

**When labor leads to persuasion: The Ikea effect in persuasive texts**

*By*

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## General Introduction

### The IKEA Effect

The IKEA effect, a term coined in economic psychology, is a common cognitive bias that refers to the tendency of people to overestimate the value of things that they have personally invested effort in creating or assembling (Norton et al., 2012). People often appraise greater value to, and are willing to pay more for, products that they assemble themselves, even though those items may not be objectively more valuable than similar items that were assembled by someone else. This bias persists even compared to products of better quality that were created by professionals (Norton, et al., 2012). The phenomenon was demonstrated in a series of studies in which participants valued their “creations” with greater regard compared to observers who did not engage in the assembly, whether it was storage boxes or Lego models they assembled, or even origami crane that they folded (Mochon, et al., 2012; Norton et al., 2012). Not only did they value their creations on the same level as experts, but they also believed that others would similarly value their craftsmanship.

### Main Mechanisms of the IKEA Effect

The existing literature proposes three main pillars on which the IKEA effect stands: self-invested effort, positive self-concept, and psychological ownership. These factors and their related psychological processes are not mutually exclusive, but rather, their impact is integrated in conjunction with each other, as they collectively cultivate a positive association between the individual and the self-assembled object, rendering it of greater perceived value.

***The value of effort.*** The initial conception was that the IKEA effect stems from the rationale of *labor equals love* (Norton et al., 2012) which is based on the effort heuristic. The effort heuristic predicts that perceived effort leads to greater value and appreciation (Kruger, et al., 2004) and, indeed, people often rely on effort to infer the quality of items (Inzlicht et al.,

2018). In general, people value their time and effort, thus investing effort into a task will often lead to greater valuation of the task and its outcome. A classic study by Aronson and Mills (1959) demonstrated the relationship between effort and valuation by requiring female participants to undergo an initiation of varying severity, prior to joining a discussion group. The more severe and embarrassing the initiation they underwent, the more positively the participants rated the discussion group, even though they all attended the same “dull” discussion (Aronson & Mills, 1959). The authors suggested that the positive valuation may be a psychological mechanism intended to reduce cognitive dissonance (Festinger, 1957) as a manner of making sense of the personal investment. This reasoning process, which stems from cognitive dissonance is also referred to as effort justification. It is the tendency of people to attribute greater value to the outcome of a task they engaged in as a means of rationalizing their effort (Aronson & Mills, 1959; Festinger & Carlsmith, 1959).

*The value of accomplishment.* Another explanation for the relationship between effort and valuation relates to our concept of self. From this perspective, the IKEA effect is driven by the inherent satisfaction and feelings of accomplishment that individuals derive from completing a task or creating something on their own (Mochon et al., 2012). This sense of accomplishment and pride may be the reason leading individuals to place a higher value on items that they have successfully created. Self-concept is a dynamic web of thought and knowledge we have about ourselves; comprised of our *Self-image*—the cognitive aspect of how we perceive ourselves and how we think others see perceive us, and *Self-esteem*—The affective aspect of how we generally feel about ourselves (Alsaker & Kroger, 2006; Baumeister; 1999). The successful completion of a task can lead to a feeling of accomplishment and positive self-efficacy (Bandura, 1982), which in turn improves our self-concept. The more difficult and demanding a task, the greater the

psychological reward (Bandura, 1982; Talsma et al., 2018), that is, if the task is accomplished successfully. It is the successful effort that leads to positive valuation, as the relation between labor and positive valuation only occurs under fruitful attempts. Failure to complete the task or destroying the creation diminishes the effect (Norton et al., 2012; Sarstedt et al., 2017). These studies indicate that effort on its own may not be sufficient to generate positive valuations, it is also the outcome of the effort that matters.

*The value of [psychological] ownership.* Finally, a psychological sense of ownership over our creations has also been demonstrated to moderate the relationship between labor and valuation (Sarstedt, et al., 2017), as effort devoted to creating an item may foster an emotional attachment and via personal sentiment. A sense of ownership over a product is induced by becoming familiar with it, controlling it, and self-investing into it (Pierce, 2001). People tend to place a greater value on things they own, a phenomenon known as the endowment effect (Kahneman, et al., 1990). This cognitive bias occurs when people perceive more value to something simply because they own it, and they demand a price much higher than non-owners may be willing to pay for it. The endowment effect is presumed to be driven by a combination of factors, including the sunk cost fallacy, loss aversion, and feelings of attachment and familiarity (Kahneman et al., 1990; Marzilli et al., 2014). Deriving from the logic of loss aversion, people may be willing to pay more just to hold on to what they perceive is their property (Kahneman et al., 1990). People may also perceive greater value in things they own because it gives them a sense of identity and self-expression. From this perspective, positive product evaluations may be the result of a broader sense of ownership in addition to emotional attachments (Walasek et al., 2017). However, a later study examined the cognitive biases underlying the IKEA effect via a developmental approach and contested the role of ownership (Marsh, et al., 2018). Marsh et al.,

(2018) concluded that a sense of ownership is not likely a main factor but rather, that there is a strong connection between our creations and our concept of self-concept, further supporting the idea of a correlation between the psychological reward of task completion and positive valuation of the self. Pride has been demonstrated to operate as an antecedent to psychological ownership and it can amplify its influence on valuation (Kirk et al., 2015). Thus, a sense of accomplishment and psychological ownership may be somewhat interrelated.

### **Study Rational: From Effort to Persuasion (or The Idea Behind Ikea)**

From a communication perspective, this line of research raises relevant questions as to whether the IKEA effect would operate similarly in the context of text. Would the cognitive processes that occur during the assembly of consumer goods apply to the “assembly” of a text? Would this process potentially result in a more positive valuation of the text someone labored on compared to a text created by someone else? Developing this line of research one step further, it becomes imperative to delve into the potential implications of text assembly were the text in question to be comprised of persuasive content. Within this context of persuasive messages, it would then be of scholarly interest to investigate whether the correlation between effort and valuation could be extended to encompass a correlation between effort and persuasion. In essence, this inquires whether self-invested effort into assembling a persuasive text could lead, not only to elevated valuation of the text, but also, to a more pronounced shift in attitude that aligns with the message conveyed within the text.

Furthermore, exploring whether individuals who invest personal effort into assembling a text are not only more likely to value it positively, but also more likely to align their attitudes with the arguments comprising the text, would contribute to the scholarly discourse by suggesting a potential mediation path of influence. More explicitly, if the data indicates that

engaging in text-assembly results in both enhanced valuations and increased persuasion, it could suggest that the potential impact of effort on attitude change is mediated via text valuation.

Summing up the questions presented above, this dissertation peruses a two-fold research question: *Would laboring on the assembly of a persuasive text lead to greater valuation of the text, and in turn, would this greater valuation translate into greater support of its persuasive content?*

### **The applicability of text as a DIY product**

This first part of the main research question inquires whether the relationship between self-invested effort and product valuation would operate similarly pertaining to text assembly, or in other words: *Would assembling a text, as opposed to solely reading it, result in a more positive valuation of the text?* It is a rather straight forward question, asking to examine whether the IKEA effect long with its underlying mechanisms, manifests when the self-assembled product is a text. This taps into a deeper inquiry aiming to assess the applicability of text as a DIY product. The IKEA effect has primarily been studied in the context of consumer products, such as household items, fashion, toys, food, and art. The pertinence of the IKEA effect to text may appear less straightforward due to the specific features of text that distinguish it from consumer goods. However, recent studies have successfully tested the IKEA effect with regards to products that are not necessarily physical nor strictly consumeristic in nature, such as music playlists (Cloots, 2019), informative presentations (Rusho & Raban, 2021), and software programming (Fink & Goldman, 2017), suggesting that the phenomenon may be applied to text-based products as well as virtual environments and non-physical items.

Furthermore, assembling a text, much like assembling consumer products, would involve self-investment of time and cognitive resources. In the process of assembling a product from

given materials, as in the common DIY product, one must follow specific instructions and place all the pieces in the correct location and order to successfully construct a functioning final product. Similarly, in the process of assembling a text from given statements and terms, one must follow specific grammatic rules and logical flow to construct a meaningful and readable text. Through the effort invested into this process, individuals may develop a sense of ownership and emotional attachment to the text they labored on, just as they would for other self-assembled products. Thus, while there are unique aspects to texts in comparison to common consumer goods, it is plausible to assume that we could find support for the applicability of the IKEA effect in the context of text assembly.

### **Text assembly as a method of self-persuasion**

The second part of the main research question seeks to determine whether assembling a persuasive text, and greater valuation of the text, would translate into greater attitude alignment with the arguments conveyed in the text. More specifically, it first inquires whether individuals' attitudes would be influenced by the content of a message they assembled more than the influence of reading the same message without engaging in its construction. It then asks whether this influence would be mediated via valuation of the text. Therefore, it is less straightforward, as it demands us to address multiple concerns, beyond assessing a potential mediation path via valuation. Mainly, it directs us to determine whether assembling a text offers sufficient engagement in order to activate the key underlying psychological mechanisms that lead to self-persuasion. In general, we can presume that prompting people to increase the perceived valuation of their own fruits of labor would be an easier task than prompting them to shift their attitudes, let alone their behaviors. Thus, while it is plausible to hypothesize, consistent with the principles of the IKEA effect, that self-invested effort in constructing a text may increase its perceived

valuation, it remains less certain as to whether such investment and increased valuation would result in attitude change, especially considering factors that affect information processing and text assessment such as reading fluency and disruption to information consumption.

When examining the potential functionality of the framework particularly with persuasive content, there are unique features relating to language and information processing that should be considered. As noted above, both fluency of the text readability and perceived message strength can impact the evaluation of the text and its processing path. Processing fluency refers to the ease with which information is consumed and understood by the individual (Song & Schwarz, 2008). Texts that are easy to read and follow a clear flow are more likely to be evaluated positively and possess persuasive power, as they require less cognitive effort to process (Winkielman et al., 2003). Fluency has been found to serve as an indicator for believability, as it increases the likelihood that a statement will be judged as true (Reber & Unkelbach, 2010). Similarly, rhyming in aphorisms has been found to increase their perceived accuracy, rendering them as more believable because it is easy to anticipate the continuation of the sentences, which increases their processing fluency (McGlone, & Tofighbakhsh, 2000). Within the context of persuasive health information, materials that are processed fluently and easily tend to elicit more positive evaluations such as liking, and they can impact an individual's willingness to undertake the treatment (Okuhara et al., 2017). Similarly, interruptions to fluency are generally perceived as negative for communication as they are likely to inhibit persuasion, because the individual's ability to process of the message may be diminished, resulting in reduced engagement with the message (Petty & Cacioppo, 1986). This is relevant for a text assembly task, where the interruption occurs simultaneously as part of the task, because this distraction imposes cognitive load and may deplete individuals' processing capacity (Kupor & Tormala, 2015). However,

reduced cognitive capacity would also result in lower ability to counterargue with the message in a systematic manner, potentially resulting in less opposition to the arguments in the text—a desired factor for persuasion goals.

Message strength refers to the quality and persuasiveness of the message itself rather than the flow of information. A well-researched, logical, and emotionally appealing message is more likely to be persuasive than a message that is poorly constructed or lacks substance, although the level of engagement with the message depends on more than message strength (Eagly & Chaiken, 1993; Petty, Cacioppo & Goldman 1981). The characteristics of the audience also play a critical role in determining the perceived strength and persuasiveness of a text. A message that resonates with an individual's values and beliefs is more likely to be persuasive than a message that contradicts them, and the processing path is determined by their motivation and ability to systematically engage with the message (Chaiken, 1980). Additionally, the audiences' prior knowledge of the topic can also influence the perception of the message's strength rendering it as more or less persuasive because they are more attuned to inaccuracies in the message, and they are more likely to have a developed arsenal of counterarguments to potentially inhibit any of persuasion attempt. If the message is perceived as strong, informative, and unbiased, there is a greater likelihood of accepting it.

To conclude, in contemplating the potential integration of the IKEA effect framework into the realm of persuasive textual content, the intricacies of cognitive mechanisms involved in information processing highlight significant factors that warrant consideration. Among others, elements such as reading fluency, text readability, and perceived message strength intertwine to shape how individuals evaluate and interact with persuasive texts. Processing fluency, reflecting the ease of information comprehension, not only affects the positive evaluation of texts but also

carries implications for their persuasive potency. Similarly, the inherent strength and appeal of the message itself influence its persuasive impact. The alignment of the audiences' values and pre-existing beliefs with the message, coupled with their prior knowledge and ability to engage, further contributes to the intricate matrix of persuasion. The exploration of these complexities underscores the need for a comprehensive understanding of the interplay between these components as we progress to test the synergy between the IKEA effect, text assembly, and the dynamics of persuasion. Given the distinctive properties of textual information, a more comprehensive investigation of relevant assumptions, with particular attention to information processing and persuasive communication, is warranted.

To address the questions and concerns raised above, and to assess the potential application of the IKEA effect as a method of self-persuasion in text-based contexts, the current dissertation draws on theories and empirical findings from the domains of the IKEA effect, self-persuasion, and information processing. It begins with an extensive meta-analysis of the IKEA effect that assesses its overall effect size, robustness, and generalizability of the phenomenon, while highlighting its underlying mechanisms and potential boundary conditions. This meta-analysis is conducted in order to attain a better grasp on the phenomenon and its potential moderators, as well as serve as a steppingstone for the following chapters. The dissertation then proceeds to review the extant literature on self-persuasion, with a focus on processes that are relevant to the main research questions. This review provides the basis for integrating the IKEA effect into a self-persuasion model within the context of text assembly and enables us to assess the similarities and distinctions between the two frameworks. Finally, the model is developed and tested in a series of empirical studies comparing the valuation and persuasion outcomes

between individuals who assembled persuasive messages, and those who merely read the same message without engaging in its creation.

### Chapters Summary

**Chapter 1.** *If you build it: Meta-analysis of the IKEA effect.* This chapter presents data from a meta-analysis aggregating data from empirical studies assessing the relationship between self-invested effort and valuation ( $n = 31$ ,  $k = 55$ ,  $N = 5454$ ). It estimates the average effect size of the IKEA effect and highlights the main underlying mechanisms that moderate the phenomenon. In addition to the three main moderators noted by existing literature—effort, self-concept, and psychological ownership—the analysis tests potential moderators including customization, product tangibility, product usage type, liking the product and positive affect. Beyond offering implications for future research on the IKEA Effect, this meta-analysis serves as a steppingstone for the consecutive chapters, as it assesses vital assumptions about the phenomenon, and enables the adaptation of the framework as an application to communication research.

**Chapter 2.** *From the IKEA Effect to Self-persuasion: An integrated model.* This chapter begins with an extensive review of relevant self-persuasion literature, covering main concepts such as cognitive dissonance, self-perception, and the power of self-generated arguments. It incorporates the advantages and limitations of self-persuasion methods compared to direct persuasion methods and highlights the varied mechanisms through which behavior can influence attitudes. Following the review, the chapter contrasts the similarities and differences between the IKEA effect and self-persuasion frameworks within the context of persuasive texts, followed by a discussion concerning the proposed integrated model which merges the two. This model is later tested in a series of empirical studies, examining the influence of assembly effort on text

valuation [IKEA effect] and the influence of both effort and valuation on attitude change [Self-persuasion].

**Chapter 3.** *The IKEA Effect in persuasive healthcare messages* presents data from three empirical studies testing the proposed model. Experiment 1 tested the influence of self-labor on attitude change concerning a healthcare issue, presenting data from a 2-task type (assemble vs. read) by 2-healthcare practice (teeth flossing and sunscreen application) between subject design. Experiment 2 replicated the design of Study 1 with minor changes to the stimuli and questionnaire aimed to address potential issues that arose from the original materials. Experiment 3 replicated the model from the previous studies, while incorporating a major adjustment, as the stimuli were embedded within a [mock] health website. Furthermore, this study included two additional manipulations, with the intention of testing the influence of (a) *self-expression* via aesthetic customization of the web page (customization vs no customization) and (b) the *extent of effort* by altering the difficulty level of the assembly task (assemble-difficult vs. assemble-easy vs. control). This resulted in a 2 by 3 randomized experiment between subject design. The goal of Experiment 3 was to hone everything together by incorporating findings from the meta-analysis presented in Chapter 1 as well as addressing questions and concerns that arose from the preceding experiments.

**General Discussion.** This section summarizes the main findings and inferences from all the studies and addresses theoretical and methodological implications of utilizing the IKEA effect in persuasive messages. It then addresses potential study limitations and proposes practical and theoretical implications for future research.

## CHAPTER 1. If You Build It: Meta-Analysis of the Ikea Effect

Over the last two decades, the IKEA effect has garnered significant attention from researchers across a range of disciplines, including psychology, marketing, and consumer behavior. Studies have explored the underlying mechanisms of the effect, its boundary conditions, and its implications for consumer behavior and decision-making, testing this phenomenon with relation to a wide array of consumer goods, including *toys* (e.g., Marsh et al., 2018), *fashion* (e.g., Sarstedt, et al., 2017), *food* (e.g., 2014; Lefebvre & Orłowski, 2020; Raghoebar et al., 2017), *arts and crafts* (e.g., Erol, 2022; Straffon et al., 2022), *3D-prints* (e.g., Wiecek, et al., 2020), *software coding* (e.g., Fink & Geldman, 2017; Shmueli et al, 2016), *chatbots* (Wald et al., 2021), *household items* (e.g., Atakan et al., 2014b), *robotics* (Sun & Sundar, 2016); *investment portfolios* (e.g., Ashtiani et al., 2021; Brunner, et al., 2022) and *information* (e.g., Rusho & Raban, 2020). However, despite the growing interest in the IKEA effect, there is a lack of consensus as to its robustness and generalizability, and considerable work remains to be done to untangle and clarify the specific mechanisms and boundary conditions under which the IKEA Effect operates. Although most studies are informed by similar frameworks and employ akin designs, the results vary considerably. While many studies yield strong support for the effect, others exhibit weak or null effects on product valuation, and several have identified important moderators that limit its scope. In light of the discrepancies, this meta-analysis conducts a comprehensive synthesis of the existing literature by systematically examining the primary mechanisms that have been theorized to explain the IKEA Effect—self-invested effort, psychological ownership, and self-concept. The meta-analysis also tests additional contextual mechanisms that may explain variability in the results.

In the first step, it sets out to evaluate the overall effect of self-invested effort on product valuation. Accordingly, the following research question is proposed:

**RQ1:** *What is the average effect of self-invested effort on valuation of the target product?*

To answer this question, we conduct a meta-analysis that aggregates data from empirical studies assessing the relationship between effort and valuation of DIY products. Specifically, we focus on studies that manipulate the type or extent of effort invested into creating or designing a product, and then measure the influence of that effort on valuation of the product.

In succession to valuation, the meta-analysis aims to assess the overall effect that effort elicits on additional outcomes of interest including *self-concept, psychological ownership, liking of the product, and positive affect*. The first two factors—self-concept, and psychological ownership—have been highlighted in the introduction as two identified key psychological mechanisms of the phenomenon. The latter two—liking and positive affect—are associated with valuation more generally. Liking of the product is closely related to valuation as people's positive feelings towards a product can lead to a higher perceived valuation, and accordingly, several studies that tested the IKEA Effect indeed measured liking as an outcome of effort (e.g., Erkin et al., 2018; Norton et al., 2012). Similarly, the experience of positive affect is closely associated with a sense of accomplishment and pride, both of which relate to emotional attachment and psychological ownership. Although these four outcomes are typically treated as secondary to valuation, closer attention to these constructs not only may help explain the main influence of the IKEA Effect but also elucidate its underlying mechanisms. Accordingly, the two following research question was posed:

**RQ2:** *What is the average effect of self-invested effort on (a) liking; (b) self-concept; (c) psychological ownership; and (d) positive affect?*

**RQ3:** *Is the effect of effort on product valuation contingent upon these four mechanisms?*

## **Contextual Moderators**

In addition to the three main moderators presented in the introduction, there is a myriad of contextual moderators that influence the relationship. Therefore, we next gauge the more nuanced factors, highlighting additional moderators that inhibit or enhance the relationship between effort and valuation. Having laid out the main aspects of the IKEA effect and the theories from which it stems, we progress via a theory-based approach to address potential boundary conditions that may explain the variances in the findings across studies, including self-expression, extent of effort, product tangibility and product usage.

### **Self-Expression via Product Customization**

The ability to customize a product renders it unique and more likely to satisfy a person's individual preferences and tastes. It offers a form of identity expression through personal design choices (Franke & Schreier 2010; Franke et al. 2010). Customization of a product may also increase its perceived value based on the mental effort invested into designing and personalizing it. The type of effort required for the production can moderate its influence on valuation, pertaining to the extent of mental effort one is required to invest (Atakan et al., 2014a). Additionally, customizing a product increases the emotional bonding with it as a result of the time spent on the product and the mental effort invested into its appearance (Mugge et al., 2009). It could develop a feeling of ownership and control, which increases its perceived value. Furthermore, according to some studies, consumers experience greater enjoyment and value the

assembly experience when the customization decisions and the assembly process are integrated (Buechel & Janiszewski, 2013). Thus, the following hypothesis is posed:

**H1:** Self-invested *effort bears stronger influence on product valuation when self-customizing the item as opposed to solely assembling it.*

### **Extent of effort and freedom of choice**

When the process of creating and designing a product offers a greater freedom of choice, as in more choice options, it inevitably offers a greater opportunity for self-expression via customization. In turn, expression of self develops attachment and sense of ownership, which may lead to increased valuation (Ling, et al., 2020). Similarly, when there are more restrictions on creativity, as in less choice options, the task of creation is not as mentally taxing or engaging. In this manner, restriction levels can be used as an indicator for mental effort. Challenging tasks develop greater product attachment, as the level of emotional attachment is influenced by both the extent of invested effort and the degree of self-expression (Atakan et al., 2014a; Mugge, et al. 2009). From an alternative perspective, having an abundance of options is not always positive. Too many options can over complicate the customization, due to the requirement of processing a simultaneous overload of information and attributes (Dellaert & Stremersch 2005; Valenzuela et al. 2009). From this perspective, constraints can both enhance creativity, as well as inhibit it (e.g., Dahl & Moreau 2007). Ideally, one could compare the level of effort between different studies to assert whether conditions which elicit greater effort result in greater effect sizes. However, one cannot assume the extent of effort without it being consistently measured across different studies, especially considering distinct features such as product types and design processes. What we can assume, however, is that the lowest level of elicited effort, whether mental or physical, may be associated with studies in which the item was created via 3D-

printing. After all, the “creation” of the product in such cases merely involved pressing a button to instruct the program to begin printing. Accordingly, the second hypothesis is posed:

**H2:** *Self-invested effort has a weaker influence on product valuation when the item is created via 3D-printing.*

### **Product Tangibility**

Tangible products are physical objects that can be touched and handled. Touching and holding a physical object can increase the sense of ownership and attachment to it (Peck & Shu 2009). Even sensory information derived from touching a product can influence its perceived valuation (Atakan, 2014). This explains why simply touching items may increase people's willingness to pay for them (Wolf, et al., 2008). Because tangible products can be experienced through multiple senses, they may create a stronger emotional connection than intangible products (e.g., digital products or services). The sense of attachment may be increased by touching and handling the product, as it can create a physical connection and make the product feel more "real" and personal to the consumer. Product tangibility, however, does not guarantee increased attachment. It depends on the personal preferences and the context of the product. For example, a consumer may not feel attached to a product if they did not have any involvement in its creation or purchase decision, or if the product does not meet their expectations.

Some of the evidence concerning the IKEA effect, have been retrieved from studies where the assembly and design efforts were conducted virtually on a computer via a digital design program (e.g., Franke et al., 2010; Ling et al., 2020), while other studies required participants to physically create the product. In most studies where the item was 3D-printed, participants received the item at the end of the process, offering them the experience of holding the final creation (e.g., Walaseck et al., 2017). In other studies, the product was digital in nature,

such as a music playlist (e.g., Cloots, 2019), or an informative presentation (e.g., Rusho & Raban, 2020), thus experiencing a final physical product was not feasible. Based on literature, one can expect that due to a stronger sense of attachment and ownership of tangible products, as opposed to digital products, the former will result in greater valuations.

**H3:** *Self-invested effort has stronger influence on item valuation when creating a physically tangible item versus creating it virtually.*

Furthermore, there may be an interaction between the two variables relating to the creation process—product tangibility and customization—as they may enhance or inhibit one another. Put differently, creating a tangible item that requires customization could result in stronger effects because it integrates both self-invested effort and self-expression via customization. Similarly, we could expect that creating an intangible item that does not require customization would derive weaker effects due to lower involvement in the product creation paired with lower sensory arousal.

**H4:** *There is an interaction between product tangibility and customization, such that (a) greater valuation emerges for tangible customized products, while (b) lower valuation emerges for non-tangible non-customized products.*

### **Product Usage: Utilitarian vs. Hedonistic**

People may value products differently based on whether their intended usage is utilitarian or hedonic. Utility products are those that are primarily used to fulfill a functional need or solve a practical problem. They tend to be purchased because they provide a specific benefit and are typically evaluated logically, based on their performance and effectiveness in fulfilling their intended purpose (Dhar & Wertenbroch, 2000; Voss, et al., 2003). Hedonic products, on the other

hand, are primarily used for pleasure or enjoyment. They tend to be purchased for their emotional or psychological benefits, and are typically evaluated based on their design, brand, and overall affective appeal (Dhar & Wertenbroch, 2000; Voss et al., 2003).

The two usage types are clearly not mutually exclusive, as some products can have both hedonic and utilitarian benefits. For example, a smartphone can be used for communication, information, and entertainment, and at the same time, it can be an indicator of social status and its casing design can indicate personal aesthetic preference in addition to the utility of protecting the phone. Although some products offer both utilitarian and hedonic uses, people tend to categorize them as primarily one or the other (Dhar & Wertenbroch, 2000). More specifically, hedonic products are often associated with subjective preferences and aesthetics, as they lend themselves to a form of self-expression and extension of self (Maimaran & Simonson, 2011), which, in turn, increases a sense of product attachment (Wiecek et al., 2020). In comparison to utilitarian items, hedonic products foster greater feelings of product ownership because they trigger emotional cues (Shu & Peck, 2011). Thus, one can assume that people experience a greater sense of ownership for hedonic products compared to utilitarian products (Chan, 2015; Shu & Peck 2011; Wiecek et al., 2020), likely because the former invokes a stronger emotional attachment which in turn develops a stronger endowment effect (Chan, 2015).

The question arising from the IKEA Effect literature is whether self-created products would produce a similar pattern of valuation favoring hedonistic products, or rather, would the mechanisms that elicit emotional attachment and sense of ownership via the creation process render self-created utilitarian products valuable as hedonistic ones. A recent study tested this assumption and found that co-production increased positive attachment and valuations of hedonic products, but not utilitarian products (Wiecek et al., 2020). However, the products they

tested in their study were 3D printed items, meaning that there was not much engagement on behalf of the participants. Furthermore, the original study by Norton et al., (2012) found a significant effect even for an explicitly utilitarian product such as storage boxes. Given the limited literature assessing whether the IKEA effect is mainly relevant for hedonistic items or whether it operates with utilitarian items alike, the final research question is posed:

**RQ4:** Does usage type (*Utilitarian vs Hedonistic*) of self-produced items moderate the influence of effort on product valuation?

## **Method**

### **Literature search process.**

First, we searched for relevant empirical studies via electronic databases that concerned the IKEA Effect, including Google Scholar, ProQuest, ResearchGate and the UW library catalog. The queries identified academic journal publications, conference papers, book chapters, and doctoral dissertations from a range of domains and disciplines. The terms in the queries that were used to search the databases included: IKEA Effect, Willingness to pay (WTP), effort justification, valuation, DIY, self-customization, and co-creation. In a second step, after constructing an initial corpus, we conducted secondary queries within the articles that cited the main articles in the initial corpus. Finally, we contacted authors ( $k = 11$ ) for supplemental files in case information was missing from their manuscripts which was critical for the models.

### **Inclusion criteria.**

To be included in the meta-analysis, studies had to meet the following criteria. First, the stimuli in the study had to require subjects to construct or customize a target object, whether it was done physically or digitally via a computer program. We did not include studies with solely envisioned efforts, such as asking subjects to imagine that they constructed an item (e.g., Atakan

et al., 2014b study 1; Erkin, et al., 2018 study 2). Second, the study had to assess valuation of the target object as the dependent variable. While the focus was on assessments of monetary valuation, we also included studies that measured other forms of assessments, such as liking, perceived valence and preference fit. Third, studies had to include at least one of the following comparisons: (1) a comparison of valuations between subjects who engaged in the creation of the target object (i.e., builders) and subjects who reviewed a readymade object (i.e., non-builders), or alternatively, (2) a comparison between two groups of “builders,” where the effort type was manipulated. Fourth, each study had to report on the statistics necessary for calculating effect sizes, (e.g., group means, standard deviations, sample sizes,  $t$ -values or  $F$ -values, counts, frequencies, or exact  $p$ -values). In cases where the original manuscript was missing the necessary data to evaluate effect sizes ( $k = 11$ ), corresponding authors were contacted, and the relevant data were obtained. After the screening process, 31 research reports that documented results of 55 separate studies were included in the meta-analysis, with a total sample size of 5,454 participants [See Appendix 1.A for literature search workflow]

## **Measures**

### ***Predictor: Customization/Effort manipulation***

The studies were initially coded for whether self-invested effort was manipulated by requesting subjects to 1 = assemble a product, 2 = customize and design a product, or 3 = both customize and assemble a product. Categories 2 and 3 were then combined into one, creating a binary variable that indicated whether the process of item creation required customization or not.

