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SELF-MONITORING AND IKEA EFFECT

Running Title: SELF-MONITORING AND IKEA EFFECT

**Labor and Individual Differences:
Their Influence on Product Value Perception**

By

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SELF-MONITORING AND IKEA EFFECT

ABSTRACT

THU TRANG, NGUYEN THI Labor and Individual Differences: Their Influence on Product Value Perception. Departments of Economics and Psychology, March 2014

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The current research examined the impact of self-monitoring propensity on the “IKEA Effect”, in which labor induces greater liking for the products of one's labor, and as a result overvaluation of one's creation. Whereas there was some research, such as those on toolkits or the “IKEA Effect”, which investigated valuation of self-created or self-build products, there is still little on personality traits influencing such valuations. In the experiment, students evaluated their self-assembled origami crane, cranes made by other participants, or cranes made by someone with high experience doing origami. The valuations made by the groups in different conditions are then compared. Results suggest that labor does not lead to increased valuation and interaction with self-monitoring was not significant but can be qualified as a trend. These finding can have implications for marketing manager decisions, and company employers and managers more generally. Our research discusses alternative explanations, implications, and opportunities for future research.

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I. Introduction

Ikea is a successful Swedish furniture manufacturer, whose large portion of products requires some form of self-assembly. Buying a ready-made manufactured piece of furniture handled by the professionals might have saved time and effort that could have been used elsewhere. There is also the possibility that the results of assembling might not turn out as refined as those assembled by the experts. The opportunity costs and possible risks created by those products should have discouraged mass of consumers from purchasing them, unless offered a low price which subtracted the cost of their own labor, which would result in significant losses faced by the company. However, Ikea has been very successful and profitable with the company's self-assembly products.

Various companies that allow consumers to act as co-creators of the goods, such as teddy bears, t-shirts, coffee mugs or even automobile, by letting them participate in design or assembly of their own products, have also been popular among consumers (Mochon, Norton & Ariely, 2012). One of the crucial reasons behind this phenomenon, might be the same as one behind children choosing a jigsaw puzzle or a coloring page over a mere picture. As children, consumers already have experienced the phenomenon of "labor leading to love" (Norton, Mochon and Ariely, 2011). Harvard researchers recently found through series of experiments that labor can induce greater liking for the products of one's labor. As a result, many tend to overvalue their own creations. This phenomenon was called "IKEA effect" after the Swedish manufacturer (Norton et al., 2011).

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The meaning of labor here does not have to be physical. The products can be “built” through a computer screen through available online toolkits (Franke & Piller, 2004). Individuals investing their effort and time in a computer project, presentation or proposal might have a higher value attached to it than the people they presented it to. If the program or app unused, presentation canceled or proposal rejected, those involved in creating it will feel more hurt than those who were to listen to the presentation or saw the project or the proposal. Some managers might stick to their own ideas despite other potential better ones which are more profitable to the company. In all cases, people took part in creating the “product”, whether it required physical or mental “labor”.

Some people might be more attracted to the self-assembly and self-build products than others. Some people would be more hurt than others when they have their efforts unappreciated. Some would be more prone to holding onto their own ideas. The phenomenon can have implications in different fields and areas in life. A different propensity of some personality trait may influence the IKEA effect differently. One particular trait that can be considered relevant is self-monitoring. It reflects people’s different ability and motivation to adapt to a current social context in order to better fit into these contexts or to present themselves in favorable or appropriate ways toward others (Gangestad & Snyder, 1986).

The purpose of this study is to develop the understanding of the recently developed concept of the “IKEA Effect” in regards of self-monitoring trait. In an empirical study, using the same methods as those in the second experiment by Norton et al (2011), this research will analyze the value of self-created products from perspectives of individuals with different self-monitoring propensities.

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II. Literature Review

This section reviews the existing literature on overvaluation of the self-made product. Next, it discusses research which provided possible reasons for such a phenomenon, followed by their relation to individual's personality traits, which includes self-monitoring. It then, demonstrates various studies on high and low self-monitors, including their core characteristics and consumer evaluations. Lastly, this section links the theories and findings by previous researchers in order to come up with the hypothesis for this study.

IKEA Effect

In self-design activities such as pottering, cooking, knitting, building model airplanes, many often add a subjective value to their own creations, (Franke, Schreier & Kaiser, 2010). When involved in the creation of a good, consumers can customize the product to their tastes and needs, and consequently, increase the utility of the product (Franke et al., 2004; Franke, Keinz, & Steger, 2009; Randall, Terwiesch, & Ulrich, 2007; Schreier, 2006). In addition to preference fit, consumers may also gain utility from the obtained uniqueness of a self-designed product (Franke & Schreier, 2008) and enjoyment in the product making process (Franke & Schreier, 2010) because it was fun. Preference fit, opportunity to show uniqueness and fun product making process, are the most apparent benefits which could be attributed to the higher value of the self-created products. However, recent research, in which products did not involve preference choices, creativity or most fun activity, found another, more basic factor (Mochon et al. 2012; Norton et al., 2011) – the mere contribution in making the product.

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Norton and his colleagues (2011) discovered through series of four experiments, in which consumers assembled IKEA boxes, folded origami, and built sets of Legos, an “IKEA effect”, where labor can increase people's willingness to pay more for their self-made products. Participants who made their own origami and evaluated them, valued their amateurish origami creations higher than other people would value those same creations, and they valued their self-assembled products as highly as those made by experts (Norton et. al., 2011). When having their Lego creations destroyed after just building them, the effect dissipated. Therefore the effect takes place only if the creations were successfully completed. The study shows that even if the products were mundane Ikea storage boxes that are not unique, customized, or fun to build, participants valued their own creations more than the identical products that others made (Mochon et al., 2012). The researchers also found that no matter if the subjects were “do-it-yourselfers” or novices, labor increases valuation for both. This suggest that the enjoyment during creating the product might be negligible since the do-it-yourselfers would be more skilled and enjoying the activity more than the novice people. The “IKEA effect” is still a new concept in the behavioral economics field, and it shows that even such a basic thing as investing one own labor in the product can induce value for the “laborer”.

Franke, Schreier and Kaiser (2010) findings support Norton’s results. Through five experiments the researchers examined how the “I designed it myself” effect adds economic value to the self-created product for the consumer. The existence of this effect is found in the similar way the IKEA effect was, but instead of mere assembling, this effect involves customers in creativity and preference choice making process. The researchers found that feelings of accomplishment and the outcome of the process as well

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as the individual's perceived contribution to the self-design process facilitated the effect of self-designed products generating a significantly higher willingness to pay (Franke et al., 2010 pp. 125). Experiment 2 showed that the results were independent from the effect of preference fit, while in Experiment 3 the mere exposure, better mood, and increased attention effect were found negligible. This study explained that the feelings of accomplishment apart from self-designing might arise from self-building as well, and can affect the subjective value of the product. The study also confirms the necessity to successfully complete the product (Norton et al., 2011), since just as the task was not accomplished, the builder would not feel accomplished either. The study also shows that the value is increased when the consumer feels that she or he contributed to the result more, indicating that valuation is moderated by amount of effort put in.

