Bridging imagination gaps on the path to purchase with augmented reality: Field and experimental evidence

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Abstract

Many firms use augmented reality (AR) that projects lifelike product holograms into the physical environment to assist customers in bridging so-called 'imagination gaps', which can arise on their path to purchase. However, research has not yet studied whether and how AR might help customers address two pertinent sources of such imagination gaps: (1) increased cognitive load when evaluating multiple products together (e.g., in a bundle); and (2) extended physical distance to the point-of-sale (e.g., out-of-store, at home). Building on mental imagery theorizing, we explain how AR supports customers in bridging these gaps, and, through a series of field and experimental studies, we evidence effects on customer purchase intentions and behavior. Specifically, we show that AR-generated imagery of bundled (versus individual) products enhances intended and actual purchases at the point-of-sale. Furthermore, when deployed at distant points in the purchase funnel (out-of-store, at-

home), AR increases purchases through improved self-projection, which we describe as the psychological mechanism customers use to mentally bridge distance to the point-of-sale. We qualify this mediating mechanism through an important moderating process, where the effect of AR-generated imagery on self-projection is suppressed for customers with a holistic (versus analytic) thinking style.

Keywords: augmented reality, mental imagery, imagination gaps, purchase funnel, product bundles

Introduction

Even in today's technologically rich marketplace customers often lack important sensory information on which to base a purchase decision (Petit et al., 2019). This is a recognized problem across product categories (including furniture, apparel, or food) as well as online and offline purchase settings (Biswas, 2019). For instance, before visiting a café or when ordering for home delivery, a customer might struggle to accurately anticipate which menu items go together and how the experience of consuming these products will be. We refer to this phenomenon as 'imagination gaps' that occur when customers cannot mentally simulate the experiential relations between a product (and other products), context, and themselves (Phillips, 2017; Yim et al., 2018). Such imagination gaps are exacerbated under increased cognitive load, for instance, when customers attempt to evaluate combinations of multiple products (e.g., food and drink bundles; Zhao & Xia, 2021) or when they are physically distant from the point-of-sale (e.g., browsing online; Escalas, 2004).

Recent research suggests that reality-enhancing technologies might help customers to bridge imagination gaps on their path to purchase (Hoyer et al., 2020; Petit et al., 2019). In particular, there is a noticeable increase in firms using augmented reality (AR) that offers enhanced imagery of products *in situ* (Chylinski et al., 2020; Petit et al., 2021). For instance, Subway's AR filters on social media project lifelike 'holograms' (Carrozzi et al., 2019) of food and drinks into the physical environment, so customers can better decide which items to purchase at the point-of-sale. Similarly, customers of Domino's Pizza and Panera Bread can use AR to evaluate product bundles that can be ordered in-store or for home delivery. However, despite the growing use of AR (Table 1), practitioner surveys reveal a prevalent concern about AR's profit impact and ROI, alongside a widespread managerial perception that it is challenging to successfully implement AR as a customer-facing technology (BCG, 2018). This subdued outlook might, in part, be due to gaps in the current knowledge base.

Specifically, research has yet to provide insights into AR in relation to two common sources of imagination gaps. First, research has not yet studied whether and how AR might help customers evaluate multiple products together (e.g., product bundles; Jessen et al., 2020). Second, the premise that AR can help customers in their product evaluation at various stages of the purchase funnel has yet to be established (Hilken et al., 2018). Most studies focus on AR for online shopping (e.g., Smink et al., 2020), and we thus lack insight into whether AR is effective when customers use it before visiting the physical point-of-sale. Relatedly, we know little about how different customer segments might respond to using AR in these ways, as research has mainly studied heterogeneity in customers' preference for AR versus other media (Hilken et al., 2017; Heller et al., 2019a) or specific AR features (Baek et al., 2018; Heller et al., 2019b). Addressing these research gaps would provide a more nuanced picture of AR as a customer-facing technology and might reconcile some of the mixed support for AR's positive effects on customer purchase behavior (e.g., Kowalczuk et al., 2020; Yim et al., 2017).

To shed light on these issues, we draw on mental imagery theory (MacInnis & Price, 1987; Philips et al., 1995), which has shown promise in its application to AR but has been mainly utilized to explain how AR outperforms conventional marketing tools in customers' evaluation of individual products within online settings (Park & Yoo, 2020; Petit et al., 2021). Mental imagery theory explains how the evaluation of multiple products together (e.g., in a bundle) increases a customer's cognitive load (Pearson et al., 2013; Zhao & Xia, 2021); and emphasizes that, prior to making a purchase, customers need to relate to products in a physical sense, for instance, by mentally projecting themselves into the physical environment in which they purchase or use the products (Zemack-Rugar & Rabino, 2019; Yim et al., 2018). Building on this, we conceptualize and empirically test how AR can help customers bridge imagination gaps related to evaluating product bundles at different stages of the purchase funnel. In doing so, we seek to make three contributions.

First, we describe how the evaluation of bundled (vs. individual) products acts as a source of customer imagination gaps and how AR can bridge this gap. We argue that *AR-generated imagery* supports customers in evaluating multiple products that are presented together in a bundle (Heller et al., 2019a; Park & Yoo, 2020), which enhances the likelihood of making a purchase, when compared to conventional marketing tools. (i.e., product pictures). We establish this effect in a baseline study. Then, through a field study with customer receipt data, we demonstrate that such use of AR increases purchases of product bundles at the point-of-sale. Second, we evidence and explain how AR can be effective earlier in the purchase funnel, by studying distance from the point-of-sale as a second source of imagination gaps. We identify customers' ability to imagine themselves being there at the point-of-sale, termed *self-projection* (Yim et al., 2018), as a critical mediating mechanism when customers use AR out-of-store or at home. Through two field studies, we show that in these situations AR-generated imagery of bundled (vs. individual) products supports customer self-projection and, in turn, increases purchases (intended and actual) at the point-of-sale. Third, we substantiate the mediating role of self-projection by demonstrating the aforementioned effects can be influenced by a customer's natural thinking style (Monga & John, 2007; Hildebrand et al., 2019). Specifically, we show that the positive effect of AR-generated imagery on self-projection and, in turn, purchase intentions, is suppressed for customers with a *holistic (vs. analytic) thinking style*. Due to their predisposition to think in terms of interrelations, holistic thinkers find it easier to mentally bridge multiple products and purchase funnel stages, and thus benefit less from AR-generated imagery of bundled products.

In sum, we respond to calls for studying the future role of AR in marketing (MSI, 2020) by providing evidence for nuanced impact of AR on customer purchase intentions and behavior. We show how AR supports customers in evaluating multiple products together and, through enhanced self-projection, bridging distance to the point-of-sale. Through these theoretical insights we help guide the managerial exploitation of AR as a novel technology.

