4 is to conceptually replicate previous findings by directly manipulating the comparability of choice options rather than purchase types. If the effect was driven by the degree of comparability in which different purchase types inherently differ, I should expect to find the same results when I directly manipulate the degree of comparability rather than purchase types. To do this, I chose hotels in New York City as the stimuli. I varied the level of comparability by presenting the information as either idiosyncratic to the

hotel or as information presented in numerical terms which would make it easier to compare (e.g., distance from Manhattan, room size etc.) (see Web Appendix D). I also kept only the textual portion of the stimuli and removed any associated pictures so as to keep the focus purely on the attributes.

Method

Participants and Design. Three hundred and ninety four participants recruited through CloudResearch (Litman, Robinson, and Abberbock 2017) were randomly allocated to one of four conditions of a 2 (Comparability: Low vs. High) x 2 (Display Orientation: Horizontal vs. Vertical) between-subjects design. Five participants who failed the attention check were excluded, leaving us with 389 participants ($M_{age} = 40.93$; Female = 53.5%).

Procedure. Participants first read a scenario where they had to choose a hotel for an upcoming trip to New York City. Then, four hotel options with low or high comparability were presented horizontally or vertically. Following the choice task, participants responded to the same fluency (Cronbach's $\alpha = .897$), choice satisfaction (Cronbach's $\alpha = .963$), and choice confidence measures (Cronbach's $\alpha = .965$) as in Study 2 and 3. I included the response time measure in the choice question as an alternative proxy for fluency. I also measured perceived comparability with one item ("*I found the attributes of each option to be idiosyncratic (R)*") as a manipulation check.

Results

Manipulation check. The result suggests that our manipulation of comparability was successful. Participants reported that the attributes were more comparable in the high

comparable condition ($M = 7.26$, $SD = 1.51$) than in the low comparable condition ($M = 6.18$, $SD = 1.78$; $F(1, 387) = 41.171$, $p = .000$).

Fluency. A two-way ANOVA showed a significant interaction effect ($F(1, 385) = 8.363$, $p = .004$) and a main effect of comparability ($F(1, 385) = 10.516$, $p = .001$). Planned contrasts revealed that participants in the high comparability condition found it more fluent to choose when the options were displayed horizontally ($M = 6.78$, $SD = 1.73$) rather than vertically ($M = 6.16$, $SD = 2.25$; $F(1, 385) = 4.336$, $p = .038$). In contrast, participants in the low comparability condition found it less fluent to choose when the options were presented horizontally ($M = 5.49$, $SD = 2.11$) rather than vertically ($M = 6.09$, $SD = 2.11$; $F(1, 385) = 4.032$, $p = .045$).

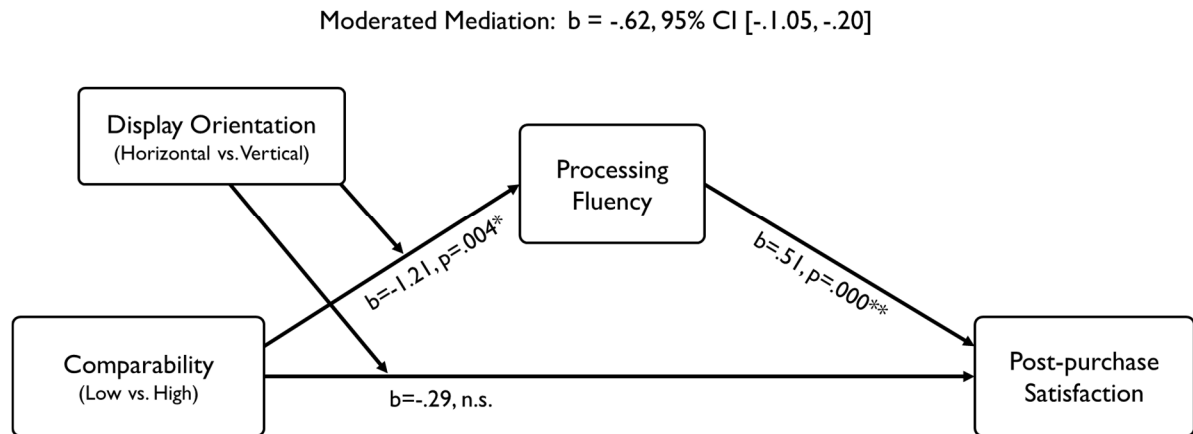
I conducted the same analysis using participant's response time in the choice task. To control for individual differences in processing speed, I included the total duration of the survey as a covariate when I analyzed this alternative proxy for fluency. As predicted, a two-way ANOVA yielded a significant interaction effect ($F(1, 384) = 4.835$, $p = .028$). Planned contrasts showed that participants who chose highly comparable options took significantly less time when the options were displayed horizontally ($M = 28.20$, $SD = 20.44$) rather than vertically ($M = 35.80$, $SD = 30.93$; $F(1, 384) = 4.600$, $p = .033$). However, for those in the low comparable condition, there was no significant difference in the time taken when the options were displayed horizontally ($M = 35.58$, $SD = 45.02$) or vertically ($M = 31.88$, $SD = 25.50$; $F(1, 384) = .942$, $p = .332$). This result suggests that those in the high comparability condition found it more fluent to choose from the horizontal rather than vertical display but this effect was mitigated for those in the low comparable condition. Taken together, these results lend further support for H2.

Choice Satisfaction. A two-way ANOVA revealed a marginally significant interaction effect ($F(1, 385) = 2.991, p = .085$). A contrast analysis showed that participants reported greater choice satisfaction when high comparable choices were presented horizontally ($M = 7.39, SD = 1.55$) than vertically ($M = 6.93, SD = 1.79; F(1, 385) = 4.222, p = .041$). For less comparable options, however, there was no significant difference ($F(1, 385) = .159, p = .691$) when presented horizontally ($M = 7.03; SD = 1.49$) or vertically ($M = 7.12; SD = 1.51$).

Choice Confidence. A two way ANOVA showed a significant interaction effect ($F(1, 385) = 4.13, p = .043$) with a contrast revealing a marginally significant difference in choice confidence when high comparable choices were presented horizontally ($M = 7.40, SD = 1.54$) than when they were presented vertically ($M = 6.92, SD = 1.90; F(1, 385) = 3.715, p = .055$). However, for low comparable choices, there was no significant difference when the choices were presented horizontally ($M = 6.73, SD = 1.86$) or vertically ($M = 6.97, SD = 1.65; F(1, 385) = .906, p = .342$).

Mediation. To test the mediating role of fluency, I conducted a moderated mediation analysis by using PROCESS Model 8 (Hayes 2017). I used comparability as the predictor variable, display orientation as a moderator, fluency as a mediator, and choice satisfaction as the dependent variable. The interaction of comparability and display orientation on choice satisfaction was fully mediated by fluency ($\beta = -.62, SE = .22, 95\% CI [-1.05, -.20]$).

Figure A6. Moderated mediation results in Study 4.



Discussion

In this study, I sought to isolate the effects of the text itself and find a stronger result compared to study 3, thereby lending credence to our initial reasoning that the relative comparability of material products makes them easier to be processed when they are displayed horizontally. I did this by varying the type of information in the attributes- one more idiosyncratic to mimic the experiential aspect of low comparability and the other more factual to mimic the material aspect of greater comparability. The results of Study 4 showed that the high comparable options were easier to process and elicited greater confidence and satisfaction when presented horizontally than vertically while for low comparable options there was a slight advantage when presented vertically in terms of fluency, but as expected this did not carry over to either choice confidence or satisfaction. Another implication is that retailers can mitigate the negative effects of a potentially incompatible display orientation by using a less comparable framing.

1.5 Conclusion

1.5.1. Summary of Results

In a series of four experiments, I showed that people derive greater choice satisfaction and confidence from choosing material products when they are displayed horizontally than vertically, but that this effect is mitigated for experiential products. This is due to the fluency arising out of the compatibility of the processing styles associated with the purchase types and the display orientation. This was facilitated by the horizontal field of vision of the human eye. I found this effect to be consistent with not only the purchase type, but also when the same product was framed in either experiential or material terms. The underlying driver for this effect was the comparability of the attributes of material products vis-a-vis experiential products. Since material products are compared more across their attributes, displaying them horizontally makes it easier to compare across their attributes for different options and choose an option with greater ease, thus resulting in greater choice confidence and choice satisfaction. A vertical display, on the other hand, does a poorer job at helping people choose material products as they are not in line with the field of vision, thereby making it more difficult to compare across attributes. For experiential products, since they are compared more by alternative which involves less comparisons across options, the effect of the display orientation on choice confidence and satisfaction is mitigated to an extent, though I did see some evidence for a slight preference for the vertical display.

1.5.2. Theoretical Contributions

This work contributed to the body of literature on experiential and material purchases (Van Bowen and Gilovich 2003; Carter and Gilovich 2010,2012; Howell et al. 2012, Gilovich and Kumar 2015; Guevara and Howell 2013; Nicolao et al. 2009; Gallo et al. 2017). Much of the work has focused on the experiential advantage or the long term happiness gained from experiential consumption over material consumption, or in some cases the preference for material purchases (Tully et al. 2015; Dubois and Ruvio 2014). However, only a few have focused on the psychological aspects prior or at the time of consumption, Gallo et al. (2017) being a notable exception. The research explores this in greater depth and contributes to the decision strategies adopted for the purchase of experiential and material products (Carter and Gilovich 2010; Gallo et al. 2017). I also show an interplay between product display layouts and the purchase type and the fact that material products displayed horizontally leads to greater choice satisfaction and confidence.

I also contribute to the literature on product displays (Chandon et al 2009, Dreze et al. 2004; Broniarczyk et al. 1998, Raghurir and Valenzuela 2008; Valenzuela and Raghurir 2015; Deng et al. 2016) and show that the product type matters when deciding upon displaying products. Material products need to be compared, and any display which inhibits that may reduce consumers satisfaction with their choice. Experiential products, on the other hand, may benefit from a more vertical layout or one which promotes more alternative level processing, but the effect is not so stark given the inherent incomparability of experiential purchases. This also explains the finding of Deng et al. (2016) where they did not find any difference in choice satisfaction from a horizontal or vertical display while choosing a single option. Their stimuli were experiential (candies) and I explain that the effect of display

orientations would be mitigated for experiential purchases but accentuated for material purchases.

The research also contributes to the judgment and decision-making literature on alternative vs attribute level comparisons (Bettman and Kakkar 1977, Bettman, Luce and Payne 1998, Dhar 1996, Tversky 1969, Shafir et al. 1993, Simonson 1998, Chernev 2003; Shi et al. 2013) and extends the literature on how product types and display orientations affect the type of evaluation conducted. I provide evidence by eye tracking that there is a difference in the extent of attribute based comparisons for material products displayed horizontally (vs. vertically) but not so for experiential products.

I also add to the literature on processing fluency (Schwarz 2004; Reber et al. 2004; Novemsky et al. 2007; Schwarz 2015) and show how this simple yet profound construct retains its importance at both the perceptual and cognitive level. I show that fluency plays a role in the evaluation of material purchases which require comparisons, but not necessarily for experiential purchases. I also build on the literature on field of vision, which while well developed in vision research, it still under researched (Deng et al. (2016) being an exception) in the consumer behavior domain. I show that the fluency with the field of vision is important, but it can also be subsumed under certain conditions such as when people are evaluating experiential purchases.

1.5.3. Practical Implications

The online retail space has made available to consumers a plethora of options, and companies are constantly searching for ways to more efficiently display their options. This research offers one avenue- that is by matching the purchase type to the display orientation.

