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How durable are compromise effects?

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ABSTRACT

The compromise effect, according to which consumers tend to prefer options positioned as a compromise in a given set of extreme options, ranks among the most prominent context effects in marketing research. Tying in with the recent debate on the robustness of the effect, this research shows that the effect is robust in terms of durable goods when using real branded products, including real payments, the possibility of a pre-choice evaluation, and no-buy options. The results of a comparative analysis based on previous studies' effect sizes suggest that, compared to decisions on fast-moving consumer goods (FMCG), the amount of cognitive effort spent on decisions regarding durables fosters the compromise effect. A second study supports this notion by showing that, regarding choices between durables, the compromise effect diminishes under a serotonin-deficiency-induced cognitive impairment, but its decrease is not as pronounced as with FMCG.

1. Introduction

Numerous empirical studies underpin that consumers' buying decisions depend on the context in which they are embedded (Celedon, Milberg, & Sinn, 2013; Dhar & Simonson, 2003; Simonson & Tversky, 1992). The compromise effect, according to which consumers prefer options positioned—as a compromise—in the middle position of a perceived product space to more extreme options, ranks among the most prominent of these context effects (Ryu, Suk, Yoon, & Park, 2014; Simonson, 1989). Specifically, researchers have confirmed that adding a high-tier premium option does promote the choice share of a compromise option of medium quality and price compared to that of a low-tier option (e.g., Neumann, Böckenholt, & Sinha, 2016; Simonson, 1989).

Recently, however, Lichters, Sarstedt, and Vogt (2015) have emphasized that the experimental designs of practically all compromise effect studies are subject to serious limitations, which hinder the generalization of their findings to real buying decisions. The authors' review of 47 compromise effect studies published over a 30-year period shows that such studies mostly rely on hypothetical choices that do not entail real economic consequences and use imaginary items, or unrealistic product descriptions. Further, the participants could not evaluate the products prior to making a choice and seldom had the option to defer buying. Testing whether the products under research have the same relevance for the decision makers in the sample as for those in the population to which the effect should apply is usually ignored, as is controlling for the participants' perception of the choice alternatives. Instead, prior research designs have fostered artificial learning processes triggered by a high number of repeated choices. In light of the biases that potentially result from such design-related limitations, Lichters et al. (2015, p. 14) conclude that researchers should consider context effects, such as the compromise effect, "from a perspective that takes the basic conditions of real-world settings into account" and that "future research should systematically evaluate the effects of the identified background factors."

Tying-in with Lichters et al.'s (2015) call, the present work (1) examines the compromise effect's robustness in an experimental design that fosters the external validity (Table 1) and (2) investigates the impact of the product type as a potential moderating background factor on the effect's occurrence and magnitude. Specifically, to date, researchers know only a little about the extent to which the compromise effect's magnitude would differ depending on whether, in realistic research designs, consumers choose between sets of durables or fast-moving consumer goods (FMCG). Purchase decisions on durables evidently induce fundamentally different mental processes than on FMCG, leading to more elaborated information processing and decision making (e.g., Duncan, 1972; Milliken, 1987), which should also affect the compromise effect's magnitude (Neumann et al., 2016).

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Table 1
Overview of experimental studies on the compromise effect in respect of durables.

Study	Journal	Decision framing			Stimuli		Experimental procedure		Comparison of durables and nondurables
		No-buy option	Economic con-sequences	Number of choices per respondent and category	Real products and brands in all options	Prices as attribute in all options	Pre-choice evaluation of alternatives	Controlled for subjects perception of alternatives	
Huber and Puto (1983)	JCR			1–2					
Simonson (1989)	JCR			1					
Kardes et al. (1989)	ACR			1		X			
Simonson and Tversky (1992)	JMR			1					
Pan and Lehmann (1993)	JCR			1–2				X	
Lehmann and Pan (1994)	JMR			2					
Heath and Chatterjee (1995)	JCR			1					X
Houghton et al. (1999)	ML			1					
Dhar et al. (2000)	JCP			1					
Nowlis and Simonson (2000)	JCP			1	X	X		X	
Pettibone and Wedell (2000)	OBHDP			2–4					
Drolet (2002)	JCR			1					
Dhar and Simonson (2003)	JMR	X		1					
Chernev (2005)	JCR			1					
Kivetz et al. (2004)	JMR			1					
Chernev (2005)	JCR			1					
Sheng et al. (2005)	PM			1–2					
Lin et al. (2006)	ML			1					
Sinn et al. (2007)	ML			1		X		X	
Chang and Liu (2008)	PM			1					
Pocheptsova et al. (2009)	JMR			1					
Khan et al. (2011)	JMR			1					
Chang et al. (2012)	JDM			1					
Pettibone (2012)	JDM			1					
Munro and Popov (2013)	EE		X[a]	1–2	X				
Ryu et al. (2014)	JBR			1				X	
Jang and Yoon (in press)	ML			2					
This study		**X**	**X**	**1**	**X**	**X**	**X**	**X**	**X**

ACR = Advances in Consumer Research, EE = Experimental Economics, IJRM = International Journal of Research in Marketing, JBR = Journal of Business Research, JCP = Journal of Consumer Psychology, JCR = Journal of Consumer Research, JDM = Judgment and Decision Making, JMR = Journal of Marketing Research, JTR = Journal of Travel Research, ML = Marketing Letters, MS = Management Science, OBHDP = Organizational Behavior and Human Decision Processes, PM = Psychology and Marketing.

[a] Products were received without payment.

Study 1 of this research reveals that the compromise effect is robust in unforced choices between durables when they have real economic consequences. A comparison of this study's results with two analogous studies in the context of FMCG by Müller, Kroll, and Vogt (2010, 2012) shows that the effect is more pronounced in respect of durables than FMCG. This finding indicates that consumers are more likely to become prey to the compromise effect in purchase situations when they are willing to invest relative large amounts of cognitive resources during an elaborate course of product selection.

Study 2 examines the robustness of this claim by exploring the differences in the compromise effect's magnitude in term of durables and FMCG given consumers' cognitive impairment due to serotonin deficiency, a neurotransmitter that modulates the availability of cognitive resources. Recent research by Lichters, Brunnlieb, Nave, Sarstedt, and Vogt (2016) has shown that the compromise effect diminishes when serotonin depletion impairs participants' cognitive resources. Since serotonin levels depend strongly on contextual factors, such as changes in chronological age (e.g., Rehman & Masson, 2001), social stressors (e.g., Shively, Mirkes, Lu, Henderson, & Bethea, 2003), pharmaceutical drug consumption (e.g., Pratt, Brody, & Gu, 2011), physical exercise (e.g., Koc & Boz, 2014), and the weather (e.g., Lambert, Reid, Kaye, Jennings, & Esler, 2002), understanding serotonin's role in the context of the compromise effect is an important endeavor (Lichters, Brunnlieb, et al., 2016). The results of study 2 show that cognitive resource impairment does diminish the compromise effect in the durable domain, but this decrease is not as pronounced as with FMCG.