Table 1. Overview of current AR applications supporting product evaluation across the purchase funnel

Example	AR Functionality	Product presentation	Use in the purchase funnel
Wahaca, Boston Pizza, Bareburger restaurants AR-enhanced print menus	Bringing text-based menus to life; customers can interact with holograms of food items projected onto their table	Individual products that customers can visualize and compare	In-store to stimulate purchases at the point-of-sale
Nike AR Sneaker Designer	Projecting different styles and colors onto a physical pair of sneakers; customers can try out sneaker styles and/or create their own design	Individual products that customers can customize with a unique design	In-store to stimulate purchases at the point-of-sale
Panera Bread In-store AR	Lifelike holograms of complementary food items from the 'YouMix2' menu; customers can visualize and order these as a combo in AR	Multiple products that customers can visualize and buy as a bundle	In-store to stimulate purchases at the point-of-sale
Bombay Sapphire AR packaging	Virtual animations projected on the product packaging; shows customers recipes of cocktails that can be created with the featured product	Multiple products that customers can visualize and buy as a bundle	In-store to stimulate purchases at the point-of-sale
Subway, Panera Bread Snapchat AR Lenses	Social media filters that promote new products on the menu; customers can view holograms of the new products together with nutritional facts	Individual products that customers can visualize and compare	Out-of-store to drive customers to purchase at the physical point-of-sale
Bon V!V Spiked Seltzer Virtual Vending Machine	Animating a billboard with a hologram of a vending machine; customers select their preferred drink and make use of a nearby store locator	Individual products that customers can visualize and compare	Out-of-store to drive customers to purchase at a nearby physical point-of-sale
Domino's Pizza AR Pizza Chef	Enabling customers to project combinations of different toppings onto a hologram of a basic pizza on a nearby surface within their home	Multiple products that customers can visualize and buy as a bundle	At-home to convince customers order for takeaway or home delivery
IKEA 'Place' AR furniture visualizer	Customers can digitally place and combine holograms of furniture items from the catalogue within their homes	Multiple products that customers can visualize and buy as a bundle	At-home to drive customers to purchase at the physical point-of-sale

Theoretical Background and Hypotheses

Augmented Reality (AR) and Customer Purchase Behavior

In Table 2 we summarize selected relevant literature, which reveals growing support for AR's positive impact on customers' intended and actual purchases (e.g., Heller et al., 2019b; Petit et al., 2021; Tan et al., 2021). However, this support is by no means universal, as several studies fail to find support for such effects (Javornik, 2016; Kowalczuk et al., 2020; Plotkina & Saurel, 2019; Yim et al., 2017), which points to gaps in our understanding of AR as a customer-facing technology. Specifically, research has almost exclusively studied customer use of AR for individual products and in a single stage of the purchase funnel (i.e., online product evaluation). This is inconsistent with firms' use of AR (Table 1) and does not accurately reflect customers' typical purchase patterns. That is, customers often seek to buy multiple products together (e.g., food and drink bundles, furniture sets, apparel outfits); they also engage in product evaluation at various points in the purchase funnel (e.g., examining the assortment in-store, viewing a mobile ad out-of-store, browsing online at-home) and/or combine multiple touchpoints in a journey (e.g., informing themselves online before visiting the physical point-of-sale; Herhausen et al., 2019). Indeed, it is generally accepted that customers move along (latent) stages in a purchase funnel, reflecting their level of engagement with the purchase decision— from non-customer to converted customer (Li & Ma, 2020). A related premise is that customers perceive greater (lower) cognitive distance to the point-of-sale when they are earlier (later) in the purchase funnel (Humphreys et al., 2021). In the following, we thus draw on mental imagery theory to describe pertinent sources of imagination gaps and hypothesize how AR might help customers bridge these gaps. Furthermore, as few studies offer insights into customer-related boundary conditions to AR use, we also seek to identify a relevant customer trait that captures heterogeneity in how customers benefit from bridging imagination gaps on the path to purchase with AR.

Table 2. Overview of selected research on AR's impact on customer purchase behavior

Study	Context	Products	Method	Theoretical basis	Technologies (features) compared	Purchase-related measures	Customer-related boundary conditions	Key findings
Javornik (2016)	Online retail	Furniture, eyewear (individual products)	Lab experiments	Media charac-teristics	Conventional website vs. AR	Purchase intentions	-	Customers using an AR app to preview a product reported a heightened flow experience, but this did not result in greater purchase intentions.
Hilken et al. (2017)	Online retail	Eyewear, cosmetics (individual products)	Lab experiments and survey	Situated cognition	Conventional website vs. AR (simulated physical control, environmental embedding)	Purchase intentions	Style-of-processing (visual vs. verbal), privacy concerns	An AR-based online service experience stimulates purchase intentions through heightened spatial presence and hedonic and utilitarian value perceptions.
Poushneh & Vasquez-Parraga (2017)	Online retail	Eyewear (individual products)	Lab experiment	User experience	Conventional website vs. AR	Willingness to buy	Users' information privacy control	AR offers an improved user experience, which, in turn, increases willingness to buy.
Yim et al. (2017)	Online retail	Eyewear, watches (individual products)	Online experiment	Interactivity, vividness, immersion	Conventional website vs. AR	Purchase intentions	-	Customers who virtually try on a watch (sunglasses) in AR (do not) indicate greater purchase intentions.
Baek et al. (2018)	Online retail	Eyewear, clothing (individual products)	Online experiments	Self-attention theory	AR (self-viewing vs. other-viewing)	Purchase intentions	Narcissism	Customers viewing a product on themselves in AR (vs. on models) indicate that they are more likely to purchase.
Beck & Crié (2018)	Online retail	Clothing, eyewear (individual products)	Online experiments	Intrinsic and extrinsic motivations	Conventional website vs. AR	Purchase intentions	-	AR increases customers' intentions to purchase directly on the website (online) as well as intentions to visit a store and purchase there (offline).
Brengmann et al. (2019)	Online retail	Furniture (individual products)	Lab experiment	Psychological ownership	Conventional website (laptop, mobile) vs. AR	Purchase intentions	-	Viewing a product in AR increases psychological ownership, which in turn correlates with purchase intentions.
Heller et al. (2019a)	Online and offline retail	Food, furniture, toys (individual products)	Lab and online experiments	Mental imagery	Conventional website vs. AR (imagery	Product choice	Visual processing type	AR-based imagery of products increases the likelihood of choosing a

