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A New Method of Measuring Temporal Discounting: the Motivational Present Value of Future Rewards

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In behaviors motivated by future concerns, people often appear myopic, e.g., saving insufficiently for retirement. We suggest that conventional measures of present value, sometimes used to predict such behavior, provide a poor measure of the present motivational value of future rewards. In four experiments we develop and examine a measure of the motivational present value of future rewards, demonstrating that the present value obtained by conventional measures overestimates their motivational present value. Additional results suggest this overestimation may reflect how people assess rewards using a monetary scale, and is not due to the presence of effort in our motivational present value measure.

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SPECIAL SESSION SUMMARY

Time and Decision: New Perspectives on Present-Biased Preferences

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SESSION OVERVIEW

Consumers are constantly faced with decisions about the timing of their consumption. Consumers evaluate investments and savings (costs incurred now for future gain), redemption of cash refunds and rebates (a wait period followed by earnings) and indulgent consumption (benefits experienced now but with a cost (e.g., to one's health) incurred later). Prior research has consistently shown that people have a preference toward the present, overweighting near outcomes compared to later outcomes. Furthermore, this impulsivity has been shown to decline with time (i.e., hyperbolic discounting or present bias; Thaler 1981). That is, when making a decision between smaller-sooner and larger-later rewards, individuals' implied rate of discounting (or preference for smaller-sooner outcomes) is higher over a short compared to a long time horizon. This pattern of behavior has been attributed to impulsivity (Loewenstein 1996), to differences in cognitive representations between near and future events (e.g., Zauberman and Lynch 2005) or to an individual difference in time orientation (e.g., Zimbardo and Boyd 1999).

The papers in this special session propose new perspectives for understanding present-biased preferences. These papers challenge current theorizing in this domain and provide boundary conditions for existing findings. In particular, they demonstrate that impatience (1) is better measured by a motivational present value approach, (2) is better understood if prior consumer decisions are taken into account and (3) might not always be as robust as previous research has suggested.

The first paper, by Ebert and Prelec, argues that conventional measures of intertemporal preference systematically underestimate consumers' present value of future outcomes. They develop a motivational measure that is based on the exerted effort to obtain outcomes at different times, and show that the traditional measures of time preference (e.g., WTA) systematically underestimates present value. The authors suggest that this may reflect how people assess rewards using a monetary scale and discuss the psychological differences in monetary and motivational measures.

The second paper, by Malkoc, Zauberman and Bettman, explores the role of previous tasks in consumer impatience. The authors demonstrate that prior decisions change processing concreteness (focus on the big picture versus details) and systematically affect present bias. Their results indicate that consumers show less present bias when in abstract mindsets, compared to when they think concretely (even when the prior task is unrelated)-introducing a new conceptualization and showing that present bias is moderated by the extent of context-dependent thinking.

The third paper, by Read and Frederick, examines the longitudinal aspect of present bias. The authors note the cross-sectional nature of the experiments that demonstrated present bias and examine such intertemporal preference reversals in three longitudinal studies. They find support for preference reversals in line with hyperbolic discounting *only* when the sooner outcome is immediate. These findings suggest that present-biased preferences support a quasi-hyperbolic form. In addition, these results provide boundary conditions for present bias, indicating the importance of temporal proximity to the outcome.

Collectively, the three papers in this special session provide new insights about consumer impatience and time discounting, by

offering new measurement, conceptualizations, and psychological drivers for present-biased preferences.

Following presentations, Drazen Prelec, the session discussant, provided an overview of how these papers inform and qualify the findings of previous research, as well as noting some of the ways in which the session offers diverging perspectives on intertemporal preferences.

EXTENDED ABSTRACTS

“A New Method of Measuring Temporal Discounting: The Motivational Present Value of Future Rewards”

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A wide range of people's behaviors in the present are motivated by longer-term or future concerns: employees work for future bonuses or to invest for retirement; students study to obtain a degree; and people exercise for future health. Many researchers and policy-makers are interested in the rates at which people discount such future concerns, or the value they place on them relative to the present, with the underlying assumption that this *present value* provides a measure of the importance or motivational power of people's future concerns on their present behavior (e.g., Chapman et al. 2001; Kirby et al. 1999).