2. Conceptualization and hypothesis development

Experimental economics research suggests that binding decisions have a significant bearing on choice behaviors. For example, Camerer and Hogarth's (1999) meta-analysis of incentive structures in economic experiments indicates that subjects tend to avoid purchases when choices are binding (i.e., the subjects have to pay to receive the product), rather than hypothetical. In the light of this result, the authors conclude that, "[…] overreporting purchase intention is quite familiar in marketing studies" (p. 24). More recently, Murphy, Allen, Stevens, and Weatherhead's (2005) meta-analysis of the hypothetical bias revealed that, contrary to binding elicitation methods, hypothetically stated preference valuation methods induce a significantly inflated willingness to pay. Furthermore, research has shown that incentive-aligned approaches in the field of choice-based conjoint analysis—in which choice tasks are depicted as potentially binding—yield superior predictive validity compared to non-aligned hypothetical conjoint analysis (e.g., Ding, Grewal, & Liechty, 2005). With regard to the compromise effect and FMCG, Müller et al. (2010, 2012) provide evidence that when choices become binding, the effect is smaller than in hypothetical choices, but still significant. However, whether this finding also holds in respect of durables is yet unclear.

Prior studies have shown that, in general, behavioral anomalies are robust, regardless of whether decisions are hypothetical or binding (e.g., Diels & Müller, 2013; Doyle, O'Connor, Reynolds, & Bottomley, 1999; Lichters, Bengart, Sarstedt, & Vogt, in press; Sharpe, Staelin, & Huber, 2008). Given the ample evidence of the compromise effect's robustness concerning durables in hypothetical settings (Table 1), the effect should also occur in a binding choice setting. Hence,

H_1. Consumers will tend to switch from a low quality/low price option L in choice sets with two durable goods (comprising 'low quality/price' and 'medium quality/price') to a 'medium quality/medium price' option M in choice sets with three durable goods (comprising 'low,' 'medium,' and 'high quality/price').

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Thus, the relative choice share of M over L will be higher in the three-product set than in the two-product core set.

Consumers purchasing durables face a greater risk with their decision outcomes compared to their decisions regarding (generally cheaper and short-lived) FMCG (Ahearne, Gruen, & Saxton, 2000; Sheng, Parker, & Nakamoto, 2005). According to the contingency model for the selection of an appropriate decision strategy (Beach & Mitchell, 1978), this greater risk leads to a higher probability of applying complex decision strategies, due to the high significance of the decision outcomes for consumers' financial reserves. Two further models support this expectation. First, following the heuristic systematic model (e.g., Chaiken, Liberman, & Eagly, 1989), the perceived risk and decision difficulty should reduce information processing's heuristic components, leading to a more systematic use of information during the decision process (Bettman, Johnson, & Payne, 1990). Second, according to the elaboration likelihood model (Petty, Cacioppo, & Schumann, 1983), the real consequences for the decision makers, together with the higher perceived risk when purchasing durables, should lead to a higher probability that the central information-processing route will be used instead of the peripheral route (Petty et al., 1983; Wegener & Chien, 2013). In sum, when purchasing durables, consumers are likely to engage in an elaborated information-processing style (Langner & Krengel, 2013), inducing greater amounts of comparative evaluations (Kardes, 2013; Wang & Wyer, 2002).

Prior research suggests that compromise choices result from deliberate information processing, rather than the usage of fast and frugal choice heuristics (Chang & Liu, 2008; Dhar & Gorlin, 2013; Khan, Zhu, & Kalra, 2011). For example, the effect is less pronounced when experimental manipulations deplete subjects' cognitive resources by, for instance, introducing cognitively demanding tasks (Pocheptsova, Amir, Dhar, & Baumeister, 2009), or by pharmaceutically reducing their brain serotonin levels (Lichters, Brunnlieb, et al., 2016). Similarly, time pressure reduces the compromise effect (e.g., Pettibone, 2012). The results of a preliminary study with 91 participants provide further support for this notion. Respondents spend significantly more time on processing the choice tasks when opting for the compromise option than they did when choosing one of the non-compromise options (see the Web Appendix B at ## *blinded for review purposes* ## for further details on the pilot study's design and the results).

To summarize, real choices between durables lead to a more deliberate way of information processing and decision making, entailing a more pronounced compromise effect compared to FMCG. Hence,

H_2. The magnitude of the compromise effect will be greater in real choices between durables than in comparable choices between cheaper FMCG.

3. Study 1: compromise effect in binding choices between durables

3.1. Methods and material

3.1.1. Experimental design, stimuli, and sample

To investigate the robustness of the compromise effect in respect of durables (H_1), this study relies on an experiment in a computer laboratory at a major German university. Following Lichters et al.'s (2015) guidelines closely, the experimental design fosters external validity by implementing the following design elements. Real products relevant to the target audience: extensive pre-testing (focus groups and face-to-face interviews) allowed for identifying two products relevant for the experiment's target audience, which prior context effect research had also used electric toothbrushes and stereo headphones (e.g., Lichters, Brunnlieb, et al., 2016; Ryu et al., 2014). Consumers are more likely to undertake tradeoffs between quality attributes and price if they have a sufficient level of product experience (Sinn, Milberg, Epstein, & Goodstein, 2007). Therefore, only those respondents who indicated that they (1) were familiar with both product groups and the brands, (2) had prior buying experience with both product groups, and (3) were generally willing to buy the products in the product groups participated in the experiment.

Following Sinn et al. (2007), the design of the choice task (Fig. 1) closely resembles real-world choice settings, as evidenced by a comparison with these products' display in major online shops such as *bestbuy.com*. Analogous to Simonson and Tversky (1992), the study relies on one brand per product category to eliminate the potential influence that differences in brand perception and brand familiarity have on choice (Sinn et al., 2007).

3.1.1.1. Realistic and meaningful attributes. This study includes a broad set of quality-related attributes. For example, the technical attributes (rotations per minute, maximum battery life in days), the number of replaceable brush heads, a customer satisfaction rating (analogous to the *amazon.com* star-rating system), and the product pictures described the electric toothbrushes. In order to stimulate the participants' purchase decisions, all the prices were slightly lower than the cheapest actual market prices at the local retailers and other well-known online shops (Table A1 in the Appendix A provides a detailed list of the stimuli used in the two studies and the pilot study).

3.1.1.2. Pre-choice inspection. Following Lehmann and Pan's (1994) recommendations, the participants had the option to evaluate the products before the experiment started. For this purpose, a product shelf without prices was set up in front of the test laboratory (see Lichters et al., 2015).

