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Anatomical depiction: How showing a product's inner structure shapes product valuations

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Abstract

Anatomical depiction is a technique where the product is decomposed into components that are spatially arranged in a layer-by-layer manner to visually explicate its inner structure. The authors demonstrate that anatomical depiction, compared to non-anatomical depiction, enhances product valuation. This effect occurs because anatomical depiction elicits a 'coming together' of the inner components in consumers' minds thereby evoking a gestalt image of the product – a process labeled simulated assemblage. The elicitation of simulated assemblage in turn boosts their confidence in the product's performance. Two field experiments first demonstrate that anatomical depiction leads to greater engagement in online settings such as peer-to-peer selling and social media advertising. Subsequently, seven laboratory and online experiments show when and how anatomical depiction elicits simulated assemblage (Studies 1A–C), test the process underlying the effect of anatomical depiction on product valuation (Studies 2A–B), and delineate two boundary conditions, showing that the positive effect of anatomical (vs. non-anatomical) depiction attenuates for consumers higher (vs. lower) in technology anxiety (Study 3) and when consumers have a hedonic (vs. utilitarian) consumption goal (Study 4). Collectively, this work provides insights to firms on how and when to use anatomical depiction to enhance consumers' confidence in and valuation of the product.

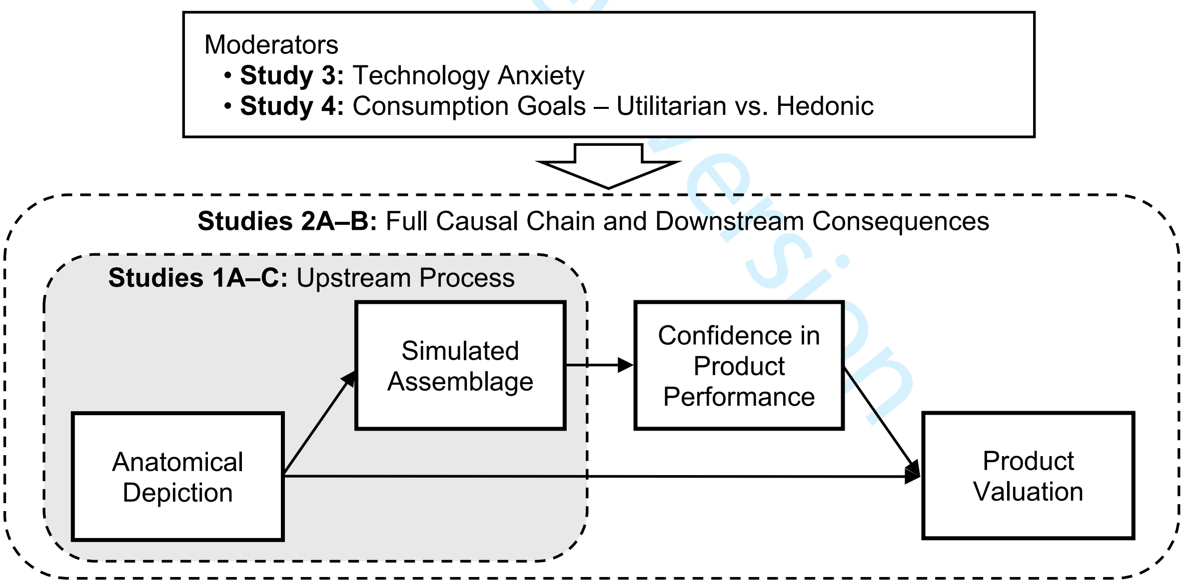
Keywords: product depiction; gestalt; perceptual grouping; mental imagery; consumer confidence; performance risk; uncertainty; exploded view

Google Glass, first unveiled to extensive positive coverage in 2012, boasted of several intriguing technological features. However, due to performance uncertainties on key dimensions such as voice control, battery life, and photo quality, consumer response was muted eventually leading to its discontinuance without seeing the full diffusion curve (Tiersky 2023). The fate of Google Glass illustrates how a product's success often depends upon consumers' confidence that it will perform in actual use. Firms employ strategies such as warranties (Shimp and Bearden 1982) or money-back guarantees (Suwelack, Hogreve, and Hoyer 2011) to instill this confidence in consumers. However, such strategies can be expensive. For example, between 2012 and 2021, worldwide automotive warranty claims topped 2.5% of revenue and needed annual reserves to be in excess of $128 billion (Warranty Week 2022). An alternative approach is to provide detailed information about how the product operates. However, this often involves technical jargon or detailed mechanistic explanations, which run the risk of increasing confusion (Fernbach et al. 2013). For instance, the biomedical startup Thync marketed a wearable patch that utilizes neural stimulation as an alternative for stimulants such as caffeine. Thync relied heavily on technical and scientific terminology to convey how its device worked, a strategy which led lay consumers to doubt its safety and effectiveness, leading to its failure (Huet 2016).

In the current research, we document how a visual depiction technique – *anatomical depiction* – may help enhance consumers' confidence in product performance. Anatomical depiction refers to a method in which an object's components are presented in a spatially arranged, layer-by-layer manner such that the object's 'inside' is revealed in a single visual. We suggest that anatomical depiction leads to the spontaneous elicitation of a 'coming together' of these components in consumers' minds, thereby evoking a gestalt image for the product – a process we term as *simulated assemblage*. The theory and empirical results reported in this paper outline how the above-defined simulated assemblage process heightens confidence in the product's performance, and consequently positively affects valuation.

We present two pilot field studies (a peer-to-peer e-commerce marketplace [Pilot A] and Meta Ads [Pilot B]), showing the impact of anatomical depiction on consumers' engagement (i.e., click-through rates; CTRs). Studies 1A–B identify conditions for anatomical depiction to evoke simulated assemblage. Study 1C explores the spontaneous nature of simulated assemblage using open-ended, unaided thought protocols. Studies 2A–B outline the full causal chain through self-reports (Study 2A) and non-scaled behavioral measures (Study 2B). Study 3 delineates technology anxiety as an individual difference that attenuates the core effect and process while Study 4 outlines a boundary condition based on consumption goals, i.e., utilitarian- vs. hedonic-focus in shopping (Figure 1).

Figure 1: Conceptual Framework.



To the best of our knowledge, this work is the first in marketing to incorporate product anatomy into the body of work documenting visual depiction effects (e.g., Elder and Krishna 2012; Vanbergen, Irmak, and Sevilla 2020). Our research outlines product anatomy as an antecedent of consumer confidence. Specifically, anatomical depiction instantiates simulated assemblage, which provides a sense of the product's construction – a process that purely external representations would not be able to offer. Furthermore, by integrating theory from insight (e.g., Schilling 2005; Korovkin et al. 2021) and product development (e.g., Fixson 2005), this work provides a theoretical framework that explains how stimulus-driven processes, such as simulated assemblage, could drive higher-order confidence judgments of product performance, thereby enhancing product valuation. From a substantive standpoint, anatomical depiction provides firms with a communication intervention to help manage consumer uncertainty related to product performance, which past research has identified as a key driver of adoption and usage diffusion (Gatignon and Robertson 1985; Shih and Venkatesh 2004).

Theoretical Background and Hypotheses Development

How Anatomical Depiction Enhances Product Valuation

Since Leonardo da Vinci pioneered a drawing technique that depicts the interior of machines and human anatomy in the Renaissance period, this form of technical drawing has been utilized for various practices, including visual representations of consumer products such as Do-It-Yourself (DIY) furniture (e.g., IKEA), car repair manuals (e.g., Haynes Manual), toys (e.g., LEGO and Meccano) and in advertising various consumer gadgets (see Figure 2 for an example; Web Appendix A for more examples). We term this form of depicting a product as "anatomical depiction" as it unveils the focal product's anatomy–something that is normally not visible to the consumer. In the current research, we operationalize anatomical depiction by showing the product's inner components laid out in a specific way. First, the inner components are arranged in a layer-by-layer manner with spatial separation. Second, the arrangement reflects the order of assembly. We experimentally test these two aspects in Study 1A and Study 1B, respectively.

Figure 2: Anatomical Depiction Used in Samsung Galaxy's Earbuds Ad.

We suggest that anatomical depiction can enhance product valuation by eliciting a type of mental simulation that heightens confidence in the product's performance. Specifically, we argue that viewing anatomical depiction leads consumers to spontaneously simulate the completion of a product's image by mentally combining the inner components that are visually presented in the order of assembly. We define this stimulus-driven process as simulated assemblage. This process is similar to how individuals form mental images that go beyond what is objectively present as perceptual information (Barsalou 1999). For example, when a series of dots is presented, these dots are visually grouped and simulated as a continuous line. Gestalt psychologists have also posited that human perception naturally makes up a whole based on the interrelations of its parts (see Wagemans et al. 2012). The general principle of feature integration shares a similar premise that distinct features shown in the same attention fixation are jointly processed to form a unitary object (Prinzmetal 1981; Treisman and Gelade 1980). Taken together, we posit that simulated assemblage operates as a perceptual grouping process in which a gestalt image of the product is formed in consumers' mind through the coming together of inner components. Formally stated:

H_{1a}: Anatomical (vs. non-anatomical) depiction leads to greater simulated assemblage.

We further posit that simulated assemblage enhances consumers' confidence around the product's performance. Uncertainties about a product's performance are often a problem that consumers aim to resolve when making a purchase (Shimp and Bearden 1982). Prior work on insight has suggested that looking at a given problem in its gestalt form can lead to insights on potential solutions (Schilling 2005). Moreover, these insights are often accompanied by increased confidence in the solution (Korovkin et al. 2021; Vitello and Salvi 2023). In our case, depicting the product in an anatomical form enables consumers to see it as a gestalt of components in their mind (i.e., simulated assemblage). This process should provide consumers insight into the product's construction, i.e., offers them a better sense of how the product is structured from its inner components. To clarify, as Rozenblit and Keil (2002, p. 523) suggest, "…functional sub-assemblies that are easy to visualize and mentally animate may lead to strong (but mistaken) feelings of understanding at a high level of analysis…" Although this feeling of subjective insight can be illusory, individuals tend to rely on it to guide their judgment and decision-making (Fernbach et al. 2013). Since a product's construction is a basic aspect which predicts its ability to perform (Fixson 2005; Gokpinar, Hopp, and Iravani 2010), deriving this insight about its construction should enhance consumers' confidence in the product's performance. In contrast, depicting the product in non-anatomical form is less likely to provide the same insight since it cannot elicit the simulated assemblage process. The theorization outlined above is also consistent with related research from the verbal domain, which shows that having a sense of understanding of how a product operates (e.g., via mechanistic explanations) makes consumers more confident that the product will deliver its core benefit (Fernbach et al. 2013; Rozenblit and Keil 2002). We therefore predict:

H_{1b}: Anatomical (vs. non-anatomical) depiction leads to greater confidence in product performance.

Moreover, we predict that consumers' confident judgments about the product's ability to perform should have positive downstream consequences upon product valuation. Prior work suggests that while attributes might drive product judgments (e.g., quality assessment) in domains where consumers have experience (Hoeffler and Ariely 1999), in contexts where consumers lack direct experience, what they mentally experience may have more of an impact on preferences (Hoeffler 2003). In our context, therefore, greater confidence in product performance – engendered by simulated assemblage – should positively drive product valuation.

Taken together, we hypothesize that simulated assemblage elicited by anatomical depiction (**H_{1a}**) makes consumers more confident in their judgments of product performance (**H_{1b}**), in turn positively valuing the product (compared to ads containing non-anatomical product depictions). Stated formally and as summarized in Figure 1:

H_{1c}: Anatomical (vs. non-anatomical) depiction leads to greater product valuation.

H_{1d}: The effect of anatomical depiction on product valuation is serially mediated by simulated assemblage and confidence in product performance, respectively.