Measures of present value most commonly used ask people to explicitly state the present value of a future reward, such as “What is the equivalent value to you today of \$120 in one year?” Obtained discount rates using such measures vary considerably, but overall they tend to be positive and rather high (see Frederick et al. 2002 for a review). If our goal is to use discounting measures to understand or predict those behaviors that are motivated by future concerns, then a present value should, ideally, represent the equivalent motivational power in the present of an event in the future. So, for example, a future reward of \$25 that a person assigns a present value of \$20 should have the same motivational power for that person as a present reward of \$20. However, for several reasons we suspect that conventional explicit discounting measures may provide a poor measure of the present motivational value of future rewards, and, if anything, are likely to overestimate this present value and so underestimate the discount rate. So, even if people explicitly say that a future reward of \$25 has a present value of \$20, they may nonetheless behave, and even expect to behave, as if it has a present value of, say, \$10. I.e., the discount rates people will demonstrate in their behavior, and even in how they expect to behave, will be higher than those measured using conventional discounting measures. We attempt to demonstrate and examine this in the current research, through the development of a new measure of discounting that assesses the motivational present value of a future reward.

In our first study, we develop a method that 1) pits effort against a future reward to assess the motivational value of the future reward (specifically, we assess how long people exert effort working on a simple task in the present in order to gain a future reward), and 2) calibrates the effort expended for the future reward against the effort expended for different immediate rewards to assess the motivational present value of the future reward. We compare the present value we obtain using this motivational measure with that obtained for the same participants using a conventional discounting

measure, and find that the present motivational values we obtain are lower than the present “explicit” values obtained on the conventional discounting measure: i.e., the future has less motivational force than we might expect given conventional discounting measures. This suggests that the present value captured by the conventional discounting measure is not the present motivational value we might wish to assess.

Two important features of our comparison of the motivational and explicit present values are: first, the same future rewards are used for both measures precluding arguments that people simply value different future quantities differently, and second, the calibration of the effort people expend for future rewards against the effort they expend on the same task for immediate rewards precludes arguments that people simply value different present quantities, e.g., effort versus money, differently.

In the second of our studies, we replicate this finding for future rewards and demonstrate that people are similarly inconsistent in their present values for uncertain or probabilistic rewards, where again the conventionally obtained explicit present values are lower than the motivational present values. In two subsequent studies we strengthen the conclusion of the first two studies, that participants’ motivational present values are inconsistent with their explicit present values, where the motivational values are systematically lower. We also examine whether the presence of effort in our motivational measure may account for this result and we compare participants’ motivational present value with the present values obtained on several alternative discounting or present value measures. In study 3, we develop a within-subjects version of our task, which aids consistent responding across the motivational and conventional discounting measure and so provides a stricter test of our result. In addition, we show that the presence of effort in our motivational measure of present value is unlikely to be responsible for our finding that present motivational values for future rewards are lower than people’s present explicit values. In study 4, we replicate these findings and examine the differences in present value obtained between several alternative discounting measures that resemble our motivational and explicit measures in different respects.

By attempting to measure the motivational force of a future reward, this research has taken a novel approach to understanding the myopic behavior people show in their day-to-day lives. Previous work interested in the motivational power of rewards in choices that trade-off desires in the present and the future has generally focused on the motivational power of immediate rewards, e.g., work on visceral effects (Loewenstein 1996) or mental effort (Baumeister and Vohs 2003) on self-control. In contrast the current research focuses on the motivational power of future rewards.

“Impatience is in the Mindset: Carryover Effects of Processing Abstractness in Sequential Tasks”

Selin Malkoc, University of Minnesota

Gal Zauberman, University of Pennsylvania

James Bettman, Duke University

Extant research on intertemporal choice has demonstrated that people are not only highly impulsive, but also display present bias by using higher discounting for shorter delays (e.g., Thaler 1981). Although there is ample evidence documenting present bias, relatively little is known about its underlying mechanism. Explanations offered include both affective (Loewenstein 1996; Rachlin and Raineri 1992) and cognitive processes (Malkoc and Zauberman 2005; Zauberman and Lynch 2005). These accounts, however, have conceptualized intertemporal decisions independently of any tasks previously engaged in and have focused on responses triggered by the focal outcome, such as outcome-specific feelings (i.e., depriva-

tion) or cognitions (i.e., representational proximity) as the driving force behind present bias.