3.1.1.3. No-buy option. To preempt any inflation of the compromise effect (Dhar & Simonson, 2003) and to increase the realism of the experiment, this study included a no-buy option.

3.1.1.4. Real choices. The study relies on a binding decision framework that implemented a random payoff mechanism (RPM) to select one decision per participant for payoff. If a participant accepted the offer to purchase the product in one of the presented choice tasks and the RPM rendered this decision payoff relevant, the participant would pay the selling price of the chosen item and receive the product in exchange. By contrast, participants left the laboratory without the product if they opted for the no-buy option. This RPM ensures that multiple observations per respondent can be interpreted independently (e.g., Cubitt, Starmer, & Sugden, 1998), as the mechanism suppresses income and portfolio effects (Braga, Humphrey, & Starmer, 2009). The respondents knew that they could purchase only one item, but they could not predict which of the choice tasks would be relevant, sensitizing them to a thoughtful decision process in each of the two choice situations. Because of its predictive validity (Ding, Park, & Bradlow, 2009; Kim, Park, Bradlow, & Ding, 2014), the use of RPMs is common in the field of experimental economics (e.g., Ding et al., 2005; Munro & Popov, 2013) and has also been called for in context effect research (e.g., Lichters et al., 2015).

3.1.2. Research procedure

The research team recruited 88 students one and a half weeks prior to the experiment. The study manipulated two factors in a 2 (product category: toothbrush and headphones) × 2 (choice set: a two-product core set vs. a three-product extended set) mixed factorial design. That is, the product category was manipulated within-subjects; each participant made one choice from each of the two categories. The choice set factor was manipulated between-subjects; participants chose from either a core set comprising the low-tier option L and the intermediate option M (CS_{core}), or from an extended set comprising L, M, and, additionally, a high-tier premium option H ($CS_{extended}$), placing M in a compromise position (e.g., Dhar & Simonson, 2003). After all the participants had been allocated to a desk, a trained instructor delivered a standardized oral introduction. Next, the participants started the computer-based survey, which asked for their demographic information, questioned them about their quality and price perceptions (item

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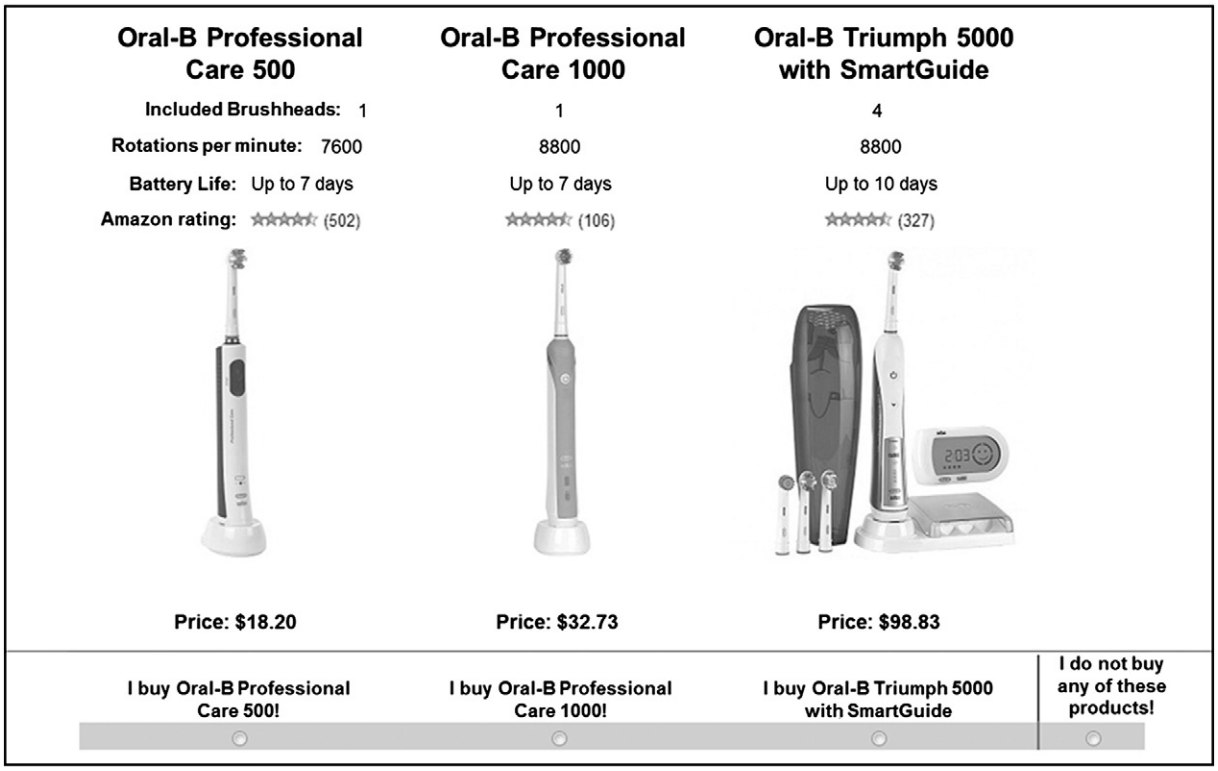

Fig. 1. Choice task with three products (electric toothbrushes).

wordings: "How do you judge the quality [price] of the presented product?"; 1 = "very low," 9 = "very high") and about their a priori buying interest (item wording: "To what extent are you interested in buying this product today?"; 1 = "not at all interested," 9 = "very interested").

Subsequently, the participants saw the choice tasks and made their choice decisions at their own pace.[4] At all stages of the experiment, the participants were allowed to consult the printed personal product catalog on their desks (see Simonson & Tversky, 1992 and study 2 in Sinn et al., 2007). Immediately after completion of the choice tasks, they played a virtual lottery game on their computers to determine which of their decisions would be binding. All the participants subsequently fulfilled their buying obligation, suggesting that they were fully aware of the economic consequences when solving the choice problems. On average, the experimental sessions lasted 30 min (including the instructions and payoff). The participants received a show-up fee of approx. USD 11 before they left the experiment. Paying the show-up fee during the last contact with the participants minimized the probability of a house money effect bias in their decisions (Lichters et al., 2015; Sharpe et al., 2008).

3.2. Results

3.2.1. Preliminary analyses

When comparing the choice rates between experimental groups, the equality of the subsamples is an important requirement (e.g., Mao & Oppewal, 2012). There are no significant differences between CS_{core} and $CS_{extended}$ in terms of gender, nor any in the quality vs. price orientation. The CS_{core} participants are slightly older than those in the $CS_{extended}$ (mean = 23.58 years (2.69) vs. 22.49 years (2.51): $t_{(86)} = 1.97$; $p = 0.052$); this difference is, however, negligible. Furthermore, no significant differences occur with respect to the choice frequencies of the no-buy option.