Moderation by Technology Anxiety

Product adoption often depends upon – among other factors – consumers being confident that the product will perform in actual use (Bearden and Shimp 1982). In this regard, our theory suggests that anatomical depiction may be effective as it can enhance consumers' confidence in product performance by evoking simulated assemblage. However, the potential positive effects of anatomical depiction (vs. non-anatomical depiction) should be less likely to manifest for consumers who are inherently less (vs. more) ready to adopt a new product.

Based on Parasuraman (2000)'s insights on technology readiness, Meuter et al. (2003) propose technology anxiety as an individual readiness trait. Specifically, consumers are arrayed along a continuum which reflects their ability and willingness to adopt technology-related tools. As such, consumers higher in technology anxiety are less able and willing to adopt products with new technologies, compared to those lower in technology anxiety (Meuter et al. 2005).

In our case, as anatomical depiction explicates the technology inherent in a product by visually highlighting its inner components and structure, we expect technology anxiety to moderate how anatomical depiction affects product valuation through the proposed process. To elaborate, consumers higher in technology anxiety should be less able and willing to process anatomical depiction, compared to those lower in technology anxiety. Prior literature on emotion shows that anxiety undermines the efficiency of individuals' cognitive processing by consuming attentional resources of working memory (see Eysenck et al. 2007). Thus, as the level of technology anxiety increases, there should be greater inhibition of simulated assemblage (a process that involves working memory for perceptual grouping). Consequently, for consumers higher in technology anxiety, anatomical depiction is *less* likely to enhance confidence in product performance. Meuter et al. (2005) also find that consumers higher in technology anxiety tend to be more unsure about the performance of technological tools. Furthermore, consistent with prior research showing that anxiety about technology can lead consumers to avoid and reject new products (e.g., Lin, MacInnis, and Eisingerich 2020; Meuter et al. 2003), we also expect technology anxiety to attenuate downstream product valuations. In contrast, for consumers lower in technology anxiety, i.e., those who are generally more technology-ready, the core effect and its process ($H_{1a\text{-}d}$) should manifest.

Combining the above, we posit that the differences in simulated assemblage, confidence in performance, and product valuation between anatomical and non-anatomical depictions would decrease as the level of technology anxiety increases. Formally:

H_2: The positive effect of anatomical (vs. non-anatomical) depiction upon simulated assemblage, confidence in product performance, and product valuation will diminish for consumers who are higher (vs. lower) in technology anxiety.

Moderation by Consumption Goals – Utilitarian vs. Hedonic

Our theory suggests that anatomical depiction increases product valuation as the evoked simulated assemblage process enhances consumers' confidence in product performance, which is often deemed a necessary benefit of the product (Chitturi, Raghunathan, and Mahajan 2007). However, consumers may also consider alternative product benefits based on their specific consumption goals (Affonso and Janiszewski 2023). For example, with utilitarian goals, consumers focus on a product's functional and practical benefits, whereas with hedonic goals, they prioritize its aesthetic and experiential benefits (Affonso and Janiszewski 2023; Chitturi, Raghunathan, and Mahajan 2008). Although a product can offer both utilitarian and hedonic benefits (Babin, Darden, and Griffin, 1994), the weight consumers place on each benefit type for product valuation may vary based on their consumption goal.

Drawing on this notion, we expect consumers' consumption goals to moderate the effect of anatomical depiction on product valuation. To elaborate, when consumers have utilitarian goals, anatomical depiction (vs. non-anatomical depiction) should positively affect product valuation as it serves to enhance their confidence related to product performance. On the other hand, when consumers have hedonic goals, they should place more weight on aesthetic rather than functional benefits of the product. Therefore, functional performance (a facet anatomical depiction positively shapes), is less compatible with their aesthetic goal orientation. In this case, because of the relative incompatibility between product-related benefits highlighted by anatomical depiction and consumers' goal orientation (Chernev 2004), anatomical depiction would be less likely to enhance product valuation. Stated formally,

H_3: The positive effect of anatomical (vs. non-anatomical) depiction on product valuation is attenuated when consumers' consumption goal is hedonic (vs. utilitarian).

To reveal a product's inside, anatomical depiction displays a greater number of objects (e.g., inner components). Thus, there is an innate difference in the amount and type of visual information provided by anatomical and non-anatomical depictions. Although this difference is intrinsic to our conceptualization, it may raise potential alternative explanations related to informativeness and complexity. Moreover, it is also plausible that simulated assemblage enhances product valuation via perceived ownership by leading consumers to imagine assembling the product (e.g., the IKEA effect; Norton, Mochon, and Ariely 2012). As such, the impact of anatomical depiction on product valuation might be explained by other accounts. We aim to conceptually and empirically differentiate our process explanation from other alternative accounts that might produce similar effects: informativeness, complexity, and perceived ownership. Our goal is not to argue that our proposed account is the only mechanism at play, but rather to evaluate whether it indeed plays a unique role different from other processes. We examine these alternative explanations by experimentally controlling for the type of depictions in all studies as well as by empirically testing the role of each alternative account in Study 2A.

Empirical Overview

The basic experimental paradigm involved presenting participants with one or multiple advertisements for consumer products (for stimuli, see Appendix A), followed by a survey containing dependent measures – scaled or open-ended, depending on the study – manipulation checks, and other relevant measures (for details, see Web Appendix B). All scaled measures were rated on seven-point scales. We operationalize simulated assemblage two ways. First, we adapted the measures from Sarantopoulos et al. (2019) to capture the extent to which participants were able to envision the coming together of the parts based on the ad they saw ("Based on the ad, I can easily imagine how the product is assembled together," "I can visualize how the parts of the product are composed," "Showing the ad makes it easy for me to visualize how the components are put together to make the product"; Studies 1–3; all Cronbach's αs > .95). Second, we use open-ended, unaided thought protocols designed to tap into what participants envisioned in their mind while viewing the ad (Study 1C).

Confidence in product performance is measured using a four-item scale ("I am confident that the product will perform well," "I am confident that the product will be effective," "I am confident that the product's quality will be high," and "I am confident that the product will perform satisfactorily"; Studies 2A and 3; all Cronbach's αs > .93) adapted from Grewal, Gotlieb, and Marmorstein (1994) and via a behavioral task where participants were asked to create ad copy designed to reflect their confidence in the focal product (Study 2B). Finally, we operationalize our downstream outcome, product valuation, by measuring willingness-to-pay (WTP) for focal products (Studies 2A–B and 4) and intention-to-purchase (Study 3).

We created experimental conditions by varying the manner of depicting the product. The anatomical depiction condition showed an image of the focal product's inner components spatially arranged with separation in the order of assembly. In the non-anatomical condition, the same product was depicted in its final, assembled form. We modified actual executions to better reflect real-world qualities. Unless otherwise noted, all other ad descriptions and attributes were identical across product depictions. The target sample size for each study was predetermined based on the sample population and study design. For online samples, we aimed for 100–120 participants per condition. For student samples, the sample size was determined by the sign-up numbers during each data collection wave. Table 1 summarizes our findings across all studies.

Pilot Studies: Two Field Experiments

Two pilot field studies aim to explore the role of anatomical depiction in engaging consumers in real-world settings: an online marketplace and a Meta ad campaign.

Pilot Study A: Field Experiment on an International Online Marketplace

Method

We conducted Pilot Study A on an online marketplace platform in which users can sell new and secondhand products by posting their own listings. We measured CTRs as an indicator of user engagement. This platform provides users with 7-day insight on impressions and users' CTRs for each listing. As outlined in the empirical overview section, we created the anatomical and non-anatomical depictions of a product listing for Dyson hair straightener using product images directly sourced from its official website (see Appendix A). We posted the listing by creating a new user account to control for the influence of a seller's selling and purchase history. This experiment was conducted over a two-week period (week 1 = anatomical depiction, week 2 = non-anatomical depiction; final N = 8,809; total impressions). We did not simultaneously post the two listings together to minimize crossover between the two experimental conditions.

Results and Discussion

Table 1: Summary of Findings.

Study	Method	Product(s)	Study Design	Sample Size	Dependent Variable(s)	Main Findings
Pilot Study 1A	Field experiment (online marketplace)	Dyson hair straightener	2 (product depiction: anatomical/non-anatomical) between-subjects	8,809 impressions	CTR	• Anatomical (vs. non-anatomical) depiction leads to greater CTR.
Pilot Study 1B	Field experiment (Meta ads campaign)	Sealy mattress	2 (product depiction: anatomical/non-anatomical) between-subjects	52,967 impressions	CTR	• Anatomical (vs. non-anatomical) depiction leads to greater CTR.
Study 1A	Online experiment (MTurk; pre-registered)	Sealy mattress	3 (product depiction: anatomical/non-anatomical/cutaway) between-subjects	296	Simulated assemblage	• Anatomical depiction leads to greater simulated assemblage, compared to both non-anatomical and cutaway depictions.
Study 1B	Online experiment (MTurk)	Fictitious air purifier/ smartwatch/ running shoe	3 (product depiction: anatomical/non-anatomical/disarranged) × 3 (product category) mixed factorial	200	Simulated assemblage	• Anatomical depiction leads to greater simulated assemblage, compared to both non-anatomical and disarranged depictions.
Study 1C	Online experiment (MTurk)	Fictitious smartwatch	3 (product depiction: anatomical/non-anatomical/disarranged) between-subjects	300	Simulated assemblage (*open-ended responses*)	• Anatomical depiction is more likely to elicit thoughts indicating simulated assemblage, compared to both non-anatomical and disarranged depictions.
Study 2A	Lab experiment	Denon headphones	2 (product depiction: anatomical/non-anatomical) between-subjects	220	WTP Simulated assemblage Confidence in product performance	• Anatomical (vs. non-anatomical) depiction leads to greater WTP, simulated assemblage, and confidence in product performance. • The effect of anatomical depiction on WTP is serially mediated by simulated assemblage and confidence in product performance, respectively.

Study	Method	Product(s)	Study Design	Sample Size	Dependent Variable(s)	Main Findings
Study 2B	Online experiment (MTurk)	Fictitious wireless speaker	2 (product depiction: anatomical/non-anatomical) between-subjects	397	WTP Simulated assemblage Confidence in product performance (*non-scaled behavioral responses*)	• Anatomical (vs. non-anatomical) depiction leads to greater WTP and simulated assemblage. • Anatomical (vs. non-anatomical) depiction leads to greater use of product performance claims in selling blurbs. • The core serial mediation is replicated with the behavioral measure of confidence in product performance.
Study 3	Online experiment (MTurk)	Sense sleep tracker	2 (product depiction: anatomical/non-anatomical) between-subjects • Measured technology anxiety	494	Purchase intention Simulated assemblage Confidence in product performance	• The positive effects of anatomical (vs. non-anatomical) depiction on purchase intention, simulated assemblage, and confidence in product performance are attenuated for consumers higher (vs. lower) in technology anxiety. • The core serial mediation is attenuated for consumers higher (vs. lower) in technology anxiety.

Study 4	Online experiment (Prolific)	Fictitious wireless speaker	2 (product depiction: anatomical/non-anatomical) × 2 (consumption goal: utilitarian/hedonic) between-subjects	444	WTP	• Consumption goal moderates the effect of anatomical depiction on WTP.
						  • With utilitarian goal, anatomical (vs. non-anatomical) depiction leads to greater WTP.
						  • With hedonic goal, the effect of anatomical depiction on WTP is attenuated.

All data and stimuli are available on OSF (https://osf.io/jqn5u/).

Overall, 231 users clicked the listing, resulting in 2.62% total CTR. A binary logistic regression on clicks (0 = users who did not click, 1 = users who clicked the listing) revealed that the CTR in the anatomical depiction condition (2.96%) was higher than in the non-anatomical depiction condition (2.30%; Wald $\chi^2(1) = 3.76$, B = .26, SE = .13, $p = .052$). Pilot Study A provides initial field evidence showing the positive effect of anatomical depiction on consumer reactions. We further report a second pilot study using Meta's advertising platform to explore the role of anatomical depiction in online display advertising.