In the current work, we suggest that the tasks people have previously engaged in have systematic effects on processing concreteness and that these changes in concreteness of processing might be sufficient to explain dynamic inconsistencies in preferences. Building upon ideas from the psychology of verbal processing (e.g., Paivio 1971) and processing orientation (e.g., Navon 1977), we argue that when in concrete processing mode, individuals are more myopic and context dependent, leading to present bias. When the processing mode is more abstract, however, preferences show more intertemporal consistency, attenuating present bias. Three studies manipulating processing specificity with prior tasks provide support for this prediction.

Based on research showing that abstract thinking is facilitated when evaluating non-comparable options (Johnson 1984; Malkoc et al., 2005), in Experiment 1 participants (N=102) were provided with two cameras presented on seven attributes (either alignable or non-alignable) and were asked to compare them. Next, they were told to imagine shipping the camera and were asked how much they would need to save to delay its receipt by 3 and 10 days. As expected, we found a 2-way interaction between time horizon and alignability ($F(1, 106)=5.653, p<.05$), demonstrating an attenuation in present bias when participants evaluated non-alignable options.

Experiment 2 (123 participants) manipulated abstraction with an unrelated elaboration task. Participants first wrote their thoughts about the Digital Millennium Copyright Act and were directed to think either about implications for a specific and concrete consumer (their roommate) or for the more abstract notion of consumers in general. Next, participants completed a separate cash refund study where they delayed the receipt date of a \$75 cash refund by 4 or 10 weeks. The analyses again found an interaction between abstractness of mindset and time horizon ($F(1, 120)=4.309, p<.05$), with less present bias shown when thinking about the broad implications compared to a specific exemplar.

In experiment 3 (231 participants), we manipulated processing concreteness with a supraliminal priming task to further test the boundaries of our effect. Participants first completed a word search puzzle that had either concrete or abstract words embedded in it. Presented as an unrelated task, participants next indicated their WTA to delay the redemption of a \$75 gift certificate by 3 and 12 months. Results replicated the two previous studies, with a significant 2-way interaction ($F(1, 229)=4.66, p<.05$) indicating diminished present bias when participants were primed with abstract words.

In sum, the current work demonstrates that intertemporal decisions are systematically influenced by the previous tasks people engage in. That is, prior decisions change the specificity (concreteness vs. abstractness) of processing and have systematic effects on present-biased preferences. Specifically, we show that when in abstract mind sets, people act less present-biased compared to when they think more concretely, suggesting that the extent of present bias depends on the abstractness of mindset, which can be influenced via prior experiences.

“Longitudinal Time Inconsistency”

Daniel Read, University of Durham

Shane Frederick, Massachusetts Institute of Technology

We investigated the hyperbolic discounting model of intertemporal choice, according to which the discount rate is a function of delay-to-outcome, with shorter delays being associated with a higher discount rate. Its major prediction is that people will predictably change their prior plans with the passage of time.

FIGURE 1

Hyperbolic discounting

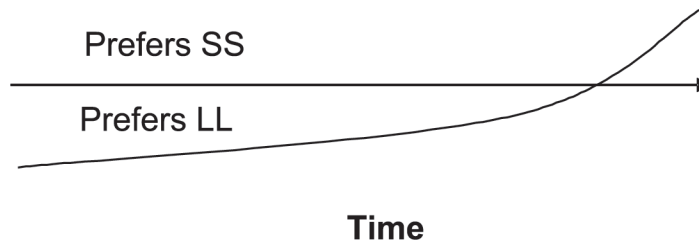


FIGURE 2

Quasi-Hyperbolic discounting

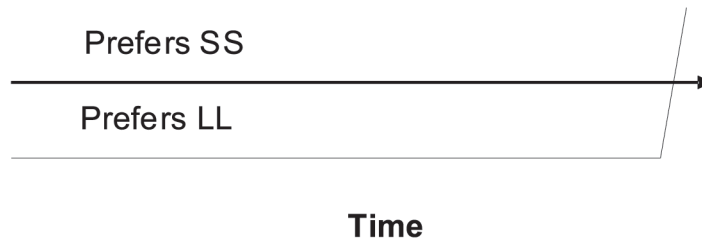


TABLE 1

Study	Time until SS	Shift ratio
1	> 24 hours	0.54
2	< 24 hours	1.25
3	< 1 hour	1.88

Specifically, if we hold the interval separating two outcomes constant, preference will often switch from a larger-later outcome (LL) to a smaller-sooner one (SS) as the two options move closer in time. The general idea is illustrated below. Figure 1 shows that as time passes, SS becomes increasingly attractive relative to LL. Preferences always move in the direction of SS, and sometimes they will ‘reverse,’ as in the illustration, when SS becomes superior to the formerly preferred LL.