If the products are more material in nature and require a greater degree of comparisons, then displaying the options horizontally such that their attributes become more comparable would lead to greater fluency for the consumers and hence greater choice confidence and satisfaction. On the other hand, for purchases which are more experiential, the display orientation would not be an important factor. This is also a cost-effective option for companies as altering the display orientation based on the purchase type does not require sophisticated algorithms. In addition, there are times, such as in smartphones, where the screen itself is vertical, and in such cases, it would benefit retailers to have a more experiential and less comparable framing for their material product choices. This would reduce the amount of dissatisfaction that consumers experience when evaluating material purchases displayed vertically. Overall, the implications for companies is that managing the display orientation of options depending on the purchase type is not only practical but also practicable.

1.5.4. Limitations and Future research

In this research, I considered horizontal and vertical layouts. However, matrix layouts are also common, and gaining an understanding would be helpful. While a lot of the previous research has indeed used matrix displays with visual guidelines to differentiate horizontal vs vertical layouts (Shi et al. 2013; Deng et al. 2016, Jang and Yoon 2018), doing so without visual guidelines may provide additional insights. In addition, smart phones have become ubiquitous, and they are inherently vertical displays. I did not specifically test on smartphone platforms, but it would be interesting to see if the effects I found for computer screen displays would carry over to smartphones as well or would there be other factors which have an impact. Finally, individual differences or cultural variables may moderate this effect. For

example, people with high power distance beliefs may prefer a vertical display orientation as it is embodied in line with their acceptance of hierarchies.

CHAPTER II

ESSAY 2. THE EFFECT OF POWER DISTANCE BELIEFS ON PREFERENCES FOR PRODUCT DISPLAY LAYOUTS

2.1 Introduction

With the advent of online retailing, retailers are no longer limited by the constraints of the shelf space. Jockeying for shelf space is no longer necessary for large companies. Indeed, the versatility of the online platform means that products can now be displayed in a multitude of manners. In fact, Amazon.com itself displays its products either as matrices or vertically as a list, or even horizontally. It is also true, that in today's globalized environment, companies operate in many different countries, each with their own cultural nuances. In this second essay, I seek to explore how culture affects the perception of different forms of product displays.

Previous research has divided cultures along the dimensions of individualistic-collectivistic, long term orientation, uncertainty avoidance, masculinity-femininity,

indulgence, vertical-horizontal and in terms of power distance belief (Hofstede 1984, 2001; Oyserman 2006; Shavitt et al. 2006). In this essay, I focus on how power distance beliefs may influence consumer's perception of horizontal vs vertical displays of products. This is important because there is limited previous research which focusses on how cultural variables may interact with product display orientations, and on the effect of cultural variables with experiential and material purchases. In addition, while the individual-collectivist variable has been well explored, power distance beliefs are relatively less explored. Yet this is an important variable since people's acceptance of hierarchies may influence them to view product displays differently and a verticality cue may become more salient for those high in power distance beliefs (PDB). This would have important managerial implications on the circumstances under which different types of product display layouts should be used.

The rest of this essay is structured as follows. In the first section, I review the literature and underlying theories. I then go on to develop the hypotheses in the second section. In the third section, I run three studies to test the hypotheses. In the fourth section, I review the findings and how they impact both theory and practice.

2.2. Literature Review and Theoretical Background

2.2.1. Display Orientation Layouts and Embodied Inferences

Products can be displayed horizontally, vertically or a combination thereof. Previous research has shown that the perceived variety is higher for products displayed horizontally than vertically due to alignment with the human field of vision, which too is horizontal (Deng et al. 2016). The location of products within displays has also received some attention, with products in the center of horizontal displays chosen more often (Chandon et al. 2008; Atalay et al 2012). It has also been seen that products placed on top shelves are perceived as being better in quality than those on the bottom shelves (Valenzuela and Raghurir 2015) and brands logos at the bottom right being perceived as heavier (Deng and Kahn 2009). The aspect of verticality itself has received some attention in this regard. Generally, verticality is associated with hierarchy (Schubert 2005; Frieze et al. 1990; Judge and Cable 2004) and with dominance (Schwartz et al. 1982). Judgements of power are susceptible to vertical product alignment (Peracchio and Meyers-Levy 2005). It is also evident in many figures of speech, as in “rising to the top, having control over the less powerful, looking down on something” (Machiels and Orth 2017). Machiels and Orth (2017) find that consumers inferred power and quality from verticality. In addition, studies have shown that when photos are taken, those taken from a lower angle elicit a perception of the subject being more powerful (Meyers-Levy and Peracchio 1992).

So there is some evidence from previous research that there exists an association of power with vertical structures compared to horizontal structures and it is possible that

this embodiment may extend to how people perceive product displays. However, I believe that this aspect can become more accessible depending on the cultural orientation of the consumers. One aspect which I explore is power distance beliefs and its effect on preference for certain product display layouts.

2.2.2. Power Distance Beliefs

Power distance was one of the earliest cultural dimensions identified by Hofstede (1980). Power distance belief is the degree of power disparity that people in a culture expect and accept (Hofstede 1984, 2001; Oyserman 2006). The central tenet of this construct is not in the actual disparity per se, but rather in the people's acceptance of this disparity (Zhang et al. 2010). People in high PDB focus more on hierarchy and inequality (Lalwani and Forcum 2016). While PDB can be endemic to a culture, it can also be a learned behavior as people in a low PDB culture maybe exposed to high PDB entities like the military (Soeters, Poponete and Page 2006). It can also transmit through media (Anderson 1997; McCracken 1986). Hence, it can also be primed. While PDBs occur at the individual level (Gao et al. 2016) and also at the cultural level, there is a strong relation between vertical and horizontal cultures, and power distance beliefs (Shavitt and Barnes 2018).

Zhang et al. (2010) contend that high PDB results in greater self control and reduction of impulse buying, and this is especially true for socially proscribed or vice categories. People with high PDB also have a greater need for structure and a resulting tendency for ranking (Lalwani and Forcum 2016). High power distance beliefs can also lead to greater social categorization which manifests in favoring ingroup brands over

outgroup brands (Wang et al. 2018) High PDB people are more rigid minded (Hofstede 2001). They also have a greater desire for clarity (Carl et al. 2004). It also results in lower sense of responsibility leading to lower charity donations (Winterich and Zhang 2014) A high level of PDB also results in greater reliance on heuristic cues (Lalwani and Forcum 2016; Winterich et al. 2018) and they also have a greater need for closure (Lee et al. 2020). If I were to generalise these outcomes, then it would appear that high power distance beliefs lead to a greater reliance on structure and heuristics. From the purview of this paper, this resulting need for structure has important implications.

2.2.3. The Need for Structure and Fluency- The Right Structure

The need for structure has been identified as a mediating variable between PDB and price-quality beliefs (Lalwani and Forcum 2016). It is defined as the desire for clarity and order, and the avoidance of ambiguity and disorder (Carl et al. 2004; Hofstede 2001; Thompson et al. 2001). People high in the need for structure value hierarchy due to the order and organization it provides (Leavitt 2003; Magee and Galinsky 2008). This need for structure is a consequence of power distance belief as the former is a motivational variable while the latter is a cultural variable (Lalwani and Forcum 2016). It leads to a propensity to organize the surroundings into a less complex and manageable form through the use of simplified cognitive structures like schemas and heuristics (Moskowitz 1993; Thompson et al. 2001). Structure is something which provides meaning to the world (Thompson et al. 2001) and this need for structure is stronger in people with high PDB as it reduces ambiguity in roles (Carl et a. 2004). In fact, people high in need for structure would selectively see structure in their environments even if one did not exist (Kay et al. 2014). It could hence be surmised that people in a high PDB

and consequent need for structure would be more prone to arrange brands in a methodical manner and to understand the position of a brand in an arrangement. Indeed, Lalwani and Forcum (2016) found that people high in PDB tend to use price more salient as it can be used as a cue to structure and rank objects. So it is possible that high PDB people would be more likely to perceive an implicit ranking from a structure such as a vertical display.

2.2.4. Fluency from the right structure

Processing fluency refers to the subjective feeling of ease and difficulty associated with any type of mental processing (Schwartz 2004, Kahn 2017, Graf et al. 2018). There has been considerable research in the benefits of processing fluency such as positive affect towards a product or brand (Janiszewski and Meyvis 2001; Novemsky et al. 2007; Schwartz 2015), greater attractiveness of stimuli (Reber, Schwartz and Winkielman 2004; Landwehr et al. 2011), choice satisfaction (Schwartz 2004; Labroo et al. 2008), greater variety perception (Morales et al. 2005; Deng et al. 2016; Hoch et al 1999; Kahn and Wansink 2004), more heuristic processing (Alter et al. 2007), greater choice confidence (Schwartz 2015) and decrease choice deferral (Novemsky et al. 2007). Previous research found that greater processing fluency ensues when there is a fit (Lee and Aaker 2004). For instance, Lee and Aaker (2004) showed that when an individual's regulatory focus goal fits with message framing, the person feels greater fluency in their message processing.

2.3 Hypothesis development

2.3.1. PDB and Display Orientation

People in high PDB would require greater need for structure and be able to rank products. The question is, which kind of structure would be most fluent for them. I propose that products when arranged vertically would facilitate greater fluency with the PDB induced need for structure, as vertical arrangements are concomitant with power, hierarchy and ranking as discussed earlier. I predict that a vertical structure would induce people in high PDB to easily find a pattern and implicit ranking of products which would be congruent with their beliefs of hierarchy.

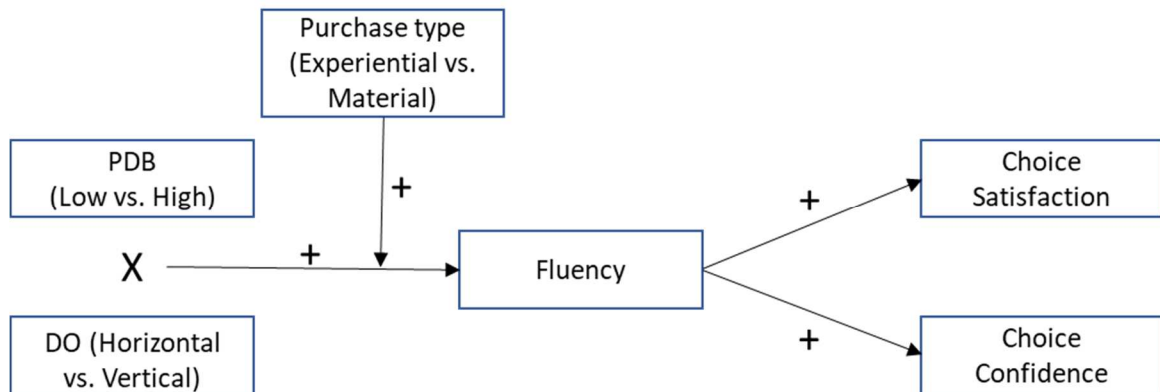
A horizontal display would be preferred less by the high PDB because it would not provide any implicit ranking, nor would it reflect a hierarchy. For low PDB, on the other hand, the horizontal display would be fluent not only with their field of vision but also with the implicit equality a horizontal structure exudes, albeit this congruence would be a weak effect since the need for structure would inherently be low in low PDB people. For high PDB people the incongruency with the horizontal structure would cause lower fluency as the products would be difficult to rank, or not come with an implicit ranking. This would cause lower satisfaction with their choice.