Pilot Study B: Field Experiment on Meta Ads Campaign

Method

We ran online display ads for an existing brand's product (Sealy's mattress) on Meta's advertising platform to measure users' CTRs. Like Pilot Study A, we created two versions (anatomical and non-anatomical depiction) of Sealy's mattress ad using images from its official website (see Appendix A). Meta's split-test function randomly assigned users of Meta social media such as Facebook and Instagram aged 18 or above and living in the U.S. to one of the two ad conditions. We ran the ads on Meta for 96 hours (Final N = 52,967; unique impressions).

Results and Discussion

In total, 418 Meta users clicked the website link, resulting in .79% total CTR (the average CTR on Meta is .90%; Irvine 2024). A binary logistic regression on clicks (0 = users who did not click the link, 1 = users who clicked the link) showed that CTR in the anatomical depiction condition (1.03%) was significantly higher than in the non-anatomical depiction condition (.61%; Wald $\chi^2(1) = 29.09$, B = .53, SE = .10, $p < .001$).

To sum up, two pilot field studies document behavioral evidence from two distinct real-world settings suggesting that anatomical depiction effectively enhances consumer responsiveness to ads. However, the underlying mechanism driving these positive consumer reactions remains unclear. In Studies 1–2, we aim to understand how and why anatomical depiction influences product valuation in more controlled settings.

Study 1: Understanding Simulated Assemblage

The objectives of Study 1 are twofold. First, we aim to clarify conditions in which anatomical depiction elicits simulated assemblage by experimentally varying the type of depictions in our control groups (Studies 1A–B). This experimental control also addresses the alternative explanation of information asymmetry (Study 1A). Second, we examine the spontaneity of simulated assemblage using an open-ended written protocol measure rather than retrospective self-report measures (Study 1C).

Study 1A: Testing the Role of Spatial Separation in Eliciting Simulated Assemblage

In Study 1A, we test how spatial separation between inner components affects simulated assemblage using a cross-sectional cutaway depiction as a second control group. Similar to anatomical depiction, a cutaway depiction reveals a product's inner components and arranges them in the order of assembly. However, cutaway depiction displays the product in a way that its components are already put together. Since there is a lack of spatial separation between the inner components, the opportunity for the viewer to visually simulate their coming together should be reduced (compared to anatomical depiction). Thus, we expect simulated assemblage to be attenuated in the cutaway condition. The cutaway condition also helps us examine the alternative explanation of information asymmetry between anatomical and non-anatomical depictions. By definition, anatomical depiction reveals a product's interior that is normally hidden and so, provides greater quantity of visual information that is not available in non-anatomical depiction.

A cutaway depiction allows us to provide similar amount and type of visual information, albeit without the inner components being visually separated.

Method

Three hundred and one individuals from Amazon Mechanical Turk (MTurk) participated in a single-factor (product depiction: anatomical/non-anatomical/cutaway) between-subjects experiment for a small payment. We excluded five participants who failed an attention check, leaving 296 responses for the analyses (M_{age} = 39.52 years; 43.6% female, 55.7% male, .7% other). This study was preregistered (https://aspredicted.org/pu5ym.pdf).

We manipulated the anatomical and non-anatomical conditions as in the pilot studies. In the cutaway condition, a portion of the focal product was cut and removed to reveal the product's inside (see Appendix A). However, the inner components were presented as being put together without any separation between them. Participants were randomly assigned to view one of the three ads for Sealy's mattresses. After viewing the ad, participants reported a three-item scale measuring simulated assemblage (α = .94). Then, participants responded to two manipulation check measures for product depiction. They first indicated whether the product's inner parts were visible in the ad (0 = "No, the inner parts were not visible," and 1 = "Yes, the inner parts were visible."). Then, participants in the anatomical and cutaway conditions indicated whether the product's inner components were clearly separated in the ad (1 = "The parts were not clearly separated out," and 7 = "The parts were clearly separated out."). Lastly, participants provided demographic information.

Manipulation checks

A binary logistic regression revealed that both in the anatomical (97.0%; Wald $\chi^2(1)$ = 59.29, B = 4.94, SE = .64, $p < .001$) and cutaway (86.0%; Wald $\chi^2(1)$ = 71.12, B = 3.28, SE

= .39, $p < .001$) conditions, significantly more participants reported seeing the inner parts than in the non-anatomical condition (18.8%). Additionally, a t-test revealed that participants in the anatomical (vs. cutaway) condition were more likely to indicate that the parts were clearly separated out ($M_{anatomical} = 6.35$, SD = .98 vs. $M_{cutaway} = 5.25$, SD = 1.64; $t(198) = 5.76$, $p < .001$).

Results and discussion

A one-way ANOVA showed a significant main effect of product depiction on simulated assemblage ($F(2, 293) = 21.40$, $p < .001$). Specifically, as hypothesized (H_{1a}), simulated assemblage was significantly greater in the anatomical (vs. non-anatomical) condition ($M_{anatomical} = 6.10$, SD = 1.00 vs. $M_{non\text{-}anatomical} = 4.99$, SD = 1.34; $t(293) = 6.53$, $p < .001$). Simulated assemblage was also significantly greater in the cutaway (vs. non-anatomical) condition ($M_{cutaway} = 5.51$, SD = 1.20; $t(293) = 3.05$, $p = .002$). This latter result is conceptually aligned with our theory since the cutaway condition reveals the focal product's inside, thereby affecting simulated assemblage to some extent. More importantly, simulated assemblage was significantly greater in the anatomical (vs. cutaway) condition ($t(293) = 3.52$, $p < .001$). This significant difference between the anatomical and cutaway depiction conditions supports our conjecture that removing spatial separation between inner components reduces the opportunity for the 'coming together' process thereby attenuating simulated assemblage. This result also helps rule out information asymmetry as a potential alternative explanation. Going forward, in Study 1B, we test the role of spatial arrangement in eliciting simulated assemblage.

Study 1B: Testing the Role of Spatial Arrangement in Eliciting Simulated Assemblage

Our theory proposes that anatomical depiction elicits simulated assemblage because it not only reveals a product's inner components but also spatially arranges them in the order of assembly. As such, when consumers view the anatomical depiction ad, a gestalt image of the completed product is formed in their mind as they visually simulate putting the adjacent components together. Therefore, if the depiction does not spatially arrange inner components in the order of assembly, simulated assemblage should be less likely to manifest. In Study 1B, we test this by modifying the order of depicting components in one of the control groups.

Method

Two hundred individuals from MTurk (M_{age} = 39.46 years; 36.5% female, 63.5% male) participated in Study 1B for a small payment. We used a 3 (product depiction: anatomical/non-anatomical/disarranged) × 3 (product category: air purifier/smartwatch/running shoe) mixed factorial design, with product depiction as a between-subjects factor and product category as a within-subjects factor. We manipulated the anatomical and non-anatomical conditions as in previous studies. In the disarranged condition, the product's inner components were decomposed, but the order of the components was disarranged (see Appendix A). Participants were randomly assigned to one of the three depiction conditions, and the presentation order of the three product categories was randomized. As such, participants were exposed to three ads enabling them to view all three product categories and one product depiction type. After viewing each ad with a buying scenario, participants reported simulated assemblage ($\alpha_{air\ purifier}$ = .97; $\alpha_{smartwatch}$ = .96; $\alpha_{running\ shoe}$ = .95) and then responded to two product depiction manipulation check measures. First, all participants indicated whether the product's inner parts were visible in the ad (as in Study 1A). Second, participants in the anatomical and disarranged conditions indicated whether the ad showed product assembly in an orderly manner for the disarrangement manipulation check ("Did the ad show the assembly of the product in an orderly manner?"; 1 = "Not at all," and 7 = "Very much"). Lastly, they were asked to identify the specific ad they saw earlier out of the three ads for each category and provided demographic information.

Manipulation checks

A binary logistic regression revealed that both in the anatomical (97.1%; Wald $\chi^2(1)$ = 38.44, B = 7.67, SE = 1.24, $p < .001$) and disarranged (98.5%; Wald $\chi^2(1)$ = 34.19, B = 8.33, SE = 1.43, $p < .001$) conditions, significantly more participants reported seeing the product's inner parts than in the non-anatomical condition (1.5%). Chi-square tests on the recognition task also confirmed these findings. More than 92% of participants in each depiction condition correctly identified the ads they were exposed to among the three ads for each category (all *p*s < .001). In addition, a t-test revealed that participants in the anatomical condition were more likely to indicate that the ad showed product assembly in an ordered manner than the disarranged condition ($M_{anatomical}$ = 6.48, SD = .68 vs. $M_{disarranged}$ = 4.92, SD = 1.64; t(133) = 7.26, $p < .001$).

Results and discussion

We conducted a mixed model ANOVA with product depiction as the independent variable and simulated assemblage for each product category as the repeated measure. The ANOVA revealed a significant main effect of product category (F(2, 394) = 26.24, $p < .001$) and a significant interaction effect (F(4, 394) = 3.21, $p = .013$). More importantly, there was a significant main effect of product depiction (F(2, 197) = 60.83, $p < .001$). Specifically, replicating H_{1a}, simulated assemblage was significantly greater in the anatomical (vs. non-anatomical) condition ($M_{anatomical}$ = 5.82, SD = .89 vs. $M_{non\text{-}anatomical}$ = 3.67, SD = 1.38; t(197) = 10.81, $p < .001$). Simulated assemblage was also significantly greater in the disarranged (vs. non-anatomical) condition ($M_{disarranged}$ = 5.16, SD = 1.14 vs. $M_{non\text{-}anatomical}$ = 3.67, SD = 1.38; t(197) = 7.39, $p < .001$). More importantly, simulated assemblage was significantly greater in the anatomical (vs. disarranged) condition (t(197) = 3.36, $p < .001$). Planned contrasts within each product also replicate the overall pattern (for details on individual means and SDs, see Web

Appendix C). The results of Study 1B support our conceptualization by showing that when the spatial arrangement of inner components does not follow the order of assembly, simulated assemblage is attenuated.

Study 1C: Process Tracing Using Open-Ended Response Protocols

Drawing upon prior literature suggesting that visual imagery can be spontaneously evoked simply by viewing a picture (Cian, Krishna, and Elder 2015) or seeing an object (MacInnis and Price 1987), we conceptualize simulated assemblage as a stimulus-driven process in which a gestalt image of the product is formed spontaneously in consumers' mind. In Study 1C, we test this conjecture using open-ended written protocols.

Method

Three hundred individuals from MTurk (M_{age} = 40.69 years; 58% female, 40.3% male, 1.7% other) participated in a single-factor (product depiction: anatomical/non-anatomical/disarranged) between-subjects experiment for a small payment. We manipulated product depiction using the smartwatch stimuli from Study 1B (see Appendix A). Participants were randomly assigned to view one of the three ads for the fictitious smartwatch along with a buying scenario. After viewing the ad, participants completed an open-ended question asking them to describe what they envisioned in their mind while viewing the ad (see Web Appendix B for the exact prompt). Participants' responses to this open-ended measure were coded for evidence of simulated assemblage. Next, all participants completed the manipulation check for product depiction ("In the ad I saw earlier, the product's inner parts were visible."). Then, participants in the anatomical and disarranged conditions completed the manipulation check for disarrangement as in Study 1B. Lastly, they provided demographic information.