### ***Outcome Variables***

*Valuation.* The effect sizes for valuation, including monetary value assessments, willingness to pay (WTP), willingness to accept (WTA) and product evaluations, were combined

into the main meta-analysis model. In addition to valuation, we tested four main outcome variables. These were (a) *liking* a product, which included liking and preference fit, (b) *self-concept*, which included competence, pride, accomplishment, self-affirmation, self-concept, and efficacy, (c) *psychological ownership*, which included perceived ownership, psychological ownership, product attachment, product identity and affective commitment, and (d) *positive affect*, which included, emotion, mood, satisfaction, and enjoyment. After testing these outcome variables, we imputed them as moderators into the main meta-regression model to assess whether they operate as significant mechanisms of the IKEA Effect—the influence of effort on valuation.

### ***Contextual Moderators***

In addition to the main mechanisms, the analysis focused on a series of moderators relating to the process of effort and characteristics of the product that was created. These included: customization, 3D printed items, product tangibility, and product usage type. The first three were coded as binary variables, indicating whether they were present in the study or not. For usage type, products were categorized as to whether their intended use was more hedonic ( $k = 27$ ), more utilitarian ( $k = 16$ ), or equally both ( $k = 7$ ). This coding was based on the validated HED/UT scale developed by Voss et al. (2003). The scale includes ten semantic differential response items, five of which refer to the hedonic dimension and five of which refer to the utilitarian dimension of consumer attitudes. [See Appendix 1.B for codebook].

### **Inter-coder reliability**

A subset of the final corpus ( $k = 24$ ) was coded by two independent coders to evaluate ICR, employing weighted Kappa to assess the level of agreement. The reliability coefficient reached .878 or higher for all variables, indicating a sufficient level of reliability among the coders. Disagreements were resolved through discussion between the coders and when needed, a

second round of coding was conducted on a different subset of data. The ICR scores were self-invested effort ( $kappa = .919$ ), product valuation ( $kappa = .919$ ), liking ( $kappa = 1$ ), self-concept ( $kappa = 1$ ), Psychological ownership ( $kappa = .893$ ), positive affect ( $kappa = 1$ ), customization ( $kappa = .919$ ), 3D printed item ( $kappa = 1$ ), product tangibility ( $kappa = 1$ ), and product usage type ( $kappa = .878$ ). Table 1 presents a summary of the article included in the analysis and a list of outcome variables measured for each study

### **Data analysis**

Effect sizes and correlation coefficients (Cohen's  $d$ ) were assessed via the Comprehensive Meta-Analysis Software (CMA v.4; Borenstein, et al., 2014.), with weights being assigned to primary studies based on the inverse of the variance. This study reports on uncorrected effect sizes based on assumption of random effects (Hedges & Vevea, 1998). A separate analysis was conducted for each of the outcome variables: (1) valuation, (2) liking, (3) self-concept, (4) psychological ownership, and (5) positive affect (RQ1-2). After analyzing main effects, statistical heterogeneity among the studies was estimated by Chi-square test at the  $p < .05$  level (Higgins & Thompson, 2002) and by using the  $I^2$  statistic to quantify the heterogeneity of the results (Higgins et al., 2019). Potential underlying mechanisms (i.e., RQ3) were tested with a meta-regression (Rosenthal, 1991). The potential role played by contextual moderators (i.e., H1-H4 and RQ4 ) was probed with Q statistic. Due to concerns over a potential file-drawer problem, a combination of publication bias indices was used. These tests are described in detail at the end of the results section.

**Table 1.**

Summary of article coding for the meta-analysis

<i>Study</i>	<i>Year</i>	<i>Study number</i>	<i>N</i>	<i>Item(s) created</i>	<i>Effort type</i>	<i>Usage</i>	<i>Dependent Measures</i>
Norton et al. <sup>T</sup>	2012	1	52	Storage box	assemble	Utilitarian	value, liking
Norton et al. <sup>T</sup>	2012	2	106	Origami	assemble	Hedonistic	value
Norton et al. <sup>T</sup>	2012	3	118	Lego	assemble	Hedonistic	value
Norton et al. <sup>T</sup>	2012	4	39	Storage box	assemble	Utilitarian	value
Mochon et al. <sup>T</sup>	2012	1	75	Lego	assemble	Hedonistic	value, self-concept, affect
Mochon et al. <sup>T</sup>	2012	2	119	Storage box	assemble	Utilitarian	value, self-concept
Sarstedt et al. <sup>T</sup>	2017	1	103	Loom bracelet	assemble	Hedonistic	value, psychological ownership
Dohle et al. <sup>T</sup>	2016	1	120	Milkshake	assemble	Hedonistic	liking, consumption
Ling et al.	2017	1	227	T-shirt	customize	Hedonistic	value
Ling et al.	2017	2	166	T-shirt	customize	Hedonistic	value
Rusho & Raban	2018	1	89	Information	both	Utilitarian	evaluation
Rusho & Raban	2020	1	79	Presentation	both	Utilitarian	evaluation
Erol <sup>T</sup>	2022	1	45	Wood painting	both	Hedonistic	value
Bühren & Pleßner <sup>T</sup>	2022	1	196	Paper plane	assemble	Hedonistic	value
Bühren & Pleßner <sup>T</sup>	2022	2	114	3D-soccer ball puzzle	assemble	Hedonistic	value
Brunner et al.	2022	1	496	Portfolio	assemble	Utilitarian	value, psychological ownership
Wiecek et al. <sup>3D</sup>	2020	1	74	Key chain	assemble	Utilitarian	value, liking
Wiecek et al. <sup>3D</sup>	2020	2	124	Key chain	assemble	Utilitarian	value, liking
Wiecek et al. <sup>3D</sup>	2020	3	143	Egg cup, Massage ball	assemble	Util/Hed	evaluation, liking
Wiecek et al. <sup>3D</sup>	2020	4	204	Egg cup	assemble	Util/Hed	evaluation, liking
Fink & Geldman	2017	1	80	Mobile app	both	Utilitarian	value
Diefenbach et al. <sup>T</sup>	2018	1	106	Tote bag	both	Utilitarian	value, psychological ownership
Diefenbach et al.	2018	2	136	Smartphone	customize	Util/Hed	value, psychological ownership
Cloots	2019	2	86	Music playlist	customize	Hedonistic	value, self-concept, psychological ownership
Franke et al.	2010	2	114	T-shirt	customize	Hedonistic	value

<i>Study</i>	<i>Year</i>	<i>Study number</i>	<i>N</i>	<i>Item(s) created</i>	<i>Effort type</i>	<i>Usage</i>	<i>Dependent Measures</i>
Franke et al.	2010	3	116	Skis	customize	Hedonistic	value, liking, self-concept
Franke et al.	2010	4	129	T-shirt	customize	Hedonistic	value
Franke et al.	2010	5	65	Wristwatch	customize	Util/Hed	value, liking
Rusho & Raban	2021	1	89	Presentation	both	Utilitarian	value
Herd & Moreau <sup>T</sup>	2012	1	97	Drawing	both	Hedonistic	value
Herd & Moreau	2012	2	89	Cell phone case	both	Hedonistic	value
Herd & Moreau	2012	3	82	Travel mug	customize	Utilitarian	value
Predmore et al. <sup>T</sup>	2021	1	83	Storage box	assemble	Utilitarian	value
Erkin et al. <sup>3D</sup>	2018	1	76	Key chain	assemble	Utilitarian	value, liking, psychological ownership
Erkin et al. <sup>3D</sup>	2018	3	100	Key chain	assemble	Util/Hed	value, liking, psychological ownership
Erkin et al. <sup>3D</sup>	2018	4	102	Key chain	assemble	Util/Hed	value, liking
Franke & Schreier	2010	1	186	Scarves	customize	Hedonistic	value, liking, affect
Franke et al.	2009	1	327	Newspaper	customize	Utilitarian	value
Franke et al.	2009	2	1039	Newspaper, Pen, Kitchen, Skis, Cereal	customize	Util/Hed	value
Franke & Piller	2004	1	165	Wristwatch	customize	Hedonistic	value
Atakan et al. (a) <sup>T</sup>	2014	1	75	Picture frame	assemble	Hedonistic	value, psychological ownership
Atakan et al. (a) <sup>T</sup>	2014	2	103	Travel mug	customize	Utilitarian	value, psychological ownership
Atakan et al. (a) <sup>T</sup>	2014	3	122	Music cd & case	both	Hedonistic	value, psychological ownership
Atakan et al. (a) <sup>T</sup>	2014	4	144	Music cd & case	both	Hedonistic	value, psychological ownership
Atakan et al. (b) <sup>T</sup>	2014	2	141	T-shirt	both	Hedonistic	evaluation, psychological ownership, affect
Schreier	2006	1	185	Cell phone covers, T-shirt, Scarves	customize	Hedonistic	value
Maiz et al. <sup>T</sup>	2019	1	111	Fruit plate	both	Hedonistic	liking, consumption, affect
Troye & Supphellen <sup>T</sup>	2012	1	240	Meal kit	assemble	Hedonistic	liking
Troye & Supphellen <sup>T</sup>	2012	2	74	Meal kit	assemble	Hedonistic	liking
Troye & Supphellen <sup>T</sup>	2012	3	98	Meal kit	assemble	Hedonistic	liking

*Note.* <sup>T</sup> Product tangible during creation; <sup>3D</sup> Product created via 3D printing; value = monetary valuation including WTP and WTA ; evaluation = assessment of product valance

## Results

### Efforts' Influence on Product-Related Outcomes

Regarding the influence of self-invested effort on valuation (RQ1), across 45 individual studies, the average effect was positive, moderate, and significant ( $d = 0.57$ ,  $SE = .06$ ,  $p < .005$ , 95% CI [.45, .69]), such that builders tended to report on higher valuation compared to their nonbuilders counterparts. Additionally, there was a substantial heterogeneity in effect sizes ( $Q(44) = 206.32$ ,  $I^2 = 78.67\%$ ,  $p < .005$ ). Similarly, across 17 individual studies, the effect of self-invested effort on *liking* (RQ2a) was positive, moderate, and significant ( $d = 0.57$ ,  $SE = .10$ ,  $p < .005$ , 95% CI [.38, .75]) with substantial heterogeneity in effect sizes ( $Q(16) = 57.48$ ,  $I^2 = 72.17\%$ ,  $p < .005$ ). Moreover, the effect of effort on self-concept (RQ2b) was positive, strong, and significant, albeit only across four studies ( $d = 1.17$ ,  $SE = .30$ ,  $p < .005$ , 95% CI [.58, 1.77]) with substantial heterogeneity in effect sizes ( $Q(3) = 21.24$ ,  $I^2 = 85.88\%$ ,  $p < .005$ ). With respect to *psychological ownership* (RQ2c), across 13 studies, the IKEA Effect was again positive, strong, and significant ( $d = 0.85$ ,  $SE = .11$ ,  $p < .001$ , 95% CI [.63, 1.07]) with substantial heterogeneity in effect sizes ( $Q(12) = 55.70$ ,  $I^2 = 78.46\%$ ,  $p < .001$ ). Finally, an examination of the influence of effort on positive affect (RQ2d) yielded a positive, strong, and significant effect ( $d = 0.76$ ,  $SE = .19$ ,  $p < .005$ , 95% CI [.40, 1.12]), with limited heterogeneity in effect sizes ( $Q(3) = 8.75$ ,  $I^2 = 65.71\%$ ,  $p < .005$ ). [See table 2 for summary data of the five models; See figures 1-2 for a complete outline of effect sizes on *valuation* and *liking* by study]. Taken together, the results associated with RQ1-RQ2 paint a rather consistent portrait of the IKEA Effect, such that there seems to be substantial influence on various product-related outcomes. With that in mind, however, there is also noticeable variance in effect sizes that can be potentially explained with a closer look at theory-driven moderators.

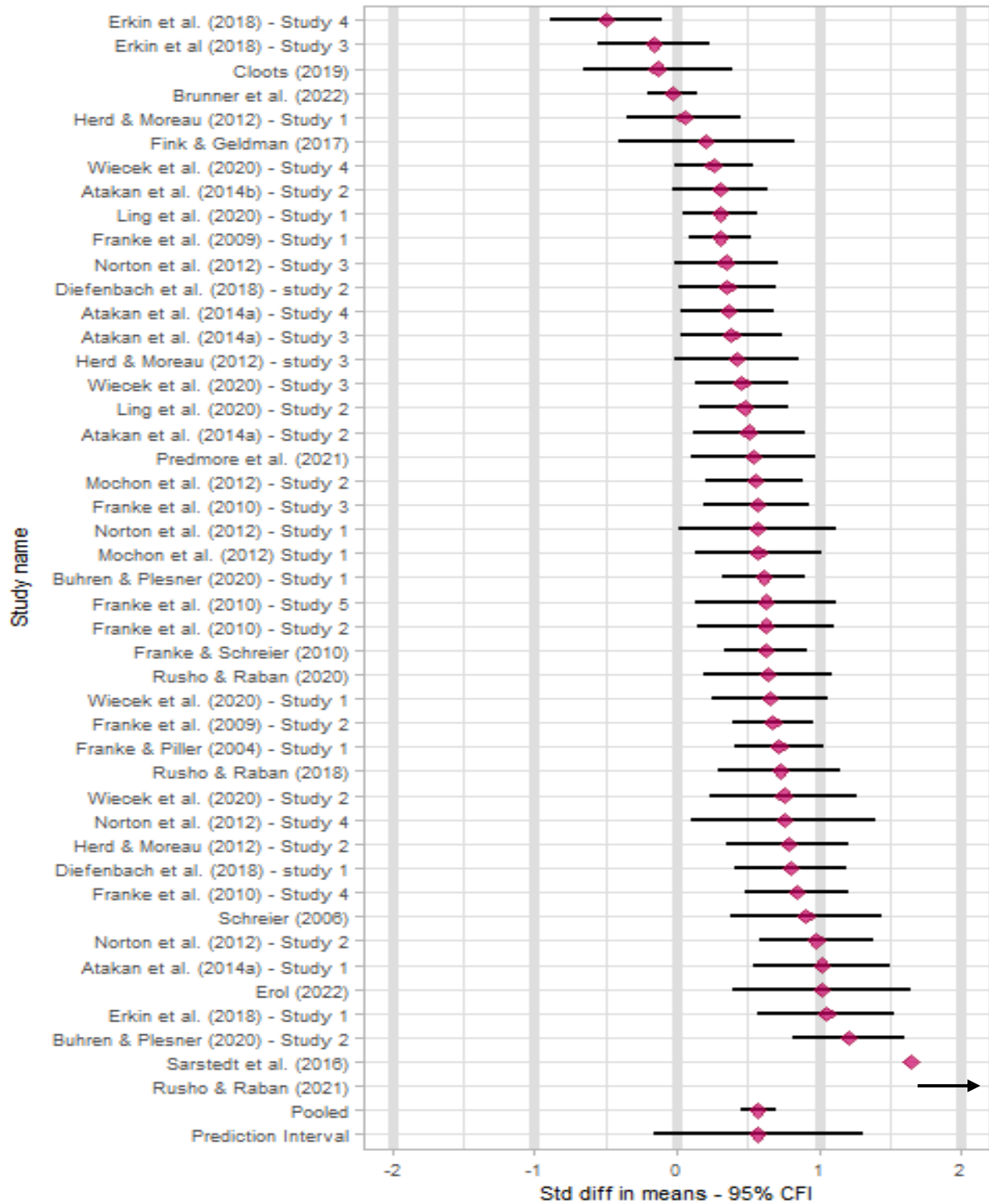


Figure 1 . Distribution of standard deviation in Means for the effect of labor on valuation.

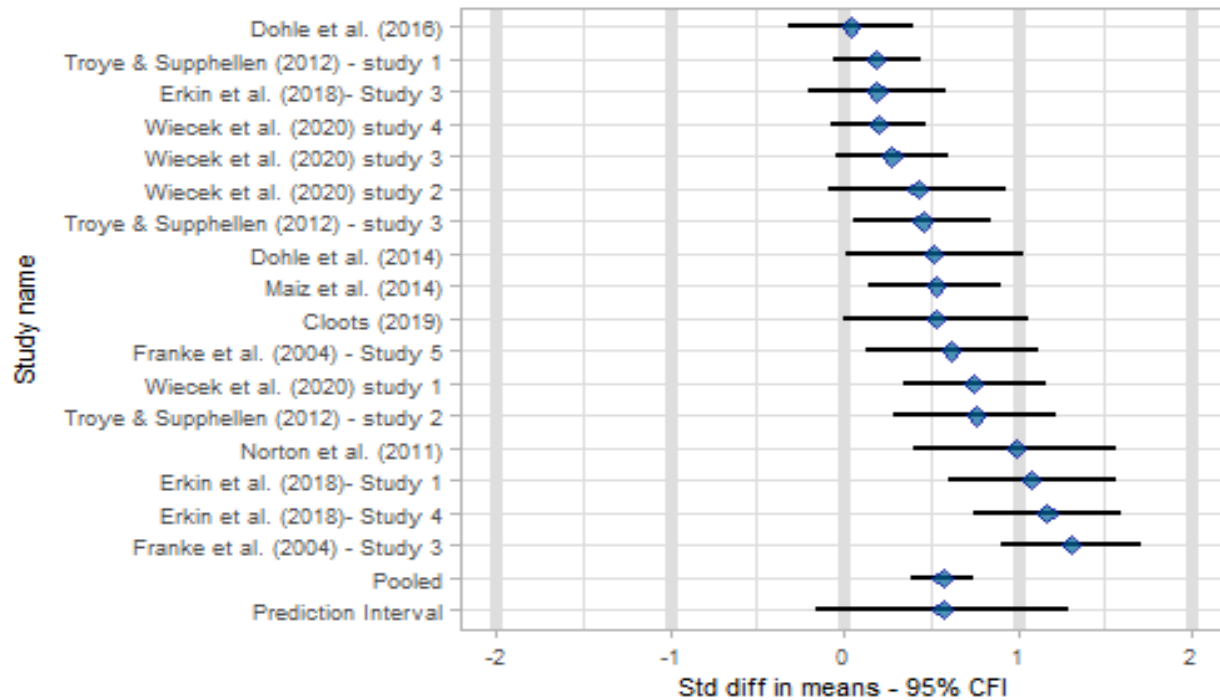


Figure 2 . Distribution of standard deviation in Means for the effect of labor on liking.

**Table 2.**

The effect of self-invested effort on valuation and secondary outcome variables

	k	Heterogeneity Statistics		Random Effects	
		I <sup>2</sup>	Q <sub>b</sub>	d(se)	95% CI
Valuation	45	78.67%	206.32**	0.57(.06)	0.45, .69
Liking	17	72.17%	57.48**	0.57(.10)	0.38, .75
Self-Concept	4	85.88%	21.24**	1.17(.30)	0.58, 1.77
Psychological Ownership	13	78.46%	55.70***	0.85(.11)	0.63, 1.07
Affect	4	65.71%	8.75**	0.76(.19)	0.40, 1.12

Note: CI = confidence interval. \*p < .05, \*\*p < .01, \*\*\*p < .001.

### Four Potential Mechanisms of the IKEA Effect

Next, a meta-regression assessed whether the IKEA Effect on valuation (RQ3) is contingent on the level of (a) liking, (b) self-concept, (c) psychological ownership, and (d) positive affect. To begin, the meta-regression model did not support the role played by *liking* as a moderator of the IKEA Effect on valuation ( $b = .17, SE = .36, p = .646, k = 17; Q(1) = 0.21, p = .646, R^2 = .00$ ). Likewise, *self-concept* did not emerge as a significant moderator of the IKEA Effect on valuation ( $b = .22, SE = .33, p = .504, k = 4; Q(1) = 0.45, p = .504, R^2 = .00$ ). Interestingly, however, *psychological ownership* significantly amplified the IKEA Effect ( $b = .75, SE = .30, p = .012, k = 13; Q(1) = 6.26, p = .012, R^2 = .44$ ). Each increase in psychological ownership translated into a considerable increase in the impact of self-invested effort on valuation. Similarly, the meta-regression pointed to the significant role played by experienced *positive affect* in enhancing the influence exerted by the IKEA Effect on valuation ( $b = .57, SE = .23, p = .011, k = 4; Q(1) = 6.44, p = .011, R^2 = .64$ ).

### Contextual Moderators

We now progress to test the contextual moderators in our data and assess whether they significantly impact the IKEA Effect—the influence of effort on valuation. Table 3 summarizes these models. These moderators pertain to the process of item creation, characteristics of the product, and demographic characteristics of the sample. Counter to the assumption of H1, the meta-regression model did indicate that customization is a significant moderator of effort on valuation ( $Q(1) = 0.027, p = .870$ ). Similarly, counter to H2 and H3, the meta-regression model did not find support for either 3D printing ( $Q(1) = 1.874, p = .171$ ), nor product tangibility ( $Q(1) = 0.769, p = .381$ ), as playing significant roles in the IKEA Effect. Finally, RQ4 asked whether there would be variance in valuations between usage types of products. The meta regression

indicates that there is no significant difference based on the intended usage of the product as being more hedonistic or utilitarian ( $Q(1) = 0.083, p = .773$ ), indicating that the IKEA Effect operates with utilitarian products and hedonistic products alike.

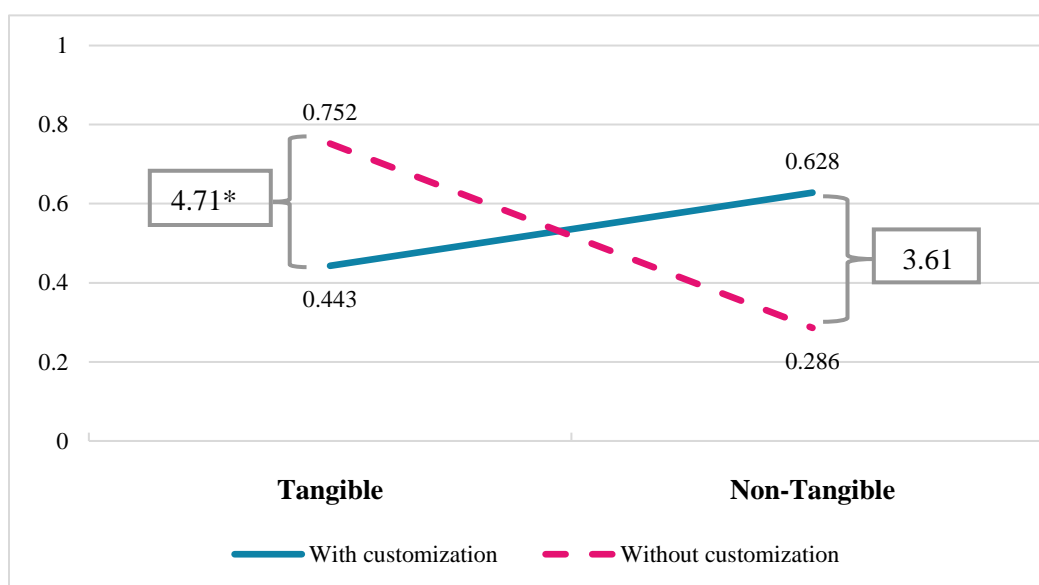
**Table 3.**

The IKEA effect by contextual moderators (H1, H2, H3 & RQ4)

<i>Variable</i>	<i>d</i>	<i>k</i>	<i>n</i>	<i>Q</i>	<i>p</i>	<i>95% CI</i>
Main effect	.57	45	5,454			[.45,.69]
Customization				0.027	.870	
With	.58	26	3,141			[.44,.72]
Without	.56	19	2,313			[.34,.77]
3D Printing				1.874	.171	
With	.34	7	785			[-.02,.71]
Without	.61	38	4,669			[.48,.71]
Tangibility				0.769	.381	
Tangible	.63	18	1,790			[.48,.78]
Intangible	.53	27	3,664			[.36,.70]
Usage type				0.083	.773	
Hedonic	.60	23	2,683			[.47,.73]
Utilitarian	.56	18	2,159			[.30,.81]

Additional analyses tested H4 for a possible interaction between tangibility and customization, resulting in a significant difference in retrieved effect sizes ( $Q(3) = 8.67, p = .034$ ). However, it was the tangible products without customization that elicited the greatest effects, not the tangible with customization as initially expected. As illustrated in Figure 3, the strongest IKEA Effect emerged for those who engaged with a physical product that was not customized ( $d = 0.75, SE = .10, p < .001, 95\% CI [.56, .95]$ ), followed by a digital product that was customized ( $d = 0.63, SE = .09, p < .001, 95\% CI [.50, .81]$ ), a physical product that was customized ( $d = 0.44, SE = .10, p < .001, 95\% CI [.24, .64]$ ), and a digital product that was not Customized ( $d = 0.29, SE = .16, p = .066, 95\% CI [-.02, .59]$ ). Critically, the post hoc

comparisons across conditions, further supported H4, showing a significant difference between the physical assembly of a customized and a non-customized product ( $Q(1) = 4.71, p = .030$ ). The difference between the digital creation of a customized and a non-customized product was not significant within the 95% CI, ( $Q(1) = 3.61, p = .058$ ).

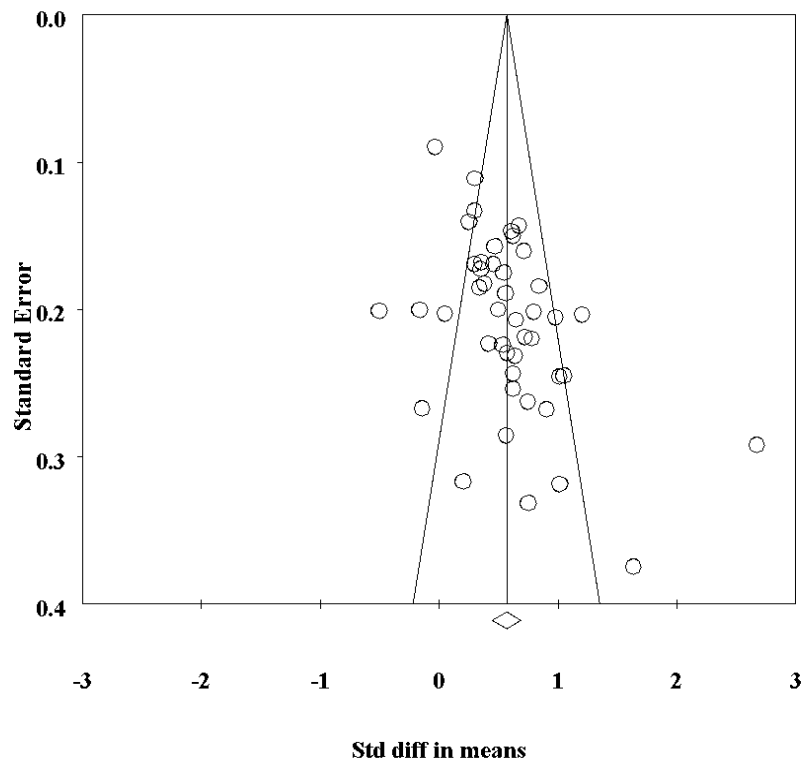


**Figure 3.** The influence of effort on valuation moderated by tangibility and customization (H4). Values by bracket represent post-hoc tests for group differences;  $* = p < .05$

### Publication bias

We employ multiple methods to assess whether our corpus suffered from publication bias. First, we calculate Kendall's Tau to estimate the relation between standardized effects and their variances (Begg & Mazumdar, 1994). By juxtaposing the effect sizes with their standard error for each study, we produce a funnel plot that indicates a considerable clustering of studies in the upper-left part of the funnel [See figure 4]. This rather a-symmetrical distribution in the data suggests that studies with large samples that demonstrated stronger effects may be underrepresented. Similarly, we see another, albeit smaller, cluster in the lower-right quarter of the plot, indicating that small-sample studies with weak effects may also be underrepresented in

the meta-analysis. Alternatively, we can employ the trim-and-fill technique, proposed by Duval and Tweedie (2000). This nonparametric method is used to assess publication bias numerically by compiling how many studies would need to be added and removed to achieve “ideal” symmetry. Initially, small-sample studies are withdrawn from the model as they are usually the culprits for asymmetry. In a second step, the plot-center is filled with omitted studies, then a more accurate averaged effect is estimated. According to this method, 13 studies should be trimmed from our model, resulting in a weaker average IKEA effect ( $d = 0.38$ , 95% CI [.25, .51]) compared to the initial effect observed. Finally, we can also conclude there is a possible



**Figure 4.** Funnel Plot for the Detection of a Potential Publication Bias

publication bias based on the fact that both Egger’s (1997) test for asymmetry ( $p < .001$ ) and Begg and Mazumdar’s rank-correlation test ( $p = .006$ ) reached significance. Each of the different methods noted a similar conclusion, that adding more unpublished research would result in a

lower average effect size. When considered collectively, the various publication bias estimates suggest that the IKEA effect literature may consistently under-report weak effect outcomes.