A series of pre-analyses allowed ruling out that any differences in the quality and price perceptions, as well as in the a priori buying interest, caused differences in the choice shares in CS_{core} and $CS_{extended}$. Specifically, the pre-analyses included three mixed effect general linear models (GLMs) for each product category (one for each of the three ratings; i.e., the options' perceived quality and price, as well as the subjects' buying interest). The respective ratings served as within-subjects factor and the experimental condition (CS_{core} vs. $CS_{extended}$) as between-subjects factor. The analysis reveals significant differences between the three alternatives L, M, and H regarding the perceived quality and price across both the product categories—the mean rating of L was lower than the mean rating of M, which was lower than that of H. By contrast, no significant interactions emerged between the within factor (products) and the between factor (CS_{core} vs. $CS_{extended}$). These results confirm that the subsamples do not differ in terms of quality, price perception, and buying interest. Finally, contrasting the participants' (aggregated) subjective quality and price perceptions shows that both H options are on the extended efficiency frontier between L and M. Therefore, H is formally also an efficient (i.e., Pareto-optimal) choice (Neumann et al., 2016; Pechtl, 2009). In sum, the experimental manipulation of the perceived quality and price worked as expected.

3.2.2. Analysis of the compromise effect

Across the four conditions under research (two product categories for each CS_{core} vs. $CS_{extended}$), the buying rates range from 37.8% to 55.6%. Consistent with previous research (e.g., Chernev, 2005; Mourali, Böckenholt, & Laroche, 2007; Müller et al., 2012), the analysis omits H option choices (4.5% of all choices) from further analysis. Hence, substitution effects do not affect the remaining choices (see Huber & Puto, 1983; Simonson, 1989).

[4] The choice tasks were introduced by means of the following text on the participants' computer screen: "On the following pages you will be asked to make two buying decisions. However, only one of these decisions will be relevant after the survey (by means of the mechanism we have just described to you). In each of the two choice tasks, we present different product variants at varying prices. Your task is to decide whether you are willing to buy one of the presented products, or not. In order to guide your decision, we also provide important information about each product variant and our selling price."

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To check the robustness of the compromise effect (H_1), the analysis tests whether, between the two-products core set (CS_{core}) and those shares in the three-products extended sets that include the high-tier option H ($CS_{extended}$), a positive change occurs in the relative choice shares of option M compared to those of option L. The compromise effect holds if relation (1) holds, as follows:

$$\frac{P(M|\{L;\ M\})}{P(L|\{L;\ M\})+P(M|\{L;\ M\})}<\frac{P(M|\{L;\ M;\ H\})}{P(L|\{L;\ M;\ H\})+P(M|\{L;\ M;\ H\})} \quad (1)$$

The results in Table 2 reveal that, in both product categories, the relative purchase rate of option M is higher in $CS_{extended}$ than in CS_{core}. Aggregating the choices over both the product groups (e.g., Lehmann & Pan, 1994) shows that the introduction of the high-tier premium option H under treatment $CS_{extended}$ increases the relative share of option M from 43.6% to 76.5%. A Fisher's exact test reveals that this increase is significant at ($p = 0.004$). More precisely, with respect to the headphones, the introduction of option H leads to a significant increase in the relative share of the compromise option M from 45.5% to 80.0% ($p = 0.023$). For toothbrushes, the addition of the high-tier option H leads to a significant ($p = 0.093$) increase in the choice shares from 41.2% (CS_{core}) to 71.4% ($CS_{extended}$). To summarize, the results show a systematic increase in the relative purchase shares of the compromise option M, thus providing support for hypothesis H_1.

3.2.3. The compromise effect in respect of durables vs. FMCG

The comparison of the magnitude of the compromise effect in respect of FMCG and durables (H_2) draws on the rate of increase (RI) as the quotient of relative choice shares for option M in $CS_{extended}$ and in CS_{core} (e.g., Müller et al., 2012). An RI of one or less would indicate absence of the compromise effect. The higher the RI above this threshold of one, the more pronounced the compromise effect (Müller et al., 2010). The analysis compares the RIs with those that Müller et al. (2010, 2012) report in respect of FMCG. Both these studies apply a design analogous to this study in that the authors incorporate (1) binding choices of (2) potential consumers regarding (3) real items in (4) choice tasks consisting of either two or three products, and (5) a no-buy-option.

The analysis yields RIs of 1.73 for the toothbrushes and 1.76 for the headphones, both of which are higher than in Müller et al. (2010), who report an average RI of 1.41 across two FMCG categories, and in Müller et al. (2012), who report an average RI of 1.32 across six FMCG categories. A Wilcoxon rank-sum test reveals that the average RI—and thereby the magnitude of the compromise effect—for durables is significantly higher than for FMCG ($Mean_{Durbales} = 1.75$ (0.02) vs. $Mean_{FMCG} = 1.34$ (0.13): Wilcoxon-$W_{(10)} = 19$; $p = 0.045$), providing support for H_2. These results suggest that the amount of cognitive effort spent on decisions on durables fosters the compromise effect compared to decisions on FMCG. Study 2 sheds further light on this idea.

4. Study 2: compromise effect on durables under cognitive impairment

Recent research by Lichters, Brunnlieb, et al. (2016) shows that cognitive impairment—induced by a pharmaceutical reduction of the brain serotonin levels—eliminates the compromise effect. However, their research does not address product category-specific effects. With respect to durables, researchers might expect a serotonin deficiency—which limits the participants' availability of cognitive resources, thereby stalling their ability to engage in complex decision making—eliminates the compromise effect. However, the increased involvement that comes with choices between durables compared to FMCG might override the mitigating effects of the serotonin deficiency, leaving the compromise effect intact. Study 2 sets out to provide insights into these opposing predictions in an exploratory way.

4.1. Methods and material

4.1.1. Experimental design, stimuli, and sample

Study 2 relies on a $2 \times 2 \times 2$ mixed factorial design with two durable categories (Braun's Oral-B electric toothbrushes and Sony's stereo headphones—see Table A1 in the Appendix A for a description of product variants and attributes), as well as on the number of products per choice (first two and then three) as within-subjects factors and on the experimental condition (treatment vs. placebo) as between-subjects factor. Analogous to Lichters, Brunnlieb, et al. (2016), the participants made six choices from sets comprising two product options {L, M}, followed by six further choices from sets comprising three options {L, M, H} for each durable category (in total 24 choices). In each set, the price of L was always lower than the price of M, whose price was always lower than the price of H. Following Müller et al. (2012), one choice task in each of the choices stages represents a holdout task used for assessing the stability of the participants' preferences and their attention span. The corresponding decisions were excluded from the main analyses, resulting in 20 net decisions per participant ($2_{choice\ stages} \times 2_{categories} \times 5_{price\ scenarios}$).