H1: People with high (low) PDB would have a greater choice confidence from a vertically (horizontally) arranged choice set

H2: People with high (low) PDB would have greater choice satisfaction from choosing a product in a vertically (horizontally) arranged choice set

H3: The effect of PDB on choice confidence and choice satisfaction is mediated by processing fluency.

Figure B1: Conceptual Model



2.3.2. Moderation by Purchase Type- Material vs Experiential

However, I expect the interaction between display orientation and power distance beliefs would be moderated by the purchase type. The moderating effect of purchase type would be greater for material products than for experiential products. Experiential purchases are defined as those purchases made with the aim of acquiring a life experience while material purchases are those made with the aim of acquiring a material possession, something which is tangible (Van Bowen and Gilovich 2003). Some examples of material products would be laptops, mugs, sofas, clothes which are all possessions, while experiential products would include going to movies, concerts, vacations, restaurants etc., all related to some life experience. One critical difference between the two is the perception of objective quality. Material products, due to their tangible nature, have attributes which are more comparable and hence elicit greater comparison (Carter and

Gilovich 2010). This leads to a greater tendency focusing on objective quality for material products (Dai et al. 2020) and quality judgements rely on a ranking of options (de Langhe et al. 2016; Spiller and Belegolova 2017).

Hence, I believe that the effect would be accentuated for material products in high PDB people such that they would prefer material products which are arranged vertically as it is easily ranked and hence an implicit cue is provided. High PDB people would not prefer a horizontal layout as it provides no cue, and increases the tendency to compare amongst products which makes it more difficult to take a heuristic decision. However, low PDB people have a lower tendency to order (Lalwani and Forcum 2016) and hence less on heuristic cues and thus would want to compare more across the attributes and hence prefer material products which are arranged horizontally.

For experiential products, the reasoning would be different and would need a more in-depth explanation, since there is no prior research which has looked at the evaluation of experiential purchases by high or low PDB people. Prior research suggests that people derive happiness from experiential product for three possible reasons (Gilovich and Gallo 2019)- the ability to relate to others (Chan and Mogilner, 2017; Howell and Hill 2009; Yamaguchi et al. 2016; Kumar et al. 2019), an expression of self identity (Hornik and Diesendruck 2017; Kim, Seto, Christy and Hicks 2016; Carter and Gilovich 2012) and the fact that they are evaluated on their own terms (Carter and Gilovich 2010). Previous research has shown that people do not prefer review ratings for experiential purchases as “they do not like being told what to do” (Dai et al. 2020) but on the other hand, we also know that people with high PDB rely more on authority cues for experiential products like celebrity endorsements (Winterich et al. 2019). So people high

in PDB need cues, and I propose that they need to be able to relate to others rather than promote their own identity in order to derive happiness from their experiential purchase. This would help them make sense of the external world and fit their need for structure. On the other hand, those low in PDB are less likely to prefer a hierarchy and would tend to express their identity more strongly and thus they would derive satisfaction from their experiential choice where their identity is more easily reflected. In addition, people in high PDB are less likely to engage in intergroup social comparisons and more towards interpersonal social comparisons (Guimond et al. 2007) and a fundamental component of such a social comparison is perceived similarity (Tajfel 1981) in that people like to find more in common with their in group. This is also seen in Wang et al. (2018) where there is greater social categorization for high PDB people. The vertical structure should make it easier to categorize and identify the top position as more favorable and more related to the in group.

Hence for experiential products, a vertical orientation would still be preferred by high PDB people, as it provides an implicit cue of ranking which relates to an external cue, and in addition, social proof which would aid in relatedness with their in-group. For low PDB people, on the other hand, their need for cues are lower. It could be inferred that they would prefer fewer external cues and rely more on internal cues (Dai et al. 2019). In addition, they would prefer something more unique to themselves, and research has shown that perceptions of uniqueness are higher in conditions of higher perceived variety (Whiteley et al. 2018). Since perceived variety is higher in the horizontal orientation (Deng et al. 2016), this would help low PDB people find a more unique product for themselves. In addition, the horizontal layout would be more in sync with their low PDB

related beliefs of equality. Hence low PDB people would derive greater choice satisfaction from experiential products displayed horizontally than vertically.

Another explanation could be that Dai et al. (2020) found that people do not prefer reviews for experiential products as these are matters of personal preferences. Now their sample was from the US, and hence it can be assumed that the PDB was low. However, Winterich et al. (2020) found that people with high PDB prefer celebrity cues as they signal authority and aid in heuristic decision making. I propose that the vertical layout itself can act as a heuristic cue such that products at the top are perceived to be of better quality or more preferred. The implicit ranking structure substitutes for authority in this case. On the other hand, for people in low PDB, they would prefer the horizontal structure as it is fluent with their beliefs of equality.

In sum, the implicit ranking caused either by the tangible and rankable characteristics of material products or the social characteristics of experiential products would result in greater fluency for high PDB people. In both these cases, the fit between the purchase type, display mode and PDB would lead to greater fluency.

However, I expect that the effect will be stronger for material products since there is a more direct relationship between implicit ranking and quality perceptions, but for experiential products, the mediating sequence is longer and hence a weaker effect would be predicted.

H4: Purchase type will moderate the interaction of PDB and display orientation such that there will be a stronger effect on choice satisfaction and confidence for material products compared to experiential products due to fluency.

2.3.2. Overview of Studies

In order to test the hypotheses, I ran three experiments. In the first experiment, I checked whether people would find greater fluency and satisfaction from choosing a product displayed in a manner compatible with their power distance beliefs. In the second study, I investigated whether this would be influenced by the purchase type (experiential vs. material). In the third study, I manipulated the type of experiential vs material stimuli by framing the same product either materially or experientially.

2.4. Methodology and Findings

2.4.1. Study 1

The purpose of this study was to test whether PDB would influence the level of fluency and choice satisfaction and confidence from products displayed either horizontally or vertically.

Participants and Procedure. I recruited 187 participants from a large US university to participate in an online survey and they were randomly allocated to one of four conditions of a 2 (PDB: Low vs. High) x 2 (Display Orientation: Horizontal vs. Vertical) between subjects design. In order to control for the effects of different devices (e.g. smartphones, tablets), I filtered only those who responded on a laptop or PC and thus I was left with 115 participants ($M_{age} = 20.54$; Female = 66.95%).

Method

In order to manipulate PDB, a sentence completion task based on a standard social cognition prime (Srull and Wyer 1979) was used (Zhang et al. 2010). Here, participants were presented with a set of jumbled sentences, which they had to reform. In the high (low) PDB condition, participants completed ten sentences related to social hierarchy (equality). After that the participants had to write a short paragraph on why they agreed with social hierarchy (equality). Three items (e.g. “For the time being, I mainly think that”; “At this moment I feel that”; “On top of my mind are thoughts in agreement with saying that”) anchored on a bipolar seven point scale (Social hierarchy is

important=1 and Social equality is important = 7) from Zhang et al. (2010) (Cronbach's alpha=.922) were used as a manipulation check.

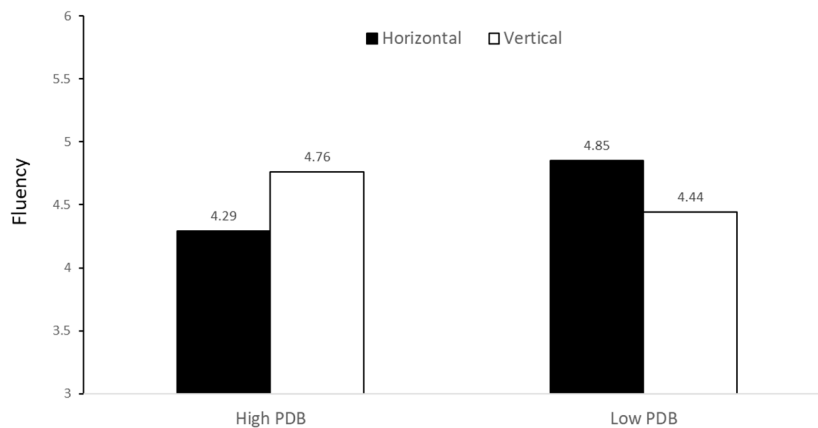
After the manipulation, participants were directed to an ostensibly separate study. Here they were shown a display of four laptops which were presented either horizontally or vertically. They were directed to choose one. After making their selection, the participants then answered questions about their choice satisfaction using a three item scale ("I am happy with the choice I made", "I am satisfied with the choice I made" and "I am confident that my choice will satisfy me"; 1 = strongly disagree, 7 = strongly agree; Deng et al. 2016; Cronbach's alpha = .955). I then measured their choice confidence using a two item scale ("*I feel confident about the choice I made*" and "*I feel certain about the choice I made*"; 1 = strongly disagree, 7 = strongly agree; Andrews 2013; Cronbach's alpha = .962) and fluency using three items adopted and modified from previous research ("I found it easy to choose an option", "I found the process of choosing smooth" and "Making this decision was difficult for me (R)"; 1 = strongly disagree, 7 = strongly agree; Cronbach's alpha = .902; Lee and Aaker 2004, Graf et al. 2018).

Results

Manipulation check. The manipulation was directionally successful ($F(1,113) = 2.42, p=.12$) with those in the low PDB condition reporting a directionally higher preference for social equality ($M=5.32; SD = 1.47$) while those in the high PDB condition reported a relatively higher preference for social hierarchy ($M = 4.84; SD = 1.72$).

Fluency. To test for fluency, I ran a two-way ANOVA with PDB and display orientations as the independent variables and fluency as the dependent variable. The results indicated that there was no main effect of PDB ($F(1,111) = .163, p = .687$) and no main effect of display orientation ($F(1,111) = .007, p = .932$). More importantly, there was no significant effect of the interaction between the two terms ($F(1,111) = 2.43, p = .12$). However, while the means were in the predicted directions, such that those in the high PDB condition found the vertical display more fluent ($M=4.76; SD = 1.53$) compared to the horizontal display ($M = 4.29; SD = 1.68$) while those in the low PDB condition found the horizontal display more fluent ($M = 4.85; SD = 1.41$) compared to the vertical display ($M = 4.44; SD = 1.49$), none of the contrasts were significant.

Figure B2: Fluency of high vs low PDB participants from horizontal and vertical display orientations in study 1

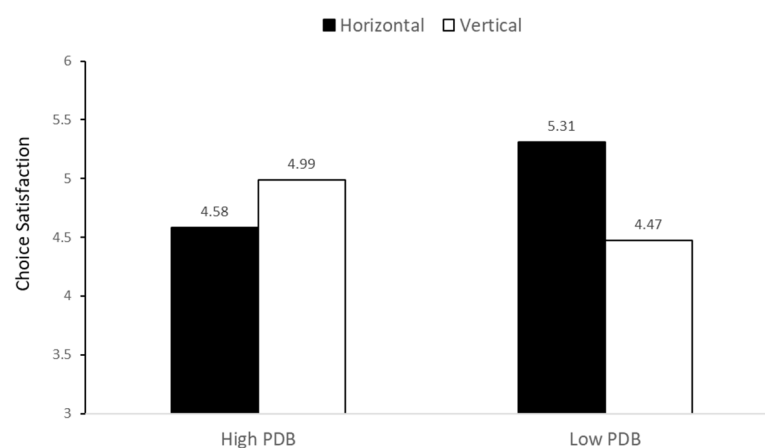


Choice Satisfaction. A two way ANOVA revealed no significant main effect of PDB ($F(1,111) = .127, p = .723$) or display orientation ($F(1,111) = .529, p = .469$). However, there was a significant interaction effect ($F(1,111) = 4.508, p = .036$).