Most experimental tests of this prediction have not investigated it in the dynamic form just described. Rather, they have relied on a potentially misleading cross-sectional design involving many choices over different pairs of dated outcomes, taken from the vantage point of a single date, rather than a longitudinal design involving many choices between a single pair of dated outcomes, made from the vantage point of different dates. We conducted three experiments using a longitudinal design. These experiments were done over email with an international sample, mostly from the United States.

Respondents made choices at multiple times between Amazon gift certificates to be received at specific future *dates* outcomes, one smaller-sooner (SS) and one larger-later (LL). The dependent measure was the choice between SS or LL, and whether preferences shifted as time to receipt diminished. The delay between the final choice and SS differed across experiments, from less than a day to less than an hour. This is important because the *quasi-hyperbolic* discounting model, predicts preference reversals will occur if the time to earliest SS is *very* short, as shown in Figure 2.

In our experiment, the measure of interest was the ratio of preference reversals in the LL?SS to those in the SS?LL direction—the shift ratio. Models of hyperbolic discounting predict this shift ratio will be greater than 1. In our studies, we observed the following as shown in Table 1.

In Experiment 1, when SS was delayed by about one day, we observed no net tendency for “hyperbolic” preference reversals. In fact, there was a weak but clear tendency for preferences to reverse in the *opposite* direction. In Experiment 2, when SS was delayed by

less than one day, there was a slight tendency for hyperbolic reversals. Only in Experiment 3, when the more immediate reward could be obtained in one hour, did evidence for hyperbolic reversals clearly emerge. Thus, these three studies provide support for the quasi-hyperbolic model.

In Experiment 3, we also asked people to explain their choices. Two reasons were frequently and clearly given for the *LL*→*SS* switches. Some offered remarkably explicit *psychophysical* explanations for hyperbolic discounting, pertaining to the perceived similarity of the two time points, as Rubinstein (2003) has postulated. Others referred to a desire to satisfy *immediate spending needs*. Usually, these needs were imminent, and often discovered over the course of the experiment—leading those who initially chose *LL* to switch to *SS*. Such explanations suggest an explanation for preference reversals and for various other phenomena in intertemporal choice. People are more likely to think of earlier needs than later ones. They are typically impatient because they are usually thinking of earlier needs. They become more patient with longer intervals because the delayed payoffs aren't pertinent to imminent needs. However, as time to rewards elapses, imminent needs again become salient, causing an impatient shift. We also believe that the differential salience of needs can explain the magnitude effect, the delay-speedup asymmetry, and other empirical regularities.

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SPECIAL SESSION SUMMARY

Changing Colors of My Thinking Hat: Influence of Situational and Task-Related Factors on Thinking Styles

Monica Wadhwa, Stanford University, USA

SESSION OVERVIEW

Much research in consumer information processing and decision making has been devoted to differences in thinking styles. Consumer behavior theorists and psychologists from different persuasions have distinguished between various thinking styles such as experiential versus rational modes of thinking (Epstein 1983, 1985), system-1 versus system-2 thinking styles (Kahneman 2003, Kahneman and Frederick 2002, Stanovich and West 1998, 2000), analytic versus holistic thinking styles (Nisbett 2001) and broad versus narrow thinking styles (Martindale 1985, Mednick 1962). Differences in thinking styles have been mostly attributed to dispositional differences (Martindale 1985, Mednick 1962) and cultural factors (Chiu 1972, Nisbett 2003, Nisbett and Miyamoto 2005). In contrast, little effort has been devoted to other important facilitators of thinking styles, particularly situational and task-related characteristics, which often guide consumer behavior (Belk 1975). A broad purpose of this session, therefore, is to push forward the boundaries of research on thinking styles by exploring situational and task-related factors that impact consumer information processing and thinking styles

The specific objectives of this session are a) to outline new measures of experiential versus rational thinking styles engendered by the nature of task and b) to examine how task-related factors (e.g., constraints) and consumer environment can impact thinking process, specifically creative thinking process. Keeping in mind the broad range of audience that ACR conference attracts, the three papers in this session represent a diversity of topics in the domain of thinking styles that are relevant for marketers and consumers, ranging from the “task-specific thinking styles” (Novak and Hoffman), to the role of constrained thinking process on creative enjoyment and motivation (Dahl and Moreau), to overt visual attention and creative thinking (Shiv and Wadhwa).