					generation, transformation)		(objects vs. spaces)	product and stimulates choice of a higher-priced product.
Heller et al. (2019b)	Online retail	Furniture (individual products)	Lab experiments	Active inference	AR (touch- vs. voice-controlled)	Willingness to pay	Assessment orientation	Touch (vs. voice) control of a product in AR increases customers' willingness to pay.
Plotkina & Suarel (2019)	Online retail	Clothing (individual products)	Online experiment, qualitative survey	Technology acceptance	Conventional mobile website (model fit: none, body size, ethnicity, body size and ethnicity) vs. AR	Purchase intentions	-	Virtual product try-on in AR does not increase purchase intentions when compared to a mobile website with images of models that have a similar body fit to the customer.
Kowalczuk et al. (2020)	Online retail	Furniture (individual products)	Lab experiment	Experiential hierarchy model	Conventional mobile website vs. AR	Purchase intentions	-	Customers who use AR to preview a product do not report greater purchase intentions, when compared to a mobile website with product pictures.
Smink et al. (2020)	Online retail	Cosmetics (individual products)	Online experiment	Equity theory	Conventional website (pictures of models, picture of self) vs. AR	Purchase intentions	-	Virtual product try-on of products in AR increases purchase intentions when compared to a conventional website (with pictures of a model or customer).
Petit et al. (2021)	Online retail	Food (individual products)	Lab experiments	Mental simulation	3D images vs. AR	Purchase intentions	-	AR (vs. 3D) visualization of food increases customers' purchase intentions through greater mental simulation. The effects depend on whether the food is packaged and the type of packaging.
Tan et al. (2021)	Online retail	Cosmetics (individual products)	Analysis of company data	Product uncertainty	AR (pre- vs. post-implementation)	Sales	-	AR usage is linked to higher sales for less popular brands, products that are higher-priced and have narrower appeal, and for new customers.
This study	Purchase funnel (in-store, out-of-store, at-home)	Food and drinks (individual products, product bundles)	Field studies, online experiments	Mental imagery	Conventional website vs. AR (individual vs. bundled product presentation)	Intended and actual purchases	Thinking styles (analytic vs. holistic)	AR-generated imagery of bundled (vs. individual) products increases intended and actual purchases of bundles at the point-of-sale. This impact is also achieved when customers use AR earlier in the purchase funnel by supporting self-projection to the point-of-sale.

Mental Imagery and Imagination Gaps

Mental imagery is the process of generating visual representations of objects, scenes, or events as well as their interrelationships within working memory (Lutz & Lutz, 1978; MacInnis & Price, 1987). Through mental imagery, customers gain information about product attributes and consequences of product purchase or use (Phillips et al., 1995). Mental imagery is described in terms of a 'cognitive flow' (Yim et al., 2018), in which customers first generate images of products and then attempt to physically relate to this imagery, for instance by imagining the physical environment in which they would purchase or use the products (Yoo & Kim, 2014; Zemack-Rugar & Rabino, 2019; Zhao & Xia, 2021).

Yet, mental imagery poses challenges. Customers can find mental imagery difficult as it involves cognitive effort, and not all customers have equal abilities to generate, maintain, and process mental images (Petrova & Cialdini, 2005). Mental imagery can also be incomplete, inaccurate, or in some cases inaccessible, particularly for novel or unfamiliar products, as it is based on existing knowledge structures (MacInnis & Price, 1987; Zhao et al., 2009). Previous research particularly emphasizes the difficulty of forming mental images of multiple products, as this requires imagining the possible relations between the products within a real-life context. Customers thus need to exert significant cognitive effort to evaluate whether even simple combinations of complementary products might go together (e.g., promoted food and drink bundles; Zhao & Xia, 2021). This is even more problematic when customers are in earlier stages of the purchase funnel that involve increased distance between product and person (e.g., when at home or out-of-store), as they additionally need to mentally bridge distance to the point-of-sale (Humphreys et al., 2021). These difficulties create what we call ‘imagination gaps’ that can become a source of uncertainty and hinder customer intentions to make a decision or subsequently buy. Imagination gaps are not just a difficulty to mentally generate images of products or their purchase or use; they represent the missing experiential relations between products, physical context, and customer (Yim et al., 2018).

Bridging Imagination Gaps through Different Marketing Tools

To help customers bridge imagination gaps, marketers frequently attempt to facilitate mental imagery through a variety of marketing tools, mostly notably product pictures (Yoo & Kim, 2014). In the case of multiple products, joint presentation in a picture can already facilitate evaluation and stimulate purchases (Zhao & Xia, 2021). However, an inherent drawback is that pictures often provide limited information about the products' relative size, features, and physical context. That is, they only partially bridge imagination gaps, and require customers to mentally fill in missing experiential relations between the products and the physical environment in which they will purchase or consume the products. In contrast, *AR-generated imagery* uniquely offloads that effort by offering lifelike, information-rich and interactive simulations where products are experienced *in situ* (Chylinski et al., 2020; Poushneh & Vasquez-Parraga, 2017). Initial research demonstrates that AR can ease customers' mental effort (Heller et al., 2019a; Petit et al., 2021); and it is likely that this effect becomes more pronounced as cognitive load increases, for example, when customers evaluate product bundles rather than individual products. This is because AR embeds product holograms into a customer's view of the physical environment (Carrozzi et al., 2019), and thus 'brings products to the customer' within their immediate surroundings, whether at home or in-store (Poncin & Mimoun, 2014; Scholz & Duffy, 2018). Customers can thus effortlessly evaluate multiple products in relation to each other within a real-life context, creating a creative 'playground' (Jessen et al., 2020) for examining the product relations. In this way, AR should outperform conventional marketing tools in stimulating customers to form purchase intentions when multiple products are presented together as a bundle. Specifically, we expect the presentation of product bundles in AR to result in greater purchase intentions compared to pictures of product bundles. We thus posit:

H1: *AR-generated (vs. picture-based) imagery increases purchase intentions to a greater extent when customers evaluate bundled (vs. individual) products.*

Bridging Imagination Gaps in the Evaluation of Product Bundles: AR at the Point-of-Sale

Firms increasingly use AR to present combinations of multiple products at the point-of-sale, rather than only individual products. For example, as shown in Table 1, in-store applications, such as the one used by Panera Bread for their 'YouMix2' campaign, allow customers to freely combine products as a bundle or preview ready-made product bundles. We contend that such AR-generated imagery of product bundles (e.g., displaying a combined hologram of coffee and cake from a café's menu) at the point-of-sale directly increases customer purchases of these bundles.

This conjecturing is based on research emphasizing that customers not only seek to generate mental images of a focal product (Escalas & Luce, 2004), but they also imagine additional information, such as which complementary products might be bought (Zemack-Rugar & Rabino, 2019). However, during image generation, a customer's mental resources are often focused on creating and maintaining the image (Pearson et al., 2013), rather than expanding it, for example, to include complementary products. Thus, while AR can be used to present products individually at the point-of-sale, this is unlikely to stimulate the purchase of product bundles, as customers still need to imagine the possible product combinations which implies increased cognitive load (Zhao & Xia, 2021). Instead, using AR to present holograms of product bundles directly within the physical environment relieves customers of this effort. Customers can readily interact with the products and inspect these from different perspectives rather than exerting cognitive effort to close the imagination gap about how the products would go together. We expect that using AR in this way increases customers' consideration and evaluation of product bundles, leading to a greater likelihood of purchasing these. We thus hypothesize:

H2: *AR-generated imagery of bundled (vs. individual) products at the point-of-sale increases customer purchases of product bundles.*

Bridging Imagination Gaps Due to Channel Distance: AR Earlier in the Purchase Funnel

We expect AR to impact customer purchase intentions and behaviors when used at the point-of-sale (e.g., an AR menu in a café), but many firms experiment with deploying AR earlier in the purchase funnel to simulate sales later at the point-of-sale (Hilken et al., 2018; Hilken et al. 2021). For instance, as shown in Table 1, Subway's AR-based sales promotions on social media are aimed at driving customers into stores to make a purchase (de Ruyter et al., 2020). Vice versa, many customers feel more comfortable using AR in familiar settings outside of the store, for example when at home (Scholz & Duffy, 2018). Yet, such settings create physical distance to the point-of-sale, which can hinder the formation of purchase intentions and their enactment, as customers need to mentally bridge an imagination gap between themselves, the products, and the physical environment at the point-of-sale.