### **Discussion**

This is the first study to synthesize the collective data accumulated about the IKEA effect and the impact of effort on valuations of DIY products. Overall, the IKEA effect represents an important phenomenon within the domain of cognitive bias, that has significant implications for both consumer behavior and decision making. Via the deep examination of extant literature, we find that the average effect size of self-invested effort on valuation and liking of self-made products is moderate, however, multiple tests of publication bias suggest that research may systematically fail to report weaker effects and after adjusting the models for greater accuracy, the average IKEA may not be as strong.

### **Underlying Mechanisms**

In the second iteration, we found that self-invested effort was a strong predictor of secondary outcome variables including self-concept, a sense of psychological ownership and attachment, and experienced positive affect. However, when we utilized these variables as underlying mechanisms in the meta-analysis model, only sense of ownership emerged as a reliable significant predictor that the IKEA effect is contingent upon. Because both valuation and liking of a product were similarly influenced by self-invested effort, and based on extant literature, we intuitively presumed that they would be correlated with one another. However, the data suggests that liking is not a significant predictor of valuation, indicating that we do not necessarily like what we value, or more precisely, that we do not estimate value of a product solely based on whether we like it.

Contrary to expectations, the data did not find support for effect being contingent positive self-concept. We should note, however, that our analysis model only included four studies that measured self-concept, therefore, more studies are needed for an accurate and generalizable inference about the role of self-concept in the IKEA Effect. Furthermore, even though self-concept did not emerge as significant, it does not suggest that self-concept does not play a major role, but rather, that there may be an interplay with other factors impeding its significance which should be addressed in future research. For instance, the relevance of self-concept as a mechanism for the phenomenon may be limited, as it relies on feelings of success and accomplishment. In the original study design, success and failure are possible outcomes as there is a single correct solution, and no subjective preferences and aesthetics involved. However, computer-generated products and designs do not allow for the possibility of failure, therefore the completion of a final product may not indicate personal success. Self-concept may play a more vital role when the task at hand is difficult and cognitively taxing because greater effort is needed to trigger the psychological rewards associated with success. To test this assumption, future IKEA effect studies should employ a task with varying levels of difficulty between conditions to test whether self-concept is significant in the difficult level but not in the easier level and enable the option to fail.

In support of expectations, the comprehensive meta-analysis suggests that the overall effect of effort on valuation was contingent upon psychological ownership, indicating this mechanism significantly facilitates the phenomenon across studies. Our results fall in line with assumptions related to the endowment effect which links ownership with inflated valuation, and the results highlight sense of ownership as a key factor leading effort to valuation. This runs counter to a study by Marsh et al. (2018) who concluded ownership was not a major mechanism

but rather that self-concept is likely the main component linked to valuation. A potential explanation for this discrepancy is that Marsh et al., (2018) examined the IKEA effect via a developmental approach, that is, their sample was composed of children aged 3 to 6-years-old, which were excluded from our analysis. Even though children develop a sense of ownership and attachment very early on, it may be argued that a sense of accomplishment and affirming their self-concept is more prominent at that stage of development. Furthermore, since our corpus was limited to studies that systematically measured self-concept, we can only attest to the role played by psychological ownership. To address this, future studies should compare a similar task between groups of different ages in order to test whether different levels of mental-cognitive development are bound by the same processes. Additional studies that systematically measure these concepts are needed to fine-tune the optimal conditions for each distinct mechanism.

### **Contextual Moderators**

Customization did not emerge as a significant predictor of valuation though there was an interesting interaction with tangibility which will be discussed shortly. Though we expected that the ability to customize a product would increase its perceived value due to greater product attachment and self-expression, the data indicated no difference between the two forms of participation, suggesting that customization efforts may not be necessary in order to increase valuation outcomes. These findings indicate the need for more studies that specifically test the impact of customization on valuation of self-made products, specifically since research has exhibited discrepancies in outcomes. For instance, Fink and Geldman (2017) tested the IKEA effect in the context of software and found that willingness to pay (WTP) was lower when subjects were required to self-design the program but found no difference in WTP between builders and non-builders. Atakan et al. (2014a), on the other hand, found that customization

resulted in greater valuation, even under low-effort requirements. Diefenbach et al., (2018) examined differences between self-designers and self-creators of tote-bags and found that both forms of involvement lead to greater emotional attachment and valuation of the final product. Ling et al, (2020) found that offering greater customization choices lead to increased valuations but that this effect was moderated by an individual's aesthetic preferences and level of self-esteem. Future studies that are interested in the influence of self-expression via customization may want to test different contexts and specifically compare self-designers to self-builders

Counter to expectations, tangibility, and customization, on their own, were not significant predictors of valuation. However, there was a significant interaction between the two, which may further explain these results. Customization of physical products seems to reduce valuation, while an opposite pattern emerged for non-tangible items, that is, customization increased valuation for digital products that were created online. This may be explained by two aspects. First, there is a spectrum of design capabilities and self-efficacy among people. Some individuals may accurately assess their designs as of lower quality. However, when designing products online via computerized programs then personal talent and capabilities do not matter. The image of the final product will seem professional either way because there is no possible way to error. Another way to look at the data is that when customizing the product, there is not a significant difference between tangible and intangible items, however, when there is no customization involved, then tangible items are more positively valued, while the valuation of non-tangible items decreases. Put it simply, if we focus solely on studies without product customization, then the data supports H3 since tangibility of products indeed elicited more positive valuations.

The use of 3D printing as a proxy for assessing low effort did not emerge as a significant moderator for the relationship between effort and valuation. We expected that this form of low

effort would not prompt the extent of consumer-product engagement which is required to foster an emotional bond a DIY product. Perhaps there is a halo effect concerning 3D printing, which amplifies the valuation of the relatively novel technology that has rapidly developed over the last few years. Its increasing popularity is a manifestation of a larger trend of emerging technologies that signal a fundamental shift in the way people participate in co-producing goods and services (Fisher , 2022; Wiececk et al., 2020). Even though on paper we could argue that these 3D studies required the lowest level of effort and engagement, what matters is how the participants perceived their engagement. More specifically, though they were only required to press a button as part of their creation effort, 3D printing technology enables people to design and create their own product at home, reducing their dependence on traditional manufacturers, which renders them as active co-producers, which is the opposite of passive consumers.

Finally, the data indicated no significant difference between the valuation of hedonistic and utilitarian usage, and none of the demographic variables emerged as significant predictors of the relation between self-invested effort and product valuation.

### **Concluding Implications**

Approaching the results of this meta-analysis from a broader perspective, a more disconcerting interpretation arises. Apart from the significant interaction between tangibility and customization, none of the contextual moderators in the meta-regression yielded significant findings. According to these data it can be assumed that the consistency of the phenomenon across studies and products is indicative of its robustness traversing cultural, generational, and geographical contexts, however, this view may be oversimplified. Alternatively, one could claim that if the IKEA Effect is in everything, then it may be in nothing, or that the studies are picking up on another process. While effort is presumed to enhance valuation, the data may, in fact, be

demonstrating that a sense of ownership is what drives the phenomenon, and that effort is peripheral, meaning that effort, whether physical or mental, may simply serve as a trigger for a prompting sense of ownership, rendering the process as a form of the endowment effect. This is important because many studies that claim to test the IKEA effect may be manipulating different biases. To reconcile the two potential inferences, and to enhance the specificity and accuracy of studies investigating the IKEA effect, we suggest that future research should consider narrowing the definition phenomenon, and perhaps focus on adhering more closely to the original experimental design (e.g., Mochon et al., 2012; Norton et al., 2012), and continue to test additional boundary conditions highlighting when the IKEA effect does and does not occur optimally.

#### **End Note**

1. The models assessing whether the IKEA effect was contingent upon self-concept and positive affect found the former insignificant and later as significant. However, it should be noted that these models only included four studies for each of these mechanisms. Therefore, these results should be taken with a pinch of salt, and rather than indicating them as definite major or peripheral factors, this is a testimony for the need for additional studies that systematically assess and compare the potential role that these mechanisms play in the relationship between invested effort and valuation of self-created products.

## **CHAPTER 2. From the Ikea Effect to Self-Persuasion**

The preceding chapter systematically deconstructed the phenomenon known as the IKEA effect, illustrating the fundamental mechanisms and moderating variables that shape the impact of self-invested effort on product valuation. With this deeper understanding of the IKEA effect and its boundary conditions, the current chapter can begin to address the main inquiry of this dissertation, which is assessing the IKEA effect framework within the context of persuasive texts as a method for self-persuasion. Thus, in order to integrate the IKEA effect into a self-persuasion model, it befits that we first undertake a parallel exposition of the extant scholarship on self-persuasion. The following section reviews the main theories and underlying mechanisms associated with self-persuasion research, focusing on the aspects relevant for the current research goals. The review is followed by a discussion on the similarities and distinctions between the classic self-persuasion methods and the proposed integrated model, highlighting its contribution, as well as potential weaknesses that should be addressed in the consecutive study design.

### **Self-persuasion**

The theory of self-persuasion was developed with the notion that receivers of a message play an active role in influencing their own attitudes (Aaronson, 1999). Persuasion literature, in general, examines the various factors that influence attitude change, including characteristics of the message, of the source, and of the target audience (Hovland et al., 1953). Within this vast literature, self-persuasion focuses on instances in which people's behaviors and thoughts influence themselves, that is, instances in which the target of persuasion is also its source. As a method of influence, self-persuasion entails creating conditions in which individuals are motivated to modify their own beliefs or behavior (Aaronson, 1995). This approach represents a potent means of stimulating attitude change and compliance, with the potential for long-term

lasting results (Aronson, 1995). Even stable states such as self-esteem have been shown to be malleable through self-persuasion techniques (Jones, 1990). Furthermore, self-persuasion may prompt greater attitude and behavioral changes compared to traditional forms of direct persuasion, as individuals perceive the motivation for change to be internal (Aronson, 1995; Hovland et al., 1953). It may seem counter intuitive that behavior can influence attitudes, because we tend to think of the relation between attitude and behavior in a manner that the former determines the latter. Knowledge about attitudes is often used to predict behavior, and if we wish to change someone's behavior, we will likely attempt to influence their attitude and thoughts regarding the matter. Self-persuasion studies, however, have demonstrated the existence of a complementary direction of influence, in which an attitude is deducted from, or adjusted to, a behavior. For example, patients who received a diagnosis in a noisy clinic environment and had to actively lean toward the physician to concentrate on their words, subsequently rated the diagnosis and treatment plan as more valuable compared to patients who received their diagnosis in a quiet room (Reference, ??). People who tried to persuade a fellow colleague to quit smoking reported more negative attitudes towards smoking compared to people who listened to someone else advocating against smoking (Elms, 1966). Even experienced debaters who were randomly assigned to advocate for one side or the other of a topical motion, later indicated greater confidence and support for the position they had advocated for (Schwardmann et al., 2019)

### **The influence of behaviors on attitudes**

The mechanisms by which behaviors influence attitudes are complex and multifaceted, with two prominent psychological processes being *self-perception* and *cognitive dissonance*. People desire to understand the cause of their behavior. At times, they use their own behavior as an indicator to determine their thoughts and feelings (Olson & Stone, 2005). Self-perception

occurs when individuals interpret their own behavior after-the-fact, as a means of understanding their attitude towards a particular target object or issue (Bem, 1967; 1972). If people repeatedly engage in a certain behavior and experience positive outcomes, they may conclude that they are doing so because they must like that activity, and infer their attitude accordingly (Bem, 1965).

Even involuntary behavior is used as an indicator of attitudes, as demonstrated by research showing that people who were instructed to nod their head vertically while reading persuasive arguments (Briñol & Petty, 2003), or listening to an editorial radio broadcast (Wells & Petty, 1980), tended to be more agreeable with the arguments compared to individuals who were instructed to shake their head horizontally. People who watched cartoons and were instructed to hold a pen in their mouth in a manner that activated muscles associated with smiling, later rated the cartoons as funnier (Strack et al., 1988). Children who were punished for, or restricted from, playing with a certain toy later rated it less favorably, even though they had rated the same toy as desirable prior to the restriction (Zanna, et al., 1973). In general, people are not very good at determining the cause of their own actions. They often do not consider external factors that influence their decision-making, and they tend to misattribute their behavior to internal motivation, believing it is a result of personal choice (Brock, 1968). Insufficient justification refers to instances in which external factors are not registered by individuals as plausible causes for their behavior and it plays a significant role in attitude change via self-perception (Brock, 1968; Festinger & Carlsmith, 1959).

Insufficient justification is also a key factor in attitude change via cognitive dissonance, which is the second main process by which behavior can influence attitudes (Lawrence & Festinger, 1962). This theory posits that people seek to maintain internal consistency between their cognitions and behaviors, and when they perceive a discrepancy between the two, they

experience a state of discomfort (Festinger, 1957). The discomfort is proportional to the magnitude of the inconsistency and can be heightened when the behavior is made public with strong commitment, as it increases the sense of scrutiny over one's actions (Brehm & Cohen, 1962). Public deliberation, for instance, can trigger a sense of commitment based on the principle of consistency, which stems from the psychological desire of individuals to maintain consistency in the way that others perceive them, and in the way they see themselves (Cialdini, 2009; Jensen & Carter, 1981). Cognitive dissonance can lead to attitude changes as individuals seek to reduce the discomfort caused by inconsistencies between their behavior and attitudes. One of the primary strategies for reducing cognitive dissonance is to add a consonant cognition that explains the discrepancy, also known as external justification. When there is not sufficient external justification for one's behavior, the next best strategy is changing the attitude that is inconsistent with the behavior (Festinger & Carlsmith, 1959; Harmon-Jones & Mills, 2019). Festinger and Carlsmith (1959) asked participants to engage in a tedious task and then to tell prospective participants that the study was interesting, for which they were randomly rewarded with either \$1 or \$20. Though all the participants likely experienced a discrepancy between their behavior (lying about the study) and their positive self-concept (someone who does not lie), participants who received the lower reward were more likely to rate the study as enjoyable. Those who received \$20 could justify their behavior by attributing it to a worthwhile external cause. Conversely, \$1 was not sufficient to justify the behavior, which resulted in attitude change.

In summary, insufficient justification is a crucial factor in both processes because individuals perceive their behavior as an indicator about themselves. However, the self-perception process entails deducing an attitude based on behavior, whereas cognitive dissonance involves adjusting an existing attitude to a behavior, thus, a main difference between the two is

that self-perception does not require a prior existing attitude, while cognitive dissonance can only occur if there is an existing attitude (Suedfeld, 1968; Wilson, 1990).

### **Self-persuasion via role-playing**

The use of role-playing, or improvisation, has been demonstrated to be a powerful tool in self-persuasion research in a series of studies during the 1950's (Hovland et al., 1953; Janis & King, 1954; King & Janis, 1956). Individuals who play a role of advocating for a certain position often end up convincing themselves in the process (Aronson, 1999; Janis & King, 1956). In one of the studies from their series, Janis and King (1954) asked participants to take part in a discussion group on different issues. In the high involvement condition participants were asked to give a persuasive speech while improvising their own arguments [self-persuasion]. In the low involvement condition participants listened to a speech by someone else in the group [direct persuasion]. Participants who generated their own arguments showed greater attitude change in line with the position they had advocated for. In a follow-up study, King and Janis (1956) instructed participants to advocate for a position oppositional to their own view concerning mandatory military service. Again, in the high involvement condition [self-persuasion], they were asked to improvise their own arguments, while in the low involvement condition [direct persuasion] they read a speech that had been prepared by someone else. Though the speeches in both conditions were comprised of relatively similar arguments, the results indicated that participants who self-generated arguments experienced greater attitude change. The authors asserted it noteworthy that participants' attitudes underwent a considerable shift toward a direction contrary to their previous standpoint, solely due to their active role playing of advocating for that particular side of the issue (King & Janis, 1956). Subsequent studies replicated this design to examine the influence of behavior on attitude change in a diverse array

of issues, including political attitudes (e.g., Watts, 1967); education related policies (e.g., Greenwald & Albert, 1968), health-related behavior such as smoking or eating habits (e.g., Elms, 1966; Janis & Mann, 1965; Li, et al., 2019; 2020b); environmental awareness (Damen, et al., 2015); pro-social behavior such as tipping (Bernritter, et al., 2017), and prevention measures to reduce sexual aggression (Wong, 2018). More recently, this method has been tested in promoting motivation for voluntary social isolation during the covid-19 pandemic (Drażkowski et al. 2020), and reduce alcohol consumption e.g., (Loman, 2019). Role-playing methods have been found to exert influence not merely on attitudes, but also on behavioral intentions (e.g., Lee & Muller, 2020), and actual real-world behavior (e.g., Müller et al., 2009).

### **The power of self-generated arguments**

A key factor in all the role-playing studies mentioned above, is people generating their own arguments, whether by actively attempting to persuade someone else via discussion, writing a persuasive essay, listing arguments, or simply thinking about arguments in response to an open-ended question. Why are self-generated arguments so successful at generating attitude change? Self-persuasion facilitated by self-generate arguments offers several advantages over traditional direct-persuasion methods. Generally, people do not like being told what to do, let alone feel like they are being manipulated. Conventional persuasion attempts, which involve externally imposed influence, can trigger individuals to engage in self-guarding strategies that may hinder the effectiveness of the persuasive message (Dillard & Shen, 2005; Mussweiler & Neumann, 2000). These strategies may include internal resistance to persuasion, such as reactance, or bolstering and counter-arguing (Briñol et al., 2004; Crawford et al., 2002).

***Reactance***, a cognitive-affective response to perceived threats to our freedom of choice, may lead to intentional avoidance of the position advocated for in the persuasive message

(Brehm, 1966; Dillard & Shen, 2005). The degree of response is affected by both the perceived level of threat to one's freedom and an individual's susceptibility to reactance as a personality trait (Dillard & Shen, 2005). However, self-persuasion methods are less likely to elicit reactance because the target of influence is also the source of influence (Briñol, et al., 2012). As such, individuals are unlikely to perceive external limitations to their freedom when they generate their own arguments.

*Counter-arguing* is another self-guarding strategy in which one elicits arguments that counter the persuasive message in an attempt to correct and oppose information provided by external sources. Counter-arguing is especially likely if the issue of debate is relevant and important to the message receiver because he or she is more attentive and knowledgeable on the topic (Petty & Cacioppo, 1986). However, similar to reactance, people are unlikely to feel the need to counter-argue with themselves as there is less motivation to correct self-generated information (Mussweiler & Neumann, 2000). Additionally, individuals preparing to advocate for a particular side of an issue tend to systematically seek arguments that support their position, often overlooking, filtering out, or dismissing oppositional arguments that counter their position (Janis & Gilmore, 1965; Janis & King, 1954). Biased scanning may lead to a lack of cognitive effort spent on counter arguments that challenge the position, while focusing solely on supporting arguments, consequently rendering the latter more salient (Janis & Gilmore, 1965).

*Self-tailored messaging* is the third main advantage of self-generated arguments within the context of self-persuasion. When individuals self-generate arguments, they tend to come up with reasoning that is most compelling to them, based on their personal cognitive process and values (Briñol, et al., 2012, Zimbardo, 1963). Within this internal debate, they also formulate arguments that challenge the vulnerabilities that they are most familiar with (Zimbardo, 1963).

Though the intended goal may be to persuade other people, by self-generating arguments, individuals effectively customize arguments to persuade themselves. Through this process of thought construction, individuals partake in an internal dialog in which they may formulate new reasoning and cognitions that further influence their own attitudes (Pingree, 2007).

In summary, the literature suggests that the power of self-persuasion stems from dynamic advocacy and self-generated arguments, underscoring the substantial impact of active engagement on shaping attitudes and behavioral intentions. By allowing individuals to internally motivate attitude change through role-playing and self-generated arguments, self-persuasion methods overcome the challenges associated with conventional direct-persuasion techniques, such as reactance and counter-arguing, ultimately leading to more compelling persuasion without activating self-guarding strategies. The personalized nature of self-persuasion, driven by individual cognitive processes and values, enhances the effectiveness of persuasion while minimizing resistance. It should be noted that while self-generated arguments are clearly a powerful tool to induce attitude change, their effectiveness, as with most forms of persuasion, are influenced by various personal, cultural, and environmental factors. The mere salience of others' attitudes versus one's own attitude can influence attitude change (Shaffer & Tabor, 1980). These relevant moderators will be discussed in greater detail later in the chapter, when comparing the similarities and differences between self-persuasion and the IKEA effect frameworks.

### **Self-persuasion and Social Media**

Over the past two decades, we have witnessed vast developments in communication technologies, with a steadily growing share of social communication migrating into online spaces and mobile connectivity. It becomes important to adjust research environments accordingly, as we attempt to pragmatize findings from lab experiments and adapt them into the

real world settings. Social media emerges as a prominent environment for inducing self-persuasion, and several factors contribute to its efficacy in this regard. Firstly, the visibility of content to others on social media aligns seamlessly with the principles of commitment and consistency (Cialdini, 2009). When individuals engage in self-persuasion by creating and sharing self-generated arguments online, the visibility of this behavior enhances its influence on attitudes, as it is observed by others within their social network. This unique feature of social media distinguishes it from other platforms, providing a potential advantage for self-persuasion methods. Second, the interactivity along the visibility among audience members on social media further amplify its impact compared to other media platforms. Research suggests that self-persuasion effects may be more pronounced online than offline due to the specific characteristics of the online environment (Boyd, 2011; Valkenburg, 2017). Valkenburg (2017) argues that various affordances of social media make self-effects more frequent and influential, and thus, more likely to be included as part of a communication processes compared to similar offline settings. Empirical studies support the idea that self-persuasion in online settings can lead to significant attitude changes. For instance, studies examining negative behavior in online interactions found that behaving negatively towards a discussion partner resulted in negative attitudes toward the discussed issue (Walther et al., 2010). Similarly, role-playing in online environments, such as video games, demonstrated that participants' attitudes were positively influenced by the group they were assigned to represent (Alhabash & Wise, 2015). Self-generating arguments and posting them on an interactive mobile app has even been found to promote healthier eating habits (Stavrositu & Kim, 2018). The act of posting online reviews has been shown to influence the poster's evaluations, particularly when the meaning associated with

review post holds high validity (Kim et al., 2021). Collectively, these factors underscore the unique and potent role of social media in fostering self-persuasion processes.

### **Integrating the IKEA Effect into a Self-Persuasion Model**

Building upon the foundations of this review, we can now progress to examine the similarities and differences between self-persuasion and the IKEA effect frameworks, while exploring the potential utilization of the latter as a means for former. As elaborated earlier, the IKEA effect refers to a cognitive bias in valuation of DIY consumer goods toward which the individual develops a sense of accomplishments, psychological ownership and emotional attachment following the personal investment of time and mental effort. On the other hand, self-persuasion via roll playing refers to the phenomenon in which individuals tend to adjust or infer their own attitudes following a scenario in which they were instructed to generate arguments or actively attempt to persuade others in support a specific position concerning an issue of conflict. Thus, upon an initial examination, the two frameworks may seem unrelated, giving the impression that their integration would be arbitrary [figures 5 and 6]. However, when considering the substitution of the DIY product with a persuasive text, as depicted in Figure 7, the integration of the two frameworks begins to reveal its rationale. In this model, assumptions of the IKEA effect would encompass the processes influencing the valuation of the text with relation to the effort invested into its construction, while assumptions associated with self-persuasion would encompass the influences concerning attitudes toward the issue mentioned in the text as well as scrutiny of the arguments comprising the text.

A wider perspective further reveals that the two frameworks share a few intersecting underlying mechanisms. Personal investment and effort justification are relevant to the two domains as both rely on the effort heuristic. In the case of the IKEA effect, an individual invests

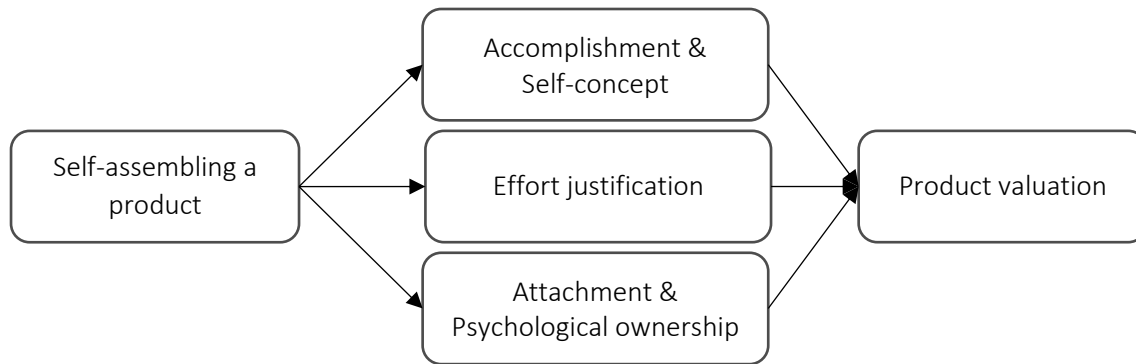


Figure 5. IKEA effect model - main mechanisms

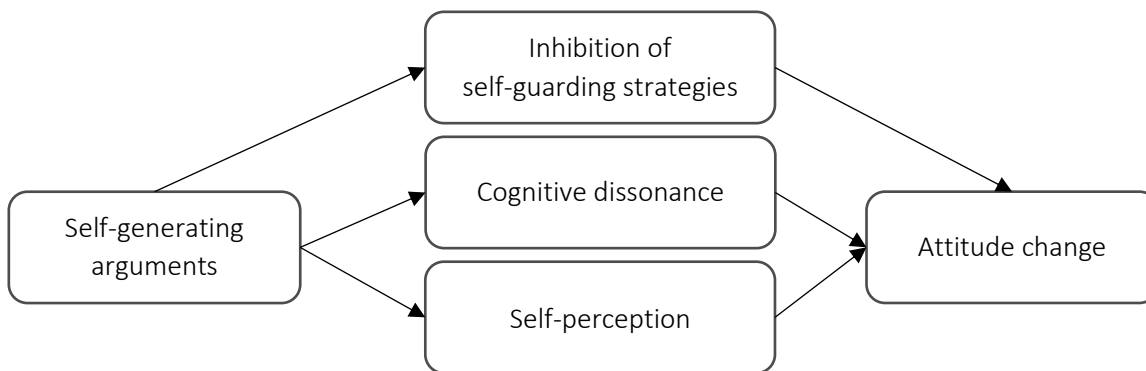


Figure 6. Self-persuasion via role playing – main mechanisms

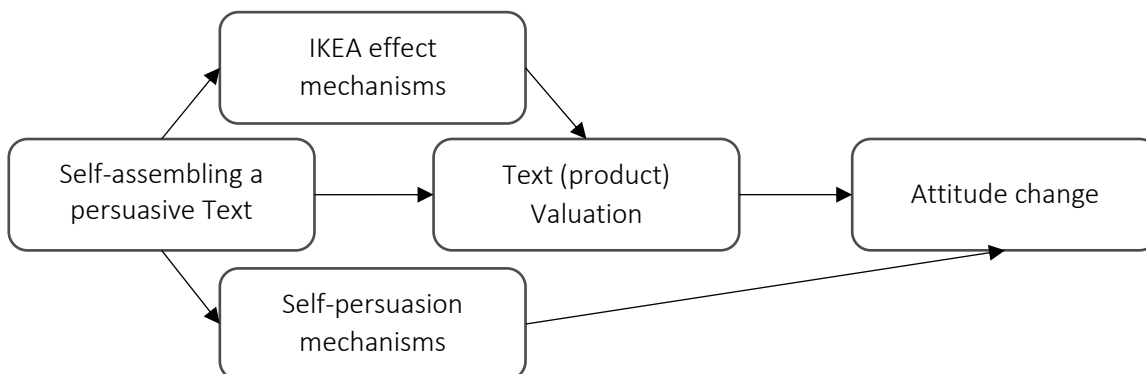


Figure 7. Integrated model for the IKEA effect and Self-persuasion in persuasive texts

time and effort in assembling a product, which may lead to a sense of ownership and attachment to the product. Similarly, in self-persuasion, an individual invests time and effort in persuasion efforts, which may lead to a sense of ownership and commitment to the expressed belief or behavior. Since individuals strive for consistency between their beliefs and their behavior, this can lead to attitude change.