The motivations behind undertaking self-building activities may provide a hint for the reasons underlying the IKEA phenomenon. Dahl and Moreau (2007) studied the reasons behind why consumers participate in creative activities and under what conditions these experiences were the most enjoyable. They conducted a qualitative study using interviews, which resulted findings suggested that the two main motivations were the sense of competence and autonomy. The authors also find through two empirical studies the importance of the presence of both autonomy and competence, and creators' level of skill (Dahl & Moreau, 2007). In one experiment, the participants receiving a set of instructions without a target outcome enjoyed the experience more since they had both sufficient guidance to complete the task successfully (competence) and the freedom to create an individualized design (autonomy). These results provide explanation for Norton, Mochon and Ariely's necessity to finish the task for the IKEA effect to be significant. In

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Dahl and Moreau's second experiment, skilled consumers reported greater perceptions of competence when fewer constraints were active. However, the results suggested that perceived competence provided stronger explanatory power of the route through which the manipulated factors influence perceived task enjoyment.

The follow-up study by Mochon, Norton and Ariely (2012) explored the "IKEA effect" further in series of four experiments, investigating possible psychological mechanisms underlying the phenomenon, and investigating the factors that influence both consumers' willingness to engage in self-creation and the utility that they derive from such activities (Mochon et al., 2012, pp. 363). The results support Dahl's and Moreau's findings on the importance of competence in creating process valuation. Experiment 1 showed that co-creating the product and accomplishing it successfully leads to the increased feelings of competence, which contributes to the increased value of self-created products and willingness to pay for them relative to those created by others (Mochon et al., 2012, pp. 367). Through Experiment 2 the researchers found that by affirming consumers' sense of self (Steele, 1988) the "IKEA effect" decreases, the valuation of creations made by the consumers, who affirmed themselves, was lower than the valuation by those who did not. The last two experiments demonstrated that threatening consumers' sense of self increases their needs for building the goods themselves, confirming the self and competence bases underlying the findings in the first and second experiment. Vohs, Park, and Schmeichel (2012) found that engaging in self-affirmation made participants felt less pressured to meet their current and important goal in their lives. White (1959) emphasizes the importance of competence as a crucial motivational factor. He suggested

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that people's urge toward competence has emerged since infancy, although it is modified later in life.

What aspect of self-built products makes "labor" an important influence on production perception? Results by Franke and his colleagues (2010) imply the role accomplishment, contribution and product outcome plays in valuing the self-created product. The other researchers (Mochon, Norton and Ariely, 2012; Dahl and Moreau, 2007) implied that feeling of competence is important in consumer interest in self-created products and in making their efforts feel rewarding. White (1959) emphasizes the importance of competence as a crucial motivational factor in life. He suggested that people's urge toward competence has emerged since infancy, although it is modified later in life. Seemly different factors, in fact, accomplishment, contribution and outcome, may be related to competence. The outcome and amount of contribution moderates the sense of competence. The sense of competence is higher when with moderate contribution the outcome is very good. The sense of competence is lower if there was little contribution or relatively large amount of contribution but not satisfactory outcome. Bandura (1977) indicates in his work on self-efficacy that competence is tightly related to performance accomplishment. One may feel both the sense of accomplishment and more competent, when achieved a goal, or completing a task. Both play a role in improving one's self-view.

The other aspect contributing to overvaluing self-built product suggested by the researchers is "effort justification" (Norton et al., 2011). Festinger (1957) suggests that people engage in a process of "dissonance reduction". It is a process, in which one tries to reduce the state of "cognitive dissonance", discomfort experienced due to simultaneously

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holding conflicting attitude and beliefs or behaviors. The uncomfortable feeling caused by the disharmony would lead to an alteration in one of the attitudes, beliefs or behaviors to reduce the discomfort. His theory (Festinger, 1957) implies that the more effort is put into something the more one comes to value what one put effort in, in order to avoid conflict between one's behavior and attitude. Aronson and Mills (1959) experiment confirmed that when people have to overcome obstacles or pain attaining something, they would have a tendency to value it more than if they had no trouble obtaining it.

Participants who underwent a severe initiation to join a group expressed more liking toward the group than participants who underwent a mild or no initiation (Aronson and Mills, 1959).

Arguments that the overvaluation of a product might also be the result of an endowment effect, where merely owning the product adds value to the product (Kahneman, Knetsch, & Thaler, 1990), rather than the result of the effort put in while creating them, might arise. Peck and Shu (2009) found that merely touching an object results in an increase feelings of ownership of that object. Yet, Norton's Experiment 2 suggested shorter time, less contact but success in building and still led to higher valuations than longer time, more contact and having the built Lego unbuilt in front of their eyes. These results do not support the explanation of the increased value due to the endowment effect. The increased ownership did not increase the attributed value to the object. However, having what one built scrapped in front of one's eyes takes away the sense of accomplishment, and contribution toward an outcome (Franke et al., 2010), since the resulting outcome was in the end the scrapped null. The results may, on the other hand, support the theory on the sense of accomplishment (Franke et al., 2010) or

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Dahl and Moreau's result on the need for competence. Not being able to finish a task prevents the builder from reaching the sense of accomplishment and feeling competent.

Bandura (1977) indicates in his study on self-efficacy that to feel competent or the sense of performance accomplishment one has to meet their goals, which implies successful completion of a task.

Self-monitoring

Since engaging in self-building the goods can influence self-view and affect the beliefs or attitude due to the need for psychological consistency, there is reason to suspect that some individuals' perceptions of the product value may be more influenced by the involvement in creation of the product than others. Franke, Schreier, and Kaiser (2010) stated that the effect, in which self-designed products generate a significantly higher willingness to pay, may vary between customer groups and societies. Research on various aspects of consumer behavior suggests that the individual difference variable of self-monitoring (Snyder, 1974; Snyder & Gangestad, 1986) may aid in differentiating those individuals who might be especially likely to be influenced by the need to improve their own self-view and have their behavior consistent with their values, attitudes or beliefs from those who might be less likely to be influenced by such variables (Snyder, & Tanke, 1976).

Self-monitoring is the sensitivity to cues for socially appropriate behavior and modifying one's behavior accordingly (Snyder, 1974). Individuals differ in willingness, desire and ability to control how they express and present themselves in social situations (Snyder & Gangestad, 1986). Consequently, they can be classified into two groups. Those, who score highly on the Self-Monitoring Scale (Snyder & Gangestad, 1986) are

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high self-monitors. They tend to be concerned about the image they project to others in social situations (Debono & Rubin, 1995, 241). They rely much on social cues of what is more appropriate or publicly desirable, and are skillful in adjusting their behavior and self-expression to what different situations demand (Mehra, Kilduff & Brass, 2001). Those opposite, who score low on the Self-Monitor Scale (Snyder & Gangstad, 1986) are low self-monitors. They are rather insensitive of social cues. Unwilling or lacking ability to adjust low self-monitors stay consistent with how they behave and present themselves even in different situations (Mehra, Kilduff & Brass, 2001). They tend to rely on their own attitudes, feelings, and dispositions when making decisions or behavioral choices (Debono & Rubin, 1995, 241).