The session will begin with a focus on “task-specific thinking styles”. Thomas Novak and Donna Hoffman will present their work that focuses on tasks as elicitors of thinking styles. More specifically, Novak and Hoffman develop a two-dimensional scale to measure the task specific thinking style. Novak and Hoffman demonstrate the importance of task specific thinking style over and above the dispositional thinking style for task performance. Furthermore, they show that the congruence of the task and task specific thinking style improves task performance, while incongruence between the task and task specific thinking style worsens performance on the task.

The focus of this session will then shift to the role of constraints on creative thinking on the enjoyment of and motivation on creative experiences. Page Moreau will present her work with Darren Dahl that examines how constraints imposed on creative thinking influence consumers’ motivation and overall task enjoyment. More specifically, Dahl and Moreau demonstrate that consumers enjoy the creative experience more in the presence of constraints such as receiving step-by-step instructions. However, they demonstrate that constraints imposed on the target outcome lower the enjoyment of the creative experience for high-skill individuals.

Finally, Monica Wadhwa will present her work with Baba Shiv focusing on the role of overt attention on creative thinking

process. Shiv and Wadhwa demonstrate that the breadth of overt attention engendered in the process of scanning an external visual field impacts the breadth of covert attention (i.e., internal attention), which subsequently impacts creative thinking in a subsequent unrelated consumer creativity task. More specifically, the authors argue that scanning a broad versus a narrow visual field (e.g., watching a movie on a 40-inch versus a 17-inch screen) can broaden the scope of covert attention, which, in turn bolsters creativity on a subsequent consumer creativity task of coming up with creative gift ideas.

In an effort to increase audience participation, the session will have the services of Amitava Chattopadhyay as a discussant. Amitava has expertise in the areas of creativity, consumer decision making, branding and marketing communication. His work has appeared in several journals including the *Journal of Marketing Research*, *Journal of Consumer Research*, *Journal of Marketing*, *Marketing Science* and *Management Science*. Amitava, thus, has a unique perspective for discussing these papers and leading a discussion about an appropriate research agenda for continued work in this area.

EXTENDED ABSTRACT

“New Measures of Task-Specific Experiential and Rational Cognition”

Thomas P. Novak and Donna L. Hoffman

Decades of theoretical and empirical research in social and cognitive psychology provide strong evidence that consumers process information in two distinct and qualitatively different ways: rational and experiential (Epstein 1994; Hogarth 2005; Kahneman and Frederick 2002, Kahneman 2003; Sloman 1996; Smith and DeCoster 2000; Stanovich and West 1998, 2000; and Strack and Deutsch 2004). A key commonality among modern dual process theories is the existence of two qualitatively different and interoperating systems, each best suited to its own purpose.

Despite this growing body of research, there has been surprisingly little research attention devoted to directly measuring how different tasks directly impact thinking style. Further, attempts to simultaneously measure the two dimensions of thinking style as either situation-specific or as an enduring state are even fewer and lack validation in a broad context.

To that end, we conducted three comprehensive studies. First, we developed and cross-validated new two-dimensional scales to measure what we term *task-specific thinking style* (TSTS) using a series of experimental tasks designed to induce primarily rational or experiential thinking. Our highly reliable TSTS measure was, as predicted, best fit by a two-dimensional factor structure. Rational TSTS was higher for rational tasks and experiential TSTS was higher for experiential tasks, providing empirical support for the idea that cognitive tasks can be arrayed along a continuum of cognition. Congruence of task and TSTS improved task performance, and incongruence worsened task performance; thus TSTS is an important process variable in understanding task performance. Both the task itself, as well as dispositional tendencies to adopt a particular thinking style, predicts TSTS. As expected, the TSTS adopted for a task is explained more by the task itself than by

dispositional differences in thinking style, supporting the use of experimental tasks to prime thinking styles and suggesting TSTS as a manipulation check for such tasks. Since dispositional tendencies predict TSTS, disposition influences the degree to which a priming task is likely to be effective, and thus disposition should be measured as a covariate when attempting to prime thinking style.