The experimental design parallels that of study 1 (e.g., in terms of the recruitment criteria, pre-choice inspection of products, and the monetary compensation) with two exceptions. First, given the potential interactions between serotonin and estrogen during the menstrual cycle (Rubinow, Schmidt, & Roca, 1998), only males participated in study 2. Second, because of the increased no-buy shares that come with choices between durables (see study 1 results) in combination with the decreased sample sizes in a pharmaceutical study, study 2 omits the no-buy option. The design therefore fully conforms to Lichters, Brunnlieb, et al. (2016, study 4a), which is a necessary requirement for engaging in product category-related comparisons.

4.1.2. Research procedure

A total of 49 male students participated in study 2 ($n_{Treatment} = 25$, $n_{Placebo} = 24$). The research team screened all the participants for psychiatric and neurological disorders. All of them also had to hand in

Table 2
Study 1: choice behavior—relative choice shares between L and M ($n = 88$).

	Option	Total counts (%)		Toothbrush counts (%)		Headphones counts (%)	
		CS_{core}	$CS_{extended}$	CS_{core}	$CS_{extended}$	CS_{core}	$CS_{extended}$
Base: $n = 88$ per category	Buy	39 (*45.3*)	42 (*46.7*)	17 (*39.5*)	17 (*37.8*)	22 (*51.2*)	25 (*55.6*)
	No-buy	47 (*54.7*)	48 (*53.3*)	26 (*60.5*)	28 (*62.2*)	21 (*48.8*)	20 (*44.4*)
	L	**22 (*56.4*)**	**8 (*23.5*)**	**10 (*58.8*)**	**4 (*28.6*)**	**12 (*54.5*)**	**4 (*20.0*)**
	M	**17 (*43.6*)**	**26 (*76.5*)**	**7 (*41.2*)**	**10 (*71.4*)**	**10 (*45.5*)**	**16 (*80.0*)**
	H	-	8	-	3	-	5
	$p(M_{CScore} \leftrightarrow M_{CSextended})$[a]	0.004	0.093	0.023			
	RI[b]	1.75	1.73	1.76			

[a] Fisher's exact test for 2×2 contingency tables (directional).
[b] Rate of increase as the quotient of adjusted M shares from CS_{core} ($n = 43$ per category) to $CS_{extended}$ ($n = 45$ per category).

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written informed consents. Exclusion criteria were cardiac, renal, pulmonary, neurological, psychiatric or gastrointestinal disorders, medication/drug use, and a personal or family history of depressive disorders (Lichters, Brunnlieb, et al., 2016). The experiment began with the administration of either the treatment or a placebo drink in a randomized double-blind procedure. The treatment group's amino acid drink lacked tryptophan—the precursor of serotonin—thereby inducing a marked decrease in brain serotonin levels (Cooper, Bloom, & Roth, 2003). The placebo group's drink was identical to that of the treatment group, except that it did contain tryptophan, thereby maintaining the participants' brain serotonin level. The two drinks tasted identical. The main experiment session started at 3 pm after a 5-hour resting period. The study draws on a two-stage RPM proposed by Lichters et al. (2015). The participants drew a ball from an urn with a 10% probability of winning USD 72. All the winners subsequently drew a ball from another urn that influenced which of their decisions would become payoff relevant. The winners then paid for their chosen items by subtracting the item's price from the USD 72. All other aspects of the research procedure correspond to those of study 1. The overall procedure lasted an average of 90 min.

4.2. Results

4.2.1. Preliminary analyses

The preliminary analyses parallel those of study 1, but, in the context of the pharmaceutical manipulation, they consider additional aspects relevant. No significant differences occur between the two experimental groups in terms of age (mean = 24.80 years (2.81)), height (mean = 183.35 cm (7.20)), and weight (mean = 83.37 kg (12.03)). The participants also do not differ significantly regarding their quality vs. price orientation measured on a four-point scale (1 "I only pay attention to the price" and 4 "I only pay attention to the quality" in both durable categories ($\text{mean}_{\text{Headphones}} = 2.79$ (0.77) and $\text{mean}_{\text{Toothbrushes}} = 2.42$ (0.71)).

Similar to study 1, a further pre-analysis implemented two mixed effect GLMs, one for each product category, using the experimental group (ATD treatment vs. placebo) as between-subjects factor. In line with the intended manipulation, the analysis reveals significant differences between the L, M, and H options regarding the perceived quality and price across both product categories. Conversely, no significant interactions emerged between the within-subjects factor (products) and the between-subjects factor (ATD treatment vs. placebo). Likewise, no significant main effect occurred across the models regarding the between-subjects factor.

4.2.2. Analysis of the compromise effect

To test for the compromise effect in a within-subjects design, the analysis contrasts the subjects' switching behavior across the two experimental conditions. In line with Lichters, Brunnlieb, et al. (2016), the analysis excludes switches to the H options from further analysis because a subject-specific focus on high quality explains these switches rationally. Table 3 presents the corresponding results.

Table 3
Study 2: switching behavior ($n = 49$).[a]

			Extended sets (2nd choice stage)		
			L	M	H
Core sets (1st choice stage)	Placebo ($n = 24$; 480 decisions)	L	41	**24**	*1*
		M	**8**	122	*44*
	Treatment (ATD) (n = 25; 500 decisions)	L	61	**17**	*2*
		M	**22**	112	*36*

Switches from L to M: $p_{\text{Placebo}} = 0.007$; $p_{\text{Treatment}} = 0.522$

[a] This table presents switches. Multiplying each cell by the factor two yields the number of choices across both decision stages.

A total of 36.36% of the placebo group's decisions for L in the first choice stage (CS_{core}) switched to the compromise option M in the second choice stage ($CS_{extended}$). An exact McNemar test reveals that the number of switches in line with the compromise effect (L → M) is significant ($p = 0.007$), providing support for the compromise effect's robustness regarding durables in the placebo group. In the treatment group, however, only 21.25% switches occurred from L to M, which is not significant ($p = 0.552$).

A further robustness check accounts for multiple decisions per respondent by drawing on the differences between each participant's relative frequency of switches from L to M and switches from M to L after adding H (Lichters, Brunnlieb, et al., 2016). This measure of a within-subjects compromise effect ranges from −1 (if a participant only switched in the opposite direction to the compromise effect) to 1 (the participant switched—in accordance with the compromise effect—from L to M in all the decision instances). In support of the previous analysis, the mean within-subjects compromise effect is significantly greater than zero in the placebo group (mean difference = 0.067 (SD = 0.149), $t_{(23)} = 2.186$; $p = 0.039$), but not in the treatment group (mean difference = −0.020 (SD = 0.150), $t_{(24)} = -0.667$; $p = 0.551$). Likewise, the difference between the two groups is significant ($t_{(47)} = 2.026$; $p = 0.048$).