However, a planned contrast showed that those in the high PDB condition were not significantly ($F(1,111) = 1.02, p = .31$) more satisfied with their choice ($M = 4.99$; $SD = 1.58$) when the options were presented vertically than when they were presented horizontally ($M = 4.58$; $SD = 1.52$). However, those in the low PDB condition were more satisfied ($F(1,111) = 3.91, p = .051$) with their choice ($M = 5.31$; $SD = 1.39$) when the options were presented horizontally than when they were presented vertically ($M = 4.47$; $SD = 1.70$). Thus, H2 was partially supported.

Choice Confidence. A two-way ANOVA revealed no significant effect of either PDB ($F(1,110) = .445, p = .506$) or display orientation ($F(1,110) = .321, p = .572$) or the interaction of PDB and display orientation ($F(1,110) = .713, p = .400$). Those in the high PDB had a choice confidence from vertical display of ($M = 4.84$; $SD = 1.66$) compared to that from a horizontal display ($M = 4.40$; $SD = 1.81$; $F(1,110) = 1.05, p = .308$) while those in the low PDB had a choice confidence from horizontal display ($M = 4.88$; $SD = 1.59$) and that from vertical display ($M = 4.79$; $SD = 1.56$; $F(1,110) = .037, p = .848$).

Figure B3: Choice satisfaction of high vs low PDB participants from horizontal and vertical display orientations in study 1



Discussion

The results of this study show some preliminary evidence in support of the hypotheses, even if it was not fully significant for the fluency. Those high in PDB found greater choice satisfaction from a vertical display while those low in PDB found greater choice satisfaction from a horizontal display. The results for fluency were in a similar direction, albeit slightly mitigated. A limitation in this study is that the manipulation of PDB was not very strong, and as such, in future studies I look at some alternate means of manipulating PDB. In addition, the sample size was small so I planned for a larger sample in the following study.

2.4.2. Study 2

In the previous study, I used only one product type (laptop). In order to further test the influence of different purchase types (experiential vs material), I included two different product types to represent these conditions. Based on the listing provided by Dai et al. (2020) for different product categories ranked according to how experiential or material they are, I chose two different products to represent either end of the scale. For experiential purchases, I chose restaurants while for material purchases, I chose staplers. In addition, as the PDB manipulation was not strong in the previous study, in this study I decided to use a different manipulation (Xu et al. 2021).

Participants and Procedure. I recruited 318 Mturkers ($M_{age} = 43.83$; Female = 54.7%) and randomly allocated them to one of eight conditions of a 2 (PDB: Low vs High) x 2 (Purchase Type: Experiential vs. Material) x 2 (Display Orientation: Horizontal vs. Vertical) between-subjects design.

Method

In the previous study, the PDB manipulation was not strong. So in this study, I tried a different manipulation. Participants were first presented with the PDB manipulation task involving a perspective taking task and writing task (Xu et al. 2021). Here, participants read a short description of a low or high PDB culture and made to imagine themselves living in that society. Participants then completed a writing task listing reasons why there should be equality or hierarchy in the office between employees and managers. After that, they were directed to an ostensibly different study where they were asked to imagine that they had a coupon and they had to make a choice of purchase. They were then presented with four choices of either Italian restaurants or staplers and asked to choose their preferred option. All the options were randomly counterbalanced. After that, they were asked to respond to questions about their choice satisfaction, confidence, and fluency. All three of these were measured on a nine-point scale. They also answered a manipulation check question on how material or experiential they felt the options were on a nine point bipolar scale anchored with (“purely material” =1; “purely experiential” =9). The survey ended with demographic questions.

Results

After removing those who participated using a mobile device, I was left with 291 participants ($M_{\text{age}} = 44.01$; Female = 53.3%).

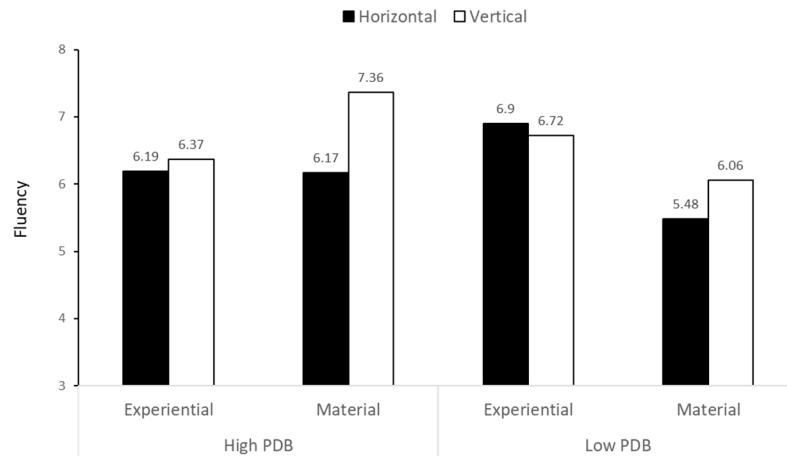
Manipulation check. A one-way ANOVA revealed that the PDB manipulation was successful ($F(1,289) = 30.08$; $p < .001$). Those in the low PDB condition reported a

higher preference for social equality ($M = 5.46$; $SD = 1.64$) while those in the high PDB condition reported a higher preference for social hierarchy ($M = 4.30$; $SD = 1.96$).

A one-way ANOVA also revealed that the manipulation of purchase type was also successful ($F(1,289) = 275.06$; $p < .001$). Those presented with the options of restaurants reported the options to be more experiential ($M = 7.62$; $SD = 1.98$) while those presented with staplers reported the options to be more material ($M = 2.96$; $SD = 2.75$).

Fluency. To control for demographic variables, I used income, age and education as covariates as all three were significant in the model. A three way ANOVA revealed that there was no main effect of PDB ($F(1,280) = 1.29$, $p = .258$), a significant main effect of purchase type ($F(1,280) = 9.62$, $p = .002$) and a marginal effect of display orientation ($F(1,280) = 2.97$; $p = .091$). None of the first order interactions were significant. More importantly, there was a marginal effect of the three-way interaction between PDB, purchase type and display orientation ($F(1,280) = 3.66$, $p = .057$). As expected, those in the high PDB condition found it easier to choose the material product when it was displayed vertically ($M = 7.36$; $SD = 1.30$) than when presented horizontally ($M = 6.17$; $SD = 2.26$; $F(1,280) = 4.61$, $p = .033$). However, this effect was not present ($F(1,280) = .091$, $p = .764$) for experiential purchases ($M_v = 6.37$; $SD = 1.99$ vs. $M_h = 6.19$; $SD = 2.39$). For those in the low PDB condition, I found a no effect ($F(1,280) = .282$, $p = .596$) for material products ($M_h = 6.90$; $SD = 1.77$ vs. $M_v = 6.72$; $SD = 2.10$) and no effect ($F(1,280) = 1.89$, $p = .17$) for experiential products ($M_h = 5.48$; $SD = 2.39$ vs $M_v = 6.06$; $SD = 2.07$).

Figure B4: Fluency of high vs low PDB participants for choosing experiential vs material products from horizontal and vertical display orientations in study 2



Choice Satisfaction. A three-way ANOVA revealed no significant three way interaction ($F(1,280) = .568, p = .452$). None of the first order interactions were significant either as a two-way ANOVA showed no significant interaction effect of PDB and purchase type ($F(1,280) = .108, p = .743$) or of PDB and display orientation ($F(1,280) = .620, p = .432$) or of purchase type and display orientation ($F(1,280) = .355, p = .552$). None of the main effects were significant either with PDB having no significant effect ($F(1,280) = .467, p = .495$) or purchase type having no main effect ($F(1,280) = 2.23, p = .136$) or display orientation having no significant main effect ($F(1,280) = 2.49, p = .116$). The means were in a direction similar to those of fluency (e.g. for high PDB assessing material products, $M_{\text{vertical}} = 8.11; SD = .93$ vs $M_{\text{horizontal}} = 7.56; SD = 1.55$) but none of the contrasts were significant.

Choice confidence. A three-way ANOVA revealed no significant three-way interaction effect ($F(1,280) = 1.28, p = .259$). None of the second order interactions were significant either with no two way interaction between PDB and purchase type ($F(1,280) = .506, p = .477$) or between PDB and display orientation ($F(1,280) = .538, p = .464$) or between purchase type and display orientation ($F(1,280) = .066, p = .797$). There was no main effect of PDB ($F(1,280) = .066, p = .797$) or display orientation ($F(1,280) = 2.19, p = .14$). However there was a main effect of purchase type ($F(1,280) = 6.21, p = .013$). The means were in a direction reflecting fluency and choice satisfaction.

Discussion

In this study I tried to measure whether the interaction between PDB and display orientations would be moderated by different purchase types. There was some evidence that the levels of fluency were influenced, such that those in the high (low) PDB condition found it easier to choose from a vertically (horizontally) oriented display, and for high PDB this effect was accentuated for material products compared to experiential products. For low PDB, there is no effect for material products or experiential products. However, I did not find any carryover of this fluency on to the dependent variables like choice satisfaction or choice confidence. It is possible that due to choosing products from the extreme ends of the experiential-material scale, a ceiling effect was experienced.

2.4.3. Study 3

In the previous study, I had tested two different purchase types by having different prototypes. However, there may be other factors which influence how the products are perceived (such as involvement, arousal), and although I had pretested for

them, a more robust effect may be obtained through manipulating the purchase type by keeping the product constant and changing the framing. To do this, I used camera as a product and framed it either experientially or materially, along the lines of Dai et al. (2020).

Participants and Procedure. I recruited 207 students ($M_{\text{age}} = 21.69$; Female = 58.9%) from a large US university to participate in the study in lieu of course credit. They were allocated to one of eight conditions of a 2 (PDB: Low vs. High) x 2 (Purchase Type: Experiential vs. Material) x 2 (Display Orientation: Horizontal vs. Vertical) between-subjects design.

Method

Participants were first presented with the PDB manipulation task involving a perspective taking task and writing task as before. After that, they were directed to an ostensibly different study where they had to imagine they were about to purchase a camera to capture moments with their friends during the holidays. They were then presented with four camera choices, which were either framed experientially or materially by focusing on the experiential aspects of the camera such as going to a race and capturing pictures, or the more material and comparable features of the camera such as megapixels, processor type etc. (See Appendix) and then asked to make a choice. Participants then answered questions regarding fluency (Cronbach's $\alpha = .897$) and choice satisfaction (Cronbach's $\alpha = .94$) using the same items on nine-point scales as the previous study. In addition, I had a question to assess how experiential or material they perceived the options which were shown to them on a nine-point scale as before.

Results

Manipulation check. A one-way ANOVA revealed that the PDB was manipulated successfully ($F(1,205) = 37.37, p < .001$). Those in the low PDB condition reported a preference for equality ($M=5.46; SD = 1.50$) while those in the high PDB condition reported a preference for social hierarchy ($M = 4.05; SD = 1.80$).