Snyder and Tanke, (1976) studied the relationship between behavior and attitude as self-monitoring propensities varied. Experiment 1 suggests that correspondence between behavior and attitude was greater for low self-monitors than high self-monitors (Snyder et al., 1976 pp. 515). Experiment 2 supports the previous one, implying that the likeliness to change their attitude after engaging in counterattitudinal behavior and the actual correlation between essay position and final attitude after counterattitudinal behavior was greater for low self-monitors than for high self-monitors. The authors provide a possible interpretation that low self-monitors explain their behavior dispositionally, when high self-monitors explain their behavior situationally. The overall results indicate that attitude-behavior and behavior-attitude consistency is higher for low self-monitoring individuals than high self-monitoring individuals. It follows that low self-monitors are more comfortable and prefer staying true to their self and might value one true self more than high self-monitors.

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There is a crucial category of variables which impact how low and high self-monitors value the products. If not taken into consideration while studying other factor, might distort the effect of interaction between self-monitoring and that factor on product evaluation. They are image variables. Often, these variables convey some information about the image one can project or attain by using or associating with a particular product. High self-monitors to whom one's image in others eyes is very important would particularly be affected by those variables. High self-monitors' tendency to evaluate products based on how the product can enhance their image, and low self-monitors' tendency to evaluate products based on their actual performance (DeBono, 2006) will be demonstrated in a number of studies below.

Through three studies with advertisements, Snyder and Debono (1985) have found that high self-monitors were more persuaded with appeals to product's images, when low self-monitors with appeals to product quality. In the first experiment, high-self-monitors showed a more favorable inclination towards image-oriented ads than low self-monitors, when low self-monitor individuals had more positive towards product's quality focused ads than high self-monitors. The second experiment showed that high self-monitor individuals were willing to pay more for a product advertised with appeals to image, while low self-monitors were willing to pay more for the product which advertisement appealed to quality. The last experiment investigated the advertisement appeal on the willingness on consumption itself, and it showed that high self-monitoring individuals are more willing to consume the product when presented with ads appealing to image of the product than low self-monitors, while low self-monitoring individuals are

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more willing to try the product when presented with quality oriented ads than high self-monitors (Snyder & Debono, 1985, pp. 1).

Study by Debono and Rubin (1995) support the results of the research by Snyder and Debono (1985) that high self-monitors might be more affected than low self-monitors by aspects of products that relate to the image of the product or the consumer project to others. The study researches the way low and high self-monitors evaluated cheese depending on the taste and country of origin (France, or Kansas which means United States) of the food. Low self-monitoring individuals in this study evaluated cheese with better taste more favorably and worse tasting cheese less favorably, no matter what country the cheese was from (Debono & Rubin, 1995, pp. 244). On the other hand, the taste of cheese seemed not to influence high self-monitoring individuals as much as the country of origin of the product. High self-monitors evaluated cheese labeled as made in France more favorably, and the cheese said to be made in Kansas less favorably (Debono & Rubin, 1995, pp. 244).

Product packaging and product evaluation study by Debono, Leavitt & Backus (2003) is another research that support the image-orientation of high self-monitors and quality- or performance-orientation of low self-monitors. Its first experiment suggested that with product quality held constant, high self-monitors were more likely than low self-monitors to choose and give more favorable evaluations to samples of perfume which had more attractive packaging or containers (Debono, Leavitt & Backus, 2003, pp. 517). The second experiment used perfumes with different qualities. The pretesting confirmed the quality and appeal of the product based on the smell. The results supported the first experiment and showed that low self-monitors, in contrast to high-self monitors,

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were more likely to be influenced by aspects related to the performance and smell than the outer appearance of the product (Debono, Leavitt & Backus, 2003, pp. 519).

Study by Smidt and Debono (2011) demonstrated both the effect of image variable on high self-monitors and low self-monitor preference for dispositional consistency, using a subtle cue such as the product name. The researchers used energy drinks in their study, one with an image-oriented name “Fast Track” and one with product with the self-descriptive name, “Energy Drink Enhancer”. The pre-test confirmed the functionality of the names. High and low self-monitors sampled and evaluated energy drinks with those names on. The results of the study showed that high self-monitors evaluated the drinks more favorably when they had the image-oriented name than when they had the self-descriptive name on (Smidt & Debono, 2011, pp. 1). Low self-monitors, on the other hand, rated the drinks more favorably when the drinks had the name simply describing itself than when they had the name referring to a pleasant or desirable image.

Shavitt, Lowrey & Han (1992) divided product’s functionality into two category groups, utilitarian and social identity functions. Utilitarian function maximizes rewards and minimizes punishments obtained from objects. It summarizes the outcomes and focus on the resulting benefits. Social identity function, on the other hand, is in service of one’s public image and self-expression to gain social acceptance and foster identification with reference groups (Shavitt, Lowrey & Han, 1992). The three experiments in the study by Shavitt, Lowrey and Han (1992) used three types of products: an utilitarian product, which served a specific function, are practical and do not serve enhancing the user’s image; a social identity product, which affects the image of person using it; and a

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multiple function product, which simply serves many functions or can perform several tasks. The first experiment in the study suggested that high self-monitors explained their attitudes for products identified as serving social identity more with focus on social image and less on practicality. In contrast, the low self-monitors explained their attitude more in terms of product quality and less of image (Shavitt, Lowrey & Han, 1992, pp. 1 and 348). In the second and third experiment, when creating advertisement for multiple function products, high self-monitors seemed to have focused more on arguments related to social image or product's image, while low-self monitors did not show clear preference (Shavitt, Lowrey & Han, 1992, pp. 355).

Although there were some research on the influence of creating the good oneself on the value of the product, the "IKEA effect", which implies that effort alone and not necessarily involving creativity, can still evolve greater value in the self-created product, is a new concept found by the Harvard researchers (Norton et al., 2011). Similarly, there have been a number of studies on the relations between self-monitoring and consumer psychology. Most of them have indicated reliably that the differing interpersonal orientations of high and low self-monitors may result in differing product evaluation. However, most of them studied how self-monitors evaluate the products or advertisement strategies based on social, or quality and functionality cues. How they perceive the value of a product based on how the product provides the possibility for self-view improvement and cognitive consistency has not been much researched yet. In the current study, we will attempt to investigate and link those two aspects which has not been replicated or deeply researched yet.

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Building on previous research on different preferences and tendencies of self-monitoring individuals of different propensities, and influence of effort on attitude and product evaluations, we examine whether self-monitoring differences would affect the IKEA phenomenon. Given that “labor” people put in creating their own product leads to product overvaluation might be due to self-view enhancement and dissonance reduction, it follows that there is a high probability those staying true to their dispositions would value their own labor or what they personally put effort in more than those who prefer to conceal their true self adjusting their behavior to different situations. In other words, we predict that low self-monitors, who probably value their true self more than high self-monitors and have preferences to have their personal beliefs, values, attitude and public behaviors in agreement, will be more affected by the IKEA effect than high self-monitors.

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III. Method

In this experiment, I explore on a qualitative basis whether there is a bigger effect of labor on the product valuation by the low self-monitors than the valuation by the high self-monitors.