Mental imagery theorizing suggests that in these situations customer self-projection could be an important intermediate step in bridging this gap (Escalas 2004; Yim et al., 2018). *Self-projection* describes a form of mental imagery in which a customer connects to products, by imagining themselves interacting with these within a relevant purchase or consumption context (Yim et al., 2018). That is, through self-projection customers can create behavioral episodes in which they 'see' themselves buying, using, or consuming products in the future (Escalas 2004; Phillips et al., 1995; Zhao & Xia, 2021). Such self-projection implies additional mental effort, but we argue that when customers can rely on AR-generated imagery of bundled (vs. individual) products, they can devote greater cognitive resources to self-projection. That is, when multiple products are presented as a bundle in AR, customers can not only better evaluate the complementarity of the products, but also more easily connect with the products, for instance, by imagining how they would purchase these together and the resulting benefits (e.g., enjoying coffee when consumed together with cake; Petit et al., 2021). Research has accordingly demonstrated that media formats that support a customer's cognitive flow enable more vivid and fluent self-projection (Yim et al., 2018).

Self-projection, in turn, increases product interest and learning, and stimulates positive emotions, which culminates in increased overall purchase intentions (Petrova & Cialdini, 2005; Phillips et al., 1995; Yim et al., 2018). Furthermore, research has demonstrated that when customers can 'see' themselves purchasing a product, this increases the perceived appeal of complementary products due to a heightened focus on the interrelationships between the complementary products (Zemack-Rugar & Rabino, 2019). Such increased appeal of potentially complementary products should increase customers' intentions to purchase product bundles as well as the likelihood of enacting these intentions when visiting the point-of-sale. We thus posit:

H3: *When customers are earlier in the purchase funnel, AR-generated imagery of bundled (vs. individual) products increases customer self-projection, which in turn increases a) purchase intentions; and b) purchase behaviors at the point-of-sale.*

Imagination Gaps and Customer Heterogeneity: Analytic vs. Holistic Thinking Styles

Although AR, through supporting self-projection, likely increases purchase intentions and behaviors even when customers use AR earlier in the purchase funnel, it is unlikely that this effect is equally pronounced for all customers. Indeed, previous studies reveal heterogeneity in customer responses to AR use, for instance related to a person's preference for processing visual information (Hilken et al., 2017) or different types of visuals (objects vs. spaces; Heller et al., 2019a), as well as general privacy concerns (Poushneh & Vasquez-Parraga, 2017) and personality traits (e.g., narcissism; Baek et al., 2018). While these studies offer relevant insights, they mainly identify boundary conditions to customers' preference for AR versus conventional media or different AR interface features (e.g., touch vs. voice control; Heller et al. 2019b). To advance the understanding of AR's role on the path to purchase, it is thus important to identify a trait that captures variance in how customers perceive the benefits of

AR for bridging imagination gaps related to evaluating multiple products together and experiencing channel distance. Furthermore, identifying a customer trait that influences the effects of AR on self-projection, would help to further substantiate this crucial mediating variable. That is, understanding how self-projection, and, in turn purchase intentions, vary across customers, enables us to further develop this underlying mechanism in out-of-store settings where customers are confronted with both sources of imagination gaps. This not only provides firms with guidance for their targeting and segmentation strategies in relation to AR, but theoretically validates our proposed mental imagery process related to self-projection.

We contend that a customer's preference for a *holistic versus analytic thinking style* (Choi et al., 2007) is one such variable, as it captures the extent to which customers are predisposed to think about product bundles and purchase funnel stages holistically (i.e., all at once) or in a piecemeal, analytic manner (i.e., examining products one by one; taking the journey step-by-step). Research has demonstrated a considerable influence of this trait on customers' product preferences and decision making, particularly when evaluating products that are new or provided in addition to current offerings (Monga & John, 2007, 2010). Holistic thinking describes "an orientation towards the context or field as a whole, including attention to relationships between a focal object and the field" (Nisbett et al., 2001; p. 293), which implies consideration of the overall path to purchase including the relationships between (multiple) products and the point-of-sale. In contrast, analytic thinking involves detaching objects from their context and focusing on specific object attributes in an independent, piecemeal fashion (Nisbett et al., 2001).

Given the inherent effort associated with mental imagery (Pearson et al., 2013), holistic thinkers, due to their focus on the whole rather than the parts, should find it less effortful to mentally simulate experiential relations between the multiple products, the physical point-of-sale, and themselves. In fact, research has shown that holistic thinkers are less prone to suffering from choice overload (Benoit & Miller, 2017) and more likely to

expand their purchases across multiple product categories (Hossain, 2018). Thus, when considering the purchase product bundles in out-of-store settings, they should find it easier to mentally bridge imagination gaps related to the products and channel distance.

Following from this argumentation, we expect holistic thinkers to benefit less from AR-generated imagery for their self-projection. This is because AR allows customers to offload mental effort to the technology, and previous research suggests that this is valued more by customers who need such support (Heller et al., 2019b; Hilken et al., 2017; Park & Yoo, 2020). As such, AR-generated imagery of product bundles will likely relieve the effort in mental imagery more for analytic thinkers by compensating for their piecemeal style of thinking when evaluating multiple products away from the point-of-sale. In contrast, holistic thinkers should be more likely to rely on their own imagination to form a vivid and contextualized self-projection. For these customers, the positive effect of AR-generated imagery of product bundles on self-projection should be suppressed. We thus hypothesize:

H4: *The positive effect of AR-generated imagery of bundled (vs. individual) products on self-projection is weaker for holistic (vs. analytic) thinkers.*