Manipulation checks

A one-way ANOVA revealed that the product depiction manipulation was successful ($F(2, 297) = 177.59$, $p < .001$). Specifically, both in the anatomical ($M_{anatomical} = 6.19$, SD = 1.26; $t(297) = 17.37$, $p < .001$) and disarranged ($M_{disarranged} = 5.79$, SD = 1.39; $t(297) = 15.16$, $p < .001$) conditions, participants were significantly more likely to indicate that they saw the product's inner parts in the ad than those in the non-anatomical condition ($M_{non\text{-}anatomical} = 2.59$, SD = 1.74). The difference between the anatomical and disarranged conditions was marginally significant ($t(297) = 1.96$, $p = .051$). An additional t-test revealed that participants in the anatomical (vs. disarranged) condition were significantly more likely to indicate that the ad showed product assembly in an ordered manner ($M_{anatomical} = 6.04$, SD = 1.26 vs. $M_{disarranged} = 4.91$, SD = 1.62; $t(201) = 5.57$, $p < .001$).

Results and discussion

Two independent coders who were blind to the hypothesis coded participants' open-ended responses into two categories. Specifically, thought protocols that indicated the unaided use of words describing simulated assemblage (e.g., how the product is formed, constructed, built, or assembled/disassembled, etc.) were coded as 1 while other protocols were coded as 0. There was 94% agreement between the coders. Disagreements were resolved through discussion. The resolved binary index served as our process-tracing measure. A binary logistic regression revealed that more participants in the anatomical condition (27.62%) articulated thoughts related to simulated assemblage after viewing the ad, compared to those in the disarranged (12.24%; Wald $\chi^2(1) = 7.10$, B = 1.01, SE = .38, $p = .008$) or non-anatomical (0%) conditions, supporting our conjecture that simulated assemblage occurs spontaneously.

To sum up, in Studies 1A and 1B, we clarify conditions under which anatomical depiction is more likely to elicit simulated assemblage. Anatomical depiction causes simulated assemblage as it reveals a product's inner components *and* spatially arranges them in the order of product assembly. Depicting inner components as a composite (i.e., cutaway view) – even if a product depiction reveals a similar amount and type of visual information on the product's interior – significantly weakens the effect (Study 1A), as does losing the layer-by-layer arrangement of the product's inner components (Study 1B). Finally, in Study 1C, using open-ended protocols rather than retrospective self-report measures, we present evidence that simulated assemblage could occur spontaneously. Moving forward to Study 2, we turn our attention to testing the full process ($H_{1a\text{-}1d}$) with downstream outcomes (i.e., product valuation).

Study 2A: Testing the Full Model

Study 2A explores the proposed process in which anatomical depiction enhances product valuation through simulated assemblage and confidence in product performance. We test this full causal chain ($H_{1a\text{-}1d}$) using serial mediation analysis. Additionally, we explore potential alternative explanations around complexity-related variables (e.g., perceived usability, learning cost, product complexity), perceived ownership, and the ad's informativeness.

Firstly, due to the greater details of inner components shown in anatomical depictions, consumers may perceive greater complexity in general (Pieters, Wedel, and Batra 2010). Such complexity might lead to attributions of technological advancement, subsequently enhancing valuations. Contrarily, prior research has also documented the detrimental effects of complexity on valuations through an increase in perceived performance risk and perceived difficulty in usage or learning costs (Mukherjee and Hoyer 2001; Holak and Lehman 1990). Secondly, one might argue that anatomical depiction affects product valuation via perceived ownership driven by consumers' imagined self-assembly. However, our theory conceptualizes simulated assemblage as a stimulus-driven perceptual grouping process that does not require physical labor or mental effort, key antecedents of perceived ownership for self-made or self-assembled products (Norton, Mochon, and Ariely 2012; Walasek, Rakow, and Matthews 2017).

As such, although plausible, we believe that complexity and perceived ownership are less likely to represent theoretically supported explanations. Nevertheless, we ensure that both anatomical and non-anatomical depictions present identical attributes such as brand names, logos, and product features to rule out the possibility of various extrinsic as well as intrinsic cues enhancing product valuation through perceived complexity (see Mukherjee and Hoyer 2001; Richardson, Dick, and Jain 1994). This experimental control was done to address the alternative explanation of the ad's informativeness as well. Furthermore, we statistically control for the alternative process variables in the serial mediation analyses.

Stimuli, Design, and Procedure

Two hundred twenty-three undergraduates participated in a single-factor (product depiction: anatomical/non-anatomical) between-subjects experiment in exchange for course credit. Three participants who failed an attention check were excluded, leaving 220 responses for analyses (M_{age} = 21.48 years; 58.6% female, 41.4% male).

Our manipulations followed previous studies (see Appendix A). Participants were asked to imagine that they were looking for a set of headphones and randomly shown one of two headphone ads. Thereafter, participants indicated the price they were willing to pay (WTP) for the headphones. We presented them with a range of average market prices ($50–$500). Then, participants reported their confidence in product performance (α = .93) and responded to the three-item scale measuring simulated assemblage (α = .95). Next, they completed a four-item scale measuring perceived ownership (e.g., "I feel that the headphones belong to me."; α = .84), a four-item scale measuring perceived usability (e.g., "Learning to use this product will be easy for me."; α = 85), a three-item scale measuring perceived learning cost ("In my opinion, learning to use the Denon headphones is likely to take a lot of time."; α = .98), a two-item scale measuring perceived complexity ("This product is very complex."; r = .82), and a three-item scale measuring the ad's informativeness (e.g., "The information offered in the ad is useful."; α = .70). Since the focal headphones were an existing brand (Denon), we measured ad familiarity ("How familiar are you with the Denon headphones ad you saw earlier?"), brand familiarity ("How familiar are you with the Denon headphones shown in the ad?"), product category familiarity ("How familiar are you with headphones in general?"), and product category knowledge ("How knowledgeable are you about headphones in general?") as control variables. We collected the manipulation check used in Studies 1A and 1B, and demographic information at the end (for full scales, see Web Appendix B).

Results and Discussion

Manipulation checks

A binary logistic regression revealed that significantly more participants reported seeing the product's inner parts in the anatomical (vs. non-anatomical) condition (99.1% vs. 24.3%; Wald $\chi^2(1) = 31.98$, B = 5.82, SE = 1.03, $p < .001$).

Willingness to pay

We applied a square-root transformation to the WTP responses to normalize the data and address zero values (Fisher, Newman, and Dhar 2018). We utilized the transformed WTP for all analyses but report untransformed means and SDs for ease of interpretation. We conducted a one-way analysis of covariance (ANCOVA) on WTP, using ad familiarity, brand familiarity, product category familiarity, and product category knowledge as covariates. Supporting H_{1c}, participants in the anatomical (vs. non-anatomical) condition indicated greater WTP for the headphones ($M_{anatomical}$ = $160.63, SD = 84.86 vs. $M_{non\text{-}anatomical}$ = $145.05, SD = 87.67; $F(1, 214) = 4.21$, $p = .041$).

Simulated assemblage

Replicating H_{1a}, a one-way ANOVA revealed that simulated assemblage was greater in the anatomical (vs. non-anatomical) condition ($M_{anatomical} = 6.06$, SD = .98 vs. $M_{non\text{-}anatomical} = 4.23$, SD = 1.44; $F(1, 218) = 121.21$, $p < .001$).

Confidence in product performance.

Supporting H_{1b}, a one-way ANOVA revealed that participants in the anatomical (vs. non-anatomical) condition were more confident about product performance ($M_{anatomical} = 5.05$, SD = .93 vs. $M_{non\text{-}anatomical} = 4.80$, SD = 1.08; $F(1, 218) = 3.35$, $p = .069$).

Serial mediation

To test the full causal chain, we conducted a serial mediation analysis, with WTP as the dependent, product depiction (0 = non-anatomical, 1 = anatomical) as the independent variable, simulated assemblage and confidence in product performance as mediators, and the four covariates, based on 5,000 bootstrap samples (PROCESS Model 6; Hayes 2018). The bias-corrected confidence interval (CI) of the indirect effects through simulated assemblage to confidence in product performance and subsequently to WTP excluded zero, which confirmed a significant serial mediation ($b_{indirect} = .57$, SE = .18, 95% CI = [.274, .957]). Other than the proposed indirect path, none of the other indirect paths were significant (see Figure 3). The exclusion of covariates does not change the core serial mediation effect ($b_{indirect} = .56$, SE = .18, 95% CI = [.243, .940]).

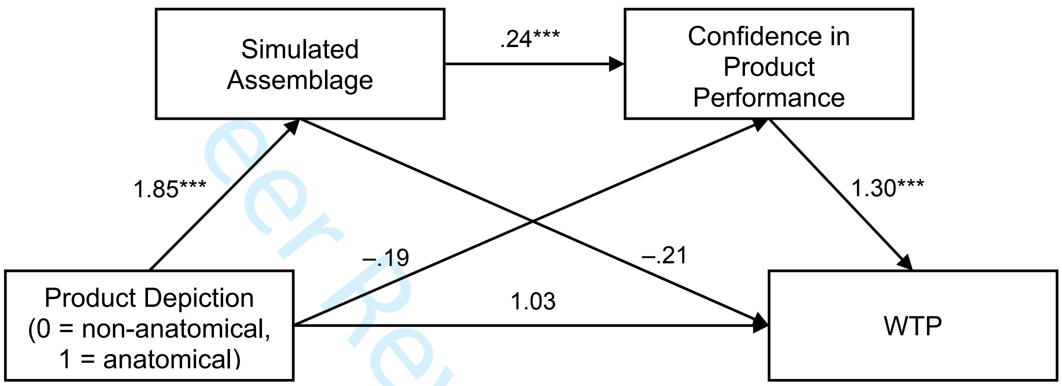
Alternative variables

One-way ANOVAs revealed that product depiction did not affect participants' perceived usability ($M_{anatomical}$ = 5.28, SD = 1.16 vs. $M_{non\text{-}anatomical}$ = 5.34, SD = 1.05; F(1, 218) = .16, *p* > .68) and learning cost ($M_{anatomical}$ = 2.43, SD = 1.32 vs. $M_{non\text{-}anatomical}$ = 2.24, SD = 1.22; F(1, 218) = 1.21, *p* > .27). Including perceived usability ($b_{indirect}$ = .58, SE = .18, 95% CI = [.270, .963]) or learning cost ($b_{indirect}$ = .55, SE = .18, 95% CI = [.255, .937]) as an additional covariate did not change the serial mediation effect. In addition, while product depiction affected perceived product complexity ($M_{anatomical}$ = 3.67, SD = 1.71 vs. $M_{non\text{-}anatomical}$ = 3.02, SD = 1.42; F(1, 218) = 9.37, *p* = .002), including it as an additional covariate did not change the serial mediation effect ($b_{indirect}$ = .45, SE = .17, 95% CI = [.175, .823]). These findings suggest that our proposed serial mediation holds even when controlling for perceived usability, learning cost, and product complexity.

Another ANOVA revealed that product depiction did not affect participants' perceived ownership ($M_{anatomical}$ = 2.51, SD = 1.20 vs. $M_{non\text{-}anatomical}$ = 2.51, SD = 1.15; F(1, 218) = .001, *p* > .97). Moreover, including perceived ownership as an additional covariate also did not change the serial mediation effect ($b_{indirect}$ = .54, SE = .18, 95% CI = [.220, .950]), confirming that perceived ownership does not account for our proposed full causal chain. In addition, product depiction did not affect the ad's informativeness ($M_{anatomical}$ = 4.27, SD = 1.16 vs. $M_{non\text{-}anatomical}$ = 4.32, SD = 1.02; F(1, 218) = .14, *p* > .70), indicating that information across two depiction conditions was perceived to be constant thereby ruling out this alternative explanation. The core serial mediation also held when additionally controlling for the ad's informativeness ($b_{indirect}$ = .31, SE = .15, 95% CI = [.043, .636]).