Participants

I used data collected from participants who were available to me and willing to participate in the study (from the area and in the several weeks amount of time). Union College students and alumni (N=148; 2 declined to give demographic information; among declared: 51 male, 146 age 18-24, 28 international students, and 32 non-native English speakers) participated in the experiment, 55 in exchange for ½ hour credit for PSY-100 or PSY-300 class, and 92 for \$4 of cash. There were 3 people who simply volunteered and did not receive any course credit hour or cash.

Measures

18-item Self-Monitoring Inventory, a change from the previous most frequently used 25-item Scale from 1974 (Snyder & Gangestad, 1986). It is an 18-question True or False questionnaire. The possible range on the self-monitoring scale was from 0 to 18, and the higher the score, higher is one's self-monitoring. The scale suggested participants with score 0-10 to be low self-monitors, and 11-18 to be high self-monitors.

Process

An experiment session took no longer than 30 minutes. Each experiment session had a capacity of 6 people per session. The process taking place during one session is described below.

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The process followed methodology used by Norton Mochon and Ariely, (2011) in their second experiment of their study, since this is the method that was tested and replicated in another study (Mochon et al., 2012) giving the results showing the existence of the IKEA effect. The only parts added were the self-monitor inventory and different fillers in the provided packet. When the subjects arrived, they were randomly assigned to one of the 3 conditions—builders, non-builders, who evaluate builders' creations and non-builders who evaluated the experts' creations. The expert creations were made by 2 people with a great deal of experience in folding origami to make several high quality cranes.

I gave builders a packet including the self-monitor inventory, fillers, a sheet of instructions on how to fold a crane and a piece of high quality origami paper, and product evaluation page. Non-builders were provided with a similar packet with tasks put in different orders but without the origami crane instruction part, or origami paper.

Builders were asked to make or an origami crane. Participants were given as much time as they needed to complete their creation. Most participants took approximately 10-15 minutes. When builders were folding their origami, the non-builders were given a filler task in another room. After the builders finished their crane, they were asked to bid on it. Like the study by Norton et al. (2011), this study tried to solicit the participants' reservation price with a variant of the Becker et al. (1964) procedure. This procedure asked participants to make a bid on their product between 0 and 100 cents. Pretesting by Norton et al. (2011) revealed that no participant bid more than \$1.00. Participants were told that we would draw a random number between 0 and 100; if the participants' number was equal to or above that number, they would pay the researchers

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that amount and take the origami creation home, while if their bid was below the number we would keep their origami.

When all the builders made their bid, and non-builders finished their filler task, the participants changed rooms. The builders went to the filler task room, the non-builders, who were in the second condition (evaluators of the origami made by builders), went to the rooms where the builders folded their cranes, while the non-builders in the third condition (evaluators of origami made by experts) went to another rooms. Non-builders in the second condition were blind to both builders' identity and bids. With cranes made by the builders on their desks, they were asked how much they would pay for our builders' origami in the same way the builders were. In the meantime, the other set of non-builders were doing a similar task but had the expert creations on their desks instead.

After completing the experiment and evaluation, the participants were asked to fill in the rest of the packet. In the end, the participants were debriefed. Builders were given their origami creations when non-builders were given an opportunity to receive an origami paper and crane folding instructions.

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IV. Results

This section assessed the influence of self-monitoring on the impact of labor on valuations of a product. The bids low self-monitor builders made on their self-folded cranes range from \$0.10 to \$1.00 (Table 1). The mean equals \$0.42, and the median \$0.48. The bids non-builders made on the same cranes range from \$0 to \$85 (Table 1). The mean equals \$0.40 and the median \$0.50. The bids made by low-self monitor non-builders on expert cranes range from \$0.05 to \$0.98 (Table 2). The mean equals 0.41, and the median \$0.50. The mode for all groups was \$0.50. The ranges and means of bids which were higher for builders than non-builders evaluating the same cranes but rival valuations on cranes made by experts suggest the possible presence of the IKEA effect.

The bids high self-monitor builders made on their self-folded cranes also range from \$0.10 to \$1.00 (Table 1). But the mean is lower than for low-self-monitors, \$0.37, and the median is higher, \$0.50. The bids non-builders made on the same cranes ranges from \$5 to \$100 (Table 1), which are higher than for bids on cranes made by the builders. The mean equals \$0.51 and the median \$0.50. The bids made by high-self monitor non-builders on expert cranes ranges from \$0.10 to \$0.95 (Table 2). The mean equals 0.47, and the median \$0.50. The mode for all groups was \$0.50. The ranges, means and medians of bids were lower for builders than non-builders evaluating the same cranes and valuations on cranes made by experts. In addition they were higher for bids on the participants' cranes than expert cranes. These results suggest that the IKEA did not occur for high-self monitors.

To test the differences, I conducted three types of analysis: a mixed design 2 (self-monitoring propensity: low or high) between X 2 (bid type: participants' bids for their

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own creations, others' bids for participants' creations) ANOVA analysis, a between design 2 (self-monitoring propensity: low or high) X 2 (bid type: participants' bids for their own creations, others' bids for experts' creations) ANOVA analysis, and just for control, a between design 2 (self-monitoring propensity: low or high) X 2 (bid type: others' bids for participants' creations, others' bids for experts' creations) ANOVA analysis.

The 2 X 2 mixed design analysis, does not support the hypothesis. There was no main effect of self-monitoring, $F(1, 50) = 0.30, p = 0.59$, such that low self-monitors ($M = \$0.40$) and high self-monitors ($M = \$0.45$) made equivalent valuations of the cranes. There was no main effect of labor $F(1, 50) = 0.97, p = .33$, such that the bids of the self-made origami cranes by builders ($M = \$0.40$) and bids by non-builders ($M = \$0.45$) of the cranes made by the builders did not differ. Contrary to our expectations, these effects were not qualified by the bid type x self-monitoring interaction $F(1, 50) = 2.78, p = 0.10$.

Among low-self monitors, labor had no effect on the crane valuation, $t(25) = 0.54, p = 0.60$, such that low self-monitors' bid ($M = \$0.42$) on their own self-made origami crane did not differ from others' bid ($M = \$0.39$) on the same crane. Among high self-monitors, labor had no effect on the bids either, $t(25) = -1.72, p = 0.10$, such that high self-monitors' bids on cranes they made themselves ($M = \$ 0.37$) were just as high as the bids made by others ($M = \$0.51$) on the same crane. When valuing their own self-made crane, low self-monitors and high self-monitors gave equivalent bidding values $t(50) = 0.62, p = 0.54$, such that low self-monitors ($M = \$0.42$) bid as much as high self-monitors ($M = \$0.37$) did on their self-made origami cranes. When assessing the cranes made by

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low-self monitors ($M = \$0.39$) others gave equivalent bids, $t(50) = -1.57$, $p = 0.12$, to those given to cranes made by high-self-monitors ($M = \$0.51$).