Additionally, both the IKEA effect and self-persuasion rely on the concept of cognitive dissonance, which occurs when an individual experiences conflicting thoughts or beliefs (Festinger, 1957). In the case of the IKEA effect, the effort invested into creating or assembling a product may generate a dissonance between the effort invested and the perceived value of the product, leading to an overestimation of its value. Similarly, in self-persuasion, an individual may experience cognitive dissonance when their attitudes or beliefs are inconsistent with their behavior, leading them to change their attitudes or beliefs to align with their behavior. Engaging in certain activities such as advocating for a certain position can also trigger attitude change as a strategy to reduce the experience of cognitive dissonance (Festinger, 1959), for instance, laboring on the assembly of a text with which content one does not agree with. Thus, a task that would produce the greatest shift of attitude should elicit effort that requires psychological justification, and the content of the persuasive text would need to be dissonant to an extent from the individual's pre-existing attitude.

While there are similarities and overlapping processes between the two, there are also a number of critical distinctions between the common methods of self-persuasion which task participants to generate arguments in advocacy of a certain position, and the proposed method for text assembly from given arguments. How does "assembling" a text differ from self-persuasion studies in which participants were instructed to write a persuasive essay or list

arguments in favor of a certain position? Most studies on self-persuasion via role-playing compare attitude change between conditions in which subjects generate their own arguments, and conditions of direct persuasion in which subjects are exposed to arguments from an external source. The IKEA effect framework would focus on the creation of a product by following specific instructions and selecting features from a predetermined list of preferences and components. By tasking subjects to assemble a paragraph from predetermined arguments, this design offers an integration between the two. In this manner, the IKEA effect can introduce an additional perspective by offering a midpoint between self-generated arguments and externally provided arguments. Individuals would engage in the creation of a persuasive message, without actually generating their own arguments. Exploring the IKEA effect through the lens of self-persuasion allows for a nuanced distinction between two key factors that are often intertwined in self-persuasion research: self-expression and engagement.

### **Moderators of self-persuasion and the Ikea effect**

We should also consider factors that moderate persuasion and how they may impact the processes in the proposed integrated model. There is an abundance of potential moderators, though this section will focus on factors that are relevant for testing the IKEA effect within the context of persuasive texts. To begin, the impact of self-generated arguments on attitude change is contingent upon the subjective relevance and perceived importance of the issues of debate, as in as with most contexts of persuasion (Sarup, 1981). Motivation and involvement with the issue are important factors in persuasion as they determine the path of information processing and therefore impact the level of scrutiny given to arguments (Petty & Cacioppo, 1986). In role-playing studies, it is likely that self-persuasion occurs through a high-elaboration mechanism because participants actively generate and express their own arguments and hold a desire to

perform well (reference, year). However, it is less clear which path of processing will occur via assembly of a text from predetermined arguments, and whether engaging with the arguments to construct a paragraph is sufficient to prompt systematic processing of their content.

Another key moderator is positive self-esteem, which can reduce the likelihood of attitude change by mitigating the negative feeling triggered by cognitive dissonance, even if the reason for increased self-esteem is not related to the behavior or the topic of persuasion (Steele, 1988). When an individual's feeling of self-worth increases, they feel less need to justify their behavior or attitude, and therefore less likely change their attitude (Steele, 1988). Conversely, threats to self-esteem can increase the magnitude of the dissonance-reduction effect, and thus increase the probability of attitude change (Heine & Lehman, 1997). From the lens of the IKEA Effect, however, a sense of accomplishment and positive self-concept following a successful product assembly, have been associated with greater valuation of the self-constructed product. Therefore, if the content of the persuasive text stands in opposition with an individual's world view and values, the experience of cognitive dissonance may be diminished by the positive feelings deriving from the success of completing the task.

Need for expression is a relevant personality trait for positive self-esteem in this context because people who have a high need for expression may find it easier and more rewarding to generate persuasive arguments, leading to greater confidence in their beliefs and potentially greater persuasion (Susmann, 2021). Alternatively, positive emotions have been associated with greater ease of persuasion and processing information via the peripheral path because individuals in a positive affective state are not motivated to scrutinize arguments systematically and tend to assess information from a more holistic view (reference). According to the emotions-as-frames perspective, emotions guide us to focus our attention on information associated with a certain

emotion and process it accordingly (Nabi, 2003). However, in the proposed utilization of the IKEA effect framework, there is no self-expression because individuals will not be generating their own arguments, nor will they communicate the arguments to a potential audience.

Therefore, we may expect this model might result in weaker attitude change effects compared to more traditional self-persuasion methods. Furthermore, the extent of effort invested into the persuasion attempt can potentially mitigate its success. Brinol et al., (2012) found opposite results when participants were asked to advocate for pro-attitudinal as opposed to counter-attitudinal views and when the target of persuasion was self or others. The authors concluded that the results stem from the extent of effort people think they need to invest compared to the actual effort they put in when trying to convince others.

Cultural differences may also play a role in the effectiveness of self-persuasion, as studies have demonstrated a variance in experience of cognitive dissonance across cultures (Li, 2020a). In collectivistic cultures, self-persuasion may be less effective due to a greater emphasis on group harmony and social norms, which can lead to a reluctance to change one's own attitudes in favor of group norms (Li, 2020a). Individuals from collectivistic cultures show dissonance effects when they focus on their relationships with others rather than on evaluation of themselves (Kitayama et al., 2004). Furthermore, the strive for positive self-concept may not be a universal phenomenon and could be culturally variant. A study of Japanese culture found that a self-critical focus is more characteristic of Japanese individuals, suggesting that the need for positive self-concept stems from distinctive aspects of western cultures (Heine et al., 1999). In comparison to self-persuasion, the IKEA effect has been demonstrated to be a robust global phenomenon. A recent study compared the occurrence of the IKEA effect between children from the UK and India and found no significant differences among the two samples (Marsh, 2022).

Additionally, the meta-analysis of the IKEA effect (chapter 1) compared the effect sizes among 55 studies from around the globe and found that the relationship between effort and valuation was not contingent upon geographical region. Thus, while there may be variance in the experience of cognitive dissonance, the tendency to over-valuate and feel attached to objects we created spans across cultures.

### **Final Notes for Study Design**

In order to design a study that adequately tests the model, we need to consider the long list of aforementioned mechanisms and assumptions that guide the two frameworks. Originally applied in the context of consumer products, the IKEA effect involves the process of assembling an explicit product from predesigned components following specific instructions. In the context of persuasive texts, the “product” refers to a cohesive and grammatically sound passage adhering to linguistic rules. Based on the original study design (Norton et al., 2012), the process would require constructing a specific text using predesigned arguments, comparable to constructing a puzzle made from fragments of text. Consequently, this means that individuals would not generate their own arguments nor determine the order in which the arguments are organized within the logical flow of the text as its structure is predetermined. This design is crucial from the perspective of the IKEA effect framework, as it enables us to compare valuations of the exact same product, where the main variance between subjects is whether they participated in its assembly or not. The absence of self-generated arguments diverges from the aforementioned studies on self-persuasion and the strengths associated with role-playing because the individual is not the direct source of the arguments. Nonetheless, the act of constructing the arguments into a meaningful text could render individuals as co-creators of the text. The text assembly task fosters active engagement with the text as it requires individuals to read the arguments in order to

reconstruct a meaningful and grammatically correct text, meaning that they would be exposed to the arguments and actively engage in the creation of the persuasive text, albeit not generating the arguments themselves. From the perspective of self-persuasion literature, this level of engagement may be sufficient to induce attitude change, because ultimately, the efficacy of self-persuasion methods derives from people genuinely considering arguments supporting the opposing side (Greenwald, 1969).

The impact of self-generated arguments on attitude change is contingent upon the subjective relevance and perceived importance of the issues of debate (Sarup, 1981). Motivation and involvement with the issue are important factors in self-persuasion as they determine the path of information processing and therefore impact the level of scrutiny given to arguments (Petty & Cacioppo, 1986). In role-playing studies, it is likely that self-persuasion occurs through a high-elaboration mechanism because participants actively generate and express their own arguments, especially in instances in which participants individuals expect to express their arguments in front of an audience. However, it is less clear which path of processing will occur via assembly of a text from given arguments, because individuals will not conjure arguments themselves. Moreover, although individuals would not be self-generating arguments, they would be investing mental effort and time into the cognitive task of reconstructing the text and organizing the arguments into the correct order. As noted earlier, investing effort into the creation of an item can cultivate a sense of psychological ownership and emotional attachment with it, which arises from the process of becoming acquainted with the item, exerting control over it, and investing oneself in it (Pierce, 2001). By developing a sense of attachment to the text they labored on, they might feel like the message was partially generated internally. A final factor to consider is that the task is cognitively taxing, meaning that their cognitive capacity is

likely to be occupied with the structure of the text and completing the task, leaving fewer cognitive resources available for self-guarding strategies. Thus, it can be presumed that laboring on the assembly of a persuasive text would not trigger self-guarding strategies such as reactance and counterarguing, at least not to the same extent that would emerge following direct persuasion attempts. Since self-guarding strategies are a main inhibitor of persuasion, it may be consecutively presumed that inhibiting them is likely to result in greater persuasion in alignment with the content of the persuasive text.

To conclude, the integration of the IKEA effect into a self-persuasion model may offer a compelling approach to understanding the cognitive processes involved in attitude change. While initially seeming unrelated, the DIY nature of the IKEA effect can be effectively translated into the domain of persuasive texts. The common threads of personal investment, effort justification, and cognitive dissonance weave a connection between the two frameworks, providing a basis for their integration. The shared reliance on the effort heuristic, personal investment, and cognitive dissonance suggests an overlap in the underlying mechanisms of the two frameworks. However, critical distinctions arise in the methods of self-persuasion, particularly when comparing the generation of arguments through role-playing to the assembly of a text from predetermined arguments. This distinction introduces a unique perspective, offering a midpoint between self-generated and externally provided arguments. The study design considerations highlight the importance of constructing a specific text using predetermined arguments, akin to assembling a puzzle. While the absence of self-generated arguments differs from traditional self-persuasion methods, the active engagement required in text assembly may foster attitude change. The cognitive effort invested in reconstructing the text, coupled with a potential sense of attachment, could mitigate self-guarding strategies, thereby enhancing persuasion.

## CHAPTER 3: The IKEA Effect in Persuasive Healthcare Messages

This chapter presents data from three empirical studies designed to test primary research goals of this dissertation which inquired: *Would laboring on the assembly of a persuasive text lead to greater valuation of the text, and in turn, would this greater valuation translate into greater support of its persuasive content?* Therefore, the initial task is to assess whether individuals would indeed value a text more positively if they engage in its assembly compared to the valuation of the same text had it been crafted by someone else, and whether they differ in their support for the position advocated for in the text.

### Study 1

#### Self-invested Effort and Text Valuation

The IKEA effect model encompasses psychological mechanisms that explain how and why effort invested in the assembly of a DIY product leads to a corresponding increase in the valuation of that product. The current study aims to test the integrated model within the context of persuasive messages. As extrapolated in the previous sections, is possible to surmise that individuals who successfully construct a text from pre-given arguments would value the outcome of their effort more positively based on the effort heuristic (Kruger, et al., 2004) and specifically the IKEA effect (Norton et al., 2012). Although text may not be easily commodified in the same manner as consumer goods, it can still be evaluated based on its logical coherence, informativeness and ability to engage the reader, thus we could expect that actively engaging in its construction would elevate perceptions regarding the content of the text and its structure. Moreover, though text in itself is not easily commodifiable, the time and effort invested into the construction of the text can be readily translated into monetary value, similar to assessing the value of editing labor. This logic suggests that individuals who engage in the assembly of the

text would perceive their labor as more valuable compared to individuals who read a text that was constructed and edited by someone else. Based on the literature concerning the influence of effort on valuation, the following hypothesis are posed:

**H1a.** *Assembling a text, as opposed to solely reading it, will result in a more positive evaluation of the text.*

**H1b.** *Assembling a text, as opposed to solely reading it, will result in a more positive valuation of the assembly labor.*

### **Text Engagement and Attitude change**

Assembling a text from individual arguments and sentence fragments requires a certain extent of cognitive and mental investment in order to create a meaningful passage with logical flow and correct grammar. The ensuing consequences of such an investment, beyond the presumed positive valuation of the text, is the potential enhancement of its persuasive efficacy. Research on persuasion and message characteristics suggests that a message which is perceived as strong and coherent has a greater probability of influencing attitudes (Dillard et al., 2007). Furthermore, if an individual's attitude does not reside with the message they labored on, they may experience cognitive dissonance associated with investing effort into assembling a message they disagree with (Festinger, 1957). This discomfort, depending on its extensity, could potentially prompt individuals to adjust their attitudes to align with the message to justify their investment of effort and reduce dissonance. Drawing on these theoretical perspectives, it can be postulated that individuals who invest effort into assembling a persuasive text will be more likely to manifest attitude change consistent with the message conveyed in the text, compared to those who simply read the same text without engaging in its assembly. Accordingly, the following hypotheses are posed.

**H2.** *Assembling a persuasive text, opposed to solely reading it, will result in greater attitude alignment with the conveyed message.*

**H3.** *The influence of effort on persuasion will be mediated by valuation.*

### **Text Engagement and Self-Guarding Strategies**

The efficacy of self-generated arguments in persuasion arises from two principal advantages over conventional direct-persuasion methods. First, self-persuasion methods are less inclined to provoke self-guarding strategies such as reactance or counter-arguing because the individual generating the arguments also serves as the influence source, thus minimizing the likelihood of perceiving external limitations on personal choice (Dillard & Shen, 2005). Second, when individuals generate arguments, they tailor the message to themselves, developing reasoning that they find most convincing based on their personal values and distinctive cognitive processes (Briñol, et al., 2012). The IKEA effect framework tested in this study is not parallel to common self-persuasion studies in which individuals are asked to generate their own arguments in advocacy of a certain position. Nor is it equivalent to direct-persuasion methods in which individuals are simply exposed to persuasive content from an external source. Rather, it resides on the intersection between the two, drawing on both their strengths and weaknesses. To clarify, the stimulus of this study requires participants to assemble a deconstructed paragraph by reordering the fragments back into a grammatically correct text with a logical flow. This means that they do not come up with arguments themselves, however they are engaged with the text creation rather than consuming it passively. From the aspect of the IKEA effect, if individuals invest effort into the creation of a text, they are likely to develop a greater sense of psychological ownership and responsibility towards it, even though they do not “design” the arguments

themselves. From the aspect of self-persuasion, engaging in the text creation may inhibit the sense of an external persuasion effort.

Taken together, one can assume that engaging in the assembly of a persuasive text, as opposed to simply reading the same text as in direct persuasion, is less likely to trigger self-guarding strategies like reactance and counterarguing, which are known to impede the effectiveness of persuasive messages. After all, the efficacy of self-persuasion methods lies in their ability to prompt individuals to genuinely consider arguments supporting the opposing viewpoint (Greenwald, 1969). People do not like being told what to do, thus if individuals feel like the text is trying to persuade or manipulate their opinion, they are more likely to experience negative affect while reading the text, and rate high levels of induction, or threat to freedom of choice (Dillard & Shen, 2005). In this context, induction refers to the provocation of a defensive or resistant response, where individuals feel their freedom of choice is being threatened or undermined, leading to an increase in counter-arguing or resistance against the persuasive message or influence (Dillard & Shen, 2005). This would likely result in negative evaluations of the text as well as reduced likelihood of agreeing with the message conveyed in the text.

According to the literature, the following three hypotheses are posed:

- H4.** *Assembling a text, opposed to solely reading it, will result in lower levels of perceived threat to freedom of choice*
- H5.** *Greater levels of perceived freedom threat will be associated negatively with attitude alignment with the persuasive message.*
- H6.** *Greater levels of perceived freedom threat will be associated negatively with text evaluations.*

## Method

### Sample & Study Design

A sample of 153 undergraduate students (81.5% female), ages ranging from 18 to 24 ( $M = 19.47$ ,  $SD = 0.9$ ) participated in the study for extra credit. The study employed an online randomized experiment with a 2 (task type: Assemble vs Read) by 2 (healthcare topics: (Sunscreen or Flossing), between subject design. In the read condition (i.e., control group), participants read a short paragraph advocating one of the two healthcare practices. In the assemble condition (Ikea effect), participants viewed one of the same two paragraphs, however, the order of the sentences was distorted, and participants were tasked to reconstruct a coherent paragraph with a logical flow by dragging the sentences into the correct order. The outcome variables included evaluations of the text (e.g., logical; persuasive) and monetary valuations of the editing work, as well as attitude towards the healthcare practice advocated for in the text that they read or assembled. [See appendix for comprehensive stimuli material and questionnaire].

### Developing the stimuli material

Two pilot studies ( $N_1 = 40$ ;  $N_2 = 147$ ) were conducted among undergraduate students to test the stimuli material as well as determine the preferred method for the text assembly task. Originally, three potential texts were developed for the stimuli, pertaining to different healthcare practices: applying sunscreen, teeth flossing and getting the Covid-19 vaccination. The information comprising the texts were taken from the Skin Cancer Foundation website ([www.skincancer.org](http://www.skincancer.org)), and the CDC webpages ([www.cdc.gov/coronavirus/2019-ncov](http://www.cdc.gov/coronavirus/2019-ncov)). The data from Pilot 2 (79.8% female;  $M_{age} = 18.95$  (0.93)), indicated a ceiling effect for attitudes concerning the Covid-19 vaccine for both pre- and post-attitude measures. This likely occurred for two reasons. First, it was a student sample which means the vast majority was vaccinated as

part of the requirement to attend in-person classes. Second, the data was collected during the height of the pandemic thus attitudes toward the vaccination, and relief from the lockdown, were already positive to begin with. Thus, it is unsurprising that nearly all respondents marked the highest value on all scales. Due to the lack of variance among participants, this healthcare issue was not included in the stimuli of the main studies.

For the text assembly task two methods were tested. To complete the text, participants were asked to either fill in missing words from the paragraph, or alternatively, reorder sentences to reconstruct a disassembled paragraph. There was not a significant difference between the two assembly methods concerning valuation and other outcome variables. Though filling in missing words could potentially offer more pragmatic use for future development, especially when considering adaptation of the method to contemporary media environments, it was eventually determined to use the sentence-reordering method for the main studies because it resembled the process of product assembly more closely to that used in IKEA effect studies.

### **Procedure**

Participants received an email with an informed consent form and a link directing them to the study on Qualtrics. After clicking the link, all participants filled a pre-attitude questionnaire comprised of items concerning the two healthcare practices that will appear in the stimuli (teeth flossing and sunscreen application), as well as filler items relating to other healthcare practices such as the importance of reducing alcohol consumption, wearing a seatbelt, and getting the Covid-19 vaccine. In the next step, participants were randomly assigned to one of the four conditions, to either read or assemble a paragraph concerning one of the two health care practices. Upon completing the assembly task, participants received a notification saying “Success! You constructed the paragraph correctly.” The notification of success was incorporated for two reasons. First, it was intended to boost a sense of accomplishment following

a successful task completion, as this is one of the main mechanisms associated with the IKEA effect (e.g., Cloots, 2019; Mochon et al., 2012). Second, and more critically, it attempted to resolve an issue from the pilot studies in which participants were not certain whether the text they submitted was correct. In pilots, the stimuli offered multiple possible solutions which were all accepted as correct. It was initially assumed that multiple solutions would make the task easier, however, for some participants this turned out to be the opposite. Because there was no indication as to which solution that they submitted was correct, participants who were engaged with the task longer were less certain about their choice. They rated the assembly task as more difficult and perceived their performance as worse compared to others. They also tended to rate the text more negatively compared to their read-only counterparts. In the main experiments the settings were changed so that only one solution was accepted. Following the stimuli, all participants filled the same questionnaire assessing the dependent variables and the long list of relevant control variables. Participants in the assemble conditions responded to an additional question asking them how difficult they found the task of assembling the paragraph. The time spent on the stimuli was tracked in all four conditions, whether reading or assembling the paragraph. This value was used as an indicator of engagement and effort invested in the task.

## **Measures**

***Pre-attitude.*** These items assessed attitudes toward the healthcare treatments from the stimuli (i.e., flossing teeth, applying sunscreen), as well attitudes toward filler issues, which were intended to distract from of main issue (e.g., reducing alcohol consumption or wearing a seatbelt). Participants responded to Likert-type items such as “applying sunscreen is effective,” and “daily application of sunscreen is important” on a 7-point scales, ranging from 1 “Strongly disagree,” to 7 “Strongly agree.”

**Post-attitude.** Post-stimuli attitudes toward the healthcare practice advocated for in the text were assessed via similar Likert-like items on a 7-point scale, ranging from 1 “Strongly disagree,” to 7 “Strongly agree.” These items included “daily application of sunscreen or flossing) is good,” “daily application of sunscreen is unnecessary,” “daily application of sunscreen is harmful,” “daily application of sunscreen is foolish,” “daily application of sunscreen is desirable.” Negative items such as “wearing sunscreen is harmful” were reverse coded. Parallel items were included for post attitudes toward flossing. These items were adapted from Dillard and Shen (2005) who assessed these as semantic-differential scales. The scales were split and converted into Likert type scales so that the pre-attitude and post-attitude could be easily compared without creating a salient repetition that could result in participants adjusting their post items based on their responses to the pre items. A factor analysis indicated that the items for sunscreen application loaded onto one dimension, except for “\_\_\_\_\_ is desirable.” The related items were averaged into a single value of post attitude toward sunscreen (Cronbach’s  $\alpha = .81$ ). A parallel process was done to create a post attitude score for flossing (Cronbach’s  $\alpha = .76$ )

**Attitude change.** This measure was calculated by deducting the average value of the pre-attitude measure from the average value of the post attitude measure. Greater positive values indicate a positive attitude change in line with the persuasive message, while negative values indicate an attitude change oppositional to the message. Zero would indicate no change.

**Text Evaluation.** Evaluation of the message was assessed via six Likert items on a 7-point scale, ranging from “Strongly disagree,” to “Strongly agree.” The items asked participants to rank their level of agreement as to whether the paragraph they read or worked on was *logical*, *interesting*, *believable*, *confusing*, *informative*, and *irritating*. The items read “Do you agree or disagree that the paragraph you read is \_\_\_\_\_.” Negative items (i.e., confusing, irritating)

were reverse coded. A factor analysis indicated all items loaded onto one dimension, except for “the paragraph was interesting.” The five remaining items were averaged into a text evaluation scale (Cronbach’s  $\alpha = .82$ ).

**Labor Valuation.** Participants were asked to rate the appropriate payment for the editing work put into assembling the paragraph, on a 5-point multiple-choice question with response options ranging from \$1 to \$20. For the participants in the assembly condition the items read: “Imagine you were working as an editor for an online health magazine. What would be the appropriate payment for the editing work you invested into constructing the paragraph?” For participants in the direct persuasion condition, the item read: “This paragraph was edited for an online health magazine. What would be the appropriate payment for the editing work invested into constructing the paragraph?”

**Freedom threat.** This scale was used to assess whether there was a difference between the conditions of assembly and direct persuasion in the experience of threat to personal choice. This index is based on the validated measure from Dillard and Shen (2005) where respondents ranked the extent to which they agree or disagree on four 7-point-Likert scales ranging from “Strongly disagree,” to “Strongly agree,” including the statements such as “*The message in the paragraph tried to make a decision for me,*” or “*...tried to manipulate me.*” A factor analysis indicated that three of the items loaded onto one dimension. These were then averaged into a perceived freedom threat value (Cronbach’s  $\alpha = .725$ )

**Political ideology.** Participants indicated where they place themselves on two political ideology scales concerning social and economic values. The scales range from 1 “strongly liberal” to 7 “strongly conservative”. The score from both scales was averaged into a combined political ideology scale. The sample was skewed to the liberal ideology with a median of 2.5, and

nearly 80% ranking themselves between strong liberal to somewhat liberal. The scale was then folded onto itself, creating a 4-item *political polarization* scale, greater values indicating a more polarized political ideology.

***Issue relevance.*** Participants stated whether they, or someone they know, suffered from health issues relating to the topic raised in the persuasive message that they read. Response options were yes, no, and I don't know. The wording for this item was "Have you or anyone of you family members or friends suffered from health issues related to sun exposure/gum health?"

***Demographic variables.*** Basic demographic data was collected including age, gender, and ethnicity. Education was not assessed because this was an undergraduate student sample.

### **Data analysis**

The mediation hypotheses were assessed using Hayes (2022) Process Macro version 4.0, a widely used tool in the field of mediation and moderation analysis which focuses on assessing the strength and significance of varied indirect effects in mediation models and moderation effects in interaction models. Process does not have strict assumptions about the distribution of data and generally estimates robust standard errors. The syntax allows for dichotomous independent variables, and also enables users to define multicategorical independent variables and moderators if necessary. However, it is always important to consider the general assumptions related to regression and mediation analysis such as linearity, heteroscedasticity and normal distribution of the residuals. To test the hypotheses, the current study utilizes Process models 4 and 6, which enable assessment of parallel mediation and sequential mediation tests accordingly. The bootstrap sample iterations were set 5000 within a 95% confidence interval. For all mediation models, the experimental condition is set as the independent variable, and post-attitude as the dependent variable. Monetary valuation, text evaluation, and perceived threat to

freedom of choice are set as mediators. Demographic variables, including political ideology and gender, are then imputed as control variables alongside issue relevance and pre-attitudes, (See figure 8 for proposed mediation model).

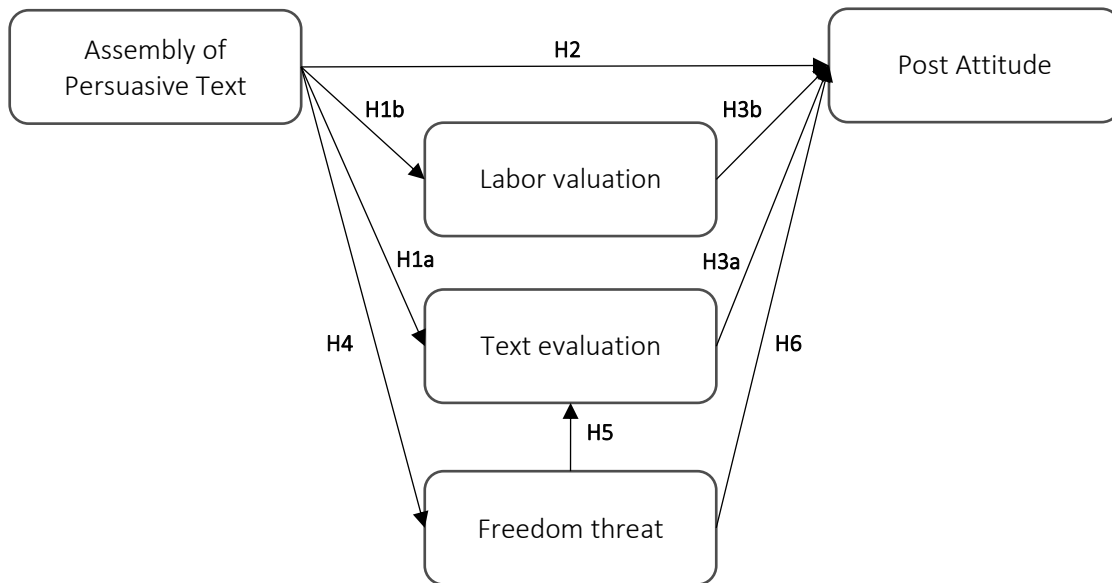


Figure 8. Model for mediation hypotheses testing

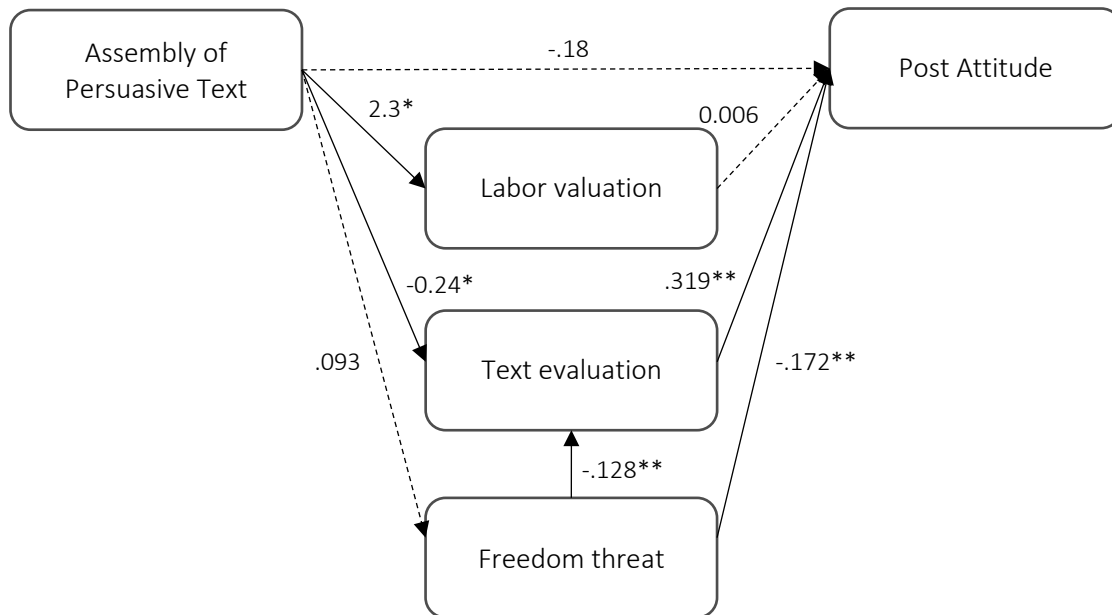
## Results

For clarity purposes, and to maintain consistency with the IKEA effect literature, participants in the text-assembly treatment group are referred to as "builders" (or "b" for short). Similarly, participants in the control group who solely read the text without engaging in its assembly are referred to as "non-builders" (or "nb"). All the models were first tested for the entire sample, and then separately for each healthcare subsample.