Taken together, Study 2A supports our hypotheses ($H_{1a\text{-}1d}$) that anatomical depiction, compared to non-anatomical depiction, elicits greater simulated assemblage, which in turn increases consumers' confidence in product performance, thereby enhancing product valuation. Importantly, we show the mediating role of simulated assemblage and confidence in product performance, controlling for the potential influences of alternative variables such as perceived usability, learning cost, product complexity, perceived ownership, and the ad's informativeness.

Figure 3: Full Causal Chain (Study 2A).



$^*p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Study 2B: Replication of the Full Model Using a Behavioral Task

Study 2B aims to replicate the effect of anatomical depiction on product valuation and its underlying mechanism using a non-scaled behavioral measure of confidence in product performance.

Stimuli, Design, and Procedure

Four hundred individuals from MTurk participated in a single-factor (product depiction: anatomical/non-anatomical) between-subjects experiment for a small payment. Three participants who failed an attention check were excluded, leaving 397 responses for analyses (M_{age} = 41.18 years; 58.7% female, 40.6% male, .8% other).

Participants were asked to imagine that they were visiting a retail store to buy a wireless speaker and encountered a speaker ad. Then, they were randomly shown one of two speaker ads (see Appendix A). Thereafter, participants indicated their WTP for the speaker. We presented them with a range of average market prices for a wireless speaker ($50–$500). Subsequently, participants were administered a task in which they were asked to develop a blurb in order to resell the speaker in an online marketplace. Participants were asked to consider specific selling points for the focal speaker that they would feel confident about (see Web Appendix B for the exact prompt). Then, they responded to the simulated assemblage scale ($\alpha = .95$) and measures for ad familiarity, brand familiarity, product category familiarity, and product category knowledge. Lastly, they responded to the product depiction manipulation check measure used in Study 1C and provided demographic information.

Manipulation checks

A t-test revealed that participants were more likely to indicate that they saw the product's inner parts in the anatomical (vs. non-anatomical) condition ($M_{anatomical} = 6.53$, SD = .94 vs. $M_{non-anatomical} = 1.62$, SD = 1.11; $t(395) = 47.56$, $p < .001$).

Willingness to pay

We square-root transformed the WTP responses as in Study 2A. We utilized the transformed WTP for all analyses but report untransformed means and SDs for ease of interpretation. We conducted a one-way ANCOVA on WTP using ad familiarity, brand familiarity, product category familiarity, and product category knowledge as covariates. Replicating Study 2A, participants in the anatomical (vs. non-anatomical) condition indicated greater WTP for the speaker ($M_{anatomical}$ = \$125.48, SD = 75.44 vs. $M_{non-anatomical}$ = \$103.95, SD = 61.97; $F(1, 391) = 9.18$, $p = .003$).

Simulated assemblage

Replicating Study 2A, a one-way ANOVA revealed that simulated assemblage was greater in the anatomical (vs. non-anatomical) condition ($M_{anatomical}$ = 5.74, SD = 1.22 vs. $M_{non-anatomical}$ = 4.28, SD = 1.54; $F(1, 395) = 110.38$, $p < .001$).

Confidence in Product Performance

Two independent coders who were blind to the hypothesis coded participants' selling blurbs into two categories. Specifically, write-ups that emphasized key performance benefits of the focal speaker were coded as 1 (e.g., words or phrases reflecting a focus on overall product performance, quality, audio or sound quality, craftsmanship, quality materials, etc.), while blurbs that focused on other aspects (e.g., price, aesthetics, color, size, etc.) were coded as 0. Overall, 73.80% of participants emphasized performance. There was 93% agreement between the two coders, and disagreements were resolved via discussion. The resolved binary index served as a measure of confidence in product performance. A binary logistic regression revealed that significantly more participants in the anatomical condition (78.79%) used product performance claims in their selling blurbs compared to those in the non-anatomical condition (68.84%; Wald $\chi^2(1) = 5.03$, B = .52, SE = .23, $p = .025$), replicating results from Study 2A.

Serial mediation

To test the full causal chain, we conducted a serial mediation analysis, with the square-root transformed WTP as the dependent, product depiction (0 = non-anatomical, 1 = anatomical) as the independent variable, simulated assemblage and confidence in product performance as the serial mediators. We also included ad familiarity, brand familiarity, product category familiarity, and product category knowledge as control variables for WTP. Given that one of our mediators was the non-scaled binary variable of confidence in product performance, we used the lavaan package in R (Rosseel 2012) to estimate the serial mediation model based on 5,000 bootstrap samples. Replicating Study 2A, the indirect effect of anatomical depiction on WTP through simulated assemblage and confidence in product performance was significant ($b_{indirect}$ = .06, SE = .03, *p* = .046; see Web Appendix D). Specifically, the paths from product depiction to simulated assemblage (b = 1.46, SE = .14, *p* < .001), from simulated assemblage to confidence in product performance (b = .04, SE = .01, *p* = .001), and from confidence in performance to WTP (b = 1.00, SE = .35, *p* = .004) were significant. Furthermore, other than the proposed serial mediation path, none of the other indirect paths, i.e., paths solely via simulated assemblage ($b_{indirect}$ = .09, SE = .16, *p* = .57) or confidence in performance ($b_{indirect}$ = .04, SE = .04, *p* = .31) were significant; the direct path from product depiction to WTP remained significant (b = .74, SE = .34, *p* = .029). The exclusion of covariates does not change the core serial mediation effect ($b_{indirect}$ = .06, SE = .03, *p* = .040). However, the direct path from product depiction to WTP becomes marginally significant (b = .69, SE = .36, *p* = .051).

To sum up, in Study 2B, we provide robust evidence of the impact of anatomical depiction and its underlying mechanism ($H_{1a\text{-}1d}$) using non-scaled, behavioral responses of confidence in product performance. These findings again hold when accounting for ad familiarity, brand familiarity, product category familiarity, and product category knowledge.

Study 3: Testing Process via Moderation by Technology Anxiety

Study 3 aims to test the primary underlying process via moderation by technology anxiety as an individual trait difference. We expect our proposed process to be attenuated for consumers higher (vs. lower) in technology anxiety (H_2).

Stimuli, Design, and Procedure

Study 3 included one manipulated factor (product depiction: anatomical/non-anatomical) and one measured factor (technology anxiety, continuous). Five hundred individuals participated in exchange for a small payment. Six participants who failed an attention check were excluded, leaving 494 responses for analyses (M_{age} = 43.22 years; 47.2% female, 51.8% male, 1.0% other).

Participants were asked to imagine that they were looking for a sleep tracker and randomly shown one of two ads for a sleep tracker. The product depiction manipulations followed previous studies (see Appendix A). Thereafter, participants responded to a three-item scale measuring their purchase intention for the sleep tracker (e.g., "How likely would you be to buy this sleep tracker?"; α = .98). Then, they responded to the confidence in product performance (α = .98) and simulated assemblage (α = .98) scales and measures for ad familiarity, brand familiarity, product category familiarity, and product category knowledge. Next, participants completed the manipulation check for depiction ("I was able to see all the different inner parts of the sleep tracker."). Participants then completed a four-item scale for technology anxiety (e.g., "I feel apprehensive about using technology."; α = .92), with higher numbers indicating higher levels of technology anxiety (M = 2.47, SD = 1.48). The overall mean and SD of technology anxiety in our sample were comparable to those found in past research. For instance, the mean and SD of technology anxiety reported by Meuter et al. (2005) were 2.32 and 1.55, respectively. Lastly, participants provided demographic information.

Results and Discussion

Manipulation checks

A t-test revealed that participants were more likely to indicate that they saw the product's inner parts in the anatomical (vs. non-anatomical) condition ($M_{anatomical}$ = 6.31, SD = .96 vs. $M_{non-anatomical}$ = 2.54, SD = 1.84; t(492) = 28.67, p < .001).

Purchase Intention

We regressed purchase intention on product depiction (0 = non-anatomical, 1 = anatomical), technology anxiety, and their interaction as predictors (PROCESS Model 1; Hayes 2018). Due to multicollinearity concerns, we did not include ad familiarity, brand familiarity, product category familiarity, and product category knowledge as covariates (all the variance inflation factors [VIF] were greater than 5). The analysis revealed a significant main effect of product depiction (b = .86, SE = .32, t(490) = 2.70, *p* = .007), no main effect of technology anxiety (b = .09, SE = .08, t(490) = 1.06, *p* > .29) and a significant interaction effect between product depiction and technology anxiety (b = –.23, SE = .11, t(490) = –2.08, *p* = .038). We employed the Johnson–Neyman technique to identify the range of technology anxiety for which the effect of product depiction on purchase intention was significant. We found a significant positive effect of anatomical (vs. non-anatomical) depiction on purchase intention among participants whose technology anxiety score was 2.33 or lower (b_{JN} = .32, SE = .17, t(490) = 1.96, *p* = .050), while this effect was not significant among participants whose technology anxiety score was higher than 2.33 (41.90% of the participants).

Simulated assemblage

We regressed simulated assemblage on product depiction (0 = non-anatomical, 1 = anatomical), technology anxiety, and their interaction as predictors (PROCESS Model 1; Hayes 2018). The analysis revealed significant main effects of product depiction (b = 2.92, SE = .29, t(490) = 9.98, *p* < .001), technology anxiety (b = .16, SE = .07, t(490) = 2.17, *p* = .030), and a significant interaction effect (b = –.33, SE = .10, t(490) = –3.27, *p* = .001). A Johnson–Neyman floodlight analysis further found a significant positive effect of anatomical (vs. non-anatomical) depiction on simulated assemblage among participants whose technology anxiety score was 6.31

or lower (b_{JN} = .82, SE = .42, t(490) = 1.96, *p* = .050). This effect was not significant among participants whose technology anxiety score was higher than 6.31 (2.23% of the participants). Thus, simulated assemblage occurred with exposure to anatomical depiction in the majority of our participants (97.77%), except for those who were extremely anxious about technology.

Confidence in Product Performance

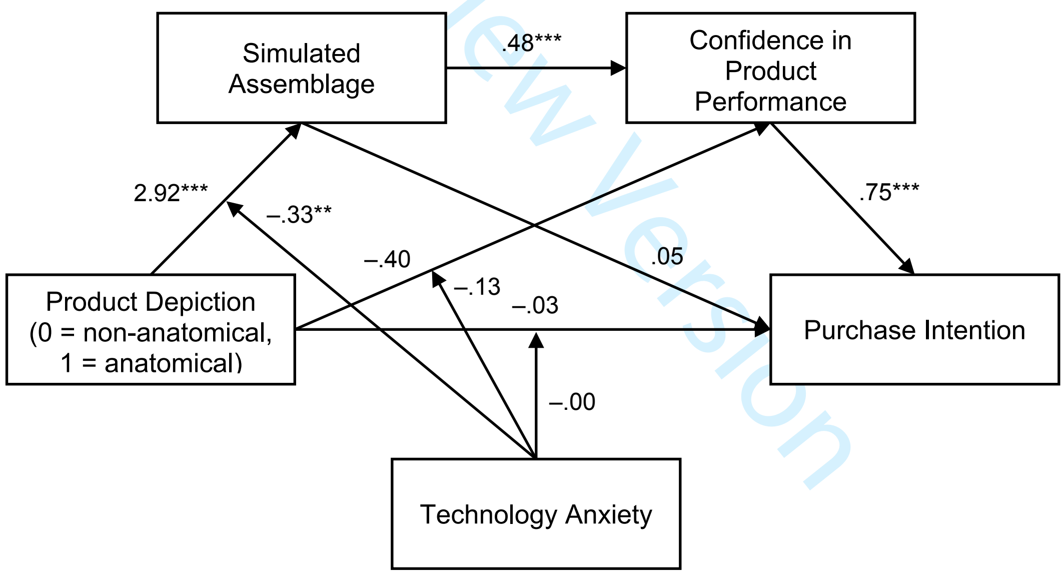
We regressed confidence in product performance on product depiction (0 = non-anatomical, 1 = anatomical), technology anxiety, and their interaction as predictors (PROCESS Model 1; Hayes 2018). The analysis revealed significant main effects of product depiction (b = .99, SE = .30, t(490) = 3.26, *p* = .001) and technology anxiety (b = .15, SE = .08, t(490) = 2.02, *p* = .044), and a significant interaction effect (b = –.28, SE = .11, t(490) = –2.69, *p* = .007). A Johnson–Neyman floodlight analysis further showed that the positive effect of anatomical (vs. non-anatomical) depiction on confidence in product performance was significant for participants whose technology anxiety score was lower than 2.41 (b_{JN} = .30, SE = .16, t(490) = 1.96, *p* = .050; 58.10% of the participants). This effect dissipated for participants whose technology anxiety score was between 2.41 and 6.89 (40.69% of the participants). Moreover, anatomical (vs. non-anatomical) depiction had a *negative* effect on confidence in product performance for participants whose technology anxiety score was higher than 6.89 (1.21% of the participants).