A further analysis of the participants' choice consistency on the basis of the holdout choice sets (Lichters, Brunnlieb, et al., 2016) successfully duplicates 95.4% of the decisions, indicating a high degree of choice consistency and engagement.

4.2.3. The compromise effect in respect of durables vs. FMCG

A final analysis contrasts the effects from an analogous study on FMCG (Lichters, Brunnlieb, et al., 2016) with those found in this study. Analyzing the odds ratios of switching (i.e., L → M divided by M → L)—as appropriate for a within-subjects design—provides evidence that the compromise effect is slightly larger for durables (odds $\text{ratio}_{\text{Placebo}} = 3.00$) than for FMCG (odds $\text{ratio}_{\text{Placebo}} = 2.88$). Furthermore, the treatments' effect seems to be stronger in the FMCG domain (odds $\text{ratio}_{\text{Treatment}} = 0.50$) compared to durables (odds $\text{ratio}_{\text{Treatment}} = 0.94$), as evidenced by the higher decline in the FMCG odds ratio. Thus, the increased involvement in choices between durables decreases the mitigating effects of cognitive impairment induced by a serotonin deficiency.

5. General discussion and implications

5.1. Summary and managerial implications

Addressing Lichters et al.'s (2015) call for further research and taking the limitations of prior studies into account (Table 1), this study used an enhanced experimental design to examine the compromise effect in respect of durables. The first of the two studies considered choices between real durable products with realistic prices, a meaningful set of product attributes, and visual stimuli, while allowing the participants to evaluate the products, offering a no-buy option, controlling for their perception of the choice alternatives, and limiting the number of choice tasks. The results provide evidence of the compromise effect's robustness in binding choices between durables. A further comparison of the effect's magnitude in binding choices reveals a significantly stronger effect in respect of durables than FMCG. These results extend recent meta-analytical work on the compromise effect in hypothetical decisions (Neumann et al., 2016), showing that the effect's increase in respect of durables generalizes to realistic binding choices. As binding buying decisions regarding durables entail a higher perceived risk, this study's results support the notion that the compromise effect is a result of applying complex decision rules instead of effortless choice heuristics (e.g., Dhar & Gorlin, 2013; Khan et al., 2011; Lichters, Brunnlieb, et al., 2016).

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Study 2 further supports this notion by showing that the compromise effect in choices between durables diminishes under cognitive impairment induced by a serotonin deficiency. Further analyses reveal that, regarding durables, the decrease in the effects' magnitude is lower than in terms of FMCG, providing additional evidence that the compromise effect is more robust for choices between durables.

From a managerial standpoint, these results suggest that companies could capitalize on compromise effects in the domain of durables rather than FMCG. Marketing managers of producing firms should include a high quality/high price premium variant in their product lines—even if this variant is likely to induce higher per-unit production costs. The very same holds for retailers' assortment strategies. Simonson (1999) notes that "[…] product assortment can play a key role, not only in satisfying wants, but also in influencing buyer wants and preferences." This study suggests that this notion holds particularly for durables.

At the same time, the results indicate that the compromise effect is only effective when the target population's serotonin levels are sufficiently high. For example, research on serotonin and aging suggests that serotonin brain levels increase in the early to mid-phase of aging (Rehman & Masson, 2001), but decrease later on. Exposure to bright light also increases serotonin levels, making the compromise effect more relevant for companies operating in Southern countries such as Brazil or Spain (e.g., Koc & Boz, 2014). As physical exercise also increases brain serotonin levels, selling durables in corresponding service environments (e.g., fitness centers) seems to be a promising avenue. At the same time, marketing practitioners who plan to exploit the compromise effect should adopt strategies that enhance serotonin levels. These strategies include, for example, increasing daylight exposure in retail space, or offering serotonin-rich food in service environments (e.g., pineapples, bananas; Koc & Boz, 2014). Finally, while adding premium options to existing product lines, as well as creating shopping environments that increase serotonin levels seem to represent effective ways to systematically and subconsciously (Simonson, 1989) direct shoppers to a (usually more profitable) compromise option, marketers should also take the ethical component of such practices into account. This notion holds particularly for durables, which are generally more expensive than FMCG. Therefore, the results also call for more consumer information and enlightenment from governmental agencies, such as the U.S. Federal Trade Commission (FTC) and consumer policy institutions (e.g., Consumer Reports).

5.2. Limitations and future research directions

This research is—of course—not free from limitations. Each product category relied on a single brand. While this procedure ruled out potential brand-induced (interaction) effects (Simonson & Tversky, 1992), further research should broaden the scope by incorporating products with different brands. Similarly, as buying situations usually consist of many available options (e.g., Hauser, 2014; Langner & Krengel, 2013), researchers should consider broader choice sets to assess whether the compromise effect is also relevant after the participants have formed a consideration set (Hauser, 2014). The participants in both studies knew that they could possibly receive the chosen products immediately after the experiment. However, Ryu et al. (2014) stress that choices for compromise options are more likely to occur if the choice consequences are temporally proximal rather than distant. Therefore, future studies may include more distant consequences (e.g., ordering from an online shop). Adjusting the design by considering options that promote the low quality/price alternative (e.g., Heath & Chatterjee, 1995) would also be a fruitful avenue for future research, especially in the light of common practice in the consumer electronics industry. In this industry, companies often follow a price skimming strategy by initiating a product life cycle with a high quality/high price product and later offering low-budget variants (e.g., tablet PCs, the Apple iPhone). As such, a major objective in further research on durables should consider different entrant positions in the perceptual product space.

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Appendix A

Table A1
Product stimuli in the pilot study, studies 1 and 2.

	Product name	Attr. 1	Attr. 2	Attr. 3	Attr. 4	Attr. 5	Attr. 6
	Coffeemaker (pilot study)	Brewing time	Automatic off after	Decalcification reminder	Touch display	Amazon rating	Price
L	Phillips Senseo HD 7810/60	30 s. per cup	60 min	No	No	4 (624)	$40.17
M	Phillips Senseo Viva Café HD 7825/60	30 s. per cup	30 min	Yes	No	4 (195)	$46.60
H	Phillips Senseo Twist HD 7870/60	30 s. per cup	15 min	Yes	Yes	4.5 (99)	$80.35

	Electric toothbrushes (pilot study and study 1)	Number of brush heads	Rotations per minute	Battery life	Amazon rating	Price
L	Oral-B Professional Care 500	1	7600	7 days	4.5 (502)	$18.20
M	Oral-B Professional Care 1000	1	8800	7 days	4.5 (106)	$32.73
H	Oral-B Triumph 5000 with SmartGuide	4	8800	10 days	4.5 (327)	$98.83