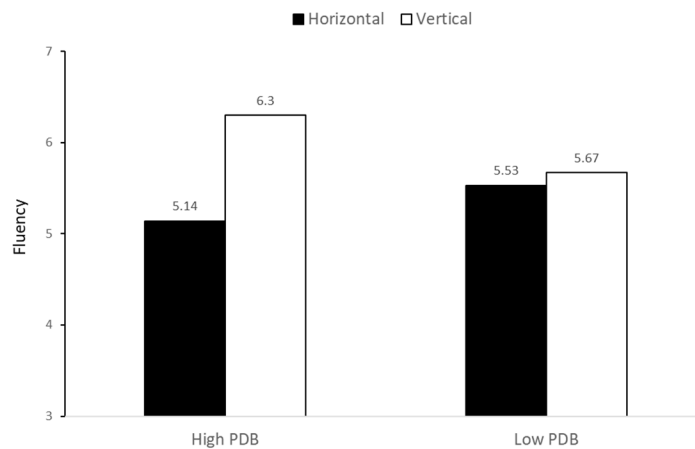
However, a one-way ANOVA revealed that the experiential vs material framing was not differentially perceived in experiential or material terms ($F(1,205) = 1.41, p = .236$) such that those in the experiential condition perceived the options as experiential ($M = 5.74; SD = 2.18$) compared to those in the material condition ($M = 5.34; SD = 2.57$).

Since the manipulation for the purchase type failed, for further analysis, I collapsed the two conditions and kept the perception of purchase type (experiential vs material) as a covariate to account for how differently participants may have perceived the two conditions.

Fluency. A two-way ANOVA revealed no main effect of PDB ($F(1,202) = .519, p = .472$) and a significant main effect of display orientation ($F(1,202) = 5.51, p = .02$). More importantly, there was a significant interaction effect of PDB and display orientation ($F(1,202) = 4.43, p = .037$). A contrast revealed that those in the low PDB condition did not perceive any significant difference in fluency when the options were presented horizontally ($M = 5.53; SD = 1.96$) or vertically ($M = 5.67; SD = 2.04; F(1,202) = .142, p = .707$). But those in the high PDB condition did perceive a significant difference in fluency such that those in the vertical condition ($M = 6.30; SD = 1.90$)

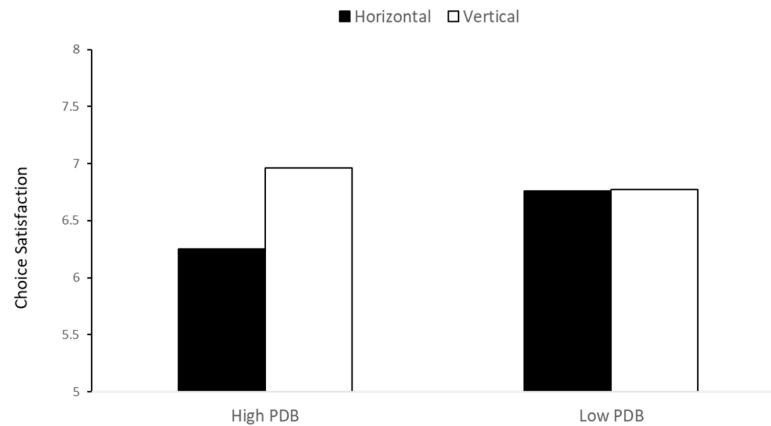
reported greater fluency than those in the horizontal condition ($M = 5.14$; $SD = 1.96$; $F(1,202) = 8.55, p = .004$).

Figure B5: Fluency of high vs low PDB participants from horizontal and vertical display orientations in study 3



Choice Satisfaction. A two way ANOVA revealed no main effect of PDB ($F(1,202) = .031, p = .859$) and a no main effect of display orientation ($F(1,202) = 2.19, p = .14$). More importantly, there was a marginally significant interaction effect of PDB and display orientation ($F(1,202) = 3.69, p = .056$). A contrast revealed that those in the low PDB condition did not perceive any significant difference in choice satisfaction when the options were presented horizontally ($M = 6.76$; $SD = 1.59$) or vertically ($M = 6.77$; $SD = 1.78$; $F(1,202) = .002, p = .964$). But those in the high PDB condition did perceive a significant difference in choice satisfaction such that those in the vertical condition ($M = 6.96$; $SD = 1.63$) reported greater fluency than those in the horizontal condition ($M = 6.25$; $SD = 1.97$; $F(1,202) = 4.16, p = .043$).

Figure B6: Choice satisfaction of high vs low PDB participants from horizontal and vertical display orientations in study 3

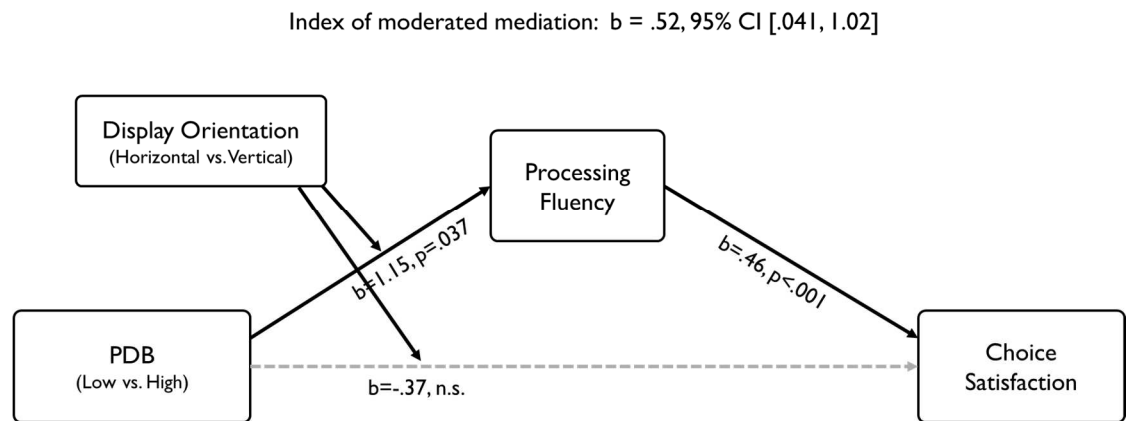


Choice Confidence. A two way ANOVA revealed no main effect of PDB ($F(1,202) = .255, p = .612$) and a no main effect of display orientation ($F(1,202) = .289, p = .346$). There was no significant interaction effect of PDB and display orientation ($F(1,202) = 1.36, p = .245$). A contrast revealed that those in the low PDB condition did not perceive any significant difference in choice satisfaction ($F(1,202) = .027, p = .870$) when the options were presented horizontally ($M = 6.57; SD = 2.06$) or vertically $M = 6.59; SD = 1.80$). Those in the high PDB condition did not perceive a significant difference in choice satisfaction ($F(1,202) = 2.16, p = .14$) such that those in the vertical condition ($M = 6.62; SD = 1.88$) reported greater fluency than those in the horizontal condition ($M = 6.11; SD = 2.23$).

Mediation. To test the mediation pathway, I ran PROCESS Model 8 with PDB as the predictor variable, display orientation as the moderator, choice satisfaction as the

dependent variable and fluency as the mediator with the perception of purchase type as the covariate. The results showed that there was a significant interaction effect of display orientation and PDB on fluency ($b = 1.15$; $SE = .54$; $t(202) = .037$) and a significant effect of fluency on choice satisfaction ($b = .46$; $SE = .05$; $t(203) = 9.06$, $p < .001$). More importantly, the index of moderated mediation showed a fully mediated indirect effect ($b = .52$; $SE = .26$, 95% CI [.041,1.02]).

Figure B7: Index of moderated mediation in study 3



Discussion

The purpose of this study was to see whether people derive greater fluency and choice satisfaction from different purchase types displayed according to their power distance beliefs. Here, I tried to manipulate the purchase type by framing the product as experiential or material, but since that did not work, the purpose of this study was limited to testing H1 through H4 after collapsing the conditions. The evidence supports these hypotheses. Participants derived greater choice satisfaction from display orientations aligned according to their power distance beliefs, and this was mediated through fluency.

2.5 Conclusion

2.5.1. Summary of Findings

The purpose of this article was to examine the effects of power distance beliefs on how people evaluate products displayed vertically or horizontally and the moderating role of experiential and material purchase types. I had predicted that the vertical display would provide for a better fit with high power distance beliefs and the ensuing fluency would result in greater choice satisfaction. This is because people in high power distance have a greater need for structure and heuristic processing, and the vertical orientation would provide a cue to making their choice of product easier. This could be a quality cue of an implicit ranking for material products, or a cue of social proof or conformity from the implicit ranking for experiential products. On the other hand, a horizontal display would have a better fit with low power distance belief people, yet the effects would be weaker. This was borne out, to some extent, in the studies that I conducted. In study 1, I saw some evidence for the main interaction effect of PDB and display orientation affecting fluency and choice satisfaction. In study 2, I investigated how this effect was attenuated or accentuated for experiential and material products respectively. In the further studies, I varied how the extent to which the products were experiential or material based on the context or the framing and got results which partially validated the hypotheses.

In all the studies, while there was some evidence for high (low) PDB participants finding the vertical (horizontal) displays easier to choose from and deriving greater

satisfaction from their choice, there was no evidence of their deriving greater choice confidence.

A question may arise as to why the biological force of the field of vision is overcome by a social cognitive force like power distance beliefs and verticality. It is important to note that in this case, that the social cognitive force of a congruent structure with the power distance belief is operating in a direction opposite to that of the biological force of field of vision. The latter promotes fluency in a horizontal direction, while the former promotes fluency in the vertical direction. However, there is another force operating at a gestalt level- the shape or frame. If a shape is vertical, then automatically our eyes are prepared to move in a vertical direction. If horizontal, then eyes are prepared to move horizontally. In fact, in some of the experiments of Shi et al. (2013), Deng et al. (2016) and Jang and Yoon (2016), they draw vertical or horizontal lines in a matrix display in order to orient vision in a certain direction. This implies that the biological effect can be overcome by a framing. Secondly, in the experiments of Deng et al. (2016), the effect of more efficient processing vanished after some time, i.e. under no time constraints, it dissipated. This implies that our eyes can adapt. Now it is important to note that the cues like lines are explicit cues. However, the cue I provided is a more implicit psychological cue of verticality. But I predict that this would still be strong enough to overcome the biological field of vision force.

2.5.2. Theoretical Contributions

The findings contribute to cross cultural, display layouts, fluency and the experiential-material literature. While previous cross-cultural literature was more

influenced by the individual-collectivist construct, there has been growing interest in power distance beliefs. This is important in two aspects. Firstly, power distance beliefs are endemic to different countries and hence this is easy to map. Secondly, this is something which can also be manipulated, and so any antecedent of power distance beliefs can be assumed to have a similar consequence of power distance beliefs, in as much of its role as a potential mediator in itself. In addition, I bring out the phenomenon of implicit ranking where people, especially in high PDB, have a greater tendency to rank products and use display cues as a mechanism to do that. I also further contribution to the literature on product display layouts by showing different conditions under which a horizontal or vertical layout may be more suitable. This also addresses the call for more research in the field of display orientations from a cultural perspective (Kahn 2017; Deng et al. 2016). I also contribute to the experiential-material literature by showing how the evaluation of these products maybe influenced by both power distance beliefs and display layouts and show a mediating role of quality perception or social proof linked to these purchase types. In addition, previous research in the experiential-material domain has focused on the post purchase evaluation of these purchase types, but there have been calls for greater understanding of the pre-purchase phase (Gallo et al. 2017) and this research addresses that by looking at a cultural dimension.

2.5.3. Managerial Implications

This study has important managerial implications. Different cultures respond differently to different types of communications and product displays can also communicate certain aspects about a product which may be interpreted differently in different cultures. It maybe pertinent to finding a fit with the power display beliefs of

different cultures and displaying products vertically or horizontally as the case maybe to ensure greater satisfaction with the choices people make. In addition, I saw strong position preferences for those high or low in PDB depending on the type of display orientation, so managers may need to keep that in mind also.