Moderated serial mediation

We conducted a moderated serial mediation analysis based on 5,000 bootstrap samples (PROCESS Model 85; Hayes 2018) with purchase intention as the dependent variable, product depiction (0 = non-anatomical, 1 = anatomical) as the independent variable, simulated assemblage and confidence in product performance as the serial mediators, and technology anxiety as the moderator. Supporting H_2, our proposed serial mediation path (product depiction

→ simulated assemblage → confidence in product performance → purchase intention) was significantly, and negatively, moderated by technology anxiety (index of moderated mediation = –.12, SE = .04, 95% CI = [–.205, –.043]). Specifically, the serial mediation effect encapsulated by H_{1d} attenuated with increasing technology anxiety. At the extreme end of the technology anxiety measure (6.25 and above), the overall effect dropped below statistical significance ($b_{indirect}$ = .30, SE = .16, 95% CI = [–.007, .600]; 2.43% of the participants). None of the other indirect paths, i.e., the path via simulated assemblage alone (index of moderated mediation = –.02, SE = .01, 95% CI = [–.052, .005]) or the path via confidence in performance alone (index of moderated mediation = –.09, SE = .08, 95% CI = [–.252, .061]) were moderated by technology anxiety (see Figure 4).

Figure 4: Full Causal Chain Moderated by Technology Anxiety (Study 3).



*p < .05, **p < .01, ***p < .001.

The results of Study 3 provide direct support for H_2. The proposed core effect and its underlying mechanism attenuate steadily as we move across consumers from the lower to the higher end of the technology anxiety spectrum. We observe this attenuation particularly strongly with individuals who are extremely anxious about technology (i.e., participants whose technology anxiety scores were greater than 6 on a seven-point scale; about 2% of our sample). Notably, for these individuals, anatomical depiction failed to elicit simulated assemblage and even decreased their confidence in product performance.

Study 4: Moderation by Consumption Goal

Study 4 aims to test H_3, i.e., that the positive effect of anatomical (compared to non-anatomical) depiction on product valuation is attenuated with hedonic (vs. utilitarian) consumption goals.

Stimuli, Design, and Procedure

Four hundred eighty-one individuals from Prolific participated in a 2 (product depiction: anatomical/non-anatomical) × 2 (consumption goal: utilitarian/hedonic) between-subjects experiment for a small payment. We excluded four participants who failed an attention check. Additionally, since we utilized the same brand, product, and ad stimulus from Study 2B, we checked for participants' prior exposure to the study/stimuli and excluded thirty-three participants who reported having taken the survey to avoid potential duplication, leaving 444 responses for analyses (M_{age} = 41.30 years; 53.6% female, 45.3% male, 1.1% other). The inclusion of these potential duplicate participants does not change our core inferences.

Participants were randomly assigned to read one of two shopping scenarios that manipulated consumption goals. Specifically, participants in the utilitarian condition read, "Imagine you're in search of a powerful wireless speaker that satisfies your auditory senses. Specifically, you are looking for a speaker with a rich, cutting-edge sound that can effortlessly fill up any room and elevate your audio experiences," while participants in the hedonic condition read, "Imagine you're in search of a beautiful wireless speaker that satisfies your aesthetic senses.

Specifically, you are looking for a speaker with a sophisticated, state-of-the-art design that can seamlessly blend into any room and elevate your home decor." The utilitarian goal manipulation aims to elicit consumers' motivation to seek functionally superior speakers, while the hedonic goal manipulation aims to elicit consumers' motivation to seek aesthetically superior speakers. Participants were then randomly shown one of two wireless speaker ads used in Study 2B (see Appendix A). Thereafter, participants indicated WTP following the same procedure used in Study 2B. They then completed measures for ad familiarity, brand familiarity, product category familiarity, and product category knowledge. Next, participants responded to a two-item manipulation check for consumption goal ("When I was evaluating the speaker, the speaker's [1 = "aesthetic value/aesthetic design," 7 = "functional value/auditory performance"] was important to me."; r = .86) and the product depiction manipulation check used in Studies 1C and 2B. Finally, they provided demographic information and indicated whether they had encountered identical survey questions earlier. This was done to filter out potential duplicate participants.

Results and Discussion

Manipulation checks

A two-way ANOVA revealed that the product depiction manipulation was successful ($F(1, 440) = 1965.43$, $p < .001$). Specifically, participants were more likely to indicate that they saw the product's inner parts in the anatomical (vs. non-anatomical) condition ($M_{anatomical} = 6.44$, SD = 1.25 vs. $M_{non\text{-}anatomical} = 1.46$, SD = 1.12). No other significant main or interaction effects emerged (all *p*s > .13). An additional two-way ANOVA revealed that the consumption goal manipulation was also successful ($M_{utilitarian} = 5.65$, SD = 1.19 vs. $M_{hedonic} = 3.72$, SD = 2.05; $F(1, 440) = 146.11$, $p < .001$). No other significant main or interaction effects emerged (all *p*s > .22).

Willingness to pay

We square-root transformed the WTP responses for analysis as in previous studies, but report untransformed means and SDs for ease of interpretation. A 2 (product depiction) × 2 (consumption goal) ANCOVA on WTP with ad familiarity, brand familiarity, product category familiarity, and product category knowledge as covariates revealed no main effects of product depiction ($F < 1$, $p > .33$) and consumption goal ($F < 1$, $p > .83$) but a significant interaction effect ($F(1, 436) = 4.29$, $p = .039$). Supporting H_3, we observed that when participants had a utilitarian goal, WTP was greater in the anatomical (vs. non-anatomical) condition ($M_{anatomical}$ = \$130.85, SD = 79.25 vs. $M_{non\text{-}anatomical}$ = \$110.46, SD = 65.11; $F(1, 436) = 4.54$, $p = .034$). However, when participants had a hedonic goal, WTP was not significantly different between the anatomical and non-anatomical conditions ($M_{anatomical}$ = \$116.67, SD = 72.91 vs. $M_{non\text{-}anatomical}$ = \$121.58, SD = 72.62; $F < 1$, $p > .42$).

Taken together, Study 4 shows that the effect of anatomical depiction on product valuation is moderated by consumption goals (H_3). Specifically, the effect of anatomical depiction on product valuation obtains with utilitarian goals, but does not manifest when consumers place more weight on aesthetic benefits for their consumption.

General Discussion

The present research investigates the effect of anatomical depiction on product valuation and its underlying mechanisms. Across nine studies, we demonstrate the core effect, examine process, identify boundaries, and test a variety of alternative explanations such as ad informativeness, product usability, learning cost, product complexity, and perceived ownership. We examine this effect across various consumer samples (e.g., online/offline, U.S./Asia, undergraduate students, MTurk/Prolific respondents, and major social media and peer-to-peer sales platform users), brand types (i.e., well-known, lesser-known, fictitious), and product categories, including tech gadgets (e.g., smartwatch, headphones, speaker, sleep tracker), wearables (e.g., shoes), home appliances (e.g., hair straightener, air purifier), and furniture (e.g., mattress), attesting to the generality of employing anatomical depiction in advertisements.

Practical Implications

To the best of our knowledge, we are the first to document scientific evidence that visually communicating a product's inner structure to customers offers benefits to firms. Although managerial practice predominantly focuses upon the firm's employees (e.g., salespersons, designers, production staff, etc.) better adopting the customers' point-of-view, anecdotal field evidence suggests that encouraging this connection in the other direction, i.e., helping customers better appreciate the manufacturer's point-of-view, can offer similar positive outcomes. For instance, the successful 2009 launch of the unibody Mac by Apple can be traced directly to highlighting the novel design and manufacturing process (machining the laptop from a block of aluminum) in its advertising campaign (Freedomidan 2009). By helping consumers visualize this process – Apple actually showed parts of the process in its ad and public relations pieces – the brand was able to successfully differentiate its new line of laptops using their inner structure as a unique selling proposition. Anatomical depiction offers a similar subtle yet effective 'visual language' for persuasion which is flexible for use across various communication channels such as digital, print, or multimedia. The empirical findings from our studies show its efficacy by way of increased WTP, purchase intention, as well as actual click-throughs.

Secondly, the current work suggests anatomical depiction could help firms efficiently manage customers' confidence in product performance. Compared to other strategies such as warranties and money-back guarantees, anatomical depiction offers a broader and relatively more cost-effective avenue to boost consumer confidence in product performance, subsequently increasing product valuation (Studies 1A–2B). This could in turn facilitate product innovation management since consumer confidence in product performance has been identified as a key driver of adoption and diffusion (Gatignon and Robertson 1985; Shih and Venkatesh 2004).

Third, the current work outlines technology anxiety as a consumer trait moderating the core effects (Study 3). Specifically, for consumers who are highly anxious about technology, the positive effect of anatomical depiction (vs. non-anatomical depiction) on product valuation and its underlying process are attenuated. These findings provide insights into segmentation strategy for firms wishing to use anatomical depiction. Specifically, firms intending to use this form of intervention might be better served in targeting consumer segments who are relatively more ready to adopt technology. Given the increasing prevalence of technology applications in various product categories, this implication is particularly relevant, especially since Study 3 also shows that anatomical depiction could potentially backfire (in terms of decreased confidence in product performance) for extremely technology-anxious consumers.

Lastly, we highlight to managers that consumers' consumption goals circumscribe the effect of anatomical depiction on product valuation (Study 4). Specifically, anatomical depiction enhances product valuation when consumers have utilitarian goals, but does not appear to do so with hedonic goals. Thus, managers should exercise caution when employing anatomical depictions if their products are positioned to provide primarily hedonic benefits (e.g., fashionable suitcase, stylish speaker).

Theoretical Contributions

Our research contributes to the marketing literature in four ways. First, we enrich the literature on visual depictions (e.g., Elder and Krishna 2012; Vanbergen, Irmak, and Sevilla

2020) by developing theory for anatomical depiction, a longstanding practice in marketing around which little to no theoretical knowledge currently exists. Although prior work has investigated various ways of depicting products, many of the insights in this line of work have been derived from *exterior* representations. This research is the first to document the impact of depicting a product in an inside-out manner, i.e., showing a product's *interior*.

Second, we contribute to mental simulation research by identifying a new antecedent to stimulus-driven imagery and describing its consequences on product-related judgments. Past research on product-related simulation has been more heavily weighted towards self-oriented imagery such as one's prospective or retrospective product experiences (e.g., Schlosser 2003; Hoeffler 2003). More recent work has begun to examine stimulus-driven imagery by exploring how visual cues shape holistic outcomes such as attitude towards a brand or behavior such as response to warning signs (e.g., Cian, Krishna, and Elder 2014, 2015). Our research expands the latter area and connects it to the former, product-related simulation area by introducing simulated assemblage as a product-focused stimulus-driven imagery process. Since simulated assemblage directly pertains to a product's inner construction, it has consequences for consumers' confidence in the product performing in future.