The 2 X 2 between analysis (self-monitoring propensity: low or high X bid type: participants' bids for their own creations, or others' bids for experts' creations), however, does partly support the hypothesis. There was no main effect of self-monitoring, $F(1, 92) = 0.007$, $p = 0.94$, such that low self-monitors ($M = \$0.42$) and high self-monitors ($M = \$0.41$) made equivalent valuations of the cranes. There was no main effect of bid type, $F(1,92) = 0.77$, $p = 0.38$, such that the bids of the self-made origami cranes by builders ($M = \$0.40$) and bids by non-builders ($M = \$0.45$) of the cranes made by the experts did not differ. However, contrary to my predictions, these effects were not qualified by the bid type x self-monitoring interaction $F(1, 92) = 0.62$, $p = 0.43$.

As expected, among low-self monitors, bid type had no effect on the crane valuation, $t(51) = -0.07$, $p = 0.95$, such that low self-monitors' bid ($M = \$0.42$) on their own self-made origami crane were as high as non-builders' bid ($M = \$0.43$) on the expert crane. Among high self-monitors, bid type had no main effect either, $t(41) = -1.04$, $p = 0.30$, such that high self-monitors' bids on cranes they made themselves ($M = \$ 0.37$) were equivalent to the bids made by non-builders' ($M = \$0.47$) on the expert crane. When assessing the cranes made by experts, low self-monitors' ($M = \$0.43$) and high-self-monitor's ($M = \$0.47$) bids did not differ, $t(42) = -0.51$, $p = 0.62$.

The 2 X 2 between analysis (self-monitoring propensity: low or high X bid type: others' bids for participants' creations, or others' bids for experts' creations), showed no main effect of self-monitoring, $F(1, 91) = 0.001$, $p = 0.98$, such that low self-monitors ($M = \$0.46$) and high self-monitors ($M = \$0.44$) made equivalent valuations of the cranes, no

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main effect of bid type, $F(1,91) = 0.13$, $p = 0.72$, such that the bids of non-builders on the origami cranes by builders ($M = \$0.45$) and bids of non-builders on the cranes made by the experts ($M = \$0.45$) did not differ. These effects were not qualified by the bid type x self-monitoring interaction $F(1, 91) = 1.2$, $p = 0.28$.

Contrary to my expectations, among low-self monitors, bid type had no effect on the crane valuation, $t(51) = -0.07$, $p = 0.95$, such that low self-monitors' bid ($M = \$0.42$) on their own self-made origami crane were as high as non-builders' bid ($M = \$0.43$) on the expert crane. Similarly, among high self-monitors, bid type had no main effect either, $t(37) = -0.77$, $p = 0.44$, such that high self-monitors' bids on cranes participants made ($M = \$0.40$) were equivalent to the their bids on the expert cranes ($M = \$0.47$).

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V. Discussion

This study failed to replicate the results from the study on the IKEA Effect, which is a cognitive bias where labor causes overvaluation of the self-made product (Norton et al., 2011). The current research added an aspect of personal differences on product valuation to investigate the interaction between self-monitoring propensities and presence of labor on the product valuation.

Previous research has demonstrated the existence of the IKEA effect, which occurs for both utilitarian and hedonic products, and suggested that people are willing to pay more for products they created themselves than for identical items made by somebody else if completed successfully (Franke et al., 2010; Norton et al., 2011). In addition, the participants believed their creation to be equivalent in value to that of the experts. Further study on IKEA effect found that feelings of competence associated with self-creating the product mediated consumer valuation of the product; affirming participants' sense of self diminished their willingness to pay more for their self-created product, while threatening consumers' sense of competence increased the valuation (Mochon et al., 2012). Other research implied that the more effort is put into something the more one comes to value what one put effort in, in order to avoid conflict between one's behavior and attitude (Aronson and Mills, 1959; Festinger, 1957). Snyder and Tanke, (1976) found that attitude-behavior and behavior-attitude consistency is higher for low self-monitoring individuals than high self-monitoring individuals.

The current research examined how people with different self-monitoring propensities are influenced by the IKEA effect. We hypothesized that low self-monitors would be more affected by IKEA effect than high self-monitors. In other words, low self-

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monitors would be more likely to overvalue their own self-made product and value their creations at prices equivalent to those given to creations done by the experts. The hypothesis was not supported. Results indicated that valuations by low self-monitors and high self-monitors were influenced by self-creation in the same way. The IKEA effect did not occur; For both low self-monitors and high self-monitors, builders, who made a bid on the crane they folded themselves, made equivalent valuation to those non-builders' made on the builder's creations. In addition, participants' valuations on the cranes done by someone with high experience doing origami did not differ from those on cranes made by the participants. Although the test results were not significant the pattern of descriptive statistics (Figure 1) is in the direction supporting the hypothesis. In addition, a p of 0.10 still qualifies as a trend, and we suspect that with more participants the bid type x self-monitoring interaction term (currently at $p = 0.10$) might have gotten to under 0.05, which would make the difference between the bids given by builders and non-builders on the same crane significant in the mixed 2x2 analysis.

Our research does not demonstrate the existence of the IKEA effect, and it does not make a difference whether one is a low or high self-monitoring individual. However, the pattern of mean values of the bids suggests that there might be a difference between low and high self-monitors, such that low self-monitors might be more likely to be affected by overvaluation of self-assembled product. Knowledge and understanding of personal differences and external forces influencing the perceived value of a product may contribute to marketing strategies and organizations more generally.

If the trends were true, low-self monitors would be more likely to take interest in the self-assembly and self-build products than high self-monitors. Therefore, the more

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efficient marketing strategy of such companies would be to target such consumers. Since low self-monitors do not pay as much attention to image cues as high self-monitors (DeBono, 2006; Debono, Leavitt & Backus, 2003; Debono & Rubin, 1995; Smidt & Debono, 2011; Snyder & Debono, 1985), there is no need to hire celebrities or supermodels to advertise the self-assembly products. Right targeting and segmentation decisions can lower the costs of product marketing. Trying to advertise such products to high-self monitors would have been both more costly and lower sale units. Thus, concentrating appeals to practicality or quality (DeBono, 2006; Debono, Leavitt & Backus, 2003; Debono & Rubin, 1995; Smidt & Debono, 2011; Snyder & Debono, 1985) would be a more effective way to market these self-build products to raise the sales. These findings might also impact where and when would be a good idea to advertise such products as well. For example, low self-monitors would be more likely to watch didactic shows, or go to store sections with utilitarian products (Franke, Schreier & Kaiser, 2010). It would be more efficient to market the product during or after such shows or programs and at such locations.

Not only consumers but employees might be affected by the findings of the current study. Since, low self-monitors put more value to “labor” and doing something instead of sitting idle, they might be more attracted to the idea of having a stable career. Unemployment would affect low-self monitors’ wellbeing more negatively (Mochon et al., 2012) than high-self monitors. Although they might not be as social and adapt well to various situations, which put them at a disadvantage, they would be more than anyone work hard to obtain and then keep their job. During recruitment or necessary layoffs, the managers might want to pay attention to this aspect as well. Moreover,

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appreciating and not ignoring the results of efforts by a self-monitor can serve as a great motivator for him or her to stay in the company or firm and do well at work. For the company to profit the most and induce full potentials of the employees, managers should pay attention to their workers. However, they should be careful about their own actions and decisions as well. Low-self monitor managers might be more prone to holding onto their own ideas instead of choosing superior options available elsewhere and continuing on pursuing a failing project, they have already invested in before (Norton et al., 2011).