More importantly, we use TSTS to systematically test congruence effects between the demands of a task and the thinking style adopted when performing the task. We examine when congruence between thinking style and task increases actual and perceived task performance, decreases task difficulty, increases involvement, and improves mood—and if congruence effects are found for both rational and experiential tasks that require qualitatively different processing styles. Our findings contribute to the literature on congruence effects involving thinking styles, and argue for task specific thinking style being routinely measured as a process variable when considering performance on a broad range of consumer activities. For example, we find that for experiential tasks, a “low cognitive engagement” strategy results in relatively high performance, but at a personal cost to the respondent. This is a particularly interesting result since although low effort strategies hurt performance (accuracy) on rational tasks (e.g. Payne et al. 1993), but not on the experiential task—low effort strategies are psychologically detrimental as respondents employing a low effort strategy perceive the experiential task as more difficult and their mood and involvement suffers. This suggests that the effort-accuracy tradeoff may not apply to experiential tasks—thinking “too much” hurts performance, while thinking “too little” seems to help.

We also hypothesized that *dispositional thinking style*, an enduring predisposition toward predominantly rational or experiential thinking, plays a key role in determining the thinking style employed in a given task, beyond the demands of the task itself. Dispositional tendencies create heterogeneity in how different individuals approach the same task, contributing to congruence or incongruence of TSTS with the task. The results show that some of the variation in whether an experiential or rational thinking style is adopted for a task will result from dispositional tendencies. Thus, TSTS provides an important mediating link between a broad, dispositional cross-situational thinking style, and performance on tasks that are congruent or incongruent with a thinking style.

Our TSTS scales may also prove useful in reconciling apparent observed conflicts in thinking style. Some theories assume the two thinking styles work in a mutually exclusive manner (Brewer 1988; Fazio 1986). Others assume sequential processing, with the more rapid experiential thinking preceding rational thinking (Fiske and Neuberg 1988; Gilbert 1989; Wegener and Petty 1995). Our approach, following Epstein (1991) and other modern dual process theories, assumes the two operate both simultaneously and sequentially. While our experimental tasks indicated largely *oppositional* effects of the two styles, it is likely that other tasks might demonstrate *synergistic* effects, with both experiential and rational TSTS correlating positively with task performance (in this case, the “dual thinking styles” strategy we observed in some of our experiments would be optimal). For example, Donovan and Epstein (1997) demonstrated that priming intuitive knowledge can facilitate intellectual performance, and Norris and Epstein (2003a) demonstrated numerous situations in which both thinking styles predict in the same direction.

Our findings are also relevant for everyday activities consumers engage in. The thinking style differences we observed on laboratory performance tasks suggest we can and should expect to find differences in rational compared to experiential task-specific

thinking for work vs. play (Babin, Darden and Griffin 1994; Hammond, McWilliam and Diaz 1998; Wolfinger and Gilly 2001), directed vs. nondirected search (Bloch Sherrell and Ridgway 1986; Bloch, Ridgway and Sherrell 1989), choice among specific alternatives vs. navigational choice (Hoffman and Novak 1996; Deci and Ryan 1985), and planned purchases vs. impulse buys (Rook 1987).

Recently, cognitive neuropsychologists have utilized brain imaging tools such as fMRI to support the presence in the brain of dual thinking styles (Goel 2003; Goel and Dolan 2003) and biochemical theories of emotion speculate that “gut reactions,” for example, may literally reside in one’s stomach (Pert 1997). Our empirical results demonstrating the importance of task-specific thinking style over and above dispositional thinking style for task performance may provide further impetus to scientists seeking neurological and chemical pathways that correspond to human cognition and task performance.

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"Thinking Inside the Box: Why Consumers Enjoy Constrained Creative Experiences"

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Since paint-by-number kits surged in popularity in the 1950's, consumers have sought out products designed to assist them in being creative. "Self-expression for the time deprived" has created demand for products offered by firms ranging from specialty crafts (e.g., Martha Stewart) to home improvement (e.g., Lowe's). Among the many products offering constrained creative experiences are kits (e.g., model trains, needlepoint), how-to guides (e.g., cook books, home repair, landscaping), and inspirational sources (e.g., home improvement programs). We consider these products as offering "constrained" creative opportunities because the products themselves explicitly constrain elements of the process (via a set of

instructions) and/or the outcome (via a visual representation of the end product). The recent sales growth in these categories suggests that consumers value these constraints, and a central objective of this research is to understand why.

