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“I Made It Work”: How Using a Self-Assembled Product Increases Task Performance

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“I Made It Work”: How Using a Self-Assembled Product Increases Task Performance

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Although it is well established that consumers have an increased valuation for self-assembled products, less is known about how using such products influences objective consumption outcomes. Across three experiments, the current research demonstrates that consumers perform better on tasks when they use a product they have self-assembled—as opposed to an identical but ready-to-use product. We show that this effect results from an increase in self-efficacy and rule out possible alternative accounts (i.e., product efficacy beliefs, performance motivation, feelings of psychological ownership, and product liking). In addition, we demonstrate that the self-assembly effect emerges only when consumers actually use the self-assembled product, is robust when product assembly requires different amounts of time and effort, and is not merely the result of a question-behavior effect. Theoretical contributions and opportunities for future research are discussed.

Keywords Task performance; Self-efficacy; Product assembly

Many products need to be assembled before they can be used. For instance, pieces of furniture, outdoor grills, golf clubs, and pool cues often require consumers to put several parts together to form the final product. From a normative standpoint, consumption experiences should not be affected by whether a product came ready-to-use or required assembly, as long as the physical properties of the final product are identical. However, prior research shows that consumers evaluate a product differently when they have played a role in its creation. For instance, consumers place greater value on products that they have made or assembled themselves (e.g., Fuchs, Schreier, & Van Osselaer, 2015; Norton, Mochon, & Ariely, 2012; Troye & Supphellen, 2012; Walasek, Rakow, & Matthews, 2017). They are also willing to pay more for products that they have customized or designed (Franke & Piller, 2004; Franke, Schreier, & Kaiser, 2010).

Although it is clear that consumers derive value from being involved in a product's creation, how using such products influences consumption

outcomes has been largely neglected. A notable exception is research on self-expressive customization showing that consumers exhibit greater motivation and perform better on tasks when they use products they have personalized themselves (Kaiser, Schreier, & Janiszewski, 2017). Importantly, this research demonstrates that the increase in motivation is due to consumers' desire to affirm their identity when they use a personalized product, while ruling out other constructs, such as self-efficacy. However, for many products, especially those that are mass produced, product assembly typically does not allow for personalization (if the directions are followed). Therefore, it is unclear how using a self-assembled product affects task performance.

The present research demonstrates that consumers perform better on tasks when they use a self-assembled product—as opposed to an identical product they did not assemble—to execute the tasks; an effect that occurs because using a self-assembled product increases self-efficacy.

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Product Assembly, Self-Efficacy, and Performance

Self-efficacy refers to the confidence in one's ability to perform well in a particular situation (Bandura, 1982). Self-efficacy serves a crucial self-regulatory function by governing people's task performance (Bandura, 1986). When people believe that they can perform well at a task, they show greater perseverance when they encounter difficulties during the execution of a task (Bandura, 1994). As such, feelings of self-efficacy are a well-established predictor of performance in a variety of domains (e.g., Lent, Brown, & Larkin, 1986; Locke & Latham, 1990). For instance, using a product with a brand (e.g., Gatorade) that promises better performance in a particular domain (e.g., athletic ability) has been found to enhance self-efficacy, which improves persistence on tasks associated with the domain (e.g., exercising; Park & John, 2014). Importantly, people high in self-efficacy's greater confidence leads them to set higher performance standards (Zimmerman, 1995), which can even improve their performance on tasks that do not necessarily require persistence (e.g., bowling, dart throwing, or memory games; see Boyce & Bingham, 1997; Coffee & Rees, 2011; Damisch, Stoberock, & Mussweiler, 2010).

Why might product assembly increase self-efficacy and improve performance? Successful completion of a product assembly process—even one that requires minimal effort—represents a goal that has been achieved (Norton et al., 2012). Consequently, research suggests that after consumers assemble a product they feel more competent because they have completed a goal (Dahl & Moreau, 2007; Norton et al., 2012). Therefore, self-assembled products can be seen as a signal of a competent identity to the self (Mochon, Norton, & Ariely, 2012). Because feelings of competence are a source of self-efficacy (Gecas, 1989; Schwarzer, 2014), consumers should experience an increase in self-efficacy when they use a self-assembled product to perform a task because the product represents a symbol of their competence. Thus, we propose that when consumers use a self-assembled product to execute a task, they will perform better on the task than when they use an identical product that was not self-assembled.