In developing this account, the current work provides an explanatory framework to understand how relatively automatic visual processing phenomena may affect downstream behavior via relevant intermediate consumer judgments (e.g., confidence in product performance). Our framework also identifies consumer-level factors such as technology anxiety and consumption goal which moderate the effect anatomical depiction upon consumer outcomes.

Third, we contribute to the literature on confidence (e.g., Koehler 1991) and performance risk (e.g., Shimp and Bearden 1982) by documenting anatomical depiction as a visual antecedent and simulated assemblage as the associated perceptual process. While prior work shows that mental simulation can enhance confidence judgments (e.g., Castaño et al. 2008; Koehler 1991), this result has been found using tasks that explicitly ask individuals to engage in the imagery/imagination process. More relevant to our work, recent research also examines cognition-based methods involving deliberative processing as ways to boost consumer confidence in the product (e.g., mechanistic explanations, Fernbach et al. 2013). The current work expands upon the above streams by introducing and explicating how a visual factor might achieve similar outcomes via a perceptual process without necessitating cognitive engagement.

Limitations and Opportunities for Future Research

This work primarily looks at products that have a clear inner structure whose decomposition is pertinent to product performance. Given the empirical ubiquity of anatomical depictions, we conjecture that other processes might operate elsewhere, especially in contexts where inner structure is non-existent or trivial in determining the product's functional values. For example, a bowl of granola or a slice of pizza may not necessarily have a clear inner structure or it may not play a critical role in impacting actual taste, even if it can be visualized using anatomical depiction. Examining processes in such contexts could yield new insights into how anatomical depiction affects different but conceptually related downstream outcomes such as perceived taste and/or food valuation.

The current work documents the effect of anatomical depiction on outcomes operationalized in various ways such as WTP, purchase intentions, self-report, and behavioral responses of confidence judgments. However, we acknowledge the lack of consequential measures of downstream outcomes extending beyond the judgments and valuation level. Future research may further test our theoretical framework using incentive-compatible experimental or field studies that can directly capture adoption and diffusion parameters such as behavioral choice, referrals, or word-of-mouth. Also, despite our efforts in controlling for the type and amount of visual information presented in product depictions in Study 1A, the question of information asymmetry between anatomical and non-anatomical depictions still remains open. Future work might explore alternative methods of depicting the product interior which could vary visual information more continuously (e.g., x-ray views, types of sectional views, etc.), and explore whether and how such depictions further influence downstream consequences. Lastly, while consumption goal moderates the core effect (Study 4), we recognize that performance attributes may correlate with experiential benefits as well (e.g., enjoyment from high audio quality). It is an open question on how the effect of anatomical depiction manifests when utilitarian and hedonic benefits diverge more clearly. Future research can extend our work by manipulating benefit type – utilitarian or hedonic – using different products.

Across all studies reported in this work, we consistently replicate that anatomical depiction elicits simulated assemblage. To further corroborate our findings, future research could explore alternative methods to elicit simulated assemblage. For instance, narrative representations (e.g., stories, scripts, etc.) of a product's construction may lead to similar effects. However, as narrative representations tend to evoke mental imagery in a more deliberative fashion (Elder and Krishna 2022), different mechanisms or moderators may come into play in shaping downstream outcomes. We speculate that need for cognition might influence the extent to which consumers simulate product construction via deliberative processing of the narrative. Additionally, simulated assemblage driven by narrative-based methods might be particularly relevant in the context of self-production where the self is more likely to be implicated in imagery formation.

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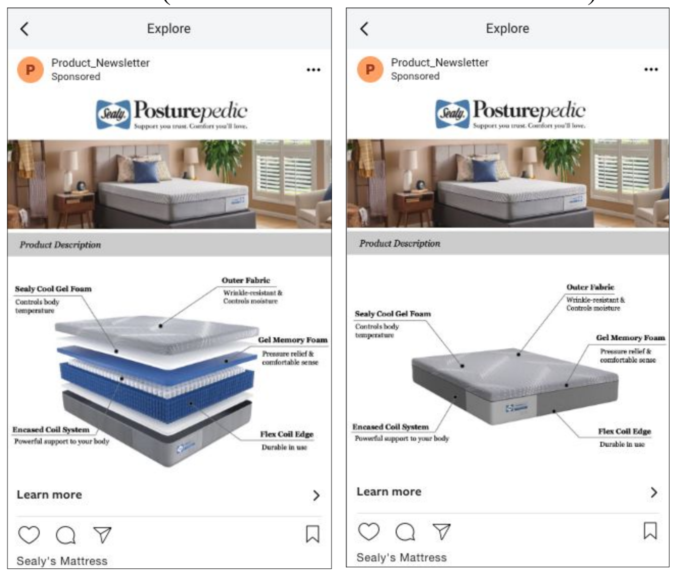
Appendix A. Stimuli Used in All Studies

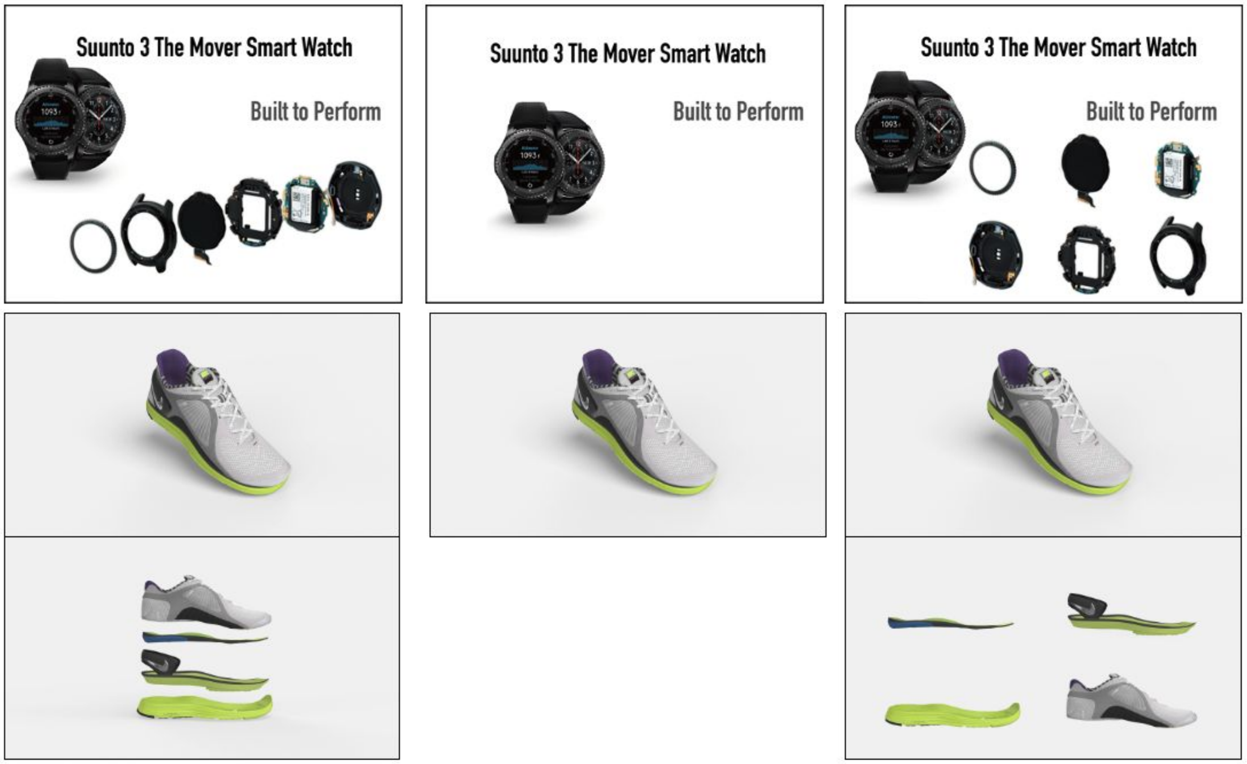
Pilot Study A
(Anatomical vs. Non-Anatomical)

Pilot Study B
(Anatomical vs. Non-Anatomical)

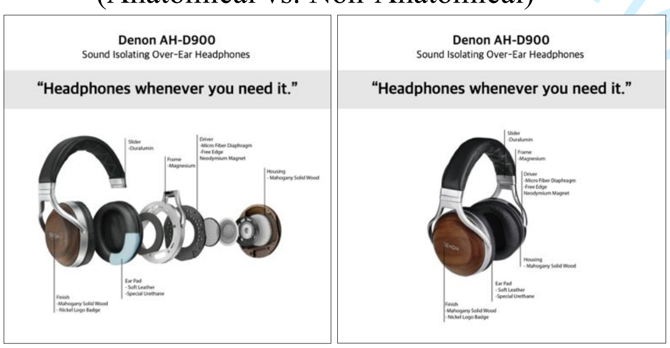


Study 1A
(Anatomical vs. Non-Anatomical vs. Cutaway)

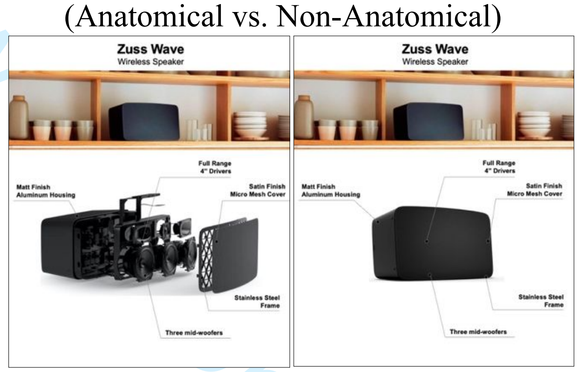
Studies 1B (Air purifier, Smartwatch, and Running Shoe) and 1C (Smartwatch)
(Anatomical vs. Non-Anatomical vs. Disarranged)



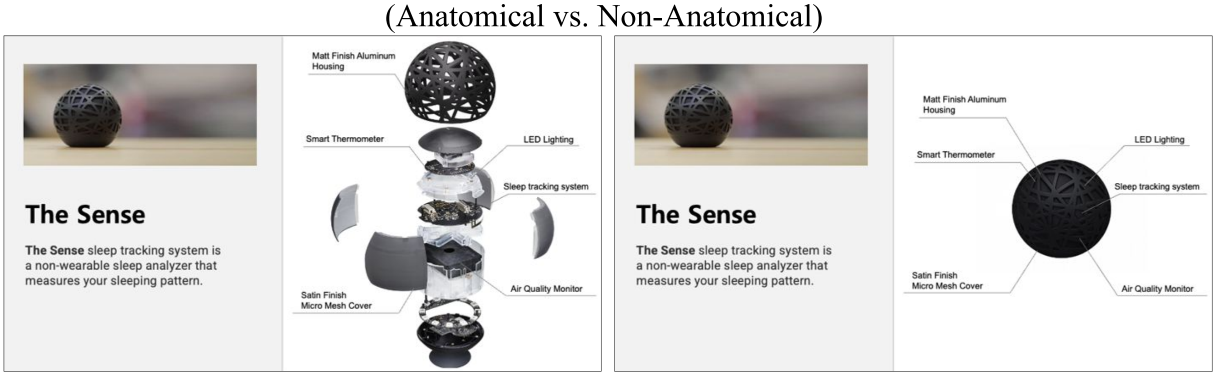
Study 2A
(Anatomical vs. Non-Anatomical)



Studies 2B and 4
(Anatomical vs. Non-Anatomical)



Study 3
(Anatomical vs. Non-Anatomical)



Web Appendices

Anatomical Depiction: How Showing a Product's Inner Structure Shapes Product Valuations

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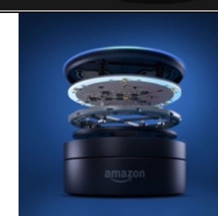
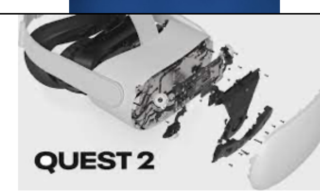
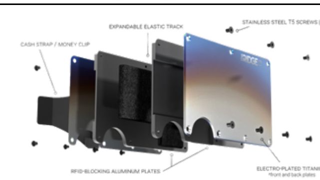
These materials have been supplied by the authors to aid in the understanding of their paper. The AMA is sharing these materials at the request of the authors.