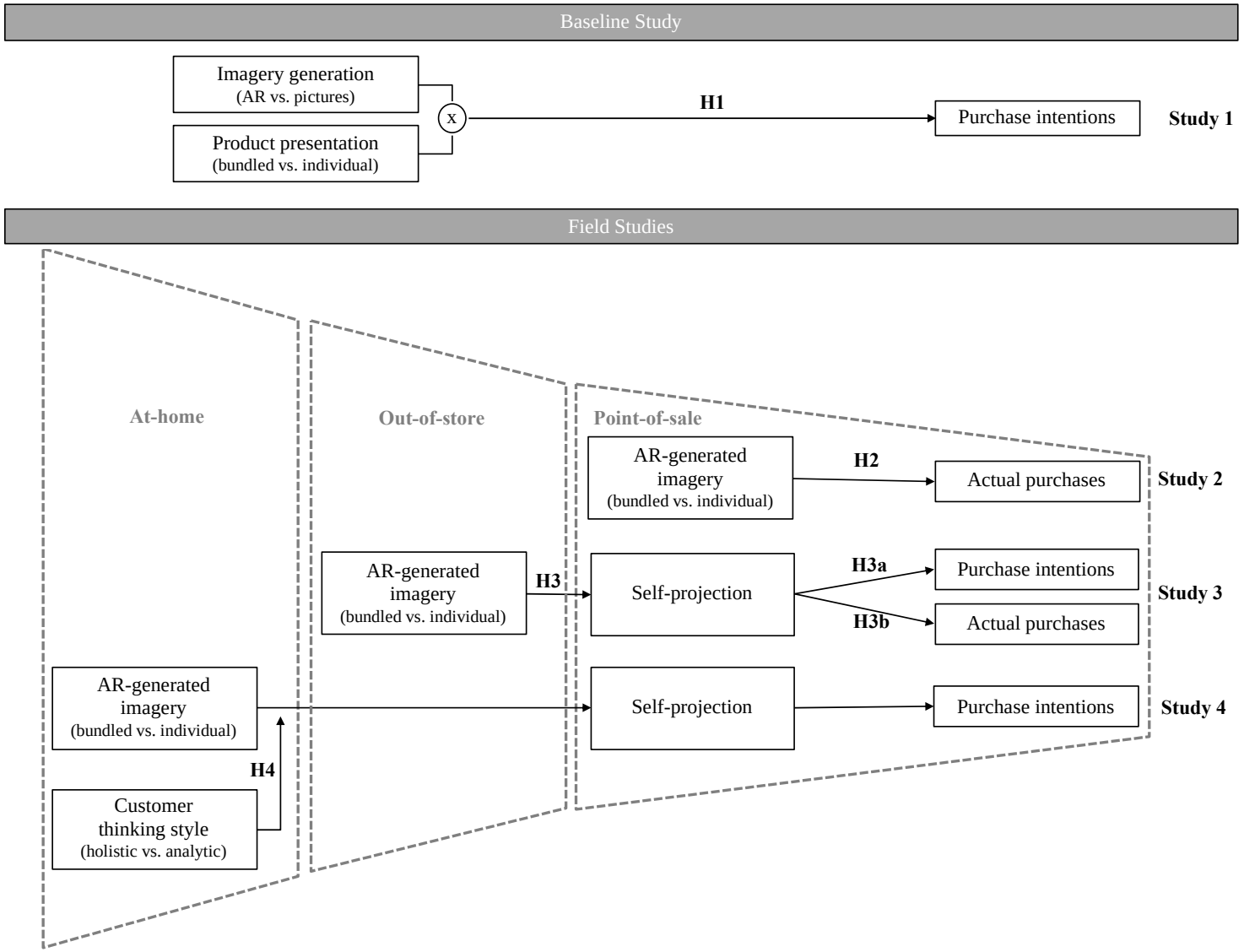
Empirical Context and Study Overview

To empirically test our hypotheses in a field setting, we collaborated with a café chain based in Europe, whose product offerings are suited for studying individual versus bundled products because they include coffee as a core product plus complementary food items, such as cake or muffins. Furthermore, the café chain promotes these products at various stages of the purchase funnel, including in-store promotions, out-of-store ads, and an online ordering system. The chain owners permitted access to their menus and products, and allowed us to use one of their cafés as a study setting. We could thus engage their frontline staff in using consistent service scripts and collecting customer receipts during the study periods, providing an authentic study setting to obtain purchase data from actual customers.

We conduct a series of studies (see Figure 1), in which we first focus on imagination gaps when customers evaluate multiple products together in a bundle. In Study 1, we establish AR's baseline potential for increasing purchase intentions for bundled (vs. individual) products compared to more conventional marketing tools (H1). In Study 2, we conduct an in-store field study to assess the impact of AR-generated imagery of bundled (vs. individual) products on customers' actual purchases at the point-of-sale (H2). Next, we delve deeper into channel distance as second source of customer imaginations gaps, by gradually increasing physical distance to the point-of-sale. In Study 3, we approach customers in out-of-store settings, to investigate the mediating role of self-projection in bridging this imagination gap (H3a and H3b). In Study 4, we move even further away from the point-of-sale. We recruit customers to use AR at-home to corroborate the mediating role of self-projection and test customers' (holistic vs. analytic) thinking style as a boundary condition to this effect (H4).

For the experimental stimuli (see also Appendix A), we collaborated with QReal, a leading provider of AR food visualization, to create an AR menu that allowed users to project holograms of coffee and food items on a nearby surface (e.g., a table) and freely rotate, resize, or move them. We chose five non-seasonal products that are constantly on the menu: the café's core product (i.e., coffee) and four differently priced food items (i.e., two cheesecakes, one muffin, and one caramel-chocolate bar) ranging from €1.90 to €4.10. We purposefully depicted coffee in a closed cup to avoid confounding effects from differing customer preferences for a specific type of drink (e.g., espresso, cappuccino, etc.). On this basis, we created two versions of the AR menu. The 'individual products' version of the menu displayed all five menu items as separate individual holograms, whereas the 'bundled products' version displayed four bundles of coffee together with one of the food items (e.g., coffee and a muffin, coffee and a cheesecake). The prices of the bundles were equal to the sum of the individual prices for the products, such that there was no discount.

Figure 1. Overall research framework



Study 1

As a baseline, we sought to establish that AR-generated imagery of bundled (vs. individual) products has a greater impact on customers' purchase intentions, when compared to conventional marketing tools such as product pictures (H1).

Method

We conducted an online study, in which we asked participants to browse a café's menu. To offer a realistic experimental setting, we used the café chain and its products as stimulus material. We randomly assigned participants to one of four groups in a 2 (imagery: AR vs. pictures) x 2 (product presentation: bundled vs. individual) between-subjects design. Participants in the AR group used the custom-developed AR menu on their smartphone, which allowed them to preview holograms of the products in their immediate surroundings. Participants in the picture group viewed an online menu with static images of the products. Both menus contained the same five products with equivalent prices and equivalent text descriptions. Participants thus saw all products on the menu, but we manipulated whether these were presented individually (e.g., coffee, muffin) or within a bundle (e.g., coffee and a muffin). After viewing the menu, participants completed a survey. We recruited participants from a large European university in exchange for course credit. 308 undergraduate students (51.9% female, M_{age} = 19.88, age range 18 to 26 years), who indicated that they regularly drink coffee, successfully viewed one of the four menus on their personal smartphone and provided a valid response in our follow-up survey.