Experiment 1

Experiment 1 had three objectives. First, we aimed to show that consumers perform better on a task when they use a self-assembled product—as

opposed to an identical but ready-to-use product—to execute the task. Second, we sought to demonstrate that the effect of using a self-assembled product on task performance is mediated by an increase in self-efficacy while ruling out possible alternative accounts. Third, we wanted to test a boundary condition of the effect. Our theory suggests that consumers should experience an increase in self-efficacy when they use a self-assembled product to execute a task. However, it could be also argued that consumers learn (or believe they learn) something during the assembly process that enhances their self-efficacy, which would increase their performance even if they use a different product during the task. Therefore, we sought to show that our predicted effect only emerges when people use a self-assembled product to execute a task and not when they assemble a product but use a different—though identical—product to execute the task.

Method

Two hundred sixty students (45.8% female; $M_{\text{age}} = 22.0$ years) from a large European university participated in the experiment for partial course credit. The data from this and subsequent experiments are published on the Open Science Framework (<https://osf.io/23jza>). The experiment employed a single-factor between-subjects design with three product conditions (ready-to-use vs. self-assembled vs. not self-assembled). Participants were told that they would be participating in a market research study purportedly about a new golf putter. Upon arrival to the lab, participants were informed that they would be asked to test the putter by trying to sink a putt into a hole using the least number of strokes from four predefined locations (2, 3, 4, and 5 feet from the hole; e.g., Garvey, Germann, & Bolton, 2016). Participants in the self-assembled condition assembled the golf putter used to execute the task from four pieces (see Appendix), while another group completed the task using an identical, but pre-assembled, putter (ready-to-use condition). A third group of participants assembled a golf putter but then used another identical but pre-assembled putter to execute the task (not self-assembled condition).

Before performing the putting task, participants completed a questionnaire that included a measure of self-efficacy beliefs ($\alpha = .92$) and several other constructs to rule them out as alternative explanations including psychological ownership ($\alpha = .90$), performance motivation ($\alpha = .84$), and product efficacy beliefs ($\alpha = .87$). After the putting task,

participants completed a measure of product liking ($\alpha = .89$). All scale items are provided in Web Appendix A. In the experiments reported in this paper, we also collected participants' evaluations of the ease of assembly (all experiments) and frustration of assembly (Experiment 2) after the key hypothesis-related measures for exploratory purposes. Details on these measures are available in Web Appendix B.

Results

Task performance

We used the total number of strokes needed to sink a putt from each of the four predefined locations as a measure of performance. We excluded one participant who took an excessive number of strokes (i.e., more than 5 SDs away from the mean; $M = 8.89$, $SD = 3.76$) from subsequent analyses leaving us with a final sample of 259 participants.

An ANOVA revealed that participants in the self-assembled condition took fewer strokes ($M = 7.92$, $SD = 3.13$) than those in the ready-to-use condition ($M = 9.51$, $SD = 3.99$; $F(1, 256) = 8.84$, $p < .01$, $\eta^2 = .03$) and those in the not self-assembled condition ($M = 9.02$, $SD = 3.39$; $F(1, 256) = 4.25$, $p = .04$, $\eta^2 = .02$). There was no difference in performance between the ready-to-use and the not self-assembled conditions ($F(1, 256) = 0.83$, $p = .36$; see Figure 1). Because our dependent variable was right-skewed, which is typical of count data, we conducted two supplemental analyses (see Web Appendix C). The first used ANOVA to analyze scores that were less than three SDs away from the mean. The second was a Poisson regression model

with all scores included. In both analyses, the significant effects reported above get stronger, while the insignificant effects remain insignificant.

Self-efficacy

Participants in the self-assembled condition reported higher self-efficacy ($M = 4.21$, $SD = 1.20$) than those in the ready-to-use condition ($M = 3.51$, $SD = 1.29$; $F(1, 256) = 13.59$, $p < .01$, $\eta^2 = .05$) and the not self-assembled condition ($M = 3.70$, $SD = 1.27$; $F(1, 256) = 7.35$, $p < .01$, $\eta^2 = .03$). The difference between the ready-to-use and not self-assembled conditions was not significant ($F(1, 256) = 0.95$, $p = .33$).