Limitations

One of the most notable limitations of our research is that, the predicted IKEA effect was not observed. Our failure to find support for the existence of the effect may have been due to one or more of the following reasons.

Firstly, all participants were students or alumni from Union College. This study was limited in its representativeness and generalizability to broader populations. For a 2x2 mixed design study N=52 might still be too low (although 104 participants were in condition 1 and 2, only 52 cranes were evaluated by both builders and non-builders). The lower number of participants decreases statistical power. Moreover, 28 of the subjects were international students. International students are more likely to be less familiar with using US dollars or cents, and more likely to misunderstand the instructions or questions in the survey. This decreases the quality of the measurement of the dependent variable.

The second reason might have been the fact that for several subjects IKEA Effect might not have been solicited or something related decreased the value. Previous research (Franke et al., 2010; Mochon et al., 2012) indicated that feeling of accomplishment or feeling competent is essential in inducing value from labor. Participants might not have

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those feelings if the cranes they made were unsuccessful, or if they felt they did not contribute much in completing the task. The cranes would be unsuccessful if in their opinion their self-creation was ugly or not similar to the “target” cranes they had in their mind, and as a result, not to their liking.

Norton and his colleagues (2011) also suggested that due to IKEA effect, labor can induce greater liking for the products of one's labor, and as a result, increase the valuation of their own creations. For control, participants were asked to rate how much they liked the origami creation on the scale 1 to 5 right after their bid. Several subjects in this study, who evaluated their own self-made crane, had their rating as 3 or below (1 – do not like it at all, 2 – don't really like it, 3- neutral, 4 – like it, 5- like it very much). Such low ratings imply that IKEA effect might not have taken place.

The presence of the crane image in the instructions might have made a difference. The builders, those who built and evaluated the cranes themselves had instructions how to fold it and as a result, also a picture of the ideal crane on the last step. The non-builders, however, did not have those instructions and hence, would not have seen that image. Therefore, builders would have paid more attention to the shape of the cranes they made and whether it is similar to the target crane which more or less would have the shape of the one shown on the picture in the instructions, and deem it as successful or not no matter if they like it in the end. Not being able to reach their target would make them feel less competent and possibly decrease the valuation of the product.

The choice of high-quality beautiful rice paper from Japan might have been a bad idea. Although it made participants more willing to pay for their crane and thus, not put 0 for the bid, the high-quality paper might have made the subjects from different condition

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groups pay more attention to different details while valuing the cranes. As suggested above, the builders would pay more attention to the shape already. The non-builders on the other hand, would pay more attention to the patterns and colors of the paper the crane was made of. Those beautiful patterns would distract non-builders from “unideal” shape of the cranes.

In some cases, even if the participants folded the cranes successfully, they might not believe they have contributed enough and as a result, not feel competent after completing the task. In many cases, assisting a participant in folding origami, especially an inexperienced one, was unavoidable. Too much help, however, can make the participant feel they did not contribute much in folding the crane. For each participant that amount of help is different and cannot be measured. Not only would it prevent the IKEA effect to occur, but it could also decrease the value of the product due to attributing the accompanying negative feeling of incompetence to the product, even though they liked the product for how it looked.

Directions for further research

Certain limitations of our study provide several directions for future investigation. For example, the present study has mostly Union College students as subjects for research and number of participants might not be high enough. Although researchers widely use students as subjects, the results would be biased. Many students are still under care of parents. Adults who deal with real world difficulties might perceive value of money in a different way. Therefore, a prompt for further research would be to replicate this study using broader range of representatives from the population and higher number of participants.

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In the current study, there is a possibility that people who made their cranes paid more attention to the shape, while other people evaluating the same crane paid more attention to the patterns and color of the crane. In order to fix that problem, there are two things that can be done. Firstly, the paper used for folding origami should have the same and less conspicuous pattern and color. Secondly, the builders, who evaluate their own self-made crane, are more likely to pay attention to the shape due to the image of the ideal crane in the last step in the instruction. Therefore, the researchers should have non-builders, who evaluate the same crane made by the builders, also have seen the same image somewhere in the package.

Another limitation was that this current study was able only to assess and control whether or not the participant contributed at all in making the crane in the present study. We did not measure or were not able to control the amount of contribution the participants put into making the crane. Another direction for future research would be to examine how contribution moderates the overvaluation of self-made product. Such a finding would be interesting, as it would show a relationship between the amount of the contribution and the magnitude of the overvaluation attributed to the self-created product. If we have measured and controlled that factor, we would have been able to determine till what point people do not feel competent and consequently, not have the IKEA effect solicited (Mochon et al., 2012), or obtain the extent to which the feeling of having made a contribution is still desirable.

The present study used origami cranes on participants, which are inexpensive and not practical. Further studies should examine whether the IKEA effect occurs when more expensive products are involved, since such products might have a bigger impact on the

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market. Norton and his colleagues (2011) found the effect on both the hedonic and utilitarian product. However, whether or how much the magnitude of overvaluation differs for image enhancing and practical products with the same market price can still be studied. In addition, different products may have effect on different people. Whether low self-monitors would be more prone to overvaluation of their self-created, if the product is utilitarian, or if IKEA effect occur at all for high self-monitors if the product has no self-enhancing properties, might be interesting approaches for further research.

Another interesting avenue for future research would be to assess how other factors such as another personality trait related to dissonance reduction impacts the IKEA effect. For example, the interesting trait would be related to cross cultural differences. The study will both replicate the experiment to test the results from previous studies and test the influence of the trait on overvaluation of self-assembled product. Some prior research suggested that in contrast to previous findings with U.S. participants, those with interdependent view of self (e.g. Japanese) might not experience dissonance (Markus & Kitayama, 1991) and as a result, dissonance reduction after self-affirmation (Heine & Lehmann, 1997). Given that IKEA Effect might happen due to self-view enhancement and dissonance reduction, there is a high possibility that people with interdependent construal of self would be less affected by self-created product overvaluation. Since majority of people from Asian countries are interdependent individuals, self-assembling type of products might not be as successful in Eastern countries as in Western ones.

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VI. Conclusion

There is wealth of research on consumer evaluations by individuals with different self-monitoring propensity, and recently, there has been research on the phenomenon where people see the products of their labor as more valuable than its actual price on the market has been shown in prior research. The current research contributed to those lines of studies with its findings about the interaction of those two variables. Although the interaction term was not significant, it could still be qualified as a trend. Therefore, the findings gave suggestions on better marketing strategy on self-assembling products. In addition, assessing one's own and other's personality and awareness of the IKEA phenomenon, can contribute to employees' well-being, better management decisions and organization's overall health.

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VII. References

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APPENDIX A

BID1 – Bid made by builders evaluating their own creations in cents

BID2 – Bid made by other participants, non-builders on the same crane made by builder
in cents

DIF – The difference between valuation made by the builder and non-builder evaluating
the same crane in cents

S-M – self- monitoring propensity, categorical variable; 1 if low self-monitor, and 0 if
high self -monitor.