Participants indicated their general purchase intentions towards the products on a single-item seven-point scale ("How likely would it be that you buy something from the menu?") anchored at 1 = "extremely unlikely" and 7 = "extremely likely". To ensure that their ratings were not driven by hunger, we followed the measurement approach by Wilcox et al. (2011) and asked participants how long ago they had their last meal (in hours). We also asked participants to rate their familiarity with AR applications ("I am familiar with

Augmented Reality applications") and the café chain brand ("I regularly go to [the café]") on seven-point scales anchored at 1 = "strongly disagree" and 7 = "strongly agree".

Results

Manipulation checks. To assess whether participants in the AR (vs. picture) group experienced more contextualized, *in situ*, imagery of the products, we adapted the eight-item spatial presence scale by Hilken et al. (2017) to fit our study context (e.g., "I felt like the products from the menu were actually there in the real world"; $\alpha = .94$; anchored at 1 = "strongly disagree" and 7 = "strongly agree"). The manipulation was effective ($M_{AR} = 4.36$, $M_{Picture} = 3.84$, $t(306) = -3.41$, $p = .001$). We also tested whether participants in the bundled (vs. individual) products group reported greater imagery of the products as a bundle, by adapting four items by Heller et al. (2019a) to refer specifically to seeing coffee and food together (e.g., "Viewing the menu gave me a good understanding of how the products would look as a bundle"; $\alpha = .81$; anchored at 1 = "strongly disagree" and 7 = "strongly agree"). The manipulation worked as intended ($M_{Bundled} = 5.53$, $M_{Individual} = 5.27$, $t(306) = -2.30$, $p = .022$).

Moderation analysis. We used the PROCESS macro (Hayes, 2018, Model 1) to test the effects of imagery generation (0 = pictures, 1 = AR), product presentation (0 = individual, 1 = bundled), and their interaction term on purchase intentions, controlling for hunger and familiarity with AR and the café. The regression results are in Table 3. We found a significant imagery generation × product presentation interaction effect on purchase intentions ($\beta = .85$, $p = .014$), controlling for hunger ($\beta = .04$, $p = .122$) and familiarity with AR ($\beta = -.01$, $p = .824$) and the café ($\beta = .23$ $p < .001$). In support of H1, analysis of the conditional effects revealed that when the products were presented as a bundle, AR outperformed pictures in stimulating customer purchase intentions ($M_{AR} = 5.31$, $M_{Picture} = 4.71$, $t(306) = -2.44$, $p = .015$). This difference did not emerge when the products were presented individually ($M_{AR} = 4.98$, $M_{Picture} = 5.23$, $t(306) = -1.04$, $p = .300$).

Discussion

We establish AR's baseline suitability for helping customers bridge imagination gaps in the evaluation of multiple products together. In support of H1, we demonstrate that firms can better present product bundles in AR, rather than in conventional product pictures, to increase customers' purchase intentions. Interestingly, we find that this is not the case when products are presented individually. AR thus appears to be particularly suited for promoting the purchase of multiple complementary products (i.e., bundles). This finding adds to the current mixed support for AR's positive impact on purchase intentions (e.g., Kowalczuk et al., 2020; Yim et al., 2017); but more importantly we uncover a potential, currently unexplored, source of these mixed findings. Our findings suggest that the use of AR might pay off more in situations when customers face increased cognitive load (e.g., when evaluating multiple products together) and thus need to rely on the technology to bridge the imagination gap. Next, we seek to test the potential impact on customers' actual purchases when they use AR at the point-of-sale.

Table 3. Study 1: Regression results

	Purchase intentions
Constant	4.36**
	(.32)
Imagery generation (AR vs. pictures)	-.25
	(.24)
Product presentation (bundled vs. individual)	-.52*
	(.24)
Imagery generation x product presentation	.85*
	(.34)
Hunger	.04
	(.02)
AR familiarity	-.01
	(.06)
Brand familiarity	.23**
	(.04)
R^2	.10
MSE	2.23
F	5.67**
df	6, 301

NOTE. — The numbers in parentheses are standard errors. Unstandardized coefficients are shown. Significance based on two-tailed test *** p < .001 ** p < .01 * p < .05.

Study 2

We sought to study whether AR-generated imagery, by addressing imagination gaps in the evaluation of multiple products together, has an impact on actual purchases. To isolate this effect, we focused on a situation in which customers do not face additional an imagination gap due to channel distance. We thus conducted an in-store field study to test H2 by which AR-generated imagery of bundled (vs. individual) products increases customers' purchase of product bundles at the point-of-sale.

Method

Across a three-day period, we approached customers individually within one of the café chain's locations, before they made a purchase. We asked them to try out the AR menu on a tablet device and fill out a short survey. Customers who agreed to participate received an anonymous participation number that they could hand in when making a purchase. For the duration of the study, the employees at the café were instructed to adhere to the same service script, which included the instruction to not attempt to cross-sell additional products to customers. They collected customers' purchase receipts and handed out feedback cards, which, when returned, entered customers into a lottery for the chance to win a 10€ consumption voucher. We chose this delayed incentive to ensure that spending came entirely out of participants' own pockets and was not confounded through a direct discount on their purchase. 105 customers (66.7% female, M_{age} = 26.67, age range 17 to 64 years) interacted with the AR menu, completed our survey, and provided a participation number with their purchase, but only 72 of them returned a completed feedback card. Nineteen additional customers participated but were omitted from the analyses, as they made their purchase with a corporate consumption card with discounts and their receipts did not offer a breakdown of the purchased drinks and/or food items.

Participants tried out the AR menu on a tablet device, which enabled them to project the coffee and/or food holograms on a nearby table and freely rotate, resize, or move them.

We used the same AR-generated imagery (bundled vs. individual) manipulation as in Study 1, and randomly assigned participants to one of two conditions in a two-group between-subjects design. Participants either saw all five products on the menu as separate individual holograms or as product bundles. In our survey, we asked them to indicate how hungry they felt when entering the café on a scale ranging from 1 = "not hungry at all" to 7 = "extremely hungry". From the receipt data, we obtained a breakdown of the purchased products, which revealed that the vast majority of customers (98.6%) bought either something to drink or a drink and food bundle. We thus coded the purchase variable as 0 = purchase of drink (or food) and 1= purchase of drink and food. On the feedback cards, participants indicated their purchase intentions when entering the café and before trying out the AR menu (i.e., whether they had already planned to purchase drink and food; coded 0 = no and 1 = yes). We collected this measure, because, consistent with our conjecturing on mental imagery and self-projection, customers at the point-of-sale often have already formed purchase intentions about specific products before visiting the store. The feedback cards also included a single, seven-point attitudinal measure of how much participants liked the menu items, which we included as an additional control variable in our analyses. The measures are listed in Appendix B.