Mediation analysis

A multicategorical mediation analysis (Hayes, 2013; Process Model 4) revealed significant indirect effects through self-efficacy between the self-assembled and ready-to-use conditions ($B = -.257$, $SE = 0.152$, $CI_{95\%} = -0.639$ to -0.023) and between the self-assembled and not self-assembled conditions ($B = -.189$, $SE = 0.123$, $CI_{95\%} = -0.502$ to -0.006). The direct effects remained significant ($ts > 1.69$; $ps < .10$), indicating partial mediation.

Alternative accounts

There was no difference in self-reported performance motivation, product efficacy beliefs, and product liking ($Fs < 1.10$, $ps > .33$) across the experimental conditions. Therefore, these constructs did not mediate the effect of assembly on performance. There was a significant effect of condition

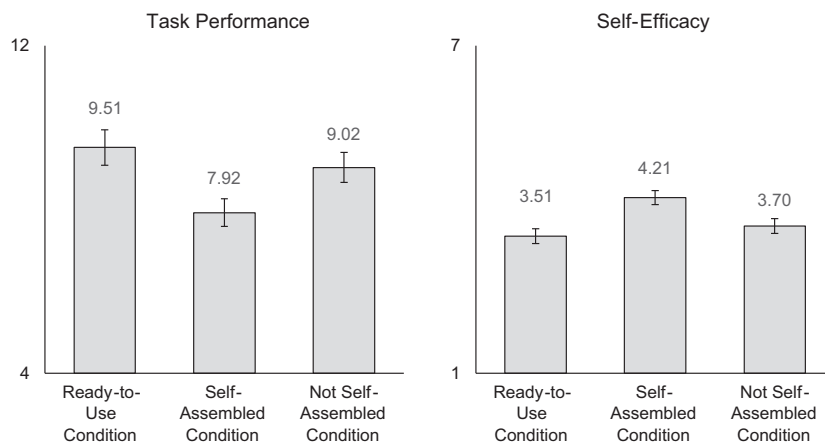


Figure 1. The effect of product assembly on task performance and self-efficacy (Experiment 1). Note: Error bars indicate ± 1 SE of the mean.

on psychological ownership ($F(2, 256) = 5.47, p < .01, \eta^2 = .04$), such that participants in the self-assembled condition reported feeling greater psychological ownership than those in the other conditions. However, psychological ownership did not mediate the effect of using a self-assembled product on performance (see Web Appendices D and E for detailed analyses of the alternative account measures). Although the indirect effects with psychological ownership as a sole mediator were not significant, we found a significant condition \rightarrow psychological ownership \rightarrow self-efficacy \rightarrow performance serial mediation between the self-assembled and ready-to-use conditions (Process Model 6; $B = -.051, SE = 0.036, CI_{95}: -0.139$ to -0.002) and between the self-assembled and not self-assembled conditions ($B = -0.062, SE = 0.041, CI_{95}: -0.160$ to -0.004). However, because this serial mediation is not supported by the results of Experiment 2, we do not elaborate on this effect further.

Discussion

These findings demonstrate that using a self-assembled product to complete a task improves performance and show that this effect is driven—at least in part—by enhanced self-efficacy, while ruling out a variety of alternative explanations. Moreover, this experiment demonstrates that the effect is conditioned on using the self-assembled product and does not occur when respondents assemble a product, but use a different (identical) product to perform the task.

Experiment 2

The purpose of Experiment 2 was to examine whether the effect of using a self-assembled product on task performance would hold when the time and effort required to assemble the product varies. While it could be argued that product assembly requiring different amounts of effort may affect self-efficacy and, thus, task performance differently, our theory suggests that it is the successful completion of the assembly process, rather than the effort invested in the process, that drive our findings. Hence, we expected our effect to be similar across different levels of assembly. To test this prediction, we manipulated the amount of time and effort required to assemble a product. We kept the level of assembly at the low end, since many products used to perform tasks (e.g., pool cues, golf clubs, and pens) only require consumers to assemble a few pieces.

Method

Two hundred thirty-six students (42.4% female; $M_{\text{age}} = 23.7$ years) participated in the experiment for partial course credit. We preregistered this experiment (<https://aspredicted.org/yp6fc.pdf>) and targeted a minimum sample of 50 subjects per cell. The experiment employed a single-factor between-subjects design with four product conditions (ready-to-use vs. baseline assembly vs. less assembly vs. more assembly). As in Experiment 1, participants ostensibly tested a new golf putter by trying to sink a putt into a hole from four locations. Participants in the ready-to-use condition received a pre-assembled putter to perform the task, while those in the baseline assembly condition assembled the golf putter from four pieces, which is the same number of pieces as the self-assembled condition in Experiment 1. In the less assembly condition, most of the pieces of the putter were pre-assembled; therefore participants only had to screw the head of the putter onto the rest of the golf club. In the more assembly condition, participants had to find the four pieces to assemble a putter from a set of sixteen pieces (each individual part of the putter had four options).