2.5.4. Limitations and Directions for Future Research

This research has focussed on power distance beliefs as the main cultural variable, but other variables may also be explored. Shavitt et al. (2006) had introduced the concept of verticality and horizontality which was to be seen in conjunction with independent-collectivist cultures, which would result in four dimensions. Perhaps the results could be different in such cases. In addition, for experiential purchases, there needs to be further exploration regarding the mediating process from power distance beliefs to choice satisfaction. This would help resolve the difference in results found by Winterich et al. (2020) and Dai et al. (2020) in terms of the effects of external cues like reviews or endorsements for experiential purchases. Moreover, this research tested participants on laptops and PC monitors, but mobile phones present a somewhat different set of characteristics especially in the vertical orientation of the screen itself, and this is something which needs further study. Another aspect is the position of people in the social hierarchy. Previous research (Kim and Zhang 2014, Gao et al. 2016) has shown that people in high PDB prefer higher status products, but this is moderated by the position of people in the social hierarchy such that people high in PDB but low in the social hierarchy would prefer more status consumption compared to those higher in the hierarchy. The question is would it affect their choice in terms of location in the vertical array.

This research had some limitations in terms of the results obtained. Some of the hypotheses were not completely validated, or had marginal effects in some cases. Secondly, I did not use samples from different cultural areas such as geographies with traditionally high PDB (e.g. Asia) versus geographies with traditionally low PDB (e.g. North America). However, there would be greater validation, and possibly stronger results, if the samples were congruous with their beliefs. In addition, the purchase type as a moderator did not show strong effects, and this is possible due to how the options were selected or framed.

2.6 Conclusion to the dissertation and additional thoughts

This dissertation sought to explore how product display orientations can elicit different levels of choice satisfaction or confidence depending on the purchase type or cultural aspects like power distance beliefs. Display orientations remains a ripe and evergreen field of study. In an era of information abundance, consumers are looking for ways to minimize the effort required for sifting through the multitude of options available for satisfying their unending needs. This is a profoundly different paradigm from the previous era of information scarcity and asymmetry. As such, any tools or mechanism which can make life easier for consumers would hold great relevance. While there are plenty of filtering and targeting algorithms abound, those are a costly measure and require the processing of humongous amounts of data. In contrast, tailoring display orientations to suit customer needs is a relatively less costly measure from a retailer's perspective to make choosing easier and thereby more satisfactory for their consumers. Of course, this cannot be seen in isolation, nor act as a substitute, and would have to be part of the marketing repertoire of an online retailer, but it is relatively easy to identify

purchase types (experiential vs material) as also the attendant display orientation, and so from a retailer's point of view, this can serve as an effective method to make life easier for their consumers, even in different cultural moorings.

Product displays themselves can be said to have an evolutionary pathway. The pre-digital era or which I call display orientations 1.0 was constrained by the structure of the shelf and the forces of gravity. In essence, most of the display was done horizontally simply because the retail shelf was structured in that manner. The vertical aspect received relatively less attention. However, with the advent of the digital age, products could be displayed horizontally or vertically or in a matrix format. This is the current age of display orientations 2.0 and here, the major constraint is the size of the screen and the potentially large amount of information available to consumers. The fifteen inch desktop or the five inch smartphone screen is still a major hurdle to effectively displaying products within the entire span of the human field of vision. However, we are on the cusp of a paradigm shift in how products can be displayed. The new era, display orientations 3.0, will be on virtual reality platforms like the meta. Here, the display is no longer constrained by the physical structure of the shelf or the size of the screen. The only constraint now is the human imagination. This era will see products displayed in myriad forms and patterns, and walking through the aisle will no longer be the same. People will experience dynamic displays, changing, as if in a house of magic and mystery. The level of personalization will be unprecedented. And with the internet of things already in full flow, how and more importantly what products would be displayed and how they would be displayed would be the subject of great interest amongst marketers and researchers alike.

Thoughts on the nature of experiential vs material products

A lot of research has focused on how experiential vs material consumption elicits different feelings amongst different people, the most popular being the experiential advantage. Yet, there still remains a lot of conjecture on what exactly constitutes an experiential or material product- are they different or the same? Are they a dichotomy or a continuum? Are they disentangled or inexorably intertwined?

In this section, I will try to go deeper into the roots of this problem from the first principles.

What is a material product? It can be thought of as something which is tangible and something which you possess. Yet this does not do true justice to its meaning. A TV which one has not bought is also a material product which you do not possess but potentially can.

At its core, shorn of all other adjectives, a material product, or a 'material' is something which occupies space. To be tangible, it has to be solid. Hence it is something which occupies space and is also dense enough to be touched, unlike a gas.

So what then is an experience? It is something which we can sense, and is mediated by our sensory organs such as sight, hearing, tasting, smelling, touching, feeling. In essence, an experience can only be manifest in the presence of these organs. Something material would exist without those. When we see the sun, it is an experience, when we eat food, it is an experience. At its core, an experience is an action of some sort as the definition of an experiential purchase says (van Boven and Gilovich 2003), and hence it occupies time. Any experience necessarily has to be a function of time.

How then are the two related? To further understand this, I will invoke some of the thoughts which have been enunciated in the discipline of physics.

The first principle is the space time continuum. Physicists have understood that anything which occupies space also occupies time. Space cannot exist without occupying time and vice versa. Hence time is the fourth dimension (the other three being the xyz axes of space). And thus, we have the first connection between material and experiential products- material products as a function of space are also experiential by virtue of the time dimension.

The second principle is the transference of energy. We know Einstein's famous mass energy relationship $e=mc^2$. Basically, what it says is that mass can be converted into energy and vice versa, and the unit that connects the two is the speed of light squared. Since materials are essentially mass, and experiences are essentially actions which consume or produce energy, all materials are potentially experiential, and all experiences are potentially materials.

To put it simply, any experience needs a material to manifest itself. And all materials are experiential. Materials are a lower energy state compared to experiences. Materials are consolidated energy while experiences are expanded mass.

In other words, the material experiential dichotomy is a false dichotomy, the two are one and the same, just experienced differently. Everything in this world is energy, just at different levels of consolidation. Everything is an experience, manifest only because we sense its material nature. Even smell is material as we take in the molecules of the aroma and they are sensed by the olfactory glands. In a way the molecules of the aroma

are tangible from the perspective of olfaction. We hear sound which is actually a mechanical wave or disturbance in the air, which again is gaseous. Sight is again electromagnetic waves, which already interacted with materials to show them off. The only limitation for a human being is the limitation of our sense organs (e.g. a dog can hear frequencies which we cannot).

The only pure experience is that of human consciousness itself, but even that needs the body to actually manifest. Another way to look at it is the Indian philosophical concept of Shiva (that which abides) and Shakti (female energy) existing in union as Shivshakti. It is all a continuum, the same differentiated into parts to realise the oneness. Thus, can that which we possess, be different from our actions? The act of possession is in itself an action, albeit one consuming lower energy and having a higher duration. All actions need some material platform to manifest, and all materials are potential sources of action or being acted upon. Hence experiences and materials cannot be seen separately from one another but seen only in unison.

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APPENDICES

APPENDIX A: MEASURES OF ESSAY 1

Measures of the dependent variables used in study 2, study 3 and study 4 and mediator (fluency) in study 3 and study 4. Study 3 and 4 used 9 point scales while study 2 used a 7 point scale with “strongly agree” anchored at scale point 7.

Choice Satisfaction

I am happy with the choice I made (Strongly disagree 1 – Strongly agree 9)

I am satisfied with my choice (Strongly disagree 1 – Strongly agree 9)

I am confident that my choice will satisfy me (Strongly disagree 1 – Strongly agree 9)

Choice Confidence

I feel confident about the choice I made (Strongly disagree 1 – Strongly agree 9)

I feel certain about the choice I made (Strongly disagree 1 – Strongly agree 9)

Fluency

I found it easy to choose an option. (Strongly disagree 1 – Strongly agree 9)

I found the process of choosing smooth (Strongly disagree 1 – Strongly agree 9)

Making this decision was difficult for me (Strongly disagree 1 – Strongly agree 9)

Measure of Experiential-Material in Study 2

To what extent would you consider your choice to be material or experiential?
(Purely material 1 – Purely experiential 9)

A material purchase is one where you acquire something for your possession (something to have) while an experiential purchase is one you use for experiencing an activity (something to do).

Similarity (Study 2)

I found the options to be quite similar to each other (Strongly disagree 1 – Strongly agree 9)

Comparability (Study 4)

I found the options idiosyncratic (Strongly disagree 1 – Strongly agree 9)

APPENDIX B: MEASURES OF ESSAY 2

Manipulation check for PDB

Please answer the following questions (1=Social Hierarchy is important, 9 = Social Equality is important)

For the time being, I mainly think that

At this moment, I feel that

On top of my mind right now are thoughts in agreement with saying that

Choice Satisfaction

I am happy with the choice I made (Strongly disagree 1 – Strongly agree 9)

I am satisfied with my choice (Strongly disagree 1 – Strongly agree 9)

I am confident that my choice will satisfy me (Strongly disagree 1 – Strongly agree 9)

Choice Confidence

I feel confident about the choice I made (Strongly disagree 1 – Strongly agree 9)

I feel certain about the choice I made (Strongly disagree 1 – Strongly agree 9)

Fluency

I found it easy to choose an option. (Strongly disagree 1 – Strongly agree 9)

I found the process of choosing smooth (Strongly disagree 1 – Strongly agree 9)

Making this decision was difficult for me (Strongly disagree 1 – Strongly agree 9)

Measure of experiential-material

To what extent would you consider the items you saw to be material or experiential? (1=purely material-9=purely experiential)

APPENDIX C: MANIPULATIONS OF ESSAY 2

Study 1 PDB manipulation

Sentence unjumbling task

In the next section, you will be presented with some jumbled sentences. You need to remake the sentence in the correct form.

Low PDB:

Social order for is hierarchy our unnecessary.

Not necessary subordinates to superiors our social order obedience from is for.

Equal everyone created is.

World in this a social hierarchy not should be this.

Function to properly subordinates is unnecessary from obedience for society.

Is unimportant to maintain order in society a hierarchy.

Equality to it is maintain important.

To obey professors students don't need to function properly for a classroom.

Place in an equal everyone has an organization.

In necessary society equality is.

Writing task

Please read the below sentence. Then give us three reasons why you would disagree with the sentence.

There should be an order of inequality in this world in which everyone has a rightful place; high and low are protected by this order.

High PDB:

Social order for is hierarchy our necessary.

Necessary subordinates to superiors our social order obedience from is for.

A defined place have should everyone high or low.

World in this a social hierarchy should be this.

A defined place have should everyone high or low.

Is important to maintain order in society a hierarchy.

To maintain social order it is important even if power is unequal.

Obey professors students must to function properly for a classroom.

An organization has a place in everyone even if high or low.

Are necessary differences in power to maintain order.

Writing task

Please read the below sentence. Then give us three reasons why you would agree with the sentence.

There should be an order of inequality in this world in which everyone has a rightful place; high and low are protected by this order.

Study 2 and 3

PDB Manipulation

Perspective Taking Task: In the first part of this study, we are interested in how people understand different cultural values. You will be asked to complete a simple perspective-taking task and answer a short question.

Low PDB reading task:

This month is cultural awareness month with the main goal to encourage peoples' mutual understanding of different cultures. One of the topics is the appreciation of values in an equal society. Now please imagine yourself living in a society which values **equality**.