Results

Regression analysis. We used binary logistic regression analysis with a bootstrapping procedure (5,000 samples) to test the effect of AR-generated imagery (0 = individual, 1 = bundled) on purchase behaviors, controlling for customers' existing purchase intentions and hunger when entering the point-of-sale as well as their attitude towards the menu items. The model was significant (χ^2 (4, n = 72) = 21.71, $p < .001$), explained between 26% (Cox & Snell R^2) and 41.5% (Nagelkerke R^2) of the variance in purchases, and correctly classified 84.7% of the cases. Consistent with our conjecturing in H2, customers who viewed the AR menu with images of bundled (vs. individual) products were seven times more likely to purchase a food item in addition to something to drink ($\beta = 1.99$, Ex(β) = 7.34, $p = .014$). Notably, this

positive effect occurred independent of a customer's previously formed intentions to purchase drink and food (β = 3.35, Ex(β) = 28.55, p = .001), hunger (β = .45, Ex(β) = 1.57, p = .014), and attitude towards the menu items (β = -.31, Ex(β) = .73, p = .539), which implies that the AR menu was an important influencer in their purchase of a product bundle.

Discussion

The findings of Study 2, in which customers use AR at the point-of-sale, offer first field evidence that addressing customers' imagination gaps through AR-generated imagery of bundled (vs. individual) products impacts actual purchase behavior. Specifically, we find that AR can influence customers to buy additional products from a complementary product category, even when they were not planning to do so. However, the results also point to the impact of customers' previously formed intentions on their purchase behavior at the point-of-sale. Next, we thus examine how AR might help customers bridge imagination gaps when forming such intentions earlier in the purchase funnel, before they visit the point-of-sale.

Study 3

We sought to examine how AR, by supporting self-projection, might help customers to bridge distance to the point-of-sale as a second pertinent source of imagination gaps. Specifically, we tested whether presenting customers with AR-generated imagery of bundled (vs. individual) products in out-of-store settings might facilitate self-projection, and, in turn, influence their purchase intentions (H3a) and purchase behavior at the point-of-sale (H3b). We study these effects within a two-stage field study with actual customer purchase data.

Method

We chose a study setting in which customers use AR out-of-store (in a mobile marketing campaign) and thus approached participants individually in the vicinity of one of the café chain's locations, asking them to try out the AR menu and fill out a short survey (phase 1). We incentivized participants with a lottery ticket that they could hand in when making a

purchase at the café within the next week (phase 2), for the chance to subsequently win a 10€ consumption voucher. We again chose a delayed incentive to ensure that the observed purchase behavior was not confounded through any direct discounts. For the duration of the study, the employees at the café were again instructed to adhere to the same service script. They also attached the lottery tickets, which included a pre-printed anonymous participation number, to customers' purchase receipts. A total of 273 participants successfully viewed the AR menu and completed our survey. Seventy of these participants (26%) completed an actual purchase, but we excluded four invalid responses (same participation number, responses provided after making a purchase) and two outliers with extremely low values on the self-projection measure (Cook's D three-times above the 4/n cutoff). The final sample contained 267 survey responses (67.0% female, M_{age} = 21.39, age range 18 to 32 years) and 64 purchase receipts (81.3% female, M_{age} = 21.39, age range 18 to 31 years) for further analysis.

We randomly assigned participants to one of two conditions in the same two-group (AR-generated imagery: bundled vs. individual) between-subjects design as in the previous studies. In phase 1, we measured customer self-projection with a five-item scale by Yim et al. (2018), which we slightly adapted to fit the study context (e.g., "I pictured myself being there buying coffee and food together"; α = .92; anchored at 1 = "strongly disagree" and 7 = "strongly agree"). We also asked participants to rate their purchase intentions using a one-item measure that specifically referred to purchasing multiple complementary products as a bundle ("If you were to go to [the café] right now, how likely would it be that you buy a food item from the menu in addition to coffee?"), anchored at 1 = "extremely unlikely" and 7 = "extremely likely". We also included the hunger control variable from Study 1 and a three-item scale measuring customers' attitude towards the promoted menu items (α = .88; adapted from Mackenzie & Lutz, 1989). We list all measures in Appendix B. In phase 2, we again assessed the receipt data, and observed an interesting nuance in the actual purchases. Specifically, a relevant proportion of customers purchased a (more expensive) food item only

(7%), which represented a potential up-selling effect from the café's core product, but not a full bundle purchase. We thus coded the purchase variable to account for this more nuanced purchase pattern (0 = drink purchase, 1 = food purchase, 2 = drink and food bundle purchase).

Results

Manipulation checks. We used the manipulation check from Study 1 (α = .82). The manipulation functioned as intended ($M_{Bundled}$ = 6.01, $M_{Individual}$ = 5.75, t(265) = -2.28, *p* = .023).

Phase 1 mediation analysis (n=267). The results of our analyses using the PROCESS macro (Hayes, 2018, Model 4) are in Table 4 Panel A. We first regressed self-projection on AR-generated imagery (0 = individual, 1 = bundled), controlling for hunger and attitude towards the menu. Consistent with our conjecturing, we found that customers who viewed AR-generated imagery of bundled (vs. individual) products reported a greater ability to self-project (β = .33, *p* = .025). We then regressed purchase intentions on self-projection and AR-generated imagery, again controlling for hunger and attitude towards the menu. In support of H3a, self-projection increased the intention to purchase a bundle at the point-of-sale (β = .30, *p* = .001). Analysis of the indirect effects based on a bootstrapping procedure with 5,000 samples and bias-corrected CIs further supported H3a, as AR-generated imagery of bundled (vs. individual) products had a positive indirect effect, through self-projection, on purchase intentions (β = .10, 95% CI = .01 to .22).

Phase 2 mediation analysis (n=64). Our analysis of customers' actual purchase data in the PROCESS macro (Hayes, 2018, Model 4) offers supporting evidence from the field for H3b. The results are summarized in Table 4 Panel B. Customers who viewed AR-generated imagery of bundled (vs. individual) products reported greater self-projection (β = .45, *p* = .035), which in turn increased their likelihood of purchasing not (only) the core product, but instead a food item or both products together in a bundle (β = .21, *p* = .016). Bootstrapping with 5,000 samples and bias-corrected confidence intervals (CI) for indirect effects further supported self-projection as the underlying mechanism for these effects (β = .10, 95% CI = .00 to .22).

Table 4. Study 3: Mediation analysis results

Panel A: Phase 1 (n = 267)		
	Self-projection	Purchase intentions
Constant	.52	-1.21
	(.46)	(.67)
AR-generated imagery (bundled vs. individual)	.33*	-.35
	(.15)	(.21)
Self-projection		.30**
		(.09)
Hunger	.05	.06
	(.08)	(.12)
Attitude towards the menu	.72***	.69***
	(.08)	(.13)
R^2	.28	.23
MSE	1.35	2.80
F	33.83***	19.88***
df	3, 263	4, 262

Panel B: Phase 2 (n = 64)		
	Self-projection	Actual purchases
Constant	2.18	.64
	(.69)	(.49)
AR-generated imagery (bundled vs. individual)	.45*	.03
	(.21)	(.14)
Self-projection		.21*
		(.09)
Hunger	-.01	.26***
	(.10)	(.07)
Attitude towards the menu	.50**	-.17
	(.12)	(.09)
R^2	.30	.26
MSE	.68	.30
F	8.49***	5.25**
df	3, 60	4, 59

NOTE. — The numbers in parentheses are standard errors. Unstandardized coefficients are shown. Significance based on two-tailed test *** p < .001 ** p < .01 * p < .05.