Before performing the putting task, participants responded to measures of self-efficacy ($\alpha = .93$) and psychological ownership ($\alpha = .87$). After completing the task, participants responded to measures of performance motivation ($\alpha = .84$) and product liking ($\alpha = .82$). As a manipulation check, participants assigned to one of the assembly conditions also rated the perceived effort of assembly. In addition, we recorded the time required to assemble the putter. Consistent with our preregistered exclusion criteria, we excluded one participant who took an excessive number of strokes (i.e., more than 5 SDs away from the mean; $M = 8.55, SD = 4.41$) from subsequent analyses leaving us with a final sample of 235 participants.

Results

Manipulation checks

Participants in the more assembly condition required more time to assemble the putter ($M = 77.74$ s, $SD = 42.11$ s) than those in the baseline assembly condition ($M = 32.05$ s, $SD = 7.76$ s; $F(1, 173) = 100.58, p < .01, \eta^2 = .37$) and those in the less assembly condition ($M = 10.42$ s, $SD = 2.94$ s; $F(1, 173) = 218.29, p < .01, \eta^2 = .56$). The difference between the baseline and less assembly conditions

was also significant ($F(1, 173) = 22.72, p < .01, \eta^2 = .12$). In addition, our analysis of perceived effort (two participants did not respond to this measure) found that participants in the more assembly condition reported the assembly more effortful ($M = 2.17, SD = 1.34$) than those in the baseline assembly condition ($M = 1.54, SD = 0.80; F(1, 171) = 12.27, p < .01, \eta^2 = .07$) and those in the less assembly condition ($M = 1.19, SD = 0.64; F(1, 171) = 29.15, p < .01, \eta^2 = .15$). The difference between the baseline and less assembly conditions was also significant ($F(1, 171) = 3.74, p = .05, \eta^2 = .02$).

Task performance

As expected, participants in the ready-to-use condition needed more strokes to complete the putting task ($M = 9.68, SD = 4.49$) than those in the baseline ($M = 8.14, SD = 4.05; F(1, 231) = 4.15, p = .04, \eta^2 = .02$), less assembly conditions ($M = 7.78, SD = 4.00; F(1, 231) = 6.29, p = .01, \eta^2 = .03$), and more assembly conditions ($M = 8.21, SD = 3.87; F(1, 231) = 3.75, p = .05, \eta^2 = .02$; see Figure 2). There was no significant difference in performance across all assembly conditions ($F_s < .32, p_s > .57$). As in Experiment 1, our dependent variable was right-skewed; therefore, we conducted the same supplemental analyses (see Web Appendix C). Consistent with Experiment 1, the significant effects reported above generally get stronger, while the insignificant effects remain insignificant.

Self-efficacy

Participants in the ready-to-use condition were lower in self-efficacy ($M = 3.44, SD = 1.33$) than those in the baseline ($M = 3.94, SD = 1.25; F(1, 231) = 4.73, p = .03, \eta^2 = .02$), less assembly conditions

($M = 4.44, SD = 1.15; F(1, 231) = 18.70, p < .01, \eta^2 = .07$), and more assembly conditions ($M = 4.09, SD = 1.29; F(1, 231) = 7.86, p < .01, \eta^2 = .03$). The difference between the baseline and less assembly conditions was also significant ($F(1, 231) = 4.62, p = .03, \eta^2 = .02$). This unexpected difference suggests that when product assembly is subjectively easy this may increase confidence. This is consistent with research showing that feelings of fluency can increase the experience of positive affect (Reber, Winkielman, & Schwarz, 1998). However, as the previous analysis indicates this difference did not carry over to performance. No other significant differences emerged between the assembly conditions ($F_s < 2.26, p_s > .13$).

Mediation analysis

A multicategorical mediation analysis (Process Model 4) revealed significant indirect effects through self-efficacy between the baseline assembly and the ready-to-use conditions ($B = -.390, SE = 0.209, CI_{95}: -0.845$ to -0.023), the less assembly and the ready-to-use conditions ($B = -.775, SE = 0.275, CI_{95}: -1.370$ to -0.306), and the more assembly and the ready-to-use conditions ($B = -.505, SE = 0.221, CI_{95}: -0.982$ to -0.121). The relative direct effects were in the same direction but reduced to non-significance ($t_s < 1.55, p_s > .12$).