### Entire Sample

The analysis revealed a significant influence of assembly effort on text evaluation, ( $t = 2.948$ ,  $MSE = 0.35$ ,  $p < 0.001$ ), however, the direction of influence was negative, contrary to

expectations of H1a. Participants in the assembly condition (builders) tended to rate the text slightly less positively compared to their non-builder counterparts ( $M_b = 4.89 (0.57)$ ,  $M_{nb} = 5.14(0.65)$ ). Interestingly though, the data reveal support for H1b which presumed greater monetary valuation for self-invested effort, ( $M_b = \$9.49$ ;  $M_{nb} = \$7.06$ ;  $t = 1.73$ ,  $MSE = 31.42$ ,  $p = .032$ ), indicating that participants in the assembly condition valued the labor invested into creating the text more than their non-builder counterparts. Contrary to H2, neither the direct effect ( $p = .081$ ), nor the total effect ( $p = .222$ ) of assembly effort on attitudes was significant. The path predicting posts-attitude was significant ( $t = 2.46$ ,  $MSE = 0.76$ ,  $p < .001$ ). Self-invested effort was not a statistically significant predictor ( $p = .11$ ), nor was valuation ( $p = .647$ ). Rather, it was text evaluation that emerged as a significant predictor of attitudes ( $t = 2.64$ ,  $se = .12$ ,  $p = .009$ ), with more positive text evaluations associated with greater attitude alignment. Additionally, even though the total and direct effects were not significant, the model indicated that there was a statistically significant indirect effect of effort on post-attitudes via text valuation, offering partial support for H3. The next two hypotheses assumed that assembly efforts would reduce the perception of threat to freedom of choice, which in turn, should translate to greater agreeableness with the message. The data did not indicate that assembly efforts influence perceived freedom threat ( $p = .64$ ), but perceived freedom threat did emerge as a significant predictor of post attitudes, with greater levels of perceived threat associated with less message agreeableness ( $t = 2.85$ ,  $se = .06$ ,  $p = .005$ ), thus offering support for H5 but not for H4. Finally, perceived freedom threat emerged as a significant predictor of text evaluation ( $t = -3.24$ ,  $se = .04$ ,  $p = .002$ ) as greater levels of perceived threat were associated negatively with text evaluations, offering support for H6. Figure 9 presents the correlation coefficient and statistical significance produced by the multiple mediation model .



**Figure 9.** Mediation model of entire sample - Experiment 1

Note. \* $p < .05$ , \*\* $p < .01$ , 95% confidence interval

Upon incorporating the relevant control variables into the model, a few interesting changes were observed, though the indirect influence of effort on attitudes via text evaluations remained significant ( $t = 2.78$ ,  $MSE = 0.679$ ,  $p = .000$ ). The path predicting perceived freedom threat was now significant ( $t = 2.4$ ,  $MSE = 1.30$ ,  $p < .001$ ), though it was not due to self-invested effort ( $p = .88$ ), but rather, it was political ideology that emerged as a significant predictor of perceived threat to freedom of choice, revealing that participants who identify more strongly as liberal tended to perceive less freedom threat from the text they read ( $t = 4.58$ ,  $se = 0.08$ ,  $p = .000$ ). Considering post attitudes as the outcome, both gender ( $t = -3.96$ ,  $se = 0.18$ ,  $p = .0001$ ) and political ideology ( $t = -2.47$ ,  $se = 0.06$ ,  $p < .05$ ) emerged as significant predictors, with individuals identifying as liberal and female expressing greater support for the healthcare practice advocated for in the text ( $t = 2.69$ ,  $MSE = .74$ ,  $p = .000$ ). It should be noted that the sample was predominantly female (78.4%). Furthermore, the sample was heavily skewed as the

vast majority identified as left leaning, with 79.3% categorizing themselves from very Liberal to somewhat Liberal, and an additional 10% identifying as moderate (or neither Liberal nor Conservative). Based on this distribution on the political spectrum, we cannot make concrete inferences comparing conservatives to liberals, however, the data would suggest that there is a meaningful difference between moderate liberals and those who identify strongly with liberal ideology. A more representative sample would be required to make accurate inferences about gender and political ideology as moderators. Notably, issue relevance did not emerge as a significant predictor of text evaluations or attitudes ( $p = .07$  ;  $p = .63$ ). Unsurprisingly, the strongest predictor of post attitudes was pre-attitudes ( $t = 7.11$ ,  $se = 0.06$ ,  $p = .000$ ). Upon adding pre-attitudes as control variable, the influence of gender and political ideology on attitudes were no longer significant ( $p = .08$  ;  $p = .06$ ), and neither was the indirect path of influence of effort on attitudes. In a final model iteration, *post attitudes* were replaced with *attitude change* as the outcome variable, but this model was not significant. Taken together, these results suggest that there may be more nuanced influences at work which deserve further investigation. Furthermore, it should be noted that even though some differences between the conditions are statistically significant, the variations are rather small, and the averages for both groups reside in the upper half of the scales. Next the model was replicated for each of the two healthcare practices.

### **By healthcare subsample**

For *Sunscreen application* ( $n = 75$ ), the significant patterns of influence were parallel to that of the full sample. Assembling the text was a significant predictor of valuations ( $t = 2.08$ ,  $MSE = 0.83$ ,  $p < 0.01$ ), with individuals who assembled the text tending to value the editing of the text more positively than their non-builder counterparts ( $M_b = \$10.84$  ;  $M_{nb,} = \$6.87$ ), while, at the same time, expressing lower evaluations for the text itself ( $M_b = 4.90$ ;  $M_{nb,} = 5.19$ ). Likewise,

assembling the text was not a significant predictor of freedom threat ( $p = .243$ ), while freedom threat was a significant predictor of text evaluation ( $t = -2.48, p = .015$ ). Higher text evaluations and lower levels of freedom threat were both associated with greater attitude alignment with the persuasive text ( $t = 2.88, p = .005$ ;  $t = -2.405, p = .019$ ). Adding the control variables to the model yielded similar results, as gender ( $t = 2.87, p = .005$ ), as well as pre-attitudes ( $t = 6.78, p = .000$ ), significantly predicted post attitudes. Concerning the *Flossing* sub-sample ( $n = 78$ ) similar patterns emerged for the influence of text assembly on valuation, however, the model was not significant, ( $t = 1.1, MSE = 0.673, p < 0.01$ ). The total effect model only appeared significant for this subsample after including pre-attitudes as a control variable, ( $t = 1.57, MSE = 0.617, p < 0.05$ ), which was the only significant predictor of post attitudes, and even that effect was relatively weak small. Table 4 presents a summary of descriptive statistics by treatment group.

**Table 4**

Sample means and standard deviations of outcome variables by treatment group – Study 1

	Full Sample		Sunscreen		Floss		Total
	assemble	control	assemble	control	assemble	control	
Labor valuation	\$9.49 (\$6.78)	\$7.06 (\$4.12)	\$10.84 (\$7.33)	\$6.87 (\$4.47)	\$8.21 (\$6.04)	\$7.26 (\$3.80)	\$8.27 (\$5.72)
Text evaluation	4.89 (0.57)	5.14 (0.65)	4.90 (0.45)	5.19 (0.61)	4.89 (0.67)	5.10 (0.69)	5.02 (0.62)
Freedom threat	3.49 (1.21)	3.39 (1.21)	3.46 (1.13)	3.14 (1.24)	3.51 (1.30)	3.65 (1.15)	3.44 (1.21)
Post attitude	5.88 (0.92)	6.14 (0.92)	5.74 (0.97)	6.07 (1.05)	6.01 (0.86)	6.21 (0.78)	6.01 (0.93)
Attitude change	0.25 (1.16)	0.13 (0.75)	0.09 (0.82)	0.16 (0.87)	0.39 (1.40)	0.11 (0.61)	0.19 (0.97)
n	76	77	37	38	39	39	153

### Discussion Study 1

Considering evaluation of the text, results were significant but in the opposite direction of expectations. Those who invested effort into assembling the paragraph tended to evaluate it more negatively and they also tended to disagree with its persuasive message compared to participants who solely read the paragraph in the direct persuasion condition. At the same time, however, those same individuals who engaged in the text assembly tended to value the editing labor more positively, offering partial support for the efficacy of the IKEA effect with relation to text as a DIY product. This discrepancy resonates with a similar disconnect in the meta-analysis (Chapter 1) indicating that liking is not necessarily correlated with valuation of a self-labored item.

It is particularly intriguing that many of the relationships between induction and attitude change were significant but in the opposite direction of what was expected, as it stands in contrast with assumption grounded in self-persuasion literature. which suggests that direct persuasion methods would lead to lower evaluations and less agreement. A straightforward interpretation of these results would be that this form of message creation may not be perceived as significantly different from direct persuasion methods and might not be sufficient to induce compliance because it triggers self-guarding strategies. It is also possible that factors such as interruptions to processing fluency hinder attitude change in this context. However, prior to making such a conclusion, it would make sense to delve into methodological factors, aiming to identify and address potential confounding factors that emerged from the study design. That way the follow-up studies could rectify these issues and gain a deeper understanding of the underlying dynamics. This approach would contribute to resolving the contradictions and enhancing the overall coherence of the findings.

Notably, pre-attitudes emerged as the strongest predictor of post-attitudes, regardless of experimental condition, indicating that any observed attitude change was relatively minor. There are several possible explanations for this finding. Firstly, it is plausible that the persuasive message employed in the study was not effective enough to induce substantial attitude change. . Alternatively, it could be that participants' attitudes were already firmly established and relatively stable on the issue at hand. This is supported by the high level of agreement found in positive support for healthcare treatment among participants. While the data did not exhibit a complete ceiling effect, there was a notable concentration of responses in the upper half of the attitude scale. Another contributing factor could be the presence of consistency bias, where participants strive to maintain consistency between their responses to the pre- and post-attitude items. Ideally, collecting pre-attitude data at an earlier time point would minimize potential biases introduced by participants attempting to maintain consistency. Unfortunately, due to constraints with the student sample used in this study, collecting data at an earlier time was not feasible. In the subsequent studies this issue was addressed by either omitting the pre-attitude assessment (Study 2) or replacing it with questions pertaining to real-life behavior as an alternative indicator of pre-attitude assessment methods that do not resemble the post-attitude measure too closely (Study 3).

Another potential issue with the study design is the difference in the text format between the control and treatment groups. The absence of a "final product" in the assembly condition may have hindered the influence of accomplishment on valuation and persuasion. Unlike their non-builder counterparts, participants in the assembly condition did not see a coherent final version of the paragraph after submitting their solution. Although they read the sentences to reorder them correctly as part of the assembly task, they did not have the opportunity to view a completed

version of the paragraph they created. Furthermore, even after reorganizing the arguments, participants may have experienced a lack of fluency due to interruptions in reading. As noted earlier, fluency plays a significant role in text evaluation, and it could potentially explain why self-invested effort in text assembly resulted in lower evaluations of the text. This potential issue will be addressed in Study 2 by showing participants the finalized version of the paragraph after they receive notification of their success.

## **Study 2**

The objective of this study, as the preceding one, is to evaluate the applicability of the IKEA effect in persuasive texts. The design and procedure closely replicate those of Study 1, with minor, albeit essential adjustments made to the stimuli and empirical process to address concerns identified in the previous experiment. The current investigation tests the same hypotheses using a new dataset collected specifically for the present study. Consequently, Study 1 could be considered as Pilot 3, representing the concluding exploratory studies before initiating the primary research studies.

## **Method**

### **Sample, Design & Procedure**

Ninety-five undergraduate students (76.3% female), in age range of 19 to 23 ( $M = 19.72$ ,  $SD = 0.87$ ) participated in the study for extra credit. The study employed an online randomized experiment with 2 (text-tasks: Assemble vs Read) by 2 (healthcare: Flossing teeth or Sunscreen application), between subject design. The modifications from the previous study were implemented in the stimuli of the two assembly conditions. First, instead of breaking up the paragraph into individual sentences, the paragraph was broken in the middle of the sentences, resulting in text fragments that were not stand-alone arguments. This created an actual puzzle

with only one possible solution, as all the pieces of the paragraph needed to be placed in the correct order for the text to appear grammatically correct and be coherently readable. This revision was necessary to address the issue from the previous stimuli, which offered more than one solution that could be assessed as grammatically correct. The second revision was prompted following the assembly task. After receiving the “success” notification, participants were presented with the complete paragraph, parallel to the version viewed in the direct-persuasion conditions. This was done to exemplify the finalized “product” in the form of a complete paragraph, and to ensure that the only difference between the control and treatment conditions was the assembly manipulation. Even if participants did not read the entire paragraph again front-to-back, it offered them an opportunity to visualize the successfully completed paragraph on which they labored, rather than a clump of separate sentence pieces.

### **Measures**

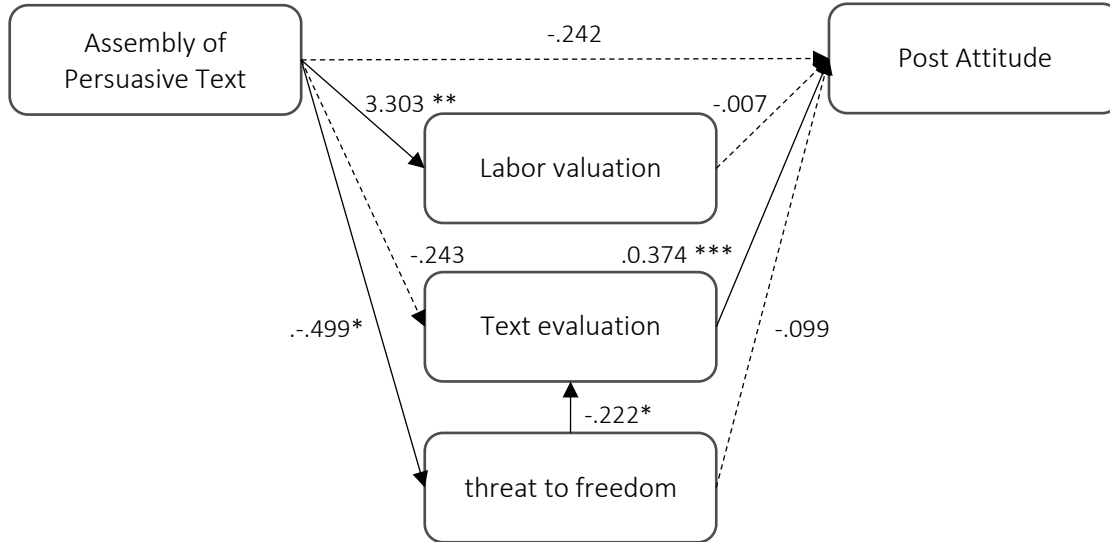
This study utilized the same measures as the preceding study, encompassing post attitudes (Sunscreen Cronbach’s  $\alpha = .859$ ; Floss Cronbach’s  $\alpha = .745$ ), text evaluation (Cronbach’s  $\alpha = .768$ ), labor valuation, perceived freedom threat (Cronbach’s  $\alpha = .56$ ), issue relevance, political ideology (single item), and the basic demographic variables. However, there were a couple of adjustments—attitude change was not assessed due to the omission of the pre-attitude measure. Furthermore, the item assessing the valuation editing labor underwent revision. Instead of a 5-point multiple-choice question, participants were presented with a slider, enabling a continuous selection ranging from \$1 to \$21. This adjustment aimed to provide a more precise assessment of perceived monetary valuation.

## Results

As in Study 1, the model was initially tested for the entire sample comparing between all participants in the assembly and read conditions. Then the model was tested again for each of the healthcare subsamples separately.

### Full Sample

Figure 10 presents the correlation coefficients produced by the mediation model. In accordance with expectations of H1b, text assembly was a significant predictor of labor valuation ( $t = 3.92, p < .001$ ), with participants in the assembly condition rating the editing labor more positively than their non-builder counterparts ( $M_b = \$12.07, sd = \$4.69; M_{nb} = \$8.60, sd = \$4.35; t = 2.09, MSE = .54, p = .016$ ). Text assembly was also a significant predictor of perceived freedom threat ( $t = -2.61, p < .05$ ), with individuals in the assembly condition expressing lower levels of perceived threat compared to non-builders ( $M_b = 3.09, sd = 0.8; M_{nb} = 3.63, sd = 1.16; t = 2.61, MSE = 1.02, p < 0.05$ ), providing additional support for H4. The model predicting text evaluation was significant, ( $t = 2.09, MSE = 0.54, p = .016$ ), though the direct path from text assembly to text evaluation was not significant ( $p = .197$ ), offering no support for H1a. Rather, it was perceived freedom threat that significantly predicted text evaluations ( $t = -2.9, p < .01$ ), with greater levels of perceived threat associated with less positive text evaluations ( $t = 2.09, MSE = 0.54, p < .05$ ), indicating support for H6. Concerning post attitudes as the outcome variable, the influence of text evaluation was significant ( $t = 3.56, p < .001$ ), with more positive text evaluation associated with stronger support for the message conveyed in the text ( $t = 2.25, MSE = 0.56, p = .001$ ), offering partial support for H3. The model found a significant indirect path of influence via perceived freedom threat and text evaluations, in a manner that text assembly resulted in less perceived threat, which lead to greater text evaluations, which in turn, were



**Figure 10.** Mediation model of entire sample - Study 2

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , 95% confidence interval

associated with greater text-attitude alignment, offering additional support for H5. However, counter to the assumption of H2, neither the total effect nor the direct effect of text assembly on attitudes were significant ( $p = .2$ ;  $p = .23$ ).

Upon incorporating the relevant control variables into the mediation model, we find that issue relevance was a significant predictor of perceived freedom threat, with those whom for the healthcare issue was relevant, perceiving less threat to their freedom of choice ( $t = 2.35$ ,  $p < .05$ ). Gender was a significant predictor of text evaluation, with female participants rating the text more favorably ( $t = 2.37$ ,  $p < .05$ ). Finally, political ideology was a significant predictor of post attitudes, with those identifying more strongly as liberal also expressing more support for the benefits and importance of the healthcare practice ( $t = -2.05$ ,  $p < .05$ ). As in the previous model, the total and direct effect of text assembly on attitudes remained insignificant, but more than that, the indirect path via perceived freedom threat and text evaluation was no longer significant,

suggesting that the variance in attitudes was mostly explained by the control variables, or alternatively, that there were contradictory influences that cancelled each other out.

### By Sub-sample

The model testing the mediation for the *Sunscreen* subsample was not as strong. Text assembly still significantly predicted monetary valuation ( $t = 2.64, p < .05$ ). Likewise, text evaluation was still a significant predictor of post attitudes ( $t = 2.02, p < .05$ ), however, other than these two paths of influence, the data did not reveal any significant effects, neither for the direct nor indirect effects of text assembly on post attitudes. For the subsample assessing *Flossing*, the observed patterns closely mirrored those of the overall model. Assembly effort significantly predicted levels of perceived threat to freedom of choice, and increased freedom threat associated with less favorable evaluations of the text. As expected, higher text evaluations

**Table 5**

Sample means and standard deviations by treatment group – Study 2

	Entire sample		Sunscreen		Floss		Total
	assemble	control	assemble	control	assemble	control	
Labor valuation	\$12.07 (\$4.69)	\$8.60 (\$4.35)	\$11.56 (\$4.15)	\$8.65 (\$4.06)	\$12.70 (\$5.32)	\$8.56 (\$4.65)	\$10.24 (\$4.81)
Text evaluation	5.57 (0.81)	5.65 (0.72)	5.66 (0.75)	5.77 (0.67)	5.45 (0.89)	5.55 (0.77)	5.61 (0.76)
Freedom threat	3.09 (0.80)	3.63 (1.16)	3.26 (0.80)	3.52 (1.19)	2.87 (0.77)	3.72 (1.15)	3.37 (1.04)
Post attitudes	5.85 (0.86)	6.07 (0.77)	5.77 (0.93)	6.17 (0.75)	5.95 (0.76)	5.98 (0.78)	5.97 (0.81)
n	45	50	25	23	20	27	95

correlated with greater alignment of attitudes with the persuasive text. While the correlations that emerged align with those of the full sample, it is noteworthy that the indirect influence of text assembly on attitudes was not significant. This could be attributed to a limited statistical power stemming from the sample size. Table 5 provides summary statistics by sample.

### **Discussion Study 2**

The findings so far support the assumption that the IKEA effect occurs within the context of text assembly, with individuals perceiving higher valuations for the editing labor of text they assembled compared to the same text edited by an external source. However, assembling the text does not seem to result in greater evaluations of the text itself. With regard to attitude change, text assembly efforts did not result in greater alignment with the message conveyed in the text. Notably, the influence of assembly on induction was significant and in the expected direction, suggesting that those who labored on text assembly perceived less threat to their freedom of choice compared to those in the direct persuasion conditions. Even though the influence on attitudes was not significant, this is a meaningful finding because inhibition freedom threat perceptions is one of the main strengths of self-persuasion methods. It consequently results in reduced self-guarding strategies such as reactance and counterarguing, which enables the individual to be more open to consider alternative information. Furthermore, as in experiment 1, responses for many of the outcome variables were concentrated in the upper half of scales, which would also contribute to the insignificant effects. This lack of variance could derive from a combination of a relatively homogeneous and a non-controversial topic which they mostly agreed upon. Since the respondents preexisting attitudes already tended to align in support of the healthcare practice, it would be difficult to induce attitude change in greater support. The results and inferences of this study are elaborated on in further detail in the general discussion.

### Study 3

This concluding experiment provides a comprehensive investigation of the primary research questions, drawing upon the insights and considerations discussed in the all the preceding sections of this dissertation. In addition to addressing the main research questions, the current study enhances the model's applicability within a more real-world setting and develops the design by incorporating two additional manipulations concerning the extent of effort and self-expression via customization. In this manner, the current study explores potential boundary conditions that can enhance our understanding of the interplay between engagement with persuasive content, text valuation, and attitude change.

#### **Effort and Valuation**

As previously discussed, the IKEA Effect is a phenomenon in which individuals tend to assign higher value to products that they assembled or co-created. This effect can be attributed to the Effort Heuristic, which posits that the extent of effort invested into a task directly influenced the perceived value of its outcome (Kruger et al, 2004). Effort is often used as an indicator for quality (Inzlicht et al., 2018), and self-investing effort into the creation of a product can develop emotional attachment and a sense of psychological ownership which is associated with greater perceived valuations (Kahneman, et al., 1990; Sarstedt, et al., 2017). Hence, it is plausible to assume that engaging tasks tend to foster stronger product attachment and the more challenging the task, the greater likelihood of evoking a sense of accomplishment and success. Accordingly, we can anticipate that engaging tasks of higher difficulty would higher valuations.

While several studies have demonstrated the path of influence between effort and valuation of self-created products, there is limited literature specifically examining the effect of extent of effort on this relationship. Diefenbach et al, (2018) and Atakan et al, (2014b) compared

valuations between two types of effort, by contrasting the outcomes of assembling the product versus customizing it. In two additional studies, (Atakan et al., 2014a; Ling et al., 2020) the number of customization choice options was manipulated as an indicator for the level of mental effort involved in creating the product. However, it can be argued that this type of mental effort does not bear any consequences for task accomplishment as there is no possibility of “failing” the task of product creation; it may simply take longer to select the preferred customization options. Furthermore, as indicated in the meta-analysis on the IKEA Effect (Chapter 1), we could not compare the extent of effort between studies without it being consistently measured. Thus, the current study aims to bridge this gap in extant literature by comparing two conditions with tasks that differ in their difficulty level. In this manner, we can progress beyond the mere expectations that those who assemble the text will perceive greater value compared to those who solely read the text and examine whether the extent of self-invested effort leads to its greater valuation. This refers to both (a) evaluations of the text, as well as (b) monetary valuation of the editing labor. Accordingly, the following hypotheses are posed:

**H1.** *The difficulty level of the text assembly task will influence its perceived valuation in a manner that the highest (a) evaluations, and (b) valuations, will be associated with the difficult assembly task, followed by the easy assembly, and lowest for the no-assembly condition.*

### **Effort and Attachment**

If the IKEA Effect manifests in a similar manner with texts as it does with consumer products, it is likely to operate through the same psychological mechanisms. One of the key underlying mechanisms of the IKEA Effect is developing a sense of psychological ownership and emotional attachment during the process of product creation. The meta-analysis detailed in

Chapter 1 further corroborated attachment as a significant moderator influencing the effect of effort on product valuation across studies. Given the existing literature, it could be presumed that individuals would develop a comparable attachment to a text they actively assemble, similar to their attachment to any product they engaged in creating. Similarly, it could be presumed that greater effort and engagement with the text would result in greater attachment, though it is unclear whether simply reordering arguments into a coherent paragraph is enough to generate an attachment to a text in the same manner as to a physical object. The current study attempts to answer this question. Finally, since attachment is a key mechanism of the Ikea effect, we may expect that greater attachment to the text will result in more positive valuations associated with the text. Accordingly, the following two hypotheses are posed:

**H2.** *The extent of effort will influence the emotional attachment to the text in a manner that stronger attachment will be associated with the difficult assembly task, followed by the easy assembly, and lowest for the no-assembly condition.*

**H3.** *A greater sense of attachment to the text will correlate with a more positive (a) text evaluation, and (b) monetary valuation*

### **Affect and Persuasion**

Emotions play a crucial role in shaping our cognitive processes, influencing the way we perceive, interpret, and evaluate incoming information. Whether it be positive emotions like happiness and excitement, or negative emotions such as anger and sadness, our emotional state can significantly impact the way we engage with information.

Research suggests that individuals in a positive emotional state may be more susceptible to persuasion compared to those in a neutral or negative emotional state, because they tend to expand their attention, encompassing a broader range of information (Fredrickson &

Branigan, 2005). Additionally, positive emotions can enhance motivation and reduce resistance to persuasion, making individuals more open to attitude change. The influence of negative emotions on persuasion is more complex and can vary depending on several factors. While negative emotions can narrow attentional focus and lead to more focused processing of information, they can also increase skepticism and resistance to persuasion. When individuals are experiencing negative emotions such as fear, or anger, their attentional focus may narrow, leading to a more selective processing of information, which may result in a heightened scrutiny of persuasive messages, making individuals more critical and less easily persuaded.

Emotional states can influence the processing route individuals take when evaluating persuasive information. Positive emotions often promote heuristic processing via the peripheral route, where individuals rely on mental shortcuts and quick judgments. Negative emotions, on the other hand, can lead to more systematic processing, where individuals engage in careful evaluation and scrutiny of the persuasive message. Additionally, emotional states can affect the level of scrutiny individuals apply to persuasive messages. When in a positive emotional state, people may be more inclined to process information in a less critical and more favorable manner. A positive mood can lead to less message scrutiny when a depressing message is encountered, as long as the message is not mood threatening (Wegener et al., 1995). Negative emotions, however, can heighten skepticism and increase the scrutiny of persuasive messages, leading to more careful evaluation of the arguments presented. Emotional states can also impact resistance to persuasion. Positive emotions can make individuals more receptive to persuasive appeals and increase their willingness to change attitudes or behaviors. Negative emotions

may enhance resistance to persuasion, making individuals more resistant to changing their existing attitudes or behaviors. However, the impact of emotions on persuasion is not uniform and can be influenced by factors such as message content, personal relevance, and individual differences. For example, if a message offers a solution to the negative state, it may be more persuasive, based on the (Nabi, 2003). Individuals who are highly involved or motivated to process information may still be influenced by persuasive messages, even in the presence of negative emotions.

A task requirement itself can prompt individuals to experience certain emotions which in turn may influence the evaluation of the task and its outcome. Concerning the text-assembly task, an overly complicated and difficult task can lead to feelings of frustration, irritation, or even anger, consequently resulting in negative assessments of the persuasive text. Alternatively, the successful completion of the task may spur a positive emotion relating to success and competence, leading to a more positive evaluation of the text. Based on this logic it can be assumed that a difficult task may produce more negative emotions such as annoyance compared to an easy-to-solve task which is more likely to result in positive emotions such as satisfaction and pride. Accordingly, the arousal of such positive and negative task related emotions is likely to be associated with positive and negative evaluations of the text. Alternatively, solving a difficult task may lead the individual to experience a stronger positive emotion compared to solving a simple task that could be solved easily by anyone.