**Table 1 Raw data of Bids by Builders and Non-Builders on same crane made by the
Builders**

Obs	BID1	BID2	DIF	S-M
1	42	50	-8	1
2	10	1	9	1
3	30	50	-20	1
4	90	60	30	1
5	81	60	21	1
6	10	10	0	1
7	20	30	-10	1
8	30	20	10	1
9	50	75	-25	1
10	100	75	25	1
11	50	19	31	1
12	10	50	-40	1
13	50	60	-10	1
14	25	85	-60	1
15	50	5	45	1
16	10	30	-20	1
17	65	35	30	1
18	1	50	-49	1
19	50	7	43	1
20	82	10	72	1
21	50	70	-20	1

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22	30	17	13	1
23	50	50	0	1
24	20	47	-27	1
25	48	50	-2	1
26	50	0	50	1
27	13	20	-7	0
28	25	50	-25	0
29	75	100	-25	0
30	40	30	10	0
31	1	25	-24	0
32	5	30	-25	0
33	100	20	80	0
34	50	50	0	0
35	7	25	-18	0
36	75	75	0	0
37	1	50	-49	0
38	100	40	60	0
39	0	50	-50	0
40	25	64	-39	0
41	50	50	0	0
42	70	75	-5	0
43	50	5	45	0
44	4	30	-26	0
45	50	50	0	0
46	50	80	-30	0
47	1	100	-99	0
48	10	75	-65	0
49	50	100	-50	0
50	70	25	45	0
51	50	75	-25	0
52	1	21	-20	0

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Table 2 Raw data of Bids made by Non-builders evaluating experts' cranes

BID3 – Bid made by other participants, non-builders on the cranes made by experts in cents

S-M – self- monitoring propensity, categorical variable; 1 if low self-monitor, and 0 if high self -monitor.

Obs	BID3	S-M
1	60	1
2	20	1
3	5	1
4	65	1
5	50	1
6	50	1
7	20	1
8	75	1
9	50	1
10	75	1
11	10	1
12	50	1
13	67	1
14	50	1
15	25	1
16	10	1
17	10	1
18	50	1
19	10	1
20	30	1
21	75	1
22	10	1
23	75	1
24	50	1
25	50	1
26	20	1
27	98	1
28	50	0
29	40	0
30	95	0
31	50	0

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32	80	0
33	10	0
34	50	0
35	25	0
36	10	0
37	50	0
38	15	0
39	59	0
40	77	0
41	80	0
42	17	0
43	42	0
44	50	0

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APPENDIX B

Graphs

Figure 1 Means of valuations on origami cranes

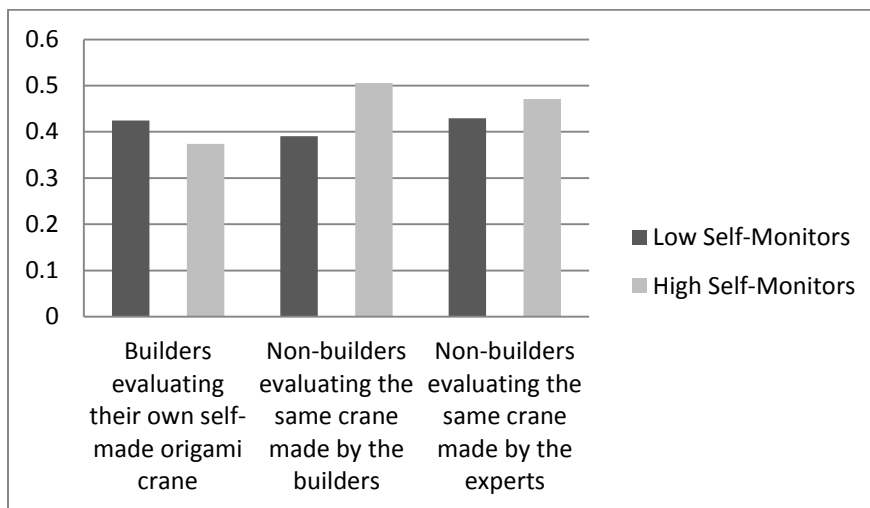
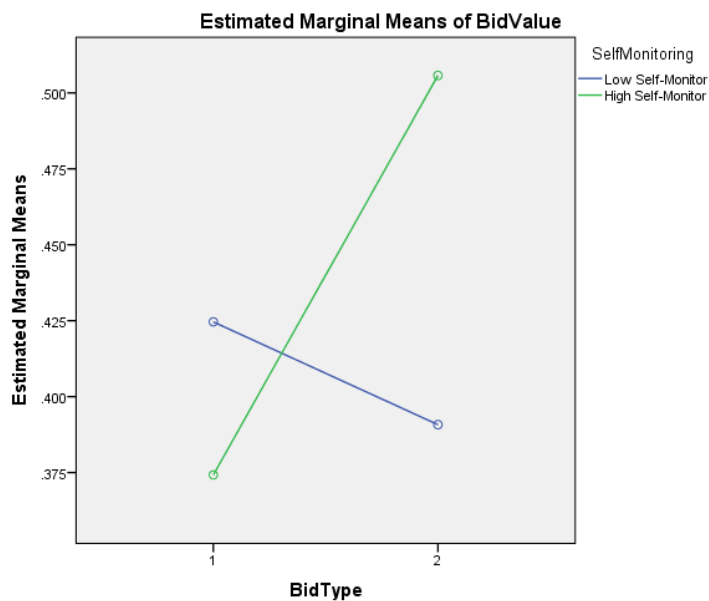


Figure 2 Mean bids on same crane: BidType 1 (builders) & 2 (non-builders) X Self-Monitoring

Profile Plots



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Figure 3 Mean bids on origami crane between design: 2 (Builders Bid or Non-Builders Evaluating Expert Creation Bid) X 2 (Self-Monitoring)