Alternative accounts

Although there were some differences between conditions on the other variables (product liking, performance motivation, and psychological ownership), none of these variables mediated the effect of condition on performance (see Web Appendices D and E for further details).

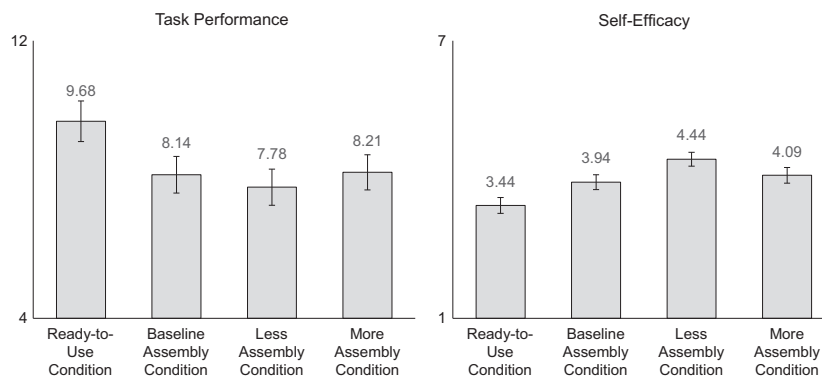


Figure 2. The effect of time and effort of assembly on task performance and self-efficacy (Experiment 2). Note: Error bars indicate ± 1 SE of the mean.

Discussion

The findings of Experiment 2 demonstrate that the effects of using a self-assembled product on self-efficacy and performance hold when product assembly requires different amounts of time and effort. This is consistent with our theory that it is the use of a *successfully* assembled product that drives the effect and not the effort invested in the assembly process. It is important to note that, in order to ensure ecological validity of our findings, we kept the amount of time and effort required for assembly within a reasonable range. However, we acknowledge that it is possible that, if the necessary effort extended beyond this range (e.g., consumers must sort through dozens of pieces to assemble a product), consumers may experience frustration, which could mitigate any effect of assembly on self-efficacy and performance.

Experiment 3

The objectives of this experiment were twofold. First, we sought to test the generalizability of our findings by examining the effect of using a self-assembled product on performance in a different product category. Second, we did not measure self-efficacy to rule out the possibility that the effect is driven by a question-behavior effect (Spangenberg, Greenwald, & Sprott, 2008) whereby simply asking people a question about their future behavior affects their subsequent behavior.

Method

Ninety-four students (50.0% female; $M_{\text{age}} = 23.5$ years) from a large European university participated in the experiment for partial course credit. We preregistered this experiment (<https://aspredicted.org/33e5r.pdf>) and targeted a minimum sample of 50 subjects per cell. However, we were unable to reach our target due to constraints on our in person subject pool.

The experiment employed a single-factor between-subjects design with two product conditions (ready-to-use vs. self-assembled). Participants in the ready-to-use condition received a ballpoint pen and were then instructed to use it to perform an anagram task. The task required them to generate as many words as possible from a set of eight letters (e.g., Damisch et al., 2010; Kaiser et al., 2017). In contrast, participants in the self-assembled condition were asked to assemble the pen from six pieces prior to performing the anagram task (see Appendix).

Results

We used the number of words generated as a measure of performance. An ANOVA found that participants who assembled the pen performed marginally better on the anagram task ($M = 30.06$, $SD = 13.90$) than those in the ready-to-use condition ($M = 25.02$, $SD = 14.72$; $F(1, 92) = 2.92$, $p = .09$, $\eta^2 = .03$). Consistent with prior studies, a supplemental analysis that excluded one respondent whose performance was more than three SDs away from the mean found a significant difference between the self-assembled ($M = 30.06$, $SD = 13.90$) and ready-to-use conditions ($M = 24.00$, $SD = 13.13$; $F(1, 91) = 4.66$, $p = .03$, $\eta^2 = .05$). Moreover, a Poisson regression with everyone included in the dataset found a significant positive effect of using a self-assembled product on performance ($\beta = .184$, $\chi^2(1) = 21.57$, $p < .01$).