Finally, the experience of negative emotions is related to reactance, a psychological self-guarding strategy that individuals may take when they perceive a threat to their freedom of choice. It often leads to a motivational state aimed at restoring or asserting that freedom. When individuals feel that their freedom is being restricted or pressured, it can trigger a defensive

emotional which is a key component of reactance. The experience of negative emotions while encountering information serves as a signal to a potential threat to freedom and will likely result in rejection of the arguments conveyed in the message, as well as lower evaluation of the message itself.

**H4a.** *Experiencing negative emotions while reading the text will correlate with less favorable evaluations of the text?*

**H4b.** *Experiencing negative emotions while reading the text will correlate with less support for the message conveyed in the text*

### **Customization as Self-expression**

Enabling customization options of products has the potential to influence perceived valuation as it offers a form of identity expression and personalization (e.g., Franke et al., 2010; Ling et al., 2020), as it taps into the psychological desire for self-expression and personalization, which can positively influence the perceived valuation of the product. By allowing individuals to tailor the product to their unique tastes or preferences, it enhances their sense of ownership and emotional connection to the product. Furthermore, it engages the individual with the process of creation, requiring more investment of thought and active choice, potentially increasing the emotional attachment and sense of ownership of the product. However, research has exhibited discrepancies in outcomes concerning the valuation of self-customized products. While some found that enabling customization decisions in the creation process leads to greater satisfaction and amplified valuations (Atakan et al, 2014; Buechel & Janiszewski, 2013; Ling et al, 2020), others found that requiring self-customizing led to lower valuations (Fink & Geldman, 2017) or no difference between valuations of those who customized the product and those who solely assembled it (Diefenbach et al., 2018). The results from the meta-analysis on the IKEA Effect

(Chapter 1) suggest that the influence of customization on valuation may be moderated by product tangibility, in a manner that it reduces valuations of tangible products while increasing the valuations of products that were not tangible during the creation process. As the task at hand involves assembly of text via a digital program, adding the option to customize the webpages appearance may bare a positive impact on both valuation of the text and emotional attachment to the creation. Accordingly, the following hypotheses are posed

**H5.** *Participants who customize the webpage will: (a) evaluate the text more positively, (b) perceive rate greater monetary value to the editing labor, (c) express higher levels of attachment to the text*

#### ***Online Health Communication and the IKEA Effect***

It has been suggested that Mobile healthcare apps can motivate users to monitor their habits and set goals to help them be healthier (Wang et al., 2016). Enabling self-customization of the app, could help maintain engagement and encourage long-term commitment (Wang et al., 2016). Within the context of the present study, this addition could address the question as to whether any effort related to the task would influence appreciation and persuasion, or does the effort need to be invested directly in the construction of the persuasive message itself. We could also ask whether taking part in the design choices of the app interface predicted more usage of the app. Based on the literature, the following hypotheses are posed:

**H6.** *Participants who customize the website's color will express greater intent to use the website in the future.*

**H7.** *Participants who customize the website's interface will express lower perceived threat to freedom from content they consume on the website.*

## Method

### Sample & Study Design

This study used a representative sample of the US general population, which was recruited via Qualtrics online samples ( $N = 534$ ), ages ranging between 18 and 82 ( $M_{\text{age}} = 42.25$ ). Of them, 264 identified as female, 260 as male, and 10 marked other. Approximately 78% identified as White or Caucasian (418), 81 as Black or African American, 15 Asian, 16, Native American or Alaskan native, 5 as Native Hawaiian or Pacific Islander and 36 as Other or preferred not to say. Of these, 31 identified as being of mixed race. Originally 569 subjects responded to the study but 35 were removed from the dataset because they sped through the stimulus material without reading it, as this defeats the purpose of the study which compares those who read and those who assemble the text. The threshold for “speeders” was set as those who spent less than three seconds on the reading task page.

Building upon the stimulus material developed for sunscreen application, this study enhances the model’s applicability in a more realistic context by integrating the stimuli into a [mock] healthcare website named “On your health.” This modification goes beyond asserting that the persuasive text originates from a healthcare website, by providing context for the message, and bolstering the external validity of the results. Additionally, the study expands the experimental design by incorporating two additional manipulations. The first manipulation explores whether effort needs to be invested directly into the construction of the text to produce message-related attitude change or whether customization of aesthetic features alone is sufficient. Half of the participants were asked to select their preferred color scheme for the health information website out of three options: green, red, or blue [see appendix for design options]. This offers the ability to test the influence of self-expression via aesthetic customization on the

relevant outcomes. The second manipulation altered the difficulty of the assembly task by fragmenting the paragraph into more segments making it slightly more difficult to reassemble. By comparing conditions of varying difficulty, this study examines whether the extent of effort further moderates the influence of text assembly on attitude change. This resulted in a 2 *customization* (customization vs no customization), by 3 *task-type* (assemble-difficult; assemble-easy; read) randomized experiment with a between subject design. [See Appendix 3.A-D for all stimuli material].

### **Procedure**

Respondents from Qualtrics sample pools were sent a recruitment link provided by the company. They first read a consent form providing information about the study, and after clicking to indicate they consent to participate, they were redirected to the study page. All participants answered the same pre-attitudinal survey in which they were asked about their everyday practices concerning application of sunscreen as well as filler items related to other healthcare practices such as tendency to floss teeth and vegetable consumption. This was collected to both distract them from the main study goal, as well as to assess their overall health habit inclination. Participants were then randomized into one of the six conditions. Those in the three customization conditions were asked to select their preferred color scheme for a health information website out of three options. Following the color selection, members of the read-only condition (control) were presented with a website page in the color they selected, containing the persuasive text. Participants in the other two groups (easy and difficult) were directed to the assembly task. After completing it successfully and receiving the “success” notification, they were presented with the same website page in color scheme that they selected, containing the text they had just worked on. Participants in the three non-customization conditions (Read/Assemble-

easy/Assemble-difficult) were not prompted to select their preferred color scheme prior to the stimuli. After the pre-assessment questionnaire they were directed to the text stimuli and the same mock webpage containing the text. Following the stimuli, all participants filled the same questionnaire assessing the dependent variables and relevant control variables.

## **Measures**

The questionnaire was comprised of the measures and scales from Study 1. These measures and correlation values for the indexes created are as detailed: Post-attitude (Cronbach's  $\alpha = .896$ ), text evaluation (Cronbach's  $\alpha = .835$ ), monetary valuation; perceived freedom threat (Cronbach's  $\alpha = .0.845$ ); political ideology (single item); issue relevance; and basic demographic variables. In addition to these, the current study also includes the measures detailed below.

***Healthcare habits.*** Participants rated the frequency in which they tend to apply sunscreen. Responses were on a five-point scale, ranging from “never” to “multiple times a day.” The questionnaire also contained filler items inquiring about their tendency to partake in other healthcare practices, including wearing a seatbelt, flossing teeth, and consuming vegetables in their daily meals. The average of these items was used as a proxy for overall healthcare tendency by the respondent, which can indicate the general attitude toward self-healthcare habits.

***Perceived effort.*** Participants in the experimental groups were asked to indicate how difficult their assembly task was in their opinion. Response options on a 5-point scale ranged from 1 (extremely easy) to 5 (extremely difficult). This item was also used as a manipulation check to verify that the difficult assembly task was indeed perceived as more difficult.

***Attachment.*** This measure was comprised of three Likert items ranging on a 7-point scale from strongly agree to strongly disagree. Two items assessing emotional attachment were adapted from Sarstedt et al., (2017). These included “ This paragraph has no special meaning for

me,” and “This paragraph moved me.” A third item pertaining attachment as an extension of self “If someone praised this paragraph, I would feel somewhat praised myself,” was adapted from Fuchs et al., (2010). The original indexes by were comprised of 28 items assessing different aspects of attachment, however, because these measures were developed for contexts of physical goods, most rendered incompatible for assessing attachment to a text. (Cronbach’s  $\alpha = .0.714$ )

***Behavior intention.*** In addition to assessing post attitudes toward the healthcare practice as in Studies 1 and 2, this study included items assessing intentional behavior, concerning the likelihood of (a) applying sunscreen on a daily basis, as well as (b) the likelihood of using the website *On Your Health* in the future. These items used a 7-point Likert scale ranging from strongly agree to strongly disagree.

***Negative Affect.*** Participants ranked the extent to which they experienced each of three following emotions while constructing/reading the text.: “irritated,” “angry,” annoyed,” on a 5-point response scale ranging from 1 “none of this feeling” to 5 “a great deal of this feeling.” (Cronbach’s  $\alpha = .0.847$ ); This scale is based on the validated measure by Dillard & Peck (2000). Their scale includes a fourth item “aggravated,” which was not included in this study.

***Education.*** A basic question concerning education was added to the demographic items, asking participants what the highest level of education they had completed so far is. This measure was a multiple-choice item with 8 options ranging from “some high school” to “graduate /MB” . Since this study uses a representative sample from a wide spectrum of education levels, unlike the preceding studies, it was imperative to assess this as an additional control variable. Around 11% had a graduate or professional degree, 30% bachelor’s or technical degree, 18.5% some college, 29% high school diploma or GED and 9% some high school education or less.

**Table 6**

Sample means and standard deviations by treatment group – Study 3

	Entire Sample			Without customization			With Customization			Total
	difficult	easy	control	difficult	easy	control	difficult	easy	control	
Post attitude	5.41 (1.22)	5.48 (1.16)	5.5 (1.28)	5.59 (1.16)	5.66 (1.05)	5.55 (1.28)	5.23 (1.25)	5.31 (1.24)	5.45 (1.29)	5.46 (1.22)
Behavior intent	2.84 (1.36)	3.04 (1.34)	3.17 (1.46)	3.01 (1.35)	3.24 (1.29)	3.18 (1.42)	2.67 (1.36)	2.85 (1.38)	3.15 (1.52)	3.01 (1.39)
Pre-behavior	1.7 (1.22)	1.6 (1.27)	1.87 (1.44)	1.75 (1.21)	1.7 (1.24)	1.76 (1.35)	1.66 (1.25)	1.5 (1.29)	1.98 (1.52)	1.72 (1.31)
Behavior gap*	-0.11 (.99)	0.11 (1.04)	-.004 (0.97)	-0.02 (0.96)	0.18 (1.05)	0.09 (0.98)	-0.2 (1.02)	0.05 (1.03)	-0.1 (0.97)	0 (1.01)
Text evaluation	6.04 (0.78)	5.95 (0.83)	5.79 (1.13)	6.12 (0.71)	6.09 (0.71)	5.86 (1.13)	5.95 (0.85)	5.81 (0.91)	5.71 (1.014)	5.93 (0.92)
Valuation	\$12.2 (0.44)	\$13.21 (0.43)	\$11.16 (0.46)	\$12.89 (0.62)	\$14.32 (0.61)	\$10.83 (0.90)	\$11.5 (0.62)	\$12.1 (0.61)	\$11.47 (0.63)	\$12.22 (0.67)
Attachment	3.79 (0.91)	3.83 (0.9)	3.74 (0.99)	3.88 (0.85)	3.83 (0.87)	3.74 (1.02)	3.71 (0.96)	3.83 (0.94)	3.73 (0.97)	3.79 (0.93)
Freedom threat	2.52 (1.3)	2.54 (1.29)	2.68 (1.55)	2.53 (1.26)	2.55 (1.4)	2.85 (1.63)	2.52 (1.35)	2.53 (1.17)	2.53 (1.45)	2.57 (1.38)
Negative emotion	1.09 (0.29)	1.17 (0.45)	1.3 (0.74)	1.07 (0.23)	1.14 (0.28)	1.3 (0.77)	1.11 (0.34)	1.20 (0.57)	1.29 (0.71)	1.18 (0.53)
n	181	186	167	91	92	82	90	94	85	534

**Note.** Behave gap refers to variance between behavior intentions and pre-behavior in z-score values

## Results

### Manipulation check

There was a significant difference between builders in the difficult versus easy assembly conditions ( $t = 6.18, p < 0.001$ ), with the former rating the task as slightly more difficult compared to the later ( $M = 2.31, sd = 0.96; M = 1.71, sd = 0.86$ ), suggesting the stimuli worked as expected. Participants in the difficult assembly condition also spent more time on average attempting to reconstruct the paragraph ( $M = 87(197), M = 186(416)$ ), further corroborating the additional effort required for completing the difficult assembly task.

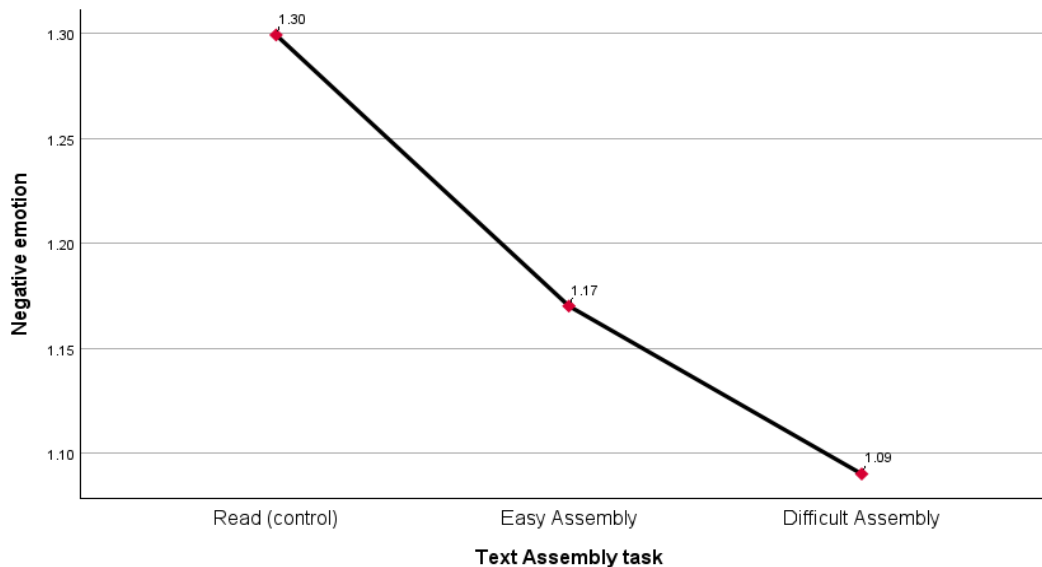
### Hypothesis testing

See table 6 for sample means and standard deviations by treatment group for variables. Of interest. The first hypothesis presumed that (a) evaluation of the text, and (b) valuation of the labor invested into the text assembly, will both be highest in the difficult assembly condition, followed by the easy assembly condition, and lowest for the no-assembly condition. A simple one-way ANOVA indicated that the main effect of text assembly task on text evaluation was significant ( $t = 1.81, p = 0.04$ ), with scores distributed in the expected direction ( $M = 6.04, sd = 0.78; M = 5.95, sd = 0.83; M = 5.79, sd = 1.13$ ). A post hoc test revealed that the difficult assembly condition was significantly different than the control group ( $p < .05$ ), but the easy assembly condition was not significantly different than either group. The model testing monetary valuation as the outcome was also significant ( $t = 2.28, p < 0.01$ ), however, it was the easy assembly task that had the highest score ( $M = \$13.21, sd = 0.43$ ), followed by the difficult and control group ( $M = \$12.2, sd = 0.44; M = \$11.16, sd = 0.46$ ). The post hoc test revealed that the easy-assembly condition was significantly different than the control group ( $p < .01$ ), but not from the difficult assembly group. Thus, H1 was partially supported by the data. It should be

noted that although both models were significant, the variance among the groups was rather small as the averages of all groups tended to cluster in the upper portion of the scale.

The next set of hypotheses presumed that greater effort invested into the text assembly will result in stronger emotional attachment to the text they labored on. In turn, greater attachment will correlate with more positive evaluations of the text and monetary valuations. The effect of assembly effort on attachment was not significant ( $p > 0.05$ ). The effect of attachment on text evaluation was significant with greater attachment levels predicting a more positive evaluation of the text ( $t = 9.57, B = .38, sd = .04, p < .001$ ). The effect of attachment on monetary valuation was not significant ( $p > .05$ ). Therefore, H2 and H3b were not supported, while H3a was supported by the data.

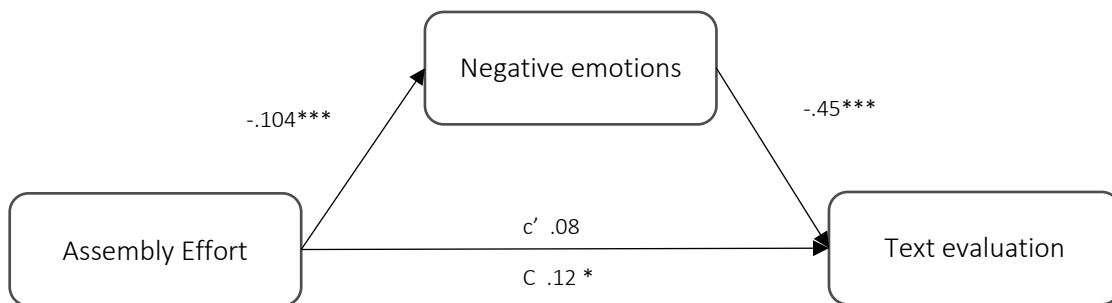
Concerning affect, H4 assumed that the experience of negative emotions while reading the text would result in less favorable evaluations of the text, as well as less support for the message conveyed in the text. First, it was necessary to test whether text assembly impacted the negative effect. The influence of assembly task on the experience of negative emotions was



**Figure 11.** Estimated means of negative emotions by effort.

significant ( $t = 2.67, p > .001$ ), as illustrated in figure 11, with those in the difficult assembly condition experiencing least negative emotions ( $M = 1.09, sd = 0.29$ ), Followed by the easy assembly condition ( $M = 1.17, sd = 0.45$ ), and the control group ( $M = 1.3, sd = 0.74$ ). A post hoc test revealed that the difficult assembly condition and the control group were significantly different than each other ( $p = .002$ ), but not from the easy assembly condition.

Next, a mediation analysis assessed the influence of assembly effort on text evaluation via negative emotions (See figure 12). The effect of negative emotions was significant, as stronger negative emotions correlated with less favorable evaluations of the text ( $p < .001$ ). The direct effect of effort on text evaluations was not significant ( $p = .11$ ) but the total effect of the model was significant ( $p = .012$ ). While H4a is supported by the data, it should be noted that the portion of variance that was explained by the mediation model was rather small ( $R^2 = .11$ ).

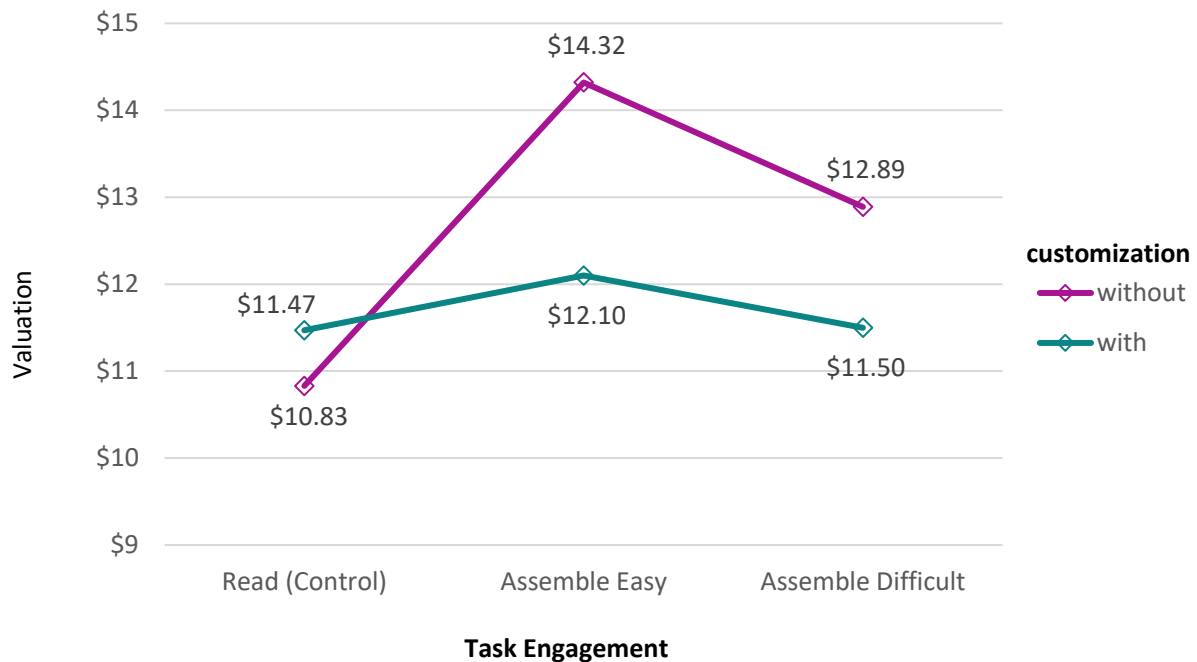


**Figure 12.** Influence of effort on text evaluation via negative emotion

Note. \* $p < .05$ , \*\*\* $p < .001$ , 95% confidence interval

The last set of hypotheses posed assumptions for outcomes relating to webpage customization, and indeed, including customization as an additional predicting variable resulted in interesting patterns among the six experimental groups. The influence of customization on attachment was not significant ( $p > .05$ ), offering no support for H6. The model assessing the outcome of monetary valuation was significant ( $t = 2.01, p < .001$ ). Assembly effort remained a

significant predictor of perceived valuation. The main effect of customization on valuation was also significant ( $p < .05$ ), with subjects who selected the color scheme rating the text editing labor as less valuable compared to their non-customizing counterparts ( $M = \$11.66, sd = 5.89; M = \$12.8, sd = 6.01$ ). Among the six experimental groups, the highest valuation was given by the easy-assembly condition without customization, followed by difficult-assembly without customization ( $M = \$14.32, sd = 0.61; M = \$12.89, sd = 0.62$ ). The lowest valuation was offered by the control group without customization ( $M = \$10.83, sd = 0.9$ ). A post hoc test revealed that the easy-assembly condition was significantly different than both non-builder groups ( $p = 0.01; p = 0.001$ ), as well as the difficult-assembly condition with customization ( $p = 0.014$ ). Interestingly, the average valuations of three groups that customized the webpage were



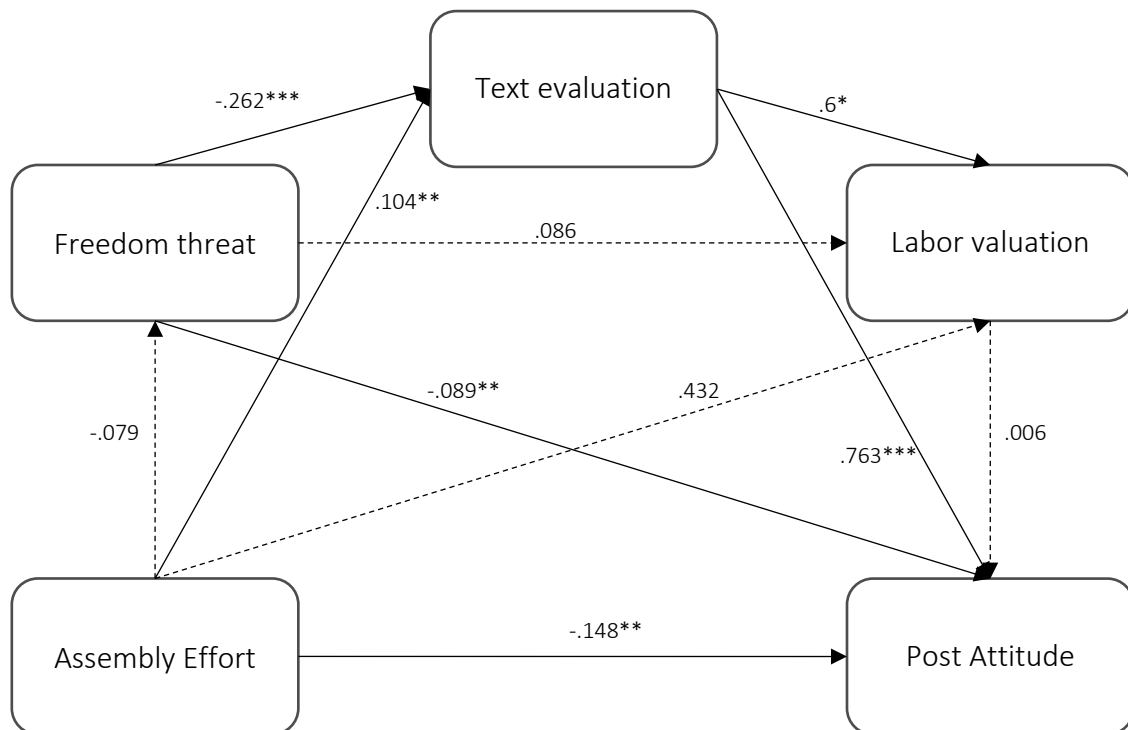
**Figure 13.** Estimated means of Valuation by text engagement and webpage customization

not significantly different than one another, regardless of task difficulty, suggesting that incorporating customization into the task dissipated the effects of text assembly effort. Figure 13 illustrates the estimated means of valuation by text engagement task and customization. These results stand counter to the expectations of H7.

Similarly, the model estimating text evaluations by treatment group was significant ( $t = 1.84$ ,  $MSE = 0.21$ ,  $p < .01$ ), with both assembly effort ( $p < .05$ ) and customization ( $p < .01$ ) significantly predicting text evaluation. Those who did not customize the color of the web page rated the text as slightly more positive than those who did customize ( $M = 6.05$ ,  $sd = 0.82$ ;  $M = 5.8$ ,  $sd = 1$ ). A post hoc revealed that only the difficult assembly condition and the control group (non-builders) without customization were significantly different than each other ( $p = .05$ ), which is not surprising as the averages of all groups were relatively close. Again, this result is counter to the expectation of H8 which assumed that those who customize will evaluate the text more positively. Another model tested whether customizing the color of the webpage would suffice to influence intentions of visiting the website in the future. While the slope was in the expected direction, with those who selected the color indicating a slightly higher likelihood of visiting the website compared to those who did not customize, the gap between the two was not significant, ( $p > .05$ ) offering no support for H6.

Finally, in order to address the main research questions pertaining to self-persuasion, this study concludes with a mediation analysis, similar to that which was conducted in the two previous studies, employing Hayes' process Macro, model 6 for serial mediation. Effort was imputed as the predicting variable and post attitude as the outcome variable. Perceived freedom threat, text evaluations and labor valuation were imputed as the mediating variables, accordingly, as illustrated in figure 14. The model predicting perceived freedom threat was not significant ( $p$

=.29), indicating no meaningful influence of assembly effort on this outcome. The model regressing text evaluation was significant ( $t = 7.2$ ,  $p < .001$ ), with both assembly effort ( $p = .02$ ), and perceived freedom threat ( $p < .001$ ) significantly predicting evaluation. As would be expected, greater effort translated into higher evaluations, while greater perceived freedom threat predicted less favorable evaluations. The model regressing labor valuation was not significant ( $p = .091$ ), though text evaluation did emerge a significant positive predictor for valuation ( $p = .05$ ). Finally, for the outcome of post attitude toward sunscreen application, the model was significant ( $t = 9.25$ ,  $p < .001$ ). Both assembly effort ( $p = .004$ ), and perceived freedom threat ( $p = .006$ ), negatively predicted post attitudes, while text evaluation, positively predicted post attitudes ( $p < .001$ ). The total effect of the model was not significant. However,



**Figure 14.** Multiple mediation for the influence of Effort on Post Attitudes  
*Note.* \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , 95% confidence interval

the indirect effect via text evaluation was significant and positive, indicating that greater effort invested into the text assembly resulted in more positive evaluations of the text, which in turn, translated to a stronger agreement with the message conveyed in the text.

Next, a series of regression models tested the impact of the relevant control variables on post attitudes (See table 7 for detailed regression model results). Adding customization as a predicting variable did not alter the significance of the paths of influence. Negative emotions ( $p < .05$ ), and attachment ( $p < .001$ ) significantly influenced post attitudes, with those who experienced fewer negative emotions, as well as those who indicated greater attachment to the text, tending to report greater agreement with support for the message. Issue relevance was not a significant predictor of post attitudes ( $p > .05$ ). Unsurprisingly, pre-behavior was a significant predictor of post attitudes, with those who already tend to apply sunscreen frequently also indicating greater support for the benefits and importance of sunscreen application. Importantly, though, even after inclusion of pre-behaviors as a control variable, the influence of text evaluation on post-attitudes remained significant ( $p < .001$ ). Upon examining the demographic control variables, political ideology did not emerge as a significant predictor of post attitudes, unlike the results of Study 2. Gender and education did, however, emerge as significant predictors, female participants, and those with higher levels of education, tending to indicate greater support for the importance and benefits of sunscreen application.