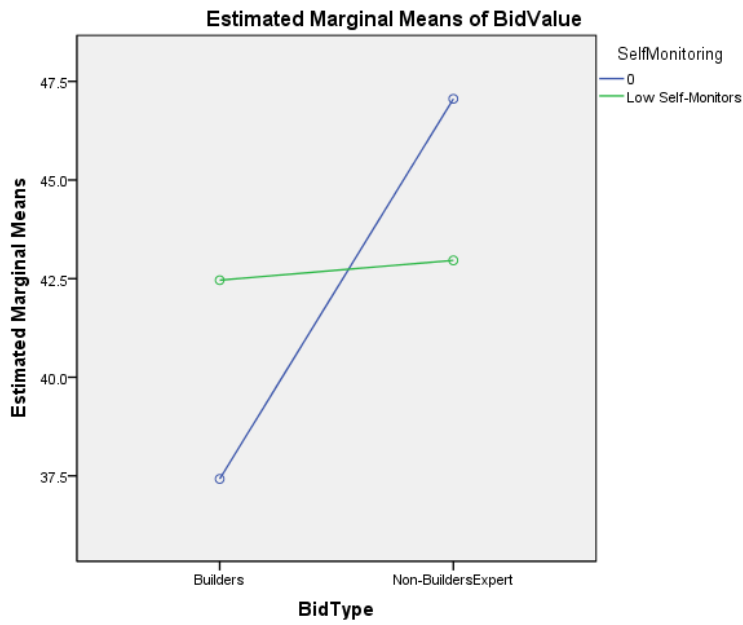
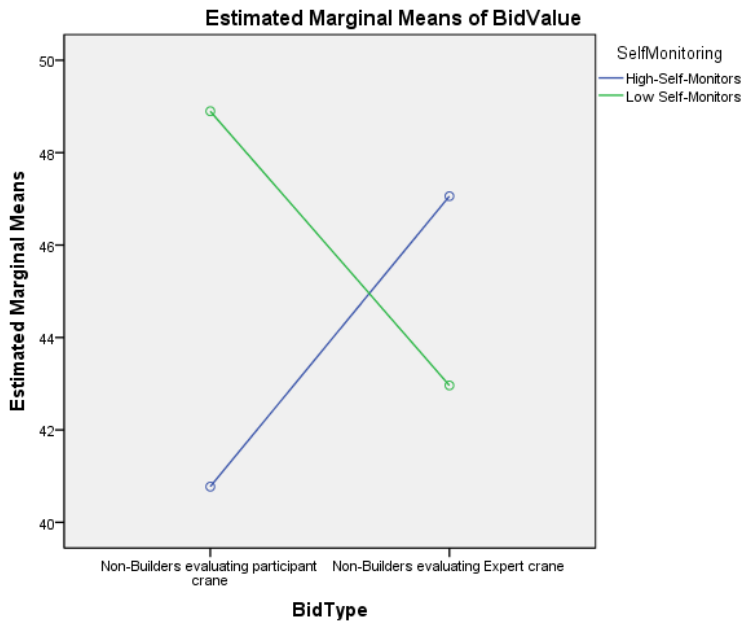


Figure 4 Mean bids on origami crane between design: 2 (Non-Builders Evaluating participant's Creation Bid or Non-Builders Evaluating Expert Creation Bid) X 2 (Self-Monitoring)



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APPENDIX C

Related Economic Model*Utility Maximization Consumers*

Standard microeconomic theory assumes that an individual has unlimited wants but limited resources. Therefore, consumers have to allocate their constrained budget efficiently to obtain maximum happiness at minimum sacrifice and effort when striving for more goods or services. In microeconomics, happiness can be measured by a concept called “utility”, which refers to the amount of total satisfaction a person gets from consumption of a certain item. Consumers are assumed to have clear preferences for different goods and services, and gain utility by getting things that give them “pleasure” and avoiding those that give them “pain”. People maximize utility by choosing the most preferred bundle, which gives the most value for a given budget and set of prices (Molina, 1996). The utility maximization model is built based on an assumption that consumers are rational, and consequently, a utility maximizer (Freeman, 2011).

According to this model, people would be more likely to ready-made products made by professionals than self-assembling products. Ready-made products have a higher probability of being successfully created. Leaving the building process to professionals instead of us, amateurs will diminish the risks of badly assembled product we will be unsatisfied with. Moreover, ready-made products usually have lower production cost, since with available technology they are usually mass produced. The higher quantity result in lower marginal cost of the product and as a result, low purchasing price of the product. The unassembled products might be at a bit lower purchasing price than already assembled ones, but process costs such as risks, time, or

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cognitive and physical effort associated with assembling a product after purchasing the materials would result in higher total cost of the product. As a result, ready-made products should give a consumer higher utility than self-built products. Despite providing lower utility, self-assembling products still have many buyers.

Participants from the IKEA Effect study gave their amateurish self-assembled products they deemed as successful a higher value than other people would have given them, and believed their self-creations rival those made by people much more experienced in their assembling (Norton et. al., 2011). The process cost and the amateurish appearance of the products should have diminished the value of the product and result in an expected lower price than the market one. However, it was not the case. The recent behavioral economic research on IKEA effect (Mochon et al.. 2012; Norton et al., 2011) shows the possible underlying motivational reason for such occurrences. These studies show that consumers gain utility through increasing the feeling of competence after contributing in making the product and accomplishing a task successfully. When the utility gained through feeling of competence exceeds the process costs and risk costs, the consumer will be willing to pay more for the self-assembled product than the same but ready-made one. The opposite would happen when the net negative effect occurs, which means costs exceed competence utility gains.

The current study adds individual characteristic reasons for such a phenomenon to occur. For certain individuals it might be more likely to have the utility gained through increased competence exceed the costs of assembling the product than others.

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APPENDIX D

Details not mentioned on data and methodology

Human Subject Process

Since this study uses human participants to collect data, in order to be able to conduct the study, going through Human subject process was necessary. After having the proposed work recognized as a research, I had to complete and send the *Application to Engage in Research Involving Human Subjects*. The application had me answer questions related to predicted issues, problems and risks related of human subjects' physical and psychological health, or confidentiality and privacy. I had to include the overall purpose and general methods for the study. I also had to attach the materials such as informed consent form or documents I would include in the packet I distribute to the participants.

After receiving the approval, I got the permission to use the funds to order the necessary materials and pay the subjects for participation in form of cash. The funds come from the Union College Student Research Grant I applied for in the previous term.

Participant, Location and Time

Students doing experimental research in psychology field have the permission to use the freud.union.edu website, where I put up timeslots for people to sign up for my study. The website had also other people's studies and all Union College students have access to the website. The website gave brief information about the research, location and possible timeslots to sign up of the study. I was the one choosing the dates and available openings for each experiment session. The location I used was a psychology lab with 4 rooms. The timeslots were spread throughout the week from Monday till Friday (sometimes on Saturday), from morning till evening at times I did was not occupied with other activities and the lab

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was not used by somebody else. There was 65 sessions in total. Each session took no more than 30 minutes and had a capacity of 6 people.

Apart from the Freud website, I distributed flyers to economic Professor, some of my friends and taped them on doors and walls of several buildings on campus. It had information about the study, location, possible rewards, my contact information and the Freud Union website on it. I printed out approximately 30 fliers on bright color paper. In addition, through emails and words of mouth I have asked my friends whether they are willing to help me with the experiment or ask their friends whether they would like to participate,

In total there were 150 participants. 55 came in exchange for ½ hour credit for PSY-100 or PSY-300 class, and 92 for \$4 of cash. There were 3 people who simply volunteered and did not receive any course credit hour or cash. The people who agreed to volunteer: 2 were my friends and the other was my sister's friend. They like everybody else emailed me or signed up on Freud website to sign up for the slot and participate in the study. There were participants who would come as friends of the participants without signing up and do it for cash.

Although, 150 Union College students or alumni took part in the experiments, 2 data had to be excluded. One participant seemed to have ignored the instructions in the study and put 0 in the bid, in how much the crane is worth and rating from 1 to 5 on how much he or she liked the crane. The other participant evaluated the crane that was evaluated already by 2 people in previous sessions through my mistake. He randomly got assigned into group 2 – non-builder evaluating the builder's creation, after he picked a paper slot. Although many people signed up for the session, only he or she showed up, and as a result did not have another builder whose crane he or she could evaluate. Therefore, I used a not wanted crane used in the previous session.