More specifically, the goals of this research are first, to understand consumers' motivations for engaging in creative tasks and second, to examine how constraints influence the quality of those experiences. A qualitative study is initially used to address these goals. Two experiments then build on the qualitative results, offering the first experimental evidence documenting the conditions under which consumers enjoy creative activities. The experiments also measure and test specific mediators to explain why consumers enjoy such tasks.

In the qualitative study, twelve respondents from eight different hobby areas (woodworking, scrap-booking, sewing, cooking, model building, card-making, quilting, jewelry-making) discussed their motivations for undertaking their hobbies. They also explained how products in their areas (e.g., kits, books, classes) influenced their experiences. Data analysis from these interviews revealed seven different basic motivations for undertaking the creative tasks, with the needs of competence and autonomy the most frequently discussed. The data also helped to identify the key pros and cons offered by creativity products. Interestingly, most of the products influenced the needs for competence (positively) and autonomy (negatively).

The findings from the qualitative study suggested the relevance for cognitive evaluation theory (CET) for further studies of consumers' creative experiences (Ryan and Deci 2000). The theory focuses specifically on two important determinants of self-motivation, the needs for autonomy and competence. Thus, we derive a series of hypotheses based on the theory to predict how the constraints imposed by creativity products (e.g., step-by-step instructions and target outcomes) will influence consumers' motivations during and enjoyment of creative experiences. In the experimental studies, participants engaged in hands-on creative tasks: cookie-making and decorating.

In the first experimental study, two factors were manipulated between-subjects: (1) instructions (step-by-step provided vs. not provided) and (2) target outcome (picture of the final product provided vs. no picture provided). Participants were 100 undergraduate students who were each shown to their own cookie-making station which contained a set of tools, pre-made dough, pre-made white icing, food coloring, and cookie decorations. At that point, both experimental manipulations occurred and all participants proceeded in making their cookies. After completing the cookie-making process, participants completed a survey instrument that contained the dependent variables of interest: competence, autonomy, and task enjoyment.

The results reveal an interaction between the two constraints (instructions and target outcome) on task enjoyment, such that participants reported the highest levels of task enjoyment when a full set of instructions was provided without a target outcome. To better understand this interaction, we performed mediation tests which revealed that perceived competence fully mediated and perceived autonomy partially mediated the effect. When instructions were provided without a target outcome, perceived competence was at its highest. Perceived autonomy was also high under these conditions, and the relatively high levels of both of these factors resulted in the greatest enjoyment. Those receiving no target outcome and a set of instructions had both the ability to successfully follow task guidance (competence) and the freedom to create an individualized design (autonomy).

The first experimental study assumed no level of prior experience in the study participants, and through randomization, miti-

gated any effects that such differences would have on motivation and enjoyment. However, prior skill levels are likely to have an important influence, not only on one's likelihood of purchasing a creative product, but also on the likelihood of enjoying the experience offered. Thus, the second experimental study examined the influence of skill level and one constraint (target outcome) on motivation and enjoyment. In this second study, all participants were provided with a full set of instructions. Target outcome was manipulated between-subjects, and prior baking skill was measured and subsequently dichotomized to create a high and a low skill group. The task and procedure was largely the same as that described in the first experimental study.

The results from this second study revealed that prior skill level may be a critical segmentation variable for manufacturers of creativity products. Those participants with low skill levels were able to achieve levels of perceived competence and task enjoyment comparable to those experienced by the high skill participants when a target outcome was dictated. Under these conditions, people of all skill levels had similar perceptions of task difficulty. For those with high skill levels, however, perceptions of competence and autonomy declined significantly when a target outcome was specified and consequently, task enjoyment declined as well.

While the study of creativity has received growing attention, Sternberg and Dess (2001) note that "we do not know enough about this important psychological process" (p. 332). Certainly this statement also applies to our understanding of consumers' experiences during and motivations underlying creative tasks. While restricted in its scope, our research is designed to initiate a more thorough examination of consumers' creative experiences.