Discussion

In sum, the findings of this experiment show that using a self-assembled product to execute a task increases task performance in a different context. Furthermore, the results suggest that the effects observed in prior experiments are not merely the result of a question-behavior effect.

General Discussion

Across three experiments, we demonstrate that using a self-assembled product to execute a task improves performance on the task; an effect that results from an increase in self-efficacy. These findings contribute to prior literature on the consequences of consumers' involvement in product creation processes (e.g., Fuchs et al., 2015; Norton et al., 2012; Walasek et al., 2017) by broadening our understanding of how product assembly influences consumption outcomes. Although our findings are consistent with research on self-customization, we find that the product assembly effect is the result of an increase in self-efficacy, rather than the desire to affirm identity as suggested by prior research on self-customization (Kaiser et al., 2017). To provide further support that the effect of product assembly operates through a different process, we conducted a follow-up experiment where we examined how using a self-assembled (vs. self-customized) product influences task performance when people can and cannot affirm identity. Consistent with the findings of Kaiser et al. (2017), the results show that

consumers perform best when they use a self-customized product and can affirm (vs. not affirm) their identity. In contrast, when consumers use a self-assembled product, their performance is not affected by whether they can affirm identity (see Web Appendix F for study details). Moreover, the results show that assembling a product has a negligible effect on how self-expressive the product is ($M = 1.32$ on a seven-point scale). These findings suggest that self-expression and the desire to affirm identity, which are important drivers of the self-customization effect, do not appear to play a role in the self-assembly effect.

Our findings offer several directions for future research. The current work demonstrates that making a product functional by assembling it enhances consumers' sense of self-efficacy and performance. Yet, future research is necessary to fully understand why this effect is conditioned on the actual use of the product. Although we suggest that this is because the self-assembled product is a symbol of competence, it is also possible that this finding is the result of magical thinking on the part of the consumer that only allows self-efficacy to spillover when the assembled product is used. Moreover, it remains unclear whether other actions taken to make a product usable beyond assembly could evoke a similar effect. For instance, would simply mixing the ingredients of a protein shake lead people to have a better workout? In a similar vein, prior research on ritualistic behavior (Brooks et al., 2016; Wang, Sun, & Kramer, 2021) shows that engaging in rituals prior to a task can improve task performance, which research has suggested (Hobson, Schroeder, Risen, Xygalatas, & Inzlicht, 2018), but not empirically demonstrated, could be due to an increase in self-efficacy. Through this lens, product assembly could be viewed as a form of ritualistic behavior that increases self-efficacy. Nevertheless, future research is necessary to fully examine the relationship between rituals and product assembly.

Moreover, our findings suggest that self-efficacy may not be the only mediator of the observed effect. Thus, further research could explore additional factors that may play a role in the process. For instance, it is possible that consumers feel more responsible for performance outcomes when they use a self-assembled product, which could improve their task performance.

In addition, it is worth investigating whether the strength of the effect is dependent on consumers' a priori self-efficacy in the domain. For instance, the effect of using a self-assembled pen on consumers' anagram task performance may be less pronounced

among consumers who are generally confident in their ability to solve anagrams. In a similar vein, since some consumers may not be confident in their ability to assemble products, using a successfully assembled product could evoke stronger feelings of self-efficacy in such consumers. In addition, the time and effort required to assemble the products used in our experiments was relatively low. Thus, future research could explore conditions wherein product assembly becomes too effortful and demanding such that the favorable consequences may vanish.

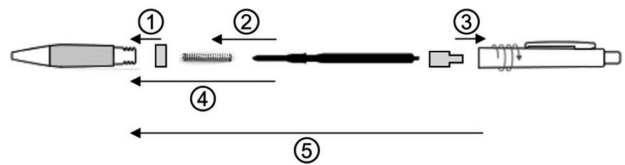
Finally, throughout the studies reported in this article, we only examined first use situations, an approach that is widely used in the related literature. However, because self-assembled products are often used more than once in real life, future studies may want to examine whether the detected effects persist when products are used over an extended period. This could be particularly interesting for products that need to be assembled each time before they are used (e.g., professional pool cues). If product assembly becomes a ritual established through repetition each time the product is used, the effect on self-efficacy could be reinforced and intensified over time (Hobson et al., 2018). However, it could also be argued that consumers may habituate to the assembly process, which may limit its impact over the long term.

Appendix: Products in Experiments 1–3.

Experiments 1 and 2



Experiment 3



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Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's website:

Appendix S1. Methodological Details Appendix.