To do so, please try to appreciate each of the following beliefs which are common in an **equal** society.

- Hierarchy is unnecessary for social order.
- Everyone is created equal.
- It is unimportant for society to maintain a hierarchical order.
- Everyone has an equal place, even in an organization.
- Equality is necessary in society.

Low PDB writing task

One context this cultural value frequently applies is a workplace setting (i.e. equality is often encouraged). Can you briefly describe why it may be a good thing for superiors (e.g. managers) to respect their subordinates (e.g. workers) and treat subordinates as their own equals? Why may it be important to have this superior-subordinate equality?

High PDB reading task:

This month is cultural awareness month with the main goal to encourage peoples' mutual understanding of different cultures. One of the topics is the appreciation of values in a hierarchical society.

Now please imagine yourself living in a society which values **hierarchy**. To do so, please try to appreciate each of the following beliefs which are common in a **hierarchical** society.



- Hierarchy is necessary for social order.
- Everyone should have a defined place, either high or low.
- It is important for society to maintain a hierarchical order.
- Everyone has a high or low place, even in an organization.
- Power differences are necessary to maintain social order.

High PDB writing task

One context this cultural value frequently applies is a workplace setting (i.e. a formal hierarchy often exists). Can you briefly describe why it may be a good thing for subordinates (e.g. workers) to respect the authority of their superiors (e.g. managers)? Why may it be important to have this power difference?

APPENDIX D: STIMULI OF ESSAY 1

Stimuli of Study 1

Experiential purchase / Horizontal display



Cancun, Mexico

- White sands, Lapis blue waters, and sunny skies
- Close to the beach bar
- Activities like parasailing, scuba diving, and dolphin swimming



The Alps, Switzerland

- Stay in the Heritage hotel at the Top of Europe - Jungfrauoch
- Guided night sledding including cheese fondue dinner
- Activities like skiing and paragliding



New York City, USA

- Stay in the middle of Manhattan, near Times Square
- Go to the Met Museum and the Central Park.
- Enjoy world-class shows on Broadway



Grand Canyon, USA

- Enjoy the breathtaking views of the Grand Canyon
- Multitude of restaurants, gift shops, and lodging options
- Hike around daytime and stargaze at night



Riding Forest, Canada

- Stay in a forest house at Elk-Glen, Manitoba, Canada
- Try freshwater fishing on serene lakes
- Experience forest trails and watch animals like bear, moose, and elk

Material purchase / Horizontal display



Ruko F11 Pro Drone

- 5k Ultra HD camera
- 120 Degrees Field of Vision
- 40 min flight time
- 300m range



Potensic T35 GPS Drone

- 4k Ultra HD camera
- 110 Degrees Field of Vision
- 60 min flight time
- 300m range



Holy Stone HS120D Drone

- 4k Ultra HD camera
- 120 Degrees Field of Vision
- 45 min flight time
- 400m range



Contixo F20 Drone

- 4k Ultra HD camera
- 110 Degrees Field of Vision
- 30 min flight time
- 600m range



Marsmo B4W Drone

- 2k Ultra HD camera
- 120 Degrees Field of Vision
- 60 min flight time
- 400m range

Experiential purchase / Vertical display



Cancun, Mexico

- White sands, lapis blue waters, and sunny skies
- Close to the beach bar
- Activities like parasailing, scuba diving, and dolphin swimming



The Alps, Switzerland

- Stay in the Heritage hotel at the Top of Europe - Jungfrauoch
- Guided night sledding including cheese fondue dinner
- Activities like skiing and paragliding



New York City, USA

- Stay in the middle of Manhattan, near Times Square
- Go to the Met Museum and the Central Park.
- Enjoy world-class shows on Broadway



Grand Canyon, USA

- Enjoy the breathtaking views of the Grand Canyon
- Multitude of restaurants, gift shops, and lodging options
- Hike around daytime and stargaze at night



Riding Forest, Canada

- Stay in a forest house at Elk-Glen, Manitoba, Canada
- Try freshwater fishing on serene lakes
- Experience forest trails and watch animals like bear, moose, and elk

Material purchase / Vertical display



Ruko F11 Pro Drone

- 5k Ultra HD camera
- 120 Degrees Field of Vision
- 40 min flight time
- 300m range



Potensic T35 GPS Drone

- 4k Ultra HD camera
- 110 Degrees Field of Vision
- 60 min flight time
- 300m range



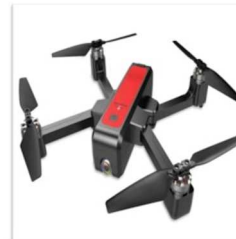
Holy Stone HS120D Drone

- 4k Ultra HD camera
- 120 Degrees Field of Vision
- 45 min flight time
- 400m range



Contixo F20 Drone

- 4k Ultra HD camera
- 110 Degrees Field of Vision
- 30 min flight time
- 600m range



Marsmo B4W Drone

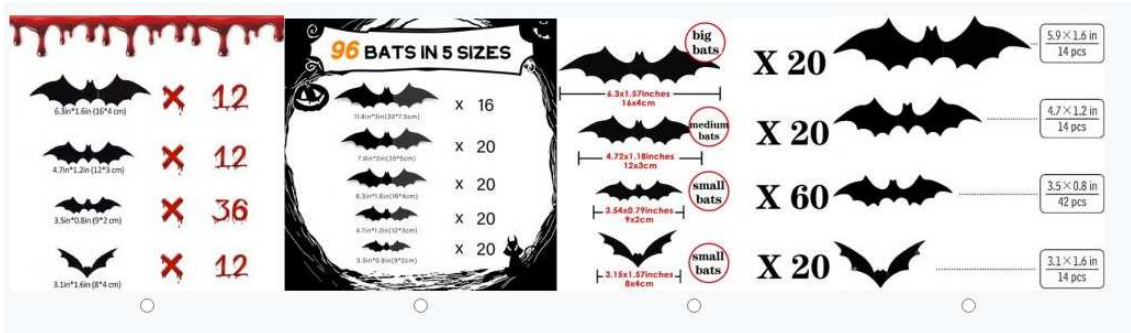
- 2k Ultra HD camera
- 120 Degrees Field of Vision
- 60 min flight time
- 400m range

Stimuli of Study 2

Horizontal display – Replicate 1



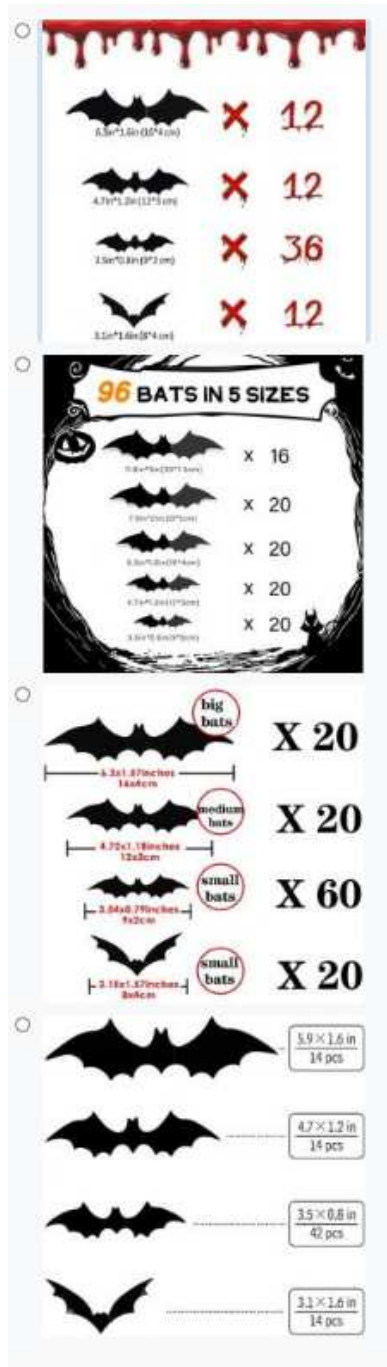
Horizontal display – Replicate 2



Vertical display -Replicate 1



Vertical display -Replicate 2



Stimuli of Study 3

Experiential purchase / Horizontal display



- Dark roast coffee
- Origin Colombia
- Great Aroma
- Strong but smooth taste



- Medium Roast Dark Coffee
- Origin Brazil
- Stunning aroma
- Refreshing finish with wood flavor



- Medium Roast Mild Coffee
- Origin Panama
- Subtle Aroma
- Notes of brown sugar, tangerine and butter pecan



- Dark Roast
- Origin Sumatra
- Intense Herbal Aroma
- Taste of sweet chocolate and licorice

I will choose later

- I will choose later

Material purchase / Horizontal display



- Has 5 Bars of Pressure
- Brews up to 30oz coffee
- Has Built-in Steamer
- Has Glass Decanter



- Has 15 Bars of Pressure
- Brews up to 20oz coffee
- Has steamer
- Brews 2 shots at once



- Has 10 Bars of Pressure
- Brews up to 35 oz coffee
- Has Milk frother
- Has push button system



- Has 20 Bars of Pressure
- Brews up to 25oz coffee
- Has Steam Wand
- Rapid system maintains temp throughout

I will choose later

- I will choose later

Experiential purchase / Vertical display

Material purchase / Vertical display



- Dark roast coffee
- Origin Colombia
- Great Aroma
- Strong but smooth taste



- Medium Roast Dark Coffee
- Origin Brazil
- Stunning aroma
- Refreshing finish with wood flavor



- Origin Panama
- Medium Roast Mild Coffee
- Subtle Aroma
- Notes of brown sugar, tangerine and butter pecan



- Dark Roast
- Origin Sumatra
- Intense Herbal Aroma
- Taste of sweet chocolate and licorice

I will choose later

- I will choose later



- Has 5 Bars of Pressure
- Brews up to 30oz coffee
- Has Built-in Steamer
- Has Glass Decanter



- Has 15 Bars of Pressure
- Brews up to 20oz coffee
- Has steamer
- Brews 2 shots at once



- Has 10 Bars of Pressure
- Brews up to 35 oz coffee
- Has Milk frother
- Has push button system



- Has 20 Bars of Pressure
- Brews up to 25oz coffee
- Has Steam Wand
- Rapid system maintains temp throughout

I will choose later

- I will choose later

Stimuli of Study 4

Low comparability / Horizontal display

| HOTEL 1 | HOTEL 2 | HOTEL 3 | HOTEL 4 |
|---|---|---|--|
| <ul style="list-style-type: none"> • Located in Hells Kitchen • Modern architecture • Rooms with wooden floors • Subway access to one nearby station • Breakfast Buffet with different Continental options | <ul style="list-style-type: none"> • Located in Secaucus • Art deco architecture • Room with antique décor giving old world charm • Access to bus station • Restaurant and bar open 24 hours | <ul style="list-style-type: none"> • Located in Brooklyn • Pueblo deco architecture • Spacious rooms with marble floors • Free parking at the hotel • Rooftop restaurant open 24 hours | <ul style="list-style-type: none"> • Located in Queens • Contemporary architecture • Large rooms with sleek interior designs • Close to the airport with free shuttle • Restaurant with international cuisine |