	Electric toothbrushes (study 2)	Number of brush heads	Rotations per minute	Battery life	Amazon rating	Cleaning modes	Price
L	Oral-B PRO 1000	1	8600	7 days	4.5	1	$46.31 to $48.73
M	Oral-B PRO 2000	1	8800	7 days	4.5	2	$50.16 to $52.58
H	Oral-B PRO 3000	2	8800	7 days	4.5	3	$67.14 to $71.65

(continued on next page)

Table A1 (*continued*)

	Headphones (pilot study and study 1)	Frequency response	Sensitivity	Cord length	Amazon rating	Price
L	Sony Headphones MDRZX300	10–24.000 Hz	102 dB	1.2 m	4.5 (243)	$17.13
M	Sony Headphones MDRZX600	6–25.000 Hz	104 dB	1.2 m	4.5 (49)	$28.77
H	Sony Headphones MDRZX700	5–40.000 Hz	106 dB	1.2 m	4.5 (11)	$56.24

	Headphones (study 2)	Frequency response	Sensitivity	Cord length	Amazon rating	Price
L	Sony MDRZX110	12–22.000 Hz	98 dB	1.2 m	4.0	$15.87 to $20.86
M	Sony MDRZX300B DJ	10–24.000 Hz	102 dB	1.2 m	4.5	$21.79 to $26.78
H	Sony MDRXB600 Extra Bass	4–24.000 Hz	104 dB	1.2 m	4.5	$47.38 to $52.93

All product variants were additionally described by their official product photos.

Appendix B. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.jbusres.2016.02.039.

References

Ahearne, M., Gruen, T., & Saxton, M. K. (2000). When the product is complex, does the advertisement's conclusion matter? *Journal of Business Research*, *48*(1), 55–62.

Beach, L. R., & Mitchell, T. R. (1978). A contingency model for the selection of decision strategies. *Academy of Management Review*, *3*(3), 439–449.

Bettman, J. R., Johnson, E. J., & Payne, J. W. (1990). A componential analysis of cognitive effort in choice. *Organizational Behavior and Human Decision Processes*, *45*(1), 111–139.

Braga, J., Humphrey, S. J., & Starmer, C. (2009). Market experience eliminates some anomalies—and creates new ones. *European Economic Review*, *53*(4), 401–416.

Camerer, C. F., & Hogarth, R. M. (1999). The effects of financial incentives in experiments: A review and capital-labor-production framework. *Journal of Risk and Uncertainty*, *19*(1–3), 7–42.

Celedon, P., Milberg, S., & Sinn, F. (2013). Attraction and superiority effects in the Chilean marketplace: Do they exist with real brands? *Journal of Business Research*, *66*(10), 1780–1786.

Chaiken, S., Liberman, A., & Eagly, A. H. (1989). Heuristic and systematic information processing within and beyond the persuasion context. In J. S. Uleman, & J. A. Bargh (Eds.), *Unintended thought* (pp. 212–252). New York: Guilford Press.

Chang, C. -C., & Liu, H. -H. (2008). Information format-option characteristics compatibility and the compromise effect. *Psychology and Marketing*, *25*(9), 881–900.

Chang, C. -C., Chuang, S. -C., Cheng, Y. -H., & Huang, T. -Y. (2012). The Compromise Effect in Choosing for Others. *Journal of Behavioral Decision Making*, *25*(2), 109–122.

Chernev, A. (2005). Context effects without a context: Attribute balance as a reason for choice. *Journal of Consumer Research*, *32*(2), 213–223.

Cooper, J. R., Bloom, F. E., & Roth, R. H. (2003). *The biochemical basis of neuropharmacology* (8th ed.). New York, NY: Oxford University Press.

Cubitt, R., Starmer, C., & Sugden, R. (1998). On the validity of the random lottery incentive system. *Experimental Economics*, *1*(2), 115–131.

Dhar, R., & Gorlin, M. (2013). A dual-system framework to understand preference construction processes in choice. *Journal of Consumer Psychology*, *23*(4), 528–542.

Dhar, R., Nowlis, S. M., & Sherman, S. J. (2000). Trying hard or hardly trying: An analysis of context effects in choice. *Journal of Consumer Psychology*, *9*(4), 189–200.

Dhar, R., & Simonson, I. (2003). The effect of forced choice on choice. *Journal of Marketing Research*, *40*(2), 146–160.

Diels, J. L., & Müller, H. (2013). Revisiting Tversky's trail–How money makes a subtle difference in similarity effect experiments. *Psychology and Marketing*, *30*(6), 501–511.

Ding, M., Grewal, R., & Liechty, J. (2005). Incentive-aligned conjoint analysis. *Journal of Marketing Research*, *42*(1), 67–82.

Ding, M., Park, Y. -H., & Bradlow, E. T. (2009). Barter markets for conjoint analysis. *Management Science*, *55*(6), 1003–1017.

Doyle, J. R., O'Connor, D. J., Reynolds, G. M., & Bottomley, P. A. (1999). The robustness of the asymmetrically dominated effect: Buying frames, phantom alternatives, and in-store purchases. *Psychology and Marketing*, *16*(3), 225–243.

Drolet, A. (2002). Inherent rule variability in consumer choice: Changing rules for change's sake. *Journal of Consumer Research*, *29*(3), 293–305.

Duncan, R. B. (1972). Characteristics of organizational environments and perceived environmental uncertainty. *Administrative Science Quarterly*, *17*(3), 313–327.

Hauser, J. R. (2014). Consideration-set heuristics. *Journal of Business Research*, *67*(8), 1688–1699.

Heath, T. B., & Chatterjee, S. (1995). Asymmetric decoy effects on lower-quality versus higher-quality brands: Meta-analytic and experimental evidence. *Journal of Consumer Research*, *22*(3), 268–284.

Houghton, D. C., Kardes, F. R., Mathieu, A., & Simonson, I. (1999). Correction processes in consumer choice. *Marketing Letters*, *10*(2), 107–112.

Huber, J., & Puto, C. (1983). Market boundaries and product choice: Illustrating attraction and substitution effects. *Journal of Consumer Research*, *10*(1), 31–44.

Jang, J. M., & Yoon, S. O. (2015). The effect of attribute-based and alternative-based processing on consumer choice in context. *Marketing Letters* (in press).

Kardes, F. R. (2013). Selective versus comparative processing. *Journal of Consumer Psychology*, *23*(1), 150–153.

Kardes, F. R., Herr, P. M., & Marlino, D. (1989). Some new light on substitution and attraction effects. In T. K. Srull (Ed.), *NA - Advances in Consumer Research Volume 16* (pp. 203–208).

Khan, U., Zhu, M., & Kalra, A. (2011). When trade-offs matter: The effect of choice construal on context effects. *Journal of Marketing Research*, *48*(1), 62–71.

Kim, H. -j., Park, Y. -H., Bradlow, E. T., & Ding, M. (2014). PIE: A holistic preference concept and measurement model. *Journal of Marketing Research*, *51*(3), 335–351.