Web Appendix A: Anatomical Depiction in Advertisements.

Forbes' Rank	Brand	Brand Value Brand Revenue	Product Category	Product Name	Launch Year	Visuals of Anatomical Depiction
1	Apple	$241.2 B $260.2 B	Technology (Cell phone)	iPhone 13	2021	
2	Google	$207.5 B $145.6 B	Technology (Thermostat)	Nest Learning Thermostat	2020	
3	Microsoft	$162.9 B $125.8 B	Technology (VR headset)	HoloLens2	2019	
4	Amazon	$135.4 B $260.5 B	Technology (AI speaker)	Echo Dot	2016	
5	Meta	$70.3 B $49.7 B	Technology (VR headset)	Oculus Quest 2	2020	

Forbes' Rank	Brand	Brand Value Brand Revenue	Product Category	Product Name	Launch Year	Visuals of Anatomical Depiction
8	Samsung	$50.4 B $209.5 B	Consumer Electronics (Earbuds)	Galaxy Buds Live	2020	
12	Intel	$39.5 B $72 B	Technology (Camera)	RealSense D455	2020	
13	Nike	$39.1 B $39.3 B	Fashion (Shoes)	Air Zoom	2021	
20	GE	$29.5 B $76.6 B	Consumer Appliances (Heat unit)	Zoneline Deluxe Series Heat Pump Unit	N/A	
24	IBM	$241.2 B $260.2 B	Consumer Electronics (Laptop)	Lenovo ThinkPad	2019	
44	Audi	$13.8 B $59.6 B	Automotive (Car)	Q3	2018	

Forbes' Rank	Brand	Brand Value Brand Revenue	Product Category	Product Name	Launch Year	Visuals of Anatomical Depiction
47	Sony	$13.3 B $63 B	Consumer Electronics (Camera)	Lensless lens camera	2014	
51	Adidas	$12.9 B $24.5 B	Fashion (Shoes)	Adizero	2021	
71	HP	$11 B $58.8 B	Consumer Electronics (Computer)	Omen 25L Desktop	2020	
80	Rolex	$9.5 B $5.2 B	Fashion (Watch)	Deepsea	2008	
90	Dell	$8.7 B $79.50 B	Consumer Electronics (Laptop)	Precision 5750	2020	
92	Lego	$8.6 B $5.8 B	Leisure (Toy)	Caterham Seven	2016	
93	Huawei	$8.5 B $188.6 B	Consumer Electronics (Earbuds)	FreeBuds 3i	2020	

Forbes' Rank	Brand	Brand Value Brand Revenue	Product Category	Product Name	Launch Year	Visuals of Anatomical Depiction
N/A	Dyson	$6.2 B $8.2 B	Consumer Appliances (Hair straightener)	Corrale	2016	
N/A	Levoit	$6.2 B	Consumer Appliances (Air purifier)	H132	2018	
N/A	Valentino	$1.07 B	Fashion (Shoes)	One Stud	2021	
N/A	Alfani	N/A N/A	Fashion (Shoes)	Step 'N Flex	2021	
N/A	Brightline Bags	N/A N/A	Fashion (Bag)	B18 Hangar	2014	
N/A	Ridge	N/A $50 M	Fashion (Wallet)	Titanium Wallet	2014	

Web Appendix B: Summary of Measurement Items.

Construct	Measurement Items (7-Point Scales)	Reliability (α or r)	Study
Simulated assemblage* (adapted from Sarantopoulos et al. 2019)	Based on the ad, I can easily imagine how the product is assembled together. Based on the ad, I can visualize how the parts of the product are [how the product is] composed. Showing the ad makes it easy for me to visualize how the components are put together to make the product.	.94 .95–.97 .95 .95 .98	Study 1A Study 1B Study 2A Study 2B Study 3
Simulated assemblage (prompt)	Please take a moment to reflect upon how the ad presented the product. Please use the space below to describe what you envisioned in your mind as you saw the ad. Please feel free to write below as much detail as you would like. The space available in the text box below is unlimited.	N/A	Study 1C
Willingness-to-pay	How much are you willing to pay for the [product] shown in the ad? Typical prices for [product category] range between $[low] and $[high].	N/A	Studies 2A, 2B, and 4
Purchase intention** (Yan, Keh, and Chen 2021)	Please rate your intention to purchase this sleep tracker in the ad. - How likely would you be to buy this sleep tracker? - How inclined would you be to buy this sleep tracker? - How willing would you be to buy this sleep tracker?	.98	Study 3
Confidence in product performance* (adapted from Grewal, Gotlieb, and Marmorstein 1994)	I am confident that the product will perform well. I am confident that the product will be effective. I am confident that the product's quality will be high. I am confident that the product will perform satisfactorily.	.93 .98	Study 2A Study 3
Confidence in product performance (prompt)	Now, imagine that you are re-selling the [product] in an online marketplace. Please write a brief, 3-5 sentence blurb for the listing based on the ad you just viewed. Please note that sellers often use claims that they are confident about as key selling points for the product posted.	N/A	Study 2B

Notes: *1 = strongly disagree, 7 = strongly agree. **1 = not at all, 7 = very much.
Pearson correlation coefficients (r) are italicized.

Construct	Measurement Items (7-Point Scales)	Reliability (α or r)	Study
Perceived ownership* (adapted from Fuchs, Prandelli, and Schreier 2010)	Although I do not own the [product] now, I have the feeling that the [product] are mine. I feel that the [product] belongs to me. I feel connected to the [product]. It is difficult for me to think of the [product] as mine (reverse coded).	.84	Study 2A
Perceived usability* (Thompson, Hamilton, and Rust 2005)	Learning to use this product will be easy for me. Interacting with this product will not require a lot of my mental effort. It will be easy to get this product to do what I want it to do. It will be easy to use this product.	.85	Study 2A
Perceived learning cost** (Mukherjee and Hoyer 2001)	In my opinion, learning to use the [product] is likely to take - a lot of time - effort - energy	.98	Study 2A
Perceived complexity* (adapted from Cox and Cox 2002)	This product is very complicated. This product is very complex.	*.82*	Study 2A
Ad informativeness** (adapted from Holzwarth, Janiszewski, and Neumann 2006)	The information offered in the ad is - useful - understandable - sufficient	.70	Study 2A
Ad familiarity	How familiar are you with the [brand's product] ad you saw earlier? 1 = not familiar at all, 7 = very familiar	N/A	Studies 2–4
Brand familiarity	How familiar are you with the [brand's product] shown in the ad? 1 = not familiar at all, 7 = very familiar	N/A	Studies 2–4
Product category familiarity	How familiar are you with [product category] in general? 1 = not familiar at all, 7 = very familiar	N/A	Studies 2–4
Product category knowledge	How knowledgeable are you about [product category] in general? 1 = not knowledgeable at all, 7 = very knowledgeable	N/A	Studies 2–4

Notes: *1 = strongly disagree, 7 = strongly agree. **1 = not at all, 7 = very much.
Pearson correlation coefficients (r) are italicized.

Construct	Measurement Items (7-Point Scales)	Reliability (α or r)	Study
Technology anxiety* (Meuter et al. 2005)	I feel apprehensive about using technology. Technical terms sound like confusing jargon to me. I have avoided technology because it is unfamiliar to me. I hesitate to use most forms of technology for fear of making mistakes I cannot correct.	.92	Study 3
Manipulation Check for Product Depiction	In the ad, were the [product]'s inner parts visible? 0 = No, the inner parts were not visible. 1 = Yes, the inner parts were visible.	N/A	Studies 1A, 1B, and 2A
Manipulation Check for Product Depiction*	In the ad I saw earlier, the product's inner parts were visible.	N/A	Studies 1C, 2B, and 4
Manipulation Check for Product Depiction*	I was able to see all the different inner parts of the sleep tracker.	N/A	Study 3
Manipulation Check for Product Depiction	How clearly the product's inner parts were separated out in the ad? 1 = The parts were not clearly separated out. 7 = The parts were clearly separated out.	N/A	Study 1A
Manipulation Check for Product Depiction**	Did the ad show the assembly of the product in an orderly manner?	N/A	Studies 1B and 1C
Manipulation Check for Consumption Goal	When I was evaluating the speaker, the speaker's [1 = "aesthetic value/aesthetic design", 7 = "functional value/auditory performance] was important to me.	*.86*	Study 4

Notes: *1 = strongly disagree, 7 = strongly agree. **1 = not at all, 7 = very much.
Pearson correlation coefficients (r) are italicized.

Web Appendix C: Planned Contrasts in Study 1B.

Table W1: Means and Standard Deviations within Each Product Category for Study 1B.

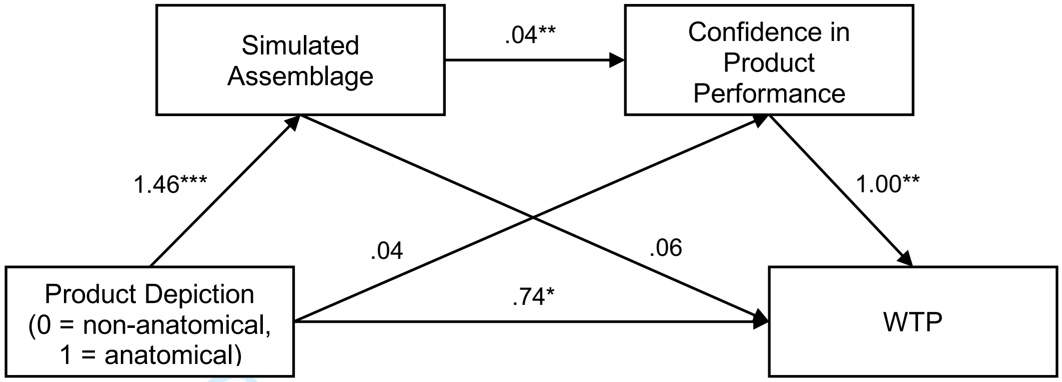
	Anatomical	**Non-Anatomical**	**Disarranged**
Air purifier	5.73 (1.28)	3.09 (1.60)	4.71 (1.74)
Smartwatch	5.73 (1.28)	3.64 (1.77)	5.18 (1.45)
Running shoe	6.01 (.89)	4.28 (1.64)	5.59 (1.25)

Notes: Cells report raw means and SDs (in parentheses).

Table W2: Planned Contrasts within Each Product Category for Study 1B.

		Mean Differences	**t- & *p*-values**
Air purifier	Anatomical vs. Non-anatomical	2.64	t(197) = 9.86, p < .001
	Disarranged vs. Non-anatomical	1.62	t(197) = 5.97, p < .001
	Anatomical vs. Disarranged	1.02	t(197) = 3.84, p < .001
Smartwatch	Anatomical vs. Non-anatomical	2.10	t(197) = 8.04, p < .001
	Disarranged vs. Non-anatomical	1.55	t(197) = 5.86, p < .001
	Anatomical vs. Disarranged	.55	t(197) = 2.13, p = .035
Running shoe	Anatomical vs. Non-anatomical	1.73	t(197) = 7.75, p < .001
	Disarranged vs. Non-anatomical	1.30	t(197) = 5.79, p < .001
	Anatomical vs. Disarranged	.42	t(197) = 1.91, p = .058

Web Appendix D: Full Causal Chain with a Behavioral Confidence Measure (Study 2B).



**p* < .05, ***p* < .01, ****p* < .001.

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