High comparability / Horizontal display

| HOTEL 1 | HOTEL 2 | HOTEL 3 | HOTEL 4 |
|--|--|---|--|
| <ul style="list-style-type: none"> • Distance from Manhattan 2 miles • 200 restaurants in 1 mile radius • Room size 195 sq. ft • Rating 3.7/5 • Price per night \$370 | <ul style="list-style-type: none"> • Distance from Manhattan 7 miles • 150 restaurants in 1 mile radius • Room size 225 sq. ft • Rating 3.9/5 • Price per night \$330 | <ul style="list-style-type: none"> • Distance from Manhattan 12 miles • 100 restaurants in 1 mile radius • Room size 245 sq. ft • Rating 4.1/5 • Price per night \$290 | <ul style="list-style-type: none"> • Distance from Manhattan 16 miles • 50 restaurants in 1 mile radius • Room size 255 sq. ft • Rating 4.3/5 • Price per night \$240 |

Low comparability / Vertical display

HOTEL 1

- Located in Hells Kitchen
- Modern architecture
- Modern rooms with wooden floors
- Subway access to one nearby station
- Breakfast Buffet with different Continental options

HOTEL 2

- Located in Secaucus
- Art deco architecture
- Room with antique décor giving old world charm
- Access to bus station
- Restaurant and bar open 24 hours

HOTEL 3

- Located in Brooklyn
- Pueblo deco architecture
- Spacious rooms with marble floors
- Free parking at the hotel
- Rooftop restaurant open 24 hours

HOTEL 4

- Located in Queens
- Contemporary architecture
- Large rooms with sleek interior designs
- Close to the airport with free shuttle
- Restaurant with international cuisine

High comparability / Vertical display

HOTEL 1

- Distance from Manhattan 2 miles
- 200 restaurants in 1 mile radius
- Room size 195 sq. ft
- Rating 3.7/5
- Price per night \$370

HOTEL 2

- Distance from Manhattan 7 miles
- 150 restaurants in 1 mile radius
- Room size 225 sq. ft
- Rating 3.9/5
- Price per night \$330

HOTEL 3

- Distance from Manhattan 12 miles
- 100 restaurants in 1 mile radius
- Room size 245 sq. ft
- Rating 4.1/5
- Price per night \$290

HOTEL 4

- Distance from Manhattan 16 miles
- 50 restaurants in 1 mile radius
- Room size 255 sq. ft
- Rating 4.3/5
- Price per night \$240

APPENDIX E: STIMULI OF ESSAY 2.

1a. Stimuli for the horizontal display condition in study 1



- 14 inch screen
- 4GB RAM
- AMD Dual-Core A4-9120E Processor
- 256GB Memory
- Windows 10



- 11.6 inch screen
- 4GB RAM
- Intel Celeron Dual Core
- 64GB Memory
- Windows 10



- 15.6 inch screen
- 8GB RAM
- Intel i3-8145U
- 128GB Memory
- Windows 10



- 15.6 inch screen
- 4GB RAM
- AMD A6-9225 Dual Core
- 500GB Memory
- Windows 10

1b. Stimuli for the vertical display condition in study 1



- 14 inch screen
- 4GB RAM
- AMD Dual-Core A4-9120E Processor
- 256GB Memory
- Windows 10



- 11.6 inch screen
- 4GB RAM
- Intel Celeron Dual Core
- 64GB Memory
- Windows 10



- 15.6 inch screen
- 8GB RAM
- Intel i3-8145U
- 128GB Memory
- Windows 10



- 15.6 inch screen
- 4GB RAM
- AMD A6-9225 Dual Core
- 500GB Memory
- Windows 10

2a. Stimuli for the experiential purchase type in the horizontal display condition in study 2



Sprezza
Experience fine Southern Italian served in an elegant and comfortable house.



Nonna
Experience fine dining and enjoy authentically made regional fare from the North of Italy.



Fachini
Experience old school Italian dining from Central Italy with classics in a high end setting.



Lucia
Experience fine dining in a cozy, rustic setting with authentic fare from the coastal regions of Italy.

2b. Stimuli for the experiential purchase type in the vertical display condition in study 2



Sprezza
Experience fine Southern Italian cuisine served in an elegant and comfortable house.



Nonna
Experience fine dining and enjoy authentically made regional fare from the North of Italy.



Fachini
Experience old school dining from Central Italy with classics in a high end setting.



Lucia
Experience fine dining in a cozy, rustic setting with authentic fare from the coastal regions of Italy.

2c. Stimuli for the material purchase type in the horizontal display condition in study 2



Staplemate

- Can staple 20 sheets
- Capacity of 200 staples
- Medium size
- Comes with 3000 staples



Whoppler

- Can staple 10 sheets
- Capacity of 300 staples
- Large size
- Comes with 2000 staples



Punchline

- Can staple 15 sheets
- Capacity of 250 staples
- Small size
- Comes with 4000 staples



Bigmouth

- Can staple 30 sheets
- Capacity of 150 staples
- Medium size
- Comes with 1000 staples

2d. Stimuli for the material purchase type in the vertical display condition in study 2



Staplemate

- Can staple 20 sheets
- Capacity of 200 staples
- Medium size
- Comes with 3000 staples



Whoppler

- Can staple 10 sheets
- Capacity of 300 staples
- Large size
- Comes with 2000 staples



Punchline

- Can staple 15 sheets
- Capacity of 250 staples
- Small size
- Comes with 4000 staples



Bigmouth

- Can staple 30 sheets
- Capacity of 150 staples
- Medium size
- Comes with 1000 staples

3a. Stimuli for experiential purchase in the horizontal condition in study 3.



Going to the car race? Enjoy the speed of the DIGIC 7 processor as it captures the race cars moving at top speed without a hitch. Come home, and watch the action again over a beer and share the thrill with your friends.



This camera with a 40 mega pixel camera is sure to wow you. Go to the forest and capture nature in its finest details, don't miss a thing...the big cats glittering eye or the dew drop on a leaf. You will love sharing this with your friends back home.



Need to focus your attention? Then look no further. This camera with its 5D autofocus system with 693 phase auto focus points can stay focused on moving objects. Now capture your favorite players in that football match in all their glory and share those moments with your friends.



When was the last time you were riding your car on a bumpy road and wanted to capture that amazing sunset? This camera lets you do just that. With its 5 axis stabilization, your camera is always stable even with lenses. Now share a perfect sunset with your friends.

3b. Stimuli for material purchase in the horizontal condition in study 3.



- 30MP full-frame CMOS sensor
- DIGIC 6 image processor
- DCI 4K capture at 60 fps
- Improved Dual-Pixel autofocus system



- 40 MP full-frame CMOS sensor
- DIGIC 8 image processor
- UHD 4K capture at 30 fps
- Dual-Pixel RAW shooting



- 26MP CMOS sensor
- DIGIC 7 processor
- Full HD video capture at 60 fps
- 45-point all-cross type autofocus system



- 35 MP CMOS sensor
- DIGIC 8 image processor
- UHD 4k capture at 45 fps
- Fast, accurate phase-detection autofocus

3c. Stimuli for experiential purchase in the vertical condition in study 3.



Going to the car race? Enjoy the speed of the DIGIC 7 processor as it captures the race cars moving at top speed without a hitch. Come home, and watch the action again over a beer and share the thrill with your friends.



This camera with a 40 mega pixel camera is sure to wow you. Go to the forest and capture nature in its finest details, don't miss a thing...the big cats glittering eye or the dew drop on a leaf. You will love sharing this with your friends back home.



Need to focus your attention? Then look no further. This camera with its 5D autofocus system with 693 phase auto focus points can stay focused on moving objects. Now capture your favorite players in that football match in all their glory and share those moments with your friends.



When was the last time you were riding your car on a bumpy road and wanted to capture that amazing sunset? This camera lets you do just that. With its 5 axis stabilization, your camera is always stable even with lenses. Now share a perfect sunset with your friends.

3d. Stimuli for material purchase in the vertical condition in study 3.



- 30MP full-frame CMOS sensor
- DIGIC 6 image processor
- DCI 4K capture at 60 fps
- Improved Dual-Pixel autofocus system



- 40 MP full-frame CMOS sensor
- DIGIC 8 image processor
- UHD 4K capture at 30 fps
- Dual-Pixel RAW shooting



- 26MP CMOS sensor
- DIGIC 7 processor
- Full HD video capture at 60 fps
- 45-point all-cross type autofocus system



- 35 MP CMOS sensor
- DIGIC 8 image processor
- UHD 4k capture at 45 fps
- Fast, accurate phase-detection autofocus

APPENDIX F: IRB Approval Form



Oklahoma State University Institutional Review Board

Date: 09/18/2018
Application Number: BU-18-43
Proposal Title: The effect of Product Display Orientation on Consumer Choice and Evaluation

Principal Investigator: Jihoon Jhang
Co-Investigator(s):
Faculty Adviser:
Project Coordinator:
Research Assistant(s): Primit Banerjee

Processed as: Expedited

Status Recommended by Reviewer(s): Approved

Approval Date: 09/18/2018

Expiration Date: 09/17/2019

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 223 Scott Hall (phone: 405-744-3377, irb@okstate.edu).

Sincerely,

A handwritten signature in black ink, appearing to read 'Hugh Crethar'.

Hugh Crethar, Chair Institutional Review Board



Oklahoma State University Institutional Review Board

Date: 09/25/2019
Application Number: BU-18-43
Proposal Title: The effect of Product Display Orientation on Consumer Choice and Evaluation

Principal Investigator: Jihoon Jhang
Co-Investigator(s):
Faculty Adviser:
Project Coordinator:
Research Assistant(s): Pramit Banerjee

Processed as: Exempt Continuation

Status Recommended by Reviewer(s): Approved

Continuation Approval Date: 09/25/2019

The continuation of the IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

Requirements under the Common Rule have changed. This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. Therefore this study has been converted to the Revised Common Rule. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a status report to the IRB when requested.
3. Promptly report to the IRB any harm experienced by a participant that is both unanticipated and related per IRB policy.
4. Maintain accurate and complete study records for evaluation by the OSU IRB and, if applicable, inspection by regulatory agencies and/or the study sponsor.
5. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or irb@okstate.edu.

Sincerely,



Oklahoma State University Institutional Review Board

Oklahoma State University IRB



Oklahoma State University Institutional Review Board

Date: 09/22/2020
Application Number: IRB-20-414
Proposal Title: Effect of Power Distance Beliefs on the Evaluation of Products in Different Layouts

Principal Investigator: Primit Banerjee
Co-Investigator(s):
Faculty Adviser: Xiang Fang
Project Coordinator:
Research Assistant(s):

Processed as: Exempt
Exempt Category:

Status Recommended by Reviewer(s): Approved

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or irb@okstate.edu.

Sincerely,
Oklahoma State University IRB

VITA

Pramit Banerjee

Candidate for the Degree of

Doctor of Philosophy

Dissertation: TWO ESSAYS ON DISPLAY ORIENTATIONS, PURCHASE TYPES
AND POWER DISTANCE BELIEFS

Major Field: Business Administration

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Business Administration at Oklahoma State University, Stillwater, Oklahoma in July, 2022.

Completed the requirements for the Post Graduate Diploma in Business Administration (recognized as MBA eqv.) in Marketing at XLRI Xavier School of Management, Jamshedpur, India in 2006.

Completed the requirements for the Bachelor of Science in Zoology and Chemistry at the University of Lucknow, Lucknow, India in 2001.

Experience:

Graduate Research/Teaching Associate at Dept. of Marketing, Oklahoma State University, Stillwater, Oklahoma from 2017 to 2022

Area Sales Manager, Nokia India Pvt. Ltd. MP/Mumbai From 2006-2008
Area Sales Manager/ Trade Marketing at Godrej Consumer Products Ltd.,
Kolkata/Delhi, India From 2009-2016

Professional Memberships:

Association for Consumer Research, American Marketing Association,
American Council for Consumer Interests