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"The Eye's Mind and the Mind's Eye: Impact of Overt Visual Attention on Creative Thinking"

Baba Shiv and Monica Wadhwa

"Eyes cannot be held responsible when the mind does the seeing"...*Pubilius Syrus*

Scanning our visual environment is an activity, which human beings engage in most of our waking lives. As consumers, we constantly scan our market-environment for information. Furthermore, depending on the size of the visual field, scanning the market environment might involve either a broad or a narrow scope of overt attention. For instance, one could shop for a particular wine (say, Merlot) from an online wine market with all the wines cluttered in a narrow visual area, thereby requiring a narrow scope of overt attention. Or, one could shop for the same wine from an online market with all the wines widespread in a broad visual area, which would require a broad scope of overt-attention. Take another example, that of watching a movie on a weekend. One could watch a movie on a 17-inch TV screen, which would require focusing on a narrow visual area, or one could watch it on a 50-inch TV screen, which would entail focusing on a broad visual area. A question that arises is, would scanning a broad visual field versus a narrow visual field to search for a wine, or watching a movie on a 50-inch rather than on a 17-inch screen make one more creative in a subsequent task of coming up with creative gift ideas for a friend? We posed this

question in a short survey to twenty consumers. All the survey respondents replied to this question in the negative, suggesting that based on common intuition, scanning the environment in one task should not impact creativity on a subsequent unrelated task.

Contrary to the common intuition, however, we argue that the way we scan our consumer environment can impact our creativity on a subsequent unrelated task. Specifically, we propose that a broad scope of overt attention can broaden the scope of covert attention, which, in turn can bolster creativity on a subsequent task. Our predictions are consistent with literature on visual perception, which suggests that the mechanisms underlying perceptual and conceptual attention are high correlated (Grosbras and Paus 2002; Kosslyn 1980). Furthermore, research on creativity suggests that a broad versus a narrow scope of internal attention is likely to bolster creativity (Mednick 1962). Thus, drawing upon the two streams of research, creativity and visual perception, we hypothesize that a broad overt attention associated with scanning a broad visual field is likely to enhance the covert breadth of attention, which can be beneficially applied to a subsequent consumer creativity task.

The results from our three studies support our predictions. In study-1, we utilized a movie-consumption (movie clips from the movie Top-Gun) task. Specifically, we manipulated the overt scope of attention by manipulating the size of the screen on which participants watched the movie. In the broad overt-attention, respondents watched the movie on a 50-inch screen, while in the narrow overt-attention respondents watched the movie on a 17-inch screen. Consistent with our predictions, respondents in the broad overt-attention condition generated more creative ideas than those in the narrow overt-attention condition. More interestingly, those in the broad overt-attention condition drew gift ideas from a significantly broader range of product categories than those in narrow overt-attention.

We replicated our results of study-1 in study-2 using a different consumption scenario. In study-2, respondents engaged in an online wine search task, and thereafter participated in the creative gift ideas task. Respondents were asked to search for Merlot wine from an online wine-market containing ten different wines. We manipulated overt attention by manipulating the size of the wine market. In the broad overt-attention condition, the wines were scattered across the screen covering the entire 15-inch display, while in the narrow overt-attention condition, all the wines appeared in the center of the screen in a small circle. Thereafter, as in study-1, all respondents participated in the creative gift-idea task. As in study-1, those in the broad overt-attention condition generated more creative ideas and drew ideas from a significantly broader range of product categories than those in narrow overt-attention condition. These results suggest that overt-attention impacts covert-attention, thereby impacting creativity on a subsequent task.

Our exposition thus far suggests that the breadth of covert attention with its concomitant effects on creativity is influenced by the overt attention associated with the size of the external visual field. Specifically, we suggest that the broad scope of overt attention bolsters the breadth of covert attention, which can be beneficially applied to a subsequent consumer creativity task. If our exposition is valid, then narrowing covert attention by asking respondents to restrict eye-movement and focus on one object in the scene versus focusing on the entire scene during the external attention task should attenuate the visual field effects on creativity in the broad-overt attention condition. This logic formed the basis to provide stronger evidence for our conceptualization in experiment 3. In experiment-3, respondents engaged in a car race task. Respondents were shown cartoon-car race clips on either an 8-inch or a 30-inch screen. Half of the respondents were made to restrict eye-movement by asking them to focus on a specific car in the