Kivetz, R., Netzer, O., & Srinivasan, V. (2004). Alternative models for capturing the compromise effect. *Journal of Marketing Research*, *41*(3), 237–257.

Koc, E., & Boz, H. (2014). Psychoneurobiochemistry of tourism marketing. *Tourism Management*, *44*(October 2014), 140–148.

Lambert, G. W., Reid, C., Kaye, D. M., Jennings, G. L., & Esler, M. D. (2002). Effect of sunlight and season on serotonin turnover in the brain. *The Lancet*, *360*(9348), 1840–1842.

Langner, T., & Krengel, M. (2013). The mere categorization effect for complex products: The moderating role of expertise and affect. *Journal of Business Research*, *66*(7), 924–932.

Lehmann, D. R., & Pan, Y. (1994). Context effects, new brand entry, and consideration sets. *Journal of Marketing Research*, *31*(3), 364–374.

Lichters, M., Bengart, P., Sarstedt, M., & Vogt, B. (2016). What really matters in attraction effect research: When choices have economic consequences. *Marketing Letters* (in press).

Lichters, M., Brunnlieb, C., Nave, G., Sarstedt, M., & Vogt, B. (2016). The influence of serotonin deficiency on choice defferral and the compromise effect. *Journal of Marketing Research*, *53*(2), 183–198.

Lichters, M., Sarstedt, M., & Vogt, B. (2015). On the practical relevance of the attraction effect: A cautionary note and guidelines for context effect experiments. *AMS Review*, *5*(1–2), 1–19.

Lin, C. -H., Yen, H. R., & Chuang, S. -C. (2006). The effects of emotion and need for cognition on consumer choice involving risk. *Marketing Letters*, *17*(1), 47–60.

Mao, W., & Oppewal, H. (2012). The attraction effect is more pronounced for consumers who rely on intuitive reasoning. *Marketing Letters*, *23*(1), 339–351.

Milliken, F. J. (1987). Three types of perceived uncertainty about the environment: State, effect, and response uncertainty. *Academy of Management Review*, *12*(1), 133–143.

Mourali, M., Böckenholt, U., & Laroche, M. (2007). Compromise and attraction effects under prevention and promotion motivations. *Journal of Consumer Research*, *34*(2), 234–247.

Müller, H., Kroll, E. B., & Vogt, B. (2010). Fact or artifact? Empirical evidence on the robustness of compromise effects in binding and non-binding choice contexts. *Journal of Retailing and Consumer Services*, *17*(5), 441–448.

Müller, H., Kroll, E. B., & Vogt, B. (2012). Do real payments really matter? A re-examination of the compromise effect in hypothetical and binding choice settings. *Marketing Letters*, *23*(1), 73–92.

Munro, A., & Popov, D. (2013). A portmanteau experiment on the relevance of individual decision anomalies for households. *Experimental Economics*, *16*(3), 1–14.

Murphy, J. J., Allen, P. G., Stevens, T. H., & Weatherhead, D. (2005). A meta-analysis of hypothetical bias in stated preference valuation. *Environmental and Resource Economics*, *30*(3), 313–325.

Neumann, N., Böckenholt, U., & Sinha, A. (2016). A meta-analysis of extremeness aversion. *Journal of Consumer Psychology*, *26*(2), 193–212.

Nowlis, S. M., & Simonson, I. (2000). Sales promotions and the choice context as competing influences on consumer decision making. *Journal of Consumer Psychology*, *9*(1), 1–16.

Pan, Y., & Lehmann, D. R. (1993). The influence of new brand entry on subjective brand judgments. *Journal of Consumer Research*, *20*(1), 76–86.

Pechtl, H. (2009). Value structures in a decoy and compromise effect experiment. *Psychology and Marketing*, *26*(8), 736–759.

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Pettibone, J. C. (2012). Testing the effect of time pressure on asymmetric dominance and compromise decoys in choice. *Judgment and Decision Making*, *7*(4), 513–523.
Pettibone, J. C., & Wedell, D. H. (2000). Examining models of nondominated decoy effects across judgment and choice. *Organizational Behavior and Human Decision Processes*, *81*(2), 300–328.
Petty, R. E., Cacioppo, J. T., & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research*, *10*(2), 135–146.
Pocheptsova, A., Amir, O., Dhar, R., & Baumeister, R. F. (2009). Deciding without resources: Resource depletion and choice in context. *Journal of Marketing Research*, *46*(3), 344–355.
Pratt, L. A., Brody, D. J., & Gu, Q. (2011). Antidepressant use in persons aged 12 and over: United States 2005–2008. *NCHS Data Brief*, *76*(October), 1–8.
Rehman, H. U., & Masson, E. A. (2001). Neuroendocrinology of ageing. *Age and Ageing*, *30*(4), 279–287.
Rubinow, D. R., Schmidt, P. J., & Roca, C. A. (1998). Estrogen-serotonin interactions: Implications for affective regulation. *Biological Psychiatry*, *44*(9), 839–850.
Ryu, G., Suk, K., Yoon, S. -O., & Park, J. (2014). The underlying mechanism of self-regulatory focus impact on compromise choice. *Journal of Business Research*, *67*(10), 2056–2063.
Sharpe, K. M., Staelin, R., & Huber, J. (2008). Using extremeness aversion to fight obesity: Policy implications of context dependent demand. *Journal of Consumer Research*, *35*(3), 406–422.
Sheng, S., Parker, A. M., & Nakamoto, K. (2005). Understanding the mechanism and determinants of compromise effects. *Psychology and Marketing*, *22*(7), 591–609.
Shively, C. A., Mirkes, S. J., Lu, N. Z., Henderson, J. A., & Bethea, C. L. (2003). Soy and social stress affect serotonin neurotransmission in primates. *The Pharmacogenomics Journal*, *3*(2), 114–121.
Simonson, I. (1989). Choice based on reasons: The case of attraction and compromise effects. *Journal of Consumer Research*, *16*(2), 158–174.
Simonson, I. (1999). The effect of product assortment on buyer preferences. *Journal of Retailing*, *75*(3), 347–370.
Simonson, I., & Tversky, A. (1992). Choice in context: Tradeoff contrast and extremeness aversion. *Journal of Marketing Research*, *29*(3), 281–295.
Sinn, F., Milberg, S. J., Epstein, L. D., & Goodstein, R. C. (2007). Compromising the compromise effect: Brands matter. *Marketing Letters*, *18*(4), 223–236.
Wang, J., & Wyer, R. S., Jr. (2002). Comparative judgment processes: The effects of task objectives and time delay on product evaluations. *Journal of Consumer Psychology*, *12*(4), 327–340.
Wegener, D. T., & Chien, Y. -W. (2013). Elaboration and choice. *Journal of Consumer Psychology*, *23*(4), 543–551.

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