In a final iteration, the models were replicated by replacing the outcome variable of post attitudes with behavioral intentions, pertaining to their likelihood of applying sunscreen on a daily basis in the future. Similar patterns emerged for behavioral intentions; however, the models were not significant, indicating that text assembly in this context was not sufficient for inducing a meaningful shift in behavioral intentions.

**Table 7**Regression models for **post attitudes** by text assembly and control variables – Study 3

	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	1.39*** (.35)	1.66*** (.39)	1.6*** (.41)	1.39*** (.324)	1.88*** (.39)
Assembly effort	-.148** (.051)	-.148** (.051)	-.161** (.051)	-.057 (.048)	-.122* (.051)
Freedom threat	-.089** (.033)	-.094** (.033)	-.061 (.034)	-.101*** (.03)	-.101** (.032)
Text evaluation	.763*** (.049)	.752*** (.049)	-.658*** (.052)	.574*** (.049)	.721*** (.049)
Valuation	.006 (.007)	.006 (.007)	.004 (.007)	.005 (.006)	.003 (.007)
Customization	--	-.123 (.084)	-.123 (.082)	--	--
Negative emotions	--	--	-.205* (.086)	--	--
Attachment	--	--	.216*** (.047)	--	--
Issue relevance	--	--	--	-.001 (.001)	--
Pre-behavior	--	--	--	.327*** (.03)	--
Political ideology	--	--	--	--	-.05 (.025)
Gender	--	--	--	--	-.372*** (.084)
Age	--	--	--	--	.006* (.003)
Education	--	--	--	--	.087*** (.026)
Adjusted R <sup>2</sup>	.385	.394	.453	.504	.421
<i>t</i>	9.25	8.31	7.43	9.31	7.01
<i>p</i>	.000	.000	.000	.000	.000

Note: n = 534, \*p < .05, \*\*p < .01, \*\*\*p < .001. Bootstrap = 5000, CI = 95%

## GENERAL DISCUSSION

The present dissertation sets out to investigate the potential application of the Ikea effect as a method for inducing attitude change within the domain of persuasive texts. The empirical investigation of this inquiry is approached through the lens of self-persuasion, guided by two primary objectives. First, it aims to ascertain whether the cognitive investment in text assembly elicits heightened valuation of said texts, analogous to the psychological processes associated with the assembly of consumer goods. Second, it seeks to evaluate the potential utility of the Ikea effect framework as a tool for self-persuasion. The empirical foundation of this project resides on four studies, encompassing a meta-analysis and three experiments. These studies serve the dual purpose of assessing the psychological processes moderating the impact of self-invested effort on valuation, and empirically scrutinizing the conceptual proposition regarding the relevance of the Ikea effect as a self-persuasion mechanism. The meta-analysis of the Ikea effect offers a comprehensive understanding of the phenomenon, shedding light on its boundary conditions, key aspects, major strengths as well as its inconsistencies. In doing so, it transcends its preliminary contribution by offering a resource to scholars interested in this aspect of economic psychology and marketing research as a whole. Additionally, it provides a steppingstone for the empirical studies conducted in this project by which we can progress to a broader academic landscape, bridging a gap between the domain of consumer behavior and the realms of communication and information processing. The studies presented here contribute to the extant literature by introducing an additional layer to our comprehension of the influence of effort and engagement on valuation. Importantly, they propose a potential utilization for the effect as a tool to capable of not only inducing attitude change but also influencing the underlying psychological processes related to persuasion. While Studies 1 and 2 test the proposed model, addressing the primary

research questions, Study 3 extends the scholarly discourse by examining potential boundary conditions and addressing issues raised in the preceding sections. This comprehensive examination seeks to clarify and explain the factors that may either enhance or inhibit the influence of self-invested effort on attitude change, thereby enriching the investigation of the Ikea effect in the context of persuasive texts and contributing to the literature of self-persuasion.

### **Key Findings and Theoretical Implications**

*RQ1.* The primary research question sought to ascertain whether the Ikea effect could manifest when the target product is a text rather than consumer goods. Findings across all three studies affirmatively indicate that the phenomenon can indeed operate with text as the self-assembled product. However, certain distinctions emerged between the initial student-sample studies and the subsequent comprehensive study with a representative sample. In studies 1 and 2, the assembly of a text from predetermined argument led participants to perceive their “editing” labor as more valuable than the labor of someone else who edited the text, particularly in terms of monetary valuation. However, when evaluating the text’s contents and structure, the data did not indicate assembly efforts resulted in more positive assessment. In fact, in Study 1, those who merely read the text without engaging in its assembly actually gave slightly more positive ratings compared to their assembling counterparts. In study 2 there was no significant difference in evaluations among participants from the different treatment groups. It is essential to mention that, on average, both builders and non-builders tended to rate the text on the positive side of the scale, indicating a general positivity in assessments. The discrepancy between the two forms of valuation is interesting because it stands contrary to the assumption that they would be interrelated. These results align with the literature on the IKEA effect, which posits that we tend to value products we actively assemble due to an inherent appreciation of our own labor and

time. Thus, even if we may think less of a product, we may still overvalue it merely because we invested ourselves into it.

However, insights from the final study prompt consideration of alternative explanations for this discrepancy. In study 3, the effort individuals invested into restructuring the paragraph significantly influenced their evaluation of the text. This suggests that the extent of effort invested into assembling a text, even when arguments are provided from an external source, can influence one's assessment of the message's qualities. Notably, in this study, the participants in the assembly conditions valued the editing labor more than those who only read the text, but there was no significant difference between the two assembly groups, suggesting that the extent of effort did not predict the monetary valuations for the editing labor. Rather, it was the evaluation of the text itself that correlated with monetary valuations, indicating that more positive text assessments resonated with higher monetary valuations. Thus, the persistence of disconnect between text evaluations and monetary valuations only among the student samples suggests a potential generational aspect influencing perceptions of labor and financial expectations. In summary, the response to the first research question is affirmative. These collective findings indicate that investing effort into assembling a text yields more positive assessments concerning the text's quality. Additionally, it leads to higher valuations of the labor involved in the text's creation, even when the arguments were not self-generated.

*RQ2.* The second research question guiding this project inquired whether invested effort into the assembly of a persuasive text would result in greater attitude change, and whether this relationship would be mediated via valuation. Once again, the three studies yielded different results. The data from the student-sample studies did not indicate that effort invested into assembling persuasive texts translated into greater advocacy for the arguments conveyed in the

text. In fact, Study 1 suggested a notable influence in the opposite direction, as participants who assembled the text tended to exhibit less agreement with the message compared to the control group. Rather than effort and evaluation, the main predictors of post attitudes in this data were preexisting attitudes, as well gender, and political ideology, with women, and stronger liberals showing more greater agreement with the message. In Study 2, text assembly did not influence post-attitudes, though it did influence perceived freedom threat, with those who engaged in the text assembly indicating less perceived threat compared to the control group. This is a notable finding in the realm of persuasion, as a diminished sense of threat to personal freedom of choice can mitigate self-guarding strategies such as reactance. The alleviation of perceived threat is a substantial obstacle to overcome in direct persuasion methods. These results suggest that engaging in the creation of the persuasive message, even when the arguments are not self-generated, may be sufficient to diminish the perception of an external source attempting to assert influence. Thus, even though there was no significant influence on attitudes, there was a significant influence on a key underlying mechanism of persuasion.

In contrast to Studies 1 and 2, the insights from Study 3 provide support for the hypothesized mediating relationship. Both the direct path from effort to post attitudes, as well as the indirect path via text evaluation were significant and aligned in the expected direction. Though the difference between the scores of the two builder groups (difficult and easy assembly, were not significant, they were both greater than the control group. Consequently, grounded in the findings of the concluding study, the answer to the second inquiry is also affirmative. Greater effort invested into the text assembly task resulted in greater evaluations of the text's qualities, which then translated into greater agreement with the persuasive message. The distinction in results between the concluding study and the two preceding studies warrants a deeper discussion

as it may be explained on both methodological and theoretical levels. First, in the final study the text was deconstructed in such a manner that there was only one possible solution which could be read correctly from front to end. This eliminated frustrations associated with a seemingly correct solution not being accepted. While in the preceding studies only one solution was accepted, there were potentially two other solutions that could be considered grammatically correct, even though the logical flow was weaker. This may have resulted in frustration among participants who were denied a seemingly correct submission. A second major difference is that embedding the text within a health information website may have bestowed a pragmatic utility on the text which was lacking in the two initial studies. In other words, it is more readily perceived as a product, rather than a mere black on white text. This change also offered the text and website a characteristic of utility which could have further enhanced the sense of contribution among the participants. Third, the variance in results may also be explained by the composition of the samples, in combination with the topic of the persuasive text. The student samples are more homogenic with regards to education and healthcare-practices. Furthermore, as they are younger and tend to be healthier, the topic of self-care and health issues may not be of great importance or consequence to them compared to the older, and more representative sample. This extends the discussion beyond the immediate focus of exploring the primary research questions, as it also sheds light on a broader consideration of the suitability and unsuitability of using student samples for certain research endeavors. On some topics there may be less variance in responses due to certain homogeneity and convergence of values, education level, worldviews, and shared experiences.

*Expression versus Engagement.* While the primary objective of this research endeavor was to evaluate the practical utilization of the Ikea effect framework as a method for inducing

attitude change, the empirical studies presented here offer a gateway to a broader theoretical exploration of the underlying psychological mechanisms inherent to self-persuasion. Classic studies on self-persuasion attribute the efficacy of these methods to the active engagement in role-playing and the formulation of self-generated arguments. In addition to the well documented benefits of self-tailored messages and inhibition of self-guarding strategies, the success of self-persuasion stems from people genuinely contemplating arguments that support the opposing viewpoint. However, in the concluding study, individuals who reconstructed a paragraph from pre-given arguments also indicated greater attitude alignment with the arguments. Thus, one of the unique contributions of the current research to the existing literature is that, under certain conditions, consideration of the alternative perspectives can occur even when the arguments are provided by an external source. This notion could be expanded to a distinction between expression and engagement. Within traditional self-persuasion techniques, the act of generating one's own arguments may be considered a form of expression. In the context of self-persuasion, individuals often partake in the process of constructing their own arguments or reasons to support a particular perspective or belief. This act of self-generation is likened to a mode of expressing one's thoughts, opinions, or rationale, emphasizing the active and personal nature of the persuasive process. Conversely, the act of assembling a text from externally sourced arguments represents a different method of influence, which centers on engagement rather than expression. It challenges individuals to comprehend the content in order to reconstruct it, without the process of producing arguments in favor of the issue or seeking counter arguments to refute the message. This distinction invites a deeper exploration of the cognitive processes underlying attitude change within the realm of self-persuasion, especially contexts that invite engagement with alternative or opposing opinions that, simultaneously, do not trigger self-guarding strategies

*Perceived influence versus actual influence.* In all three studies, evaluation of the text was a significant predictor of attitude alignment with the message conveyed in the text. The relationship between perceived message strength and agreement with a message can vary, and it often depends on factors such as subjective differences in values and knowledge, the nature of the message, and the context in which one is exposed to the information. Research on persuasion and attitude change suggests that both directions of influence can occur. It is possible that individuals first perceive a message as strong, credible, or persuasive. This positive perception can then lead to agreement or acceptance of the message. This aligns with the idea that people are more likely to be persuaded by messages they perceive as well-reasoned, credible, or compelling. On the other hand, individuals may initially agree with a message, and this agreement can subsequently influence their perception of the message's qualities. The act of agreeing with a message may lead individuals to view it more positively, reinforcing the perception of its strength. Since we cannot concretely determine the order of influence between these two factors, one could potentially argue that the path of influence may be in the complementary direction, suggesting that greater agreement with the message resulted in a more positive evaluation of the text. However, a series of studies by Dillard et al., (2007) concerning fear appeals demonstrated more support for the influence of perceived message effectiveness on actual effectiveness in terms of attitude change, offering more support for the path of influence tested in these models. In practice, both directions are likely to occur in different situations. The interplay between perceived strength and agreement is complex and can be influenced by various psychological and contextual factors. Thus, it is imperative to account for potential factors, such as preexisting attitudes and tendencies, as well as prior knowledge on the issue of conflict.

## **Study Limitations and Directions for Future Research**

*Classic self-persuasion methods.* A peripheral goal of this study was to compare the IKEA effect method of text assembly with that of direct persuasion, or in other words, engaged versus passive conditions. However, none of the studies compare the results of text assembly to a classic self-persuasion condition. Traditional self-persuasion studies which request subjects to generate their own arguments by listing arguments, writing an essay, or attempting to persuade another individual, tend to integrate engagement and argument production in a single bundle. The model in this study manipulates engagement and effort by asking participants to reconstruct a persuasive paragraph from pre-given arguments. Thus, this model design has the potential to separate effort from the act of self-generation of arguments, which would enable scholars to compare between the two and assess which has a greater impact on attitude change. If, as this dissertation claims, employing the IKEA effect with texts can offer a mid-point between direct persuasion and self-persuasion methods, then it is imperative to conduct such a comparison. However, the studies in this manuscript did not include a condition in which subjects self-generated their own arguments, thus such a comparison cannot be conducted. A future study could easily replicate the experimental design and incorporate an additional condition in which participants are asked to write a short paragraph or list arguments in favor of daily sunscreen application, or any other issue of debate, and compare post attitudes between conditions of self-generated versus self-assembled persuasive texts. Such a comparison would contribute to the self-persuasion literature by disentangling two theoretically confounded variables. This would also enable scholars to compare the results between the three groups and indicate how the proposed model fares relative to traditional self-persuasion methods versus direct persuasion methods.

*Low variance and Ceiling effects.* Even though the data indicated support for some of the assumptions, and there were a number of interesting significant findings, it is notable that there was little variance for many of outcome variables and the models only explained a small portion of that variance, especially in studies 1 and 2. There are a few potential explanations for these results which could easily be addressed in future studies. Namely, the healthcare issues selected for the studies are not highly controversial. Most people tend to have a relatively positive attitude toward both of the healthcare treatments and, if asked, would likely claim that it is important and beneficial to apply sunscreen and floss daily. Whether they actually floss and apply sunscreen is another question. To resolve this matter, future studies can employ one of three potential solutions. First, they should consider testing lesser-known healthcare practices or topics with which participants are less familiar. It is easier to influence attitudes when they are less formulated, and the individual does not have much experience with or knowledge of them. Attitudes toward lesser-known topics tend to be more susceptible to influence due to factors such as limited prior knowledge and reduced cognitive dissonance. Individuals often have less formulated attitudes on these topics, providing a greater receptivity to external information and persuasive messages. The absence of well-established beliefs reduces resistance to change, rendering attitudes more flexible. Additionally, social influence dynamics also play a role because lesser-known topics lack established social norms, further rendering individuals more open to external information. The current studies were able to nudge attitudes on well-known and socially accepted practices using this method, thus if we were to witness greater attitude change with lesser-known topics it would serve as further testimony to its potential utility.

Alternatively, subsequent research could use the same healthcare topics but advocate for the opposing stance, highlighting the negative aspects of applying sunscreen or flossing teeth.

The stimuli employed in the present studies exclusively presented arguments in favor of the two healthcare practices. As noted above, these arguments likely aligned with the pre-existing attitudes of the participants, which resulted in a ceiling effect, as it is difficult to shift attitudes to greater support when they are already near the positive pole of the scale. Thus, to elicit more significant attitude change, future studies might consider presenting arguments that emphasize potential harm associated with the healthcare products, such as the presence of benzene and other carcinogens in the components of sunscreens, or the usage of plastics in traditional dental floss products. By presenting arguments that challenge pre-existing attitudes, the model could potentially enhance its effectiveness in inducing attitude change, avoiding near-ceiling effects that emerged in the data sets. Albeit, while seeking to assert greater power for this potential method of influence, it is worth noting that even incremental shifts toward promoting better self-care, should be acknowledged as meaningful achievements, underscoring the potential impact of this method of influence.

*Artificiality and generalizability.* While the findings from the three studies present promising insights, this line of research would benefit from the development of a more pragmatic methodology for the application of the IKEA effect framework beyond controlled experimental environments. The ability to translate findings from empirical studies into practical applications for the real world holds paramount importance. Although empirical research provides valuable insights within controlled settings, its true impact is realized when these findings are made applicable and relevant to address real-world challenges, particularly in domains such as healthcare and education. The current design provided a tightly controlled environment to investigate the interplay between the invested effort and persuasive texts. While the selected design focused on isolating the participants' engagement with the text—an integral aspect of the

study—it introduced a measure of artificiality inherent in the text-assembly task. This task, involving the assembly of paragraphs from predetermined arguments, akin to constructing a puzzle, adhered to the IKEA effect framework, but simultaneously, sacrificed the authenticity of natural argumentation reducing its external validity. Specifically, the task failed to capture the complexity and spontaneity characteristic of persuasive processes in everyday communication, and it is improbable that individuals would encounter such a task outside of the lab setting.

While the controlled manipulation facilitated the focused exploration, the absence of a real-world analog for the text assembly task hinders the pragmatic utilization of the findings. Presenting such a complex and time-consuming task within contemporary communication outlets would be both unnatural, and impractical. Thus, future research seeking to refine this method should aim to simplify the task with practical considerations such as the complexity and time constraints, as well as embedding the assembly task in a more natural venue. One possibility for simplifying the task could be significantly shortening the text. Rather than requiring participants to reconstruct a full paragraph, they could be presented with a single argument with scrambled word order. Alternatively, the design could be adapted from the original pilot, where participants filled in missing words. This adaptation would render the method more feasible for integration into a social media post or even a poster, aligning with the approaches employed in recent studies on self-persuasion and open-ended questions (e.g., Loman, 2018;2019; Müller, 2016).

An alternative approach to mitigating the inherent artificiality in the current design involves the development of a distinct form of text assembly, potentially deviating from the IKEA effect framework and exploring alternative strategies to engage individuals with predetermined arguments. Future research endeavors could delve into methodologies that strike a balance experimental control and tasks that authentically reflect natural information processing.

The incorporation of tasks that allow for some participant-driven expression may enhance the external validity of the findings. For instance, rather than assembling a text akin to a puzzle, participants could select the arguments from an argument pool and craft the paragraph themselves. Alternatively, they could be tasked with ordering the arguments based on importance. In both of these scenarios, the arguments are provided from an external source, but participants gain agency in the construction process, allowing for a measure of subjective preference and self-expression, which would offer a more authentic engagement with the persuasive content. This would also add to the discussion on the continuum between engagement and self-expression, both of which play a role in processes relating to persuasion.

*Cause for negative affect.* A potential limitation of this study pertains to the measurement of negative affect, particularly as it related to the emotional component of reactance as outlined in the framework proposed by Dillard and Shen (2005). Reactance theory posits that individuals are inclined to restore their freedom of choice when they perceive a threat to that freedom. Such perceived threats can elicit a negative emotional response that serves as an alert signal to the potential infringement on one's freedom. In the context of Study 3, participants were asked with rating the extent to which they experienced feelings of anger, frustration, and irritation during the process of assembling and/or reading the text. However, the measurement that was employed did not differentiate between negative emotions arising from reading the text and those stemming from frustration in irritancy associated with the text assembly task. Consequently, it remains indeterminant whether the stated level of negative emotions primarily resulted from frustration induced by the task or prompted by the content of the message itself, representing a crucial distinction associated with the reactance component. A future study aiming to further investigate reactance and assess the extent to which such an assembly task mitigated perceived threats to

freedom of choice should refine the measurement to disentangle these two potential causes, ensuring greater clarity in the evaluation and consequences of the emotional response. The data may provide insight into this debate, given that participants in the difficult assembly condition tended to report slightly lower levels of negative emotions compared to those in the easy assembly condition. This outcome is particularly noteworthy considering that the difficult assembly would likely elicit greater frustration associated with the task. The observed discrepancy in reported negative emotions suggests that they stemmed from the perceived threat to freedom of choice. This finding warrants further examination as it may contribute to the discourse surrounding the nuanced relationship between task difficulty and emotional response.

A related potential issue inquires whether the stimuli and design actually manipulated engagement with the text. Indeed, there was a certain extent of cognitive effort invested into the reordering of the arguments, however, was that sufficient in order to engage individuals with the text to produce a meaningful shift in attitudes? A simple way to assess whether individuals engaged with the text would be to measure their memory by conducting a simple recall assessment on issues mentioned in the text, or asking them to write the text from memory

*Boundary conditions and potential moderators.* Finally, to further examine the compatibility of the IKEA effect in the realm of persuasive texts, it is imperative to investigate the phenomenon's boundary conditions. Evaluating whether factors that shape or hinder the IKEA effect in consumer goods extend to text assembly enhances the potential utility of this model for self-persuasion. One of the primary objectives underpinning this study was to assess the interplay between text assembly, text evaluation and attitude change. While the current investigation systematically examined select potential moderators, including emotional attachment, the experience of negative emotions, perceived freedom threat, it is important to

acknowledge the existence of an extensive array of potential moderators and underlying mechanisms that may further outline the boundary conditions surrounding the Ikea effect and self-persuasion. Due to inherent constraints within the study scope, a comprehensive exploration of all the conceivable mechanisms and moderators was unfeasible. Future research endeavors seeking to expand and build upon these findings are encouraged to examine additional mechanisms that were outlined in the meta-analysis of the Ikea effect and in the review of self-persuasion literature. For instance, a noteworthy joint underlying mechanism is the experience of cognitive dissonance, a psychological phenomenon that has been suggested to result in attitude change under certain circumstances. However, the topics employed in the current study may not have been sufficiently controversial as to evoke the discomfort associated with dissonance. To address this, a future study intent on eliciting cognitive dissonance could select more contentious issues rather than healthcare practices. It may be the case that dissonance did play a role in attitude change for participants due to the fact that the task itself was meaningless or boring, yet they invested time and effort, leading them to perceive the fruit of their labor and as more valuable. However, due to constraints of the study scope, the experience of dissonance was not empirically assessed. A future research endeavor could assess preexisting attitudes toward specific issues and explicitly prompt those participants to assemble a text that conflates their established worldview, increasing the likelihood that participants experience cognitive dissonance as a result from the position they “advocated” for. Furthermore, future research could delve into the potential influence of an audience or lack thereof on the self-persuasion process. The awareness of an audience may intensify concerns related to external judgment and scrutiny of one’s actions and words, thereby adding supplementary layers to the dynamics of self-persuasion. Another example could focus on self-concept which is a key mechanism as the

IKEA effect has only been found to occur under successful completion. In their original study, Norton et al., (2012), when subjects were prevented from completing the product assembly, or were instructed to deliberately destroy their creation, the phenomenon did not occur. Their findings suggest that these higher estimates are associated with higher levels of self-concept and feelings of accomplishment. Thus, future studies could manipulate this factor by introducing a random “failure” or “success” notification after participants submit their text, or perhaps adding a time limit in which some people do not succeed to reconstruct the original paragraph in time.

From another aspect, the three studies primarily focused on aspects related to western cultures, specifically North America. Pursuing this line of research with a comparison of cultural divergences would be of scholarly significance. More explicitly, the meta-analysis on the Ikea effect yielded non-significant difference across cultures and geographical regions. Nevertheless, extant research indicates to the differences in the efficacy of self-persuasion and the experience of cognitive dissonance between Western and Eastern cultures, specifically outlining the dynamics within individualistic and collectivistic cultures. Thus, it would be of empirical interest to examine whether cultural nuances exert influence on the relationship between effort, engagement, and persuasion. Comparative studies across diverse cultures can unveil whether the Ikea effect would manifest and guide persuasive approaches for specific cultural contexts.

To conclude, the theoretical implications of the research presented here extend beyond the immediate focus of the Ikea effect, prompting considerations for overlapping underlying psychological mechanisms of self-persuasion. This dissertation, which is anchored in the Ikea effect framework, transcends traditional consumer psychology into communication studies, and invites a continued exploration of the nature of self-persuasion with a broader interdisciplinary approach.

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\* *Note.* An asterisk precedes references that were included in the meta-analysis of Chapter 1

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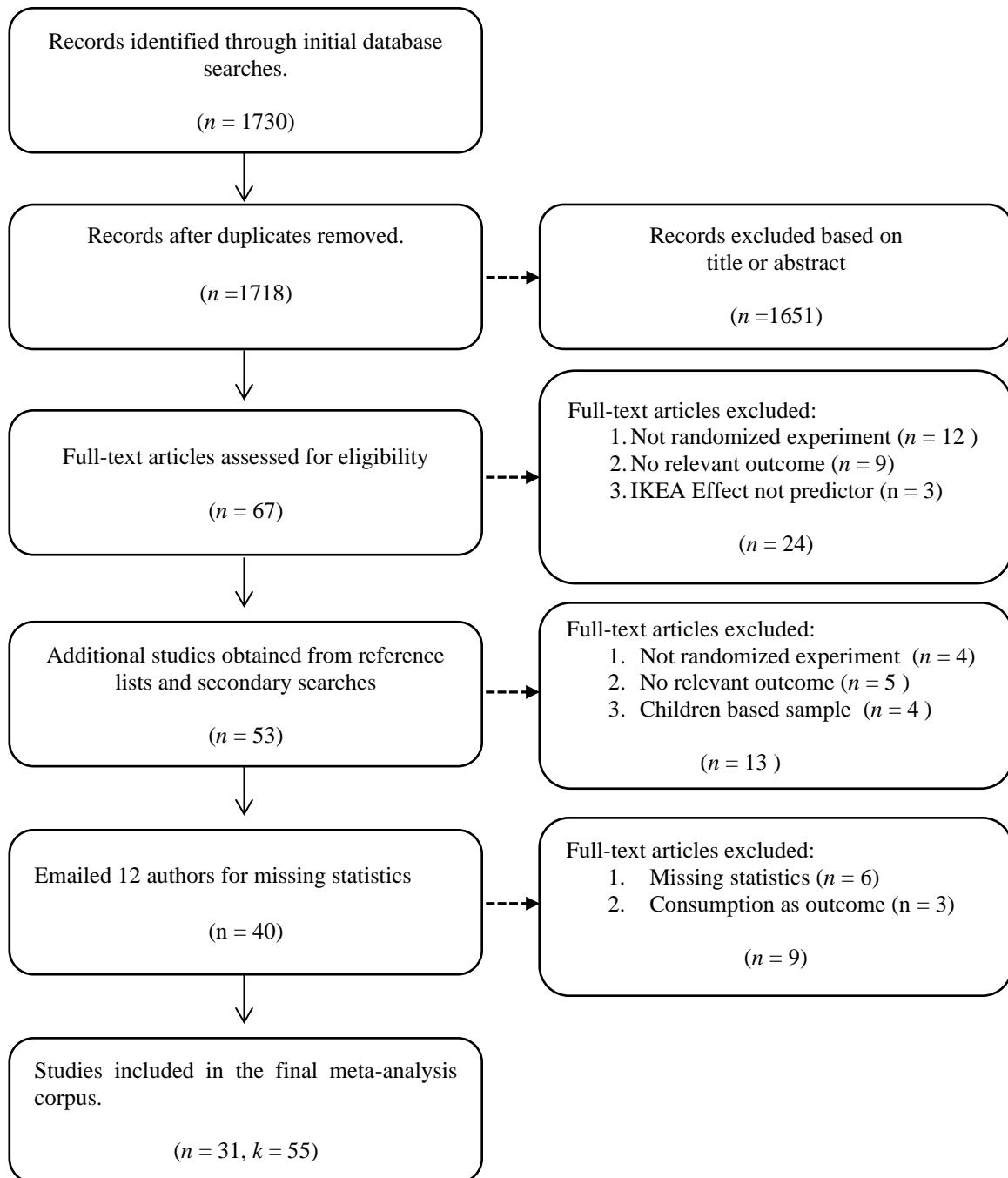
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## Appendix

## Appendix 1.A.

Figure 15. Search strategy flow-chart



## Appendix 1.B

**Table 8**

Codebook for meta-analysis

<b>Identifiers</b>		
Study ID #		
Study title		
Authors		
Year		
<b>Main Outcome</b>		
Var 2	Value Outcome	1 = monetary value <ul style="list-style-type: none"> <li>• estimated value.</li> <li>• willingness to pay (WTP)</li> <li>• willingness to accept (WTA)</li> </ul> 2 = ranked value (e.g., Likert like scale) 3 = consumption
<b>Effort manipulation</b>		
Var 3	customization	1 = builders assembled the product 2 = builders designed the product 3 = both assembled and designed
Var 4	Freedom of choice	Builder groups had a different number of choice options
<b>Product</b>		
Var 5	Tangible design	0 = design/assemble product digitally 1 = design/assemble product physically
Var 6	Tangible Final	0 = No physical final product (all digital) 1 = participants received a physical final product
Var 7	Usage type	1 = more utilitarian 2 = more hedonic <ul style="list-style-type: none"> <li>• based on Voss hedonic/utilitarian scale</li> </ul>
<b>Moderators – if measured in the study code 1, if not code 0</b>		
Var 8	liking	Includes: Liking, preference fit
Var 9	Consumption	

Var 10	Ownership/ attachment	Includes: Perceived ownership, psychological ownership
Var 11	competence	Includes: Competence, pride, accomplishment, self-affirmation
<b>Sample</b>		
Var 12	Population	0 = general population 1 = students (academic) 2 = children (k12)
Var 13	Size	
Var 14	Region	1= North America; 2 = West Europe; 3 = Oceania; 4 = East Asia; 5 = Other
Var 15	Mean age	

*Note for Codebook.* Initially, we coded for consumption as an additional outcome variable, and conducted a separate model to test the influence of effort on consumption. Several studies examined food as a self-made product and measured its valuation based on consumption rather than a monetary estimate or product evaluation (e.g., Monnier et al., 2022; REFER). Consumption of food, however, does not necessarily indicate a greater perceived value, as consumption may be influenced by different factors such as cravings, coping mechanisms, taste, and personal preferences, thus, consumption may be more akin to usage rather than an indicator of perceived product value. One study also measured perceived naturalness (Dohle, Rall & Siegrist 2014), and another assessed caloric perception (Lefebvre & Orłowski, 2020), both of which could potentially serve as indicators for positive assessment of the food as healthier, but these do not necessarily translate into greater valuation. People may consume junk food or unhealthy food despite knowing it is not nutritious. After tightening the inclusion criteria, we decided to remove studies that only tested consumption as an outcome variable, to avoid comparing apples to oranges. Our omission of studies that only tested consumption as the main outcome variable does not indicate that the IKEA Effect is not relevant for food products, but rather it indicates the need to develop a systematic work-frame for future studies to follow. The outcome variables of food related studies were varied, as, some tested for consumption or liking of the food, others tested for caloric perception, perceptions of portion and food desirability. In order to compare these, future studies should consider a consistent set of measures that are potentially more aligned with the IKEA Effect assumptions, as consumption in itself is not parallel to valuation as an outcome.

## Appendix 2.A.1

**Table 9**

Regression models for **post attitudes** by text assembly and control variables – Study 1

	Model 1	Model 2	Model 3	Model 4
Constant	6.14*** (.105)	5.04*** (.724)	7.49 (.356)	3.347 (.777)
Text Assembly	-.261* (.149)	-.18 (.147)	-.146 (.139)	-.036 (.121)
Freedom threat	--	-.172** (.061)	-.142* (.061)	-.143** (.053)
Text Evaluation	--	.319** (.121)	.306** (.116)	.23* (.101)
Valuation	--	.006 (.013)	.002 (.012)	-.000 (.011)
Political ideology	--	--	-0.65 (.063)	-.025 (.055)
Gender	--	--	-.725*** (.175)	-.318 (.162)
Issue relevance	--	--	.039 (.143)	.11 (.124)
Pre-attitude	--	--	--	.392*** (.055)
Adjusted R <sup>2</sup>	.014	.117	.214	.409
<i>t</i>	1.76	2.46	2.59	3.77153
<i>p</i>	.000	.000	.000	.000

Note: n = 153, \*p < .05, \*\*p < .01, \*\*\*p < .001. Bootstrap = 5000, CI = 95%

## Appendix 2.A.2

**Table 10**

Regression models for **text evaluation** by text assembly and control variables – Study 1

	Model 1	Model 2	Model 3	Model 4
Constant	5.144*** (.069)	5.641*** (.167)	5.978*** (.27)	5.52*** (.447)
Text Assembly	-.25* (.098)	-.22* (.098)	-.207* (.098)	-.188 (.099)
Freedom threat	--	-.131** (.04)	-.102* (.042)	-.101* (.043)
Valuation	--	-.007 (.009)	-.006 (.009)	-.006 (.009)
Political ideology	--	--	-.068 (.045)	-.061 (.045)
Gender	--	--	.026 (.125)	.086 (.133)
Issue relevance	--	--	-.182 (.101)	-.17 (.101)
Pre-attitude	--	--	--	.058 (.045)
Adjusted R <sup>2</sup>	.034	.092	.105	.109
<i>t</i>	2.54	2.45	1.97	1.89
<i>p</i>	.012	.000	.001	.001

Note: n = 153, \*p < .05, \*\*p < .01, \*\*\*p < .001. Bootstrap = 5000, CI = 95%

## Appendix 2.A.1

**Table 11**

Regression models for **post attitudes** by text assembly and control variables – Study 2

	Model 1	Model 2	Model 3
Constant	6.03*** (.122)	4.38*** (.804)	5.46*** (.866)
Text Assembly	-.232 (.177)	-.247 (.187)	-.223 (.179)
Freedom threat	--	-.116 (.087)	-.092 (.086)
Text Evaluation	--	.375** (.115)	.312** (.113)
Valuation	--	-.005 (.019)	-.006 (.018)
Political ideology	--	--	-.145* (.068)
Gender	--	--	-.410* (.205)
Issue relevance	--	--	.046 (.138)
Adjusted R <sup>2</sup>	.131	.133	.222
<i>t</i>	1.31	2.15	2.17
<i>p</i>	.193	.002	.000

Note: n = 95, \*p < .05, \*\*p < .01, \*\*\*p < .001. Bootstrap = 5000, CI = 95%

## **Appendix 2.B.1**

Persuasive text for stimuli – pilot 1 & 2

### **Sunscreen Application**

Daily application of sunscreen, even on cloudy days, can dramatically decrease your risk of developing skin cancer. By wearing sunscreen, you are reducing ultraviolet exposure, which is the main cause of skin damage such as aging, wrinkling, and loss of elasticity, as well as skin cancer such as melanoma and carcinoma. Furthermore, studies show that sunscreen is important for all skin types. Although skin cancer is more prevalent in people with lighter skin, it can still affect those with darker skin. Remember that a sunburn is an immediate reaction, but critical sun damage accumulates over a lifetime.

### **Covid-19 Vaccine**

Getting vaccinated for COVID-19 is an important practice with several health benefits. By getting vaccinated you are reducing your likelihood of getting or spreading the COVID-19 virus. Furthermore, if you do get infected, then you are far less likely to develop severe symptoms. Many aren't aware that COVID-19 can affect people of all ages. Though it is more dangerous for risky populations such as older and ill people, it can still affect those who are young and in good health. A final point to remember that the vaccine is safe and side effects are unlikely. A final point to remember is that side effects are temporary, and thus are better than long-term damage from the disease itself.

### **Flossing Teeth**

Flossing regularly can dramatically reduce your risk for cavities and gum disease. By flossing your teeth, you are scraping excessive plaque, which is known to contribute to inflamed, bleeding, and painful gums. Furthermore, studies show that flossing is beneficial for most people. This is because although only 30% of the population may be genetically susceptible to gum disease, the other 70% can still develop gum disease if plaque builds up over time and inflammation is left untreated. Therefore, it is important to maintain a daily flossing routine in order to sustain a healthy smile that will last a lifetime.

## **Appendix 2.B.2**

Persuasive text for stimuli – Study 2

### **Sunscreen**

#### *Full paragraph*

Daily application of sunscreen, even on cloudy days, can dramatically decrease your risk of developing skin cancer. By wearing sunscreen, you are reducing ultraviolet exposure, which is the main cause of skin damage such as aging, wrinkling, and loss of elasticity, as well as skin cancer such as melanoma and carcinoma. Furthermore, studies show that sunscreen is important for all skin types. Although skin cancer is more prevalent in people with lighter skin, it can still affect those with darker skin. Remember that a sunburn is an immediate reaction, but critical sun damage accumulates over a lifetime.

#### *Assemble condition*

- Although
- skin cancer is more prevalent in people with lighter skin, it can still affect those with darker skin.
- Remember that a sunburn is an immediate reaction, but critical sun damage accumulates over a lifetime.
- Daily application of sunscreen, even on cloudy days, can dramatically decrease your risk of developing skin cancer.
- By wearing sunscreen, you are reducing ultraviolet exposure, which is the main cause of skin damage such as aging and wrinkling.
- Furthermore,
- studies show that sunscreen is important for all skin types.

### Appendix 3.A

#### Stimuli material for easy and difficult conditions - Study 3

##### *Read/Control Group (Direct persuasion)*

Daily application of sunscreen, even on cloudy days, can dramatically decrease your risk of developing skin cancer. By wearing sunscreen, you are reducing ultraviolet exposure, which is the main cause of skin damage such as aging, wrinkling, and loss of elasticity, as well as skin cancer such as melanoma and carcinoma. Furthermore, studies show that sunscreen is important for all skin types. Although skin cancer is more prevalent in people with lighter skin, it can still affect those with darker skin. Finally, remember that a sunburn is an immediate reaction, but critical sun damage accumulates over a lifetime.

##### *Assemble- easy (IKEA effect 1)*

- skin cancer. By wearing sunscreen, you are reducing ultraviolet exposure, which is the main cause of skin damage such as aging, wrinkling, and loss of elasticity, as well as
- Daily application of sunscreen, even on cloudy days, can dramatically decrease your risk of developing skin cancer such as melanoma and carcinoma. Furthermore,
- remember that a sunburn is an immediate reaction, but critical sun damage accumulates over a lifetime.
- studies show that sunscreen is important for all skin types. Although skin cancer is more prevalent in people with lighter skin, it can still affect those with darker skin. Finally,

##### *Assemble-difficult (IKEA Effect 2)*

- skin cancer. By wearing sunscreen, you are reducing ultraviolet exposure, which is the main cause of skin damage such as aging, wrinkling, and loss of elasticity, as well as
- Daily application of sunscreen, even on cloudy days, can dramatically decrease your risk of developing
- remember that a sunburn is an immediate reaction, but critical sun damage accumulates over a lifetime.
- skin cancer such as melanoma and carcinoma. Furthermore,
- skin cancer is more prevalent in people with lighter skin, it can still affect those with darker skin. Finally,
- studies show that sunscreen is important for all skin types. Although

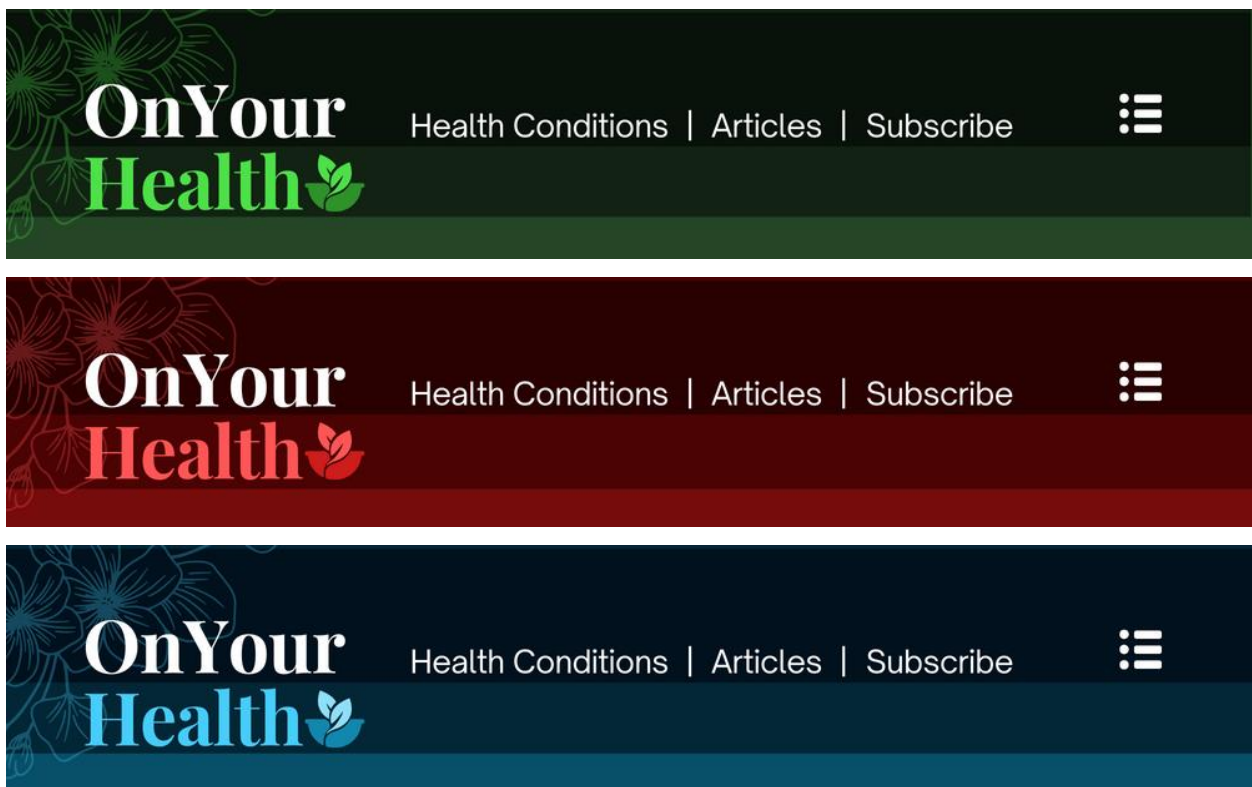
### Appendix 3.B

Three color scheme choices for website - customization manipulation



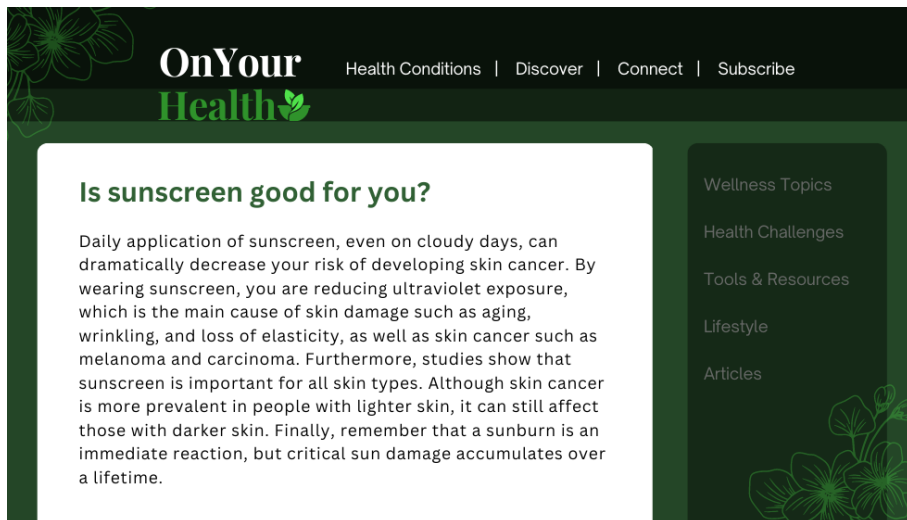
### Appendix 3.C

Website top banner based on the color scheme selection.



## Appendix 3.D

### Mock web page

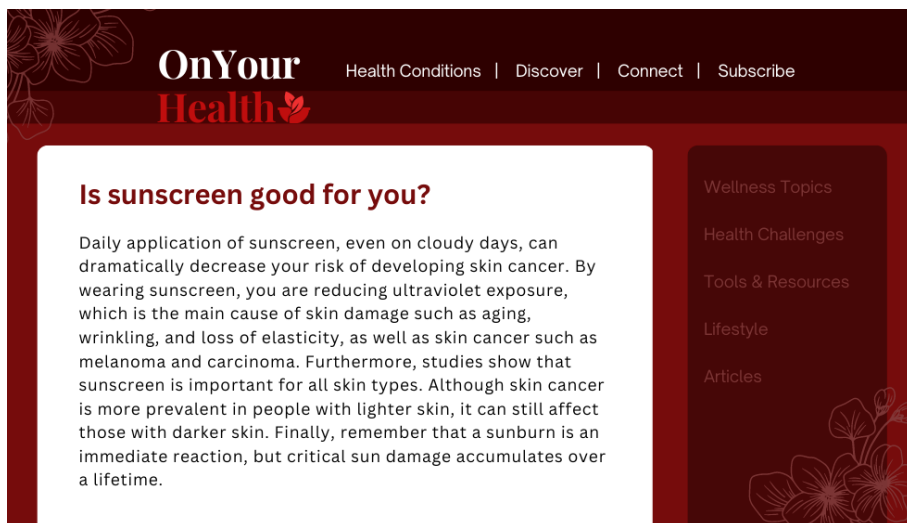


**OnYour Health** Health Conditions | Discover | Connect | Subscribe

### Is sunscreen good for you?

Daily application of sunscreen, even on cloudy days, can dramatically decrease your risk of developing skin cancer. By wearing sunscreen, you are reducing ultraviolet exposure, which is the main cause of skin damage such as aging, wrinkling, and loss of elasticity, as well as skin cancer such as melanoma and carcinoma. Furthermore, studies show that sunscreen is important for all skin types. Although skin cancer is more prevalent in people with lighter skin, it can still affect those with darker skin. Finally, remember that a sunburn is an immediate reaction, but critical sun damage accumulates over a lifetime.

- Wellness Topics
- Health Challenges
- Tools & Resources
- Lifestyle
- Articles

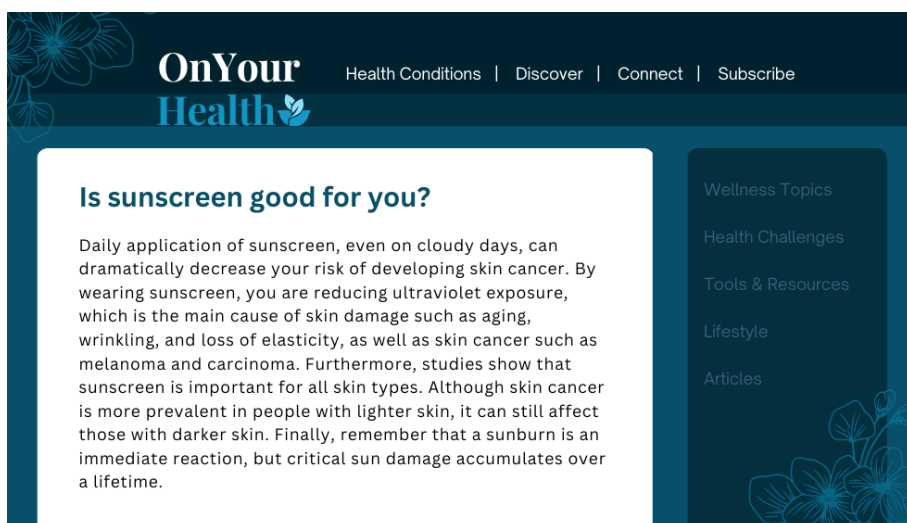


**OnYour Health** Health Conditions | Discover | Connect | Subscribe

### Is sunscreen good for you?

Daily application of sunscreen, even on cloudy days, can dramatically decrease your risk of developing skin cancer. By wearing sunscreen, you are reducing ultraviolet exposure, which is the main cause of skin damage such as aging, wrinkling, and loss of elasticity, as well as skin cancer such as melanoma and carcinoma. Furthermore, studies show that sunscreen is important for all skin types. Although skin cancer is more prevalent in people with lighter skin, it can still affect those with darker skin. Finally, remember that a sunburn is an immediate reaction, but critical sun damage accumulates over a lifetime.

- Wellness Topics
- Health Challenges
- Tools & Resources
- Lifestyle
- Articles



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### Is sunscreen good for you?

Daily application of sunscreen, even on cloudy days, can dramatically decrease your risk of developing skin cancer. By wearing sunscreen, you are reducing ultraviolet exposure, which is the main cause of skin damage such as aging, wrinkling, and loss of elasticity, as well as skin cancer such as melanoma and carcinoma. Furthermore, studies show that sunscreen is important for all skin types. Although skin cancer is more prevalent in people with lighter skin, it can still affect those with darker skin. Finally, remember that a sunburn is an immediate reaction, but critical sun damage accumulates over a lifetime.

- Wellness Topics
- Health Challenges
- Tools & Resources
- Lifestyle
- Articles

## Appendix 3.E

### Questionnaire study 3

#### Qualtrics questionnaire - On Your Health

---

Start of Block: consent

---

Start of Block: demographic screeners

What is your birth year?

▼ 2007 (77) ... 1939 (530)

*Skip To: End of Block If What is your birth year? = 2006*

*Skip To: End of Block If What is your birth year? = 2007*

English Are you fluent in English

- Yes (Highly fluent) (1) ,
- Moderately fluent (2)
- No (3)

End of Block: demographic screeners

---

Start of Block: preBehave

preBehaveInstruct

In the first section you will be asked about your personal practices. There are no right or wrong answers. Select the answer that is closest to yours.

Click NEXT to begin.

preBeFlo How often do you floss your teeth on average?

- Never (0)
- Multiple times a day (5)

---

preBeSun How often do you apply sunscreen on average?

- Never (0)
- Multiple times each day (5)

preBeVeg How often do you eat vegetables?

- Never (0)
- During every meal (5)

End of Block: preBehave

---

Start of Block: dpSun 1

instructS

On the next page you will read a short paragraph concerning a random health issue, from the website *On Your Health*

**Read the paragraph thoroughly.**

**You will answer questions about this paragraph in the following sections of the survey.**

Click "next" once you are ready to begin.

1articleGreen **Why sunscreen is good for you!**

Daily application of sunscreen, even on cloudy days, can dramatically decrease your risk of developing skin cancer. By wearing sunscreen, you are reducing ultraviolet exposure, which is the main cause of skin damage such as aging and wrinkling, as well as skin cancer such as melanoma and carcinoma. Furthermore, studies show that sunscreen is important for all skin types. Although skin cancer is more prevalent in people with lighter skin, it can still affect those with darker skin. Finally, remember that a sunburn is an immediate reaction, but critical sun damage accumulates over a lifetime.

Start of Block: dpSunDesign 2

Customize - In your opinion, which color scheme would be a good fit for a health-information website?

Select your preference from the three options, then click next.

- Green (1)
- Blue (2)
- Red (3)
- 

instructSD

On the next page you will read a short paragraph concerning a random health issue, from the website *On Your Health*, in the color scheme that you selected.

**Read the paragraph thoroughly.**

**You will answer questions about this paragraph in the following sections of the survey.**

Click "next" once you are ready to begin.

Page Break

---

instructSH

On the next page you will read a scrambled paragraph concerning a random health issue from the website *On Your Health*.

**Your task is to reorder the sentences back into a logical paragraph.**

**Important:** You can only proceed after the paragraph is constructed correctly. You have as many attempts as you need. Click "next" once you are ready to begin.

orderSH

Drag and reorder the items below to recreate the original paragraph

- skin cancer such as melanoma and carcinoma. Furthermore, (1)
- Although (11)
- skin cancer. By wearing sunscreen, you are reducing ultraviolet exposure, which is the main cause of skin damage such as aging and wrinkling, as well as (12)
- Daily application of sunscreen, even on cloudy days, can dramatically decrease your risk of developing (2)
- Finally, remember that a sunburn is an immediate reaction, but critical sun damage accumulates over a lifetime. (9)
- studies show that sunscreen is important for all skin types. (3)
- skin cancer is more prevalent in people with lighter skin, it can still affect those with darker skin. (4)

Start of Block: ikeaSunEasy 5

instructSE On the next page you will read a scrambled paragraph concerning a random health issue from the website *On Your Health*.

**Your task is to reorder the sentences back into a logical paragraph.**

**Important:** You can only proceed after the paragraph is constructed correctly. You have as many attempts as you need. Click "next" once you are ready to begin.

orderSE

Drag and reorder the items below to recreate the original paragraph

- skin cancer. By wearing sunscreen, you are reducing ultraviolet exposure, which is the main cause of skin damage (12)
- Daily application of sunscreen, even on cloudy days, can dramatically decrease your risk of developing (2)
- skin. Finally, remember that a sunburn is an immediate reaction, but critical sun damage accumulates over a lifetime. (9)
- such as aging and wrinkling, as well as skin cancer such as melanoma and carcinoma. Furthermore, studies show that sunscreen is important (3)
- for all skin types. Although skin cancer is more prevalent in people with lighter skin, it can still affect those with darker (4)

successSE

**Success!**

**You have constructed the paragraph correctly**

Click next to see the paragraph on the website "On your health"

WTA Imagine you are working as an editor for the website *On Your Health*. What would you consider an appropriate payment for the work put into constructing the paragraph?

- \$3 (1)
- \$6 (2)
- \$9 (3)
- \$12 (4)
- \$15 (5)
- \$18 (6)
- \$21 (7)

---

Start of Block: difficult

How difficult or easy was the task of reconstructing the paragraph?

- very easy (1)
- somewhat easy (2)
- neither easy nor difficult (3)
- somewhat difficult (4)
- very difficult (5)

Start of Block: valueOthers

WTP The paragraph you just read was edited for the website *On Your Health*. What would you consider an appropriate payment for the editing work put into constructing the paragraph?

- \$3 (1)
- \$6 (2)
- \$9 (3)
- \$12 (4)
- \$15 (5)
- \$18 (6)
- \$21 (7)

---

Start of Block: postSun

postInstruct

In the next sections you will rate the extent to which you agree or disagree with the several statements, from **Strongly disagree** to **Strongly agree**

Click NEXT to begin

Wearing sunscreen daily is **necessary**

Wearing sunscreen daily is **good**

Wearing sunscreen daily is **harmful**

Wearing sunscreen daily is **foolish**

Wearing sunscreen daily is **important**

Wearing sunscreen daily is **effective**

Strongly disagree (1)

Strongly agree (7)

---

Start of Block: postBehave

How likely are you to apply sunscreen every day in the next month?

Extremely unlikely (1)

Extremely likely (5)

---

How likely are you to visit the website "On your health" ?

Extremely unlikely (1)

Extremely likely (5)

End of Block: postBehave

---

Start of Block: textEvaluation

textEval

In the next section you will evaluate the paragraph you read.

Rate the extent to which you agree or disagree with each statement from "**Strongly Disagree**" to "**Strongly Agree**"

Click Next to begin

The paragraph was **logical**

The paragraph was **interesting**

The paragraph was **believable**

The paragraph was **confusing**

The paragraph was **informative**

Strongly disagree (1)

Strongly agree (7)

The paragraph was **logical**  
The paragraph was **interesting**  
The paragraph was **believable**  
The paragraph was **confusing**  
The paragraph was **informative**

- Strongly disagree (1)
- Strongly agree (7)

**Start of Block: attachment**

If someone praised the paragraph, I would feel somewhat praised myself  
I feel I emotionally connected to the message in the paragraph  
This paragraph has no special meaning for me

- Strongly disagree (1)
- Strongly agree (5)

---

**Start of Block: Freedom threat**

In the next section you will answer questions concerning the **message** of the paragraph.

---

The paragraph tried to **pressure me**  
The paragraph tried to **make a decision for me**  
The paragraph tried to **manipulate me**

- Strongly disagree (1)
- Strongly agree (7)

---

**Start of Block: negative emotion**

Next rate to what extent you experienced each emotion  
Reading the paragraph made me feel

**Angry**

- Not at all angry (1)
- Slightly angry (2)
- Moderately angry (3)
- Very angry (4)
-

**Irritated**

- Not at all irritated (1)
- Slightly irritated (2)
- Moderately irritated (3)
- Very irritated (4)
- 

**Annoyed**

- Not at all annoyed (1)
- Slightly annoyed (2)
- Moderately annoyed (3)
- Very annoyed (6)

**End of Block: emotion****You are almost done!**

In the final section you will answer a few questions about yourself.

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Where would you place yourself on a **Political Ideology** scale, from "Very Liberal" to "Very Conservative" ?

- Very Liberal (1)
- Very Conservative (7)

**Start of Block: relevance**

Have you or anyone of your close family and friends suffered from health issues related to sun exposure?

- Yes (1), No (2) , I don't know (99)

**Start of Block: Demographics**

gender With which gender do you identify?

- Female (1) , Male (2) , Other (99)
-

Education = What is the highest level of education you have completed

- Some high school or less (1)
- High school diploma or GED (2)
- Some college, but no degree (3)
- Associates or technical degree (4)
- Bachelor's degree (5)
- Graduate or professional degree (MA, MS, MBA, PhD, JD, MD, DDS etc.) (6)
- Prefer not to say (7)
- 

Race - Choose one or more races that you consider yourself to be

- White or Caucasian (1)
- Black or African American (2)
- American Indian/Native American or Alaska Native (3)
- Asian (4)
- Native Hawaiian or Other Pacific Islander (5)
- Other (6)
- Prefer not to say (7)

End of Block: Demographics

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Start of Block: End of Block

disclosure

Thank you for your participation!  
Click next to submit the survey

The purpose of this research is to study how effort may influence attitude. All participants were randomly assigned to one of six different tasks. The article and website were made up for the purpose of this study. While the website isn't real, the information used for the article is real, and was taken from the Skin Cancer Foundation Website.

Results from this research will be used for academic purposes only and your responses will remain strictly confidential. If you are interested in learning more about this research, please contact Ayellet at [pelled@wisc.edu](mailto:pelled@wisc.edu).