Discussion

This field study provides support for AR's ability to help customers bridge two pertinent sources of imagination gaps at the same time. We find that when customers use AR to view product bundles (vs. individual products) in out-of-store settings, this increases their ability to form a vision of themselves purchasing multiple products together at the point-of-sale (i.e., self-projection). The analysis of customers' purchase data reveals that such self-projection not

only increases intentions to purchase product bundles, but also translates into actual purchases at the point-of-sale. Notably, we also observe that viewing products in AR (individually or bundled) drives a substantial percentage of customers into a store to make a purchase (26% of customers in our sample). As predicted in H3b, we find a positive impact on the likelihood of purchasing of product bundles, however only when accounting for customers who were persuaded by AR to buy a food item rather than the café's core product of coffee (i.e., upselling to a more expensive category). This points towards a potential boundary condition where the purchase impact of AR-generated imagery of product bundles is weakened when customers use AR earlier in the purchase funnel.

Study 4

To further examine distance to the point-of-sale as a source of customer imagination gaps, we extend our study to an even earlier stage in the purchase funnel, when customers use AR at-home. We also sought to substantiate the mediating role of self-projection in this situation, by investigating whether customers' preference for a more holistic thinking style suppresses the effect of AR-generated imagery of bundled (vs. individual) products on self-projection (H4).

Method

In cooperation with the café chain, we conducted a fourth study, which we designed in accordance with the national health and safety regulations in response to the ongoing Covid-19 pandemic. We asked participants to browse the café's AR menu from their homes. This allowed us to focus on the use of AR early in the purchase funnel and assess the impact on intentions for the time period when customers are again able to visit the café. We recruited participants from a large European university in exchange for course credit and randomly assigned them to one group in the same two-group (AR-generated imagery: bundled vs. individual) between-subjects design as in our previous studies. Participants used their own smartphone to view the coffee and/or food holograms. 519 participants (49.9% female, M_{age} =

19.70, age range 17 to 27 years), who regularly consume coffee, successfully viewed one of the AR menus and provided a valid response in our follow-up survey.

Participants responded to the same self-projection (α = .91), purchase intention, hunger, and familiarity with the café chain measures from our previous studies. We measured customers' holistic versus analytic thinking style with the six-item causality scale (α = .78) of the Analysis-Holism Scale by Choi et al. (2007). We focused on these items as they capture a person's tendency to think about themselves and their context in an independent (analytic) versus related (holistic) manner (e.g., "Nothing is unrelated"), which is relevant to our study of customer self-projection. Participants rated all items on a seven-point scale anchored at 1 = "strongly disagree" to 7 = "strongly agree". We coded their responses such that high (low) scores corresponded to a holistic (analytic) thinking style.

Manipulation checks. We established the success of our AR-generated imagery manipulation using the same measure (α = .83) from our previous studies ($M_{Bundled}$ = 5.58, $M_{Individual}$ = 5.28, t(517) = -3.23, p = .001).

Moderated mediation analysis. We tested whether a customer's disposition towards holistic (vs. analytic) thinking moderated the effect of AR-generated imagery (0 = individual, 1 = bundled) on self-projection and, in turn, purchase intentions, controlling for hunger and familiarity with the café chain. The results of our regression analyses using the PROCESS macro (Hayes, 2018, Model 7) are in Table 5. There was a positive effect of AR-generated imagery of bundled (vs. individual) products on self-projection (β = 1.70, p = .025). Furthermore, and in support of H4, this effect was qualified by a significant AR-generated imagery × customer thinking style interaction (β = -.30, p = .037). A floodlight analysis revealed that AR-generated imagery of bundled (vs. individual) products increased self-projection for customers with a strong analytic thinking style (2.67, β = .894, p = .020), but this effect grew weaker through the neutral point of the Analysis-Holism Scale (3.97, β = .50, p = .018), and no longer reached significance for more holistic thinkers (Johnson-Neyman

value: 4.76, β = .27, p = .050, 31.02% of the sample below). In a second regression analysis, self-projection had a positive effect on purchase intentions (β = .32, p < .001) and a bootstrapping procedure with 5,000 samples and bias-corrected confidence intervals (CI) provided further support for H4 (index of moderated mediation: -.10, 95% CI = -.21 to -.00). The effect of AR-generated imagery through self-projection on purchase intentions was positive and significant at 1 SD below the mean value (4.35) of the Analysis-Holism Scale (i.e., for analytic thinkers, β = .13, 95% CI = .02 to .25); but this was not the case at the mean value (5.18, β = .04, 95% CI = -.03 to .13) and 1 SD above the mean (6.02, β = -.04, 95% CI = -.16 to .08) – that is, for holistic thinkers.

Discussion

The findings lend further support to the mediating role of customer self-projection when firms use AR early in the purchase funnel, when customers use AR at home, to bridge imagination gaps. In this situation, AR-generated imagery of bundled (vs. individual) products helps customers to 'see' themselves buying complementary products together at the physical point-of-sale. Furthermore, and in relation to this underlying process, we identify an important boundary condition in form of customers' disposition towards a holistic (vs. analytic) thinking style. Analytic thinkers, due to their focus on de-contextualized thinking, find self-projection difficult; but AR-generated imagery of product bundles supports them in this process, and increases their purchase intentions. However, consistent with our conjecturing in H4, this benefit of AR-generated imagery grows weaker for customers with a strong holistic thinking style, as they can more readily bridge imagination gaps through their own mental simulation.

Table 5. Study 4: Regression results

	Self-projection	Purchase intentions
Constant	1.87***	2.88***
	(.53)	(.24)
AR-generated imagery (bundled vs. individual)	1.70*	.44***
	(.76)	(.13)
Thinking style	.40***	
	(.10)	
AR-generated imagery x thinking style	-.30*	
	(.14)	
Self-projection		.32***
		(.05)
Hunger	.01	-.03
	(.02)	(.02)
Brand familiarity	.14***	.09*
	(.04)	(.04)
R^2	.07	.13
MSE	1.86	2.23
F	7.55***	19.15***
df	5, 513	4, 514

NOTE. — The numbers in parentheses are standard errors. Unstandardized coefficients are shown. Significance based on two-tailed test *** p < .001 ** p < .01 * p < .05.

General Discussion

Despite its promise as a novel customer-facing technology, there are prevalent managerial concerns about AR's positive impact on customer purchase behavior (BCG, 2018). We argue that this can, in part, be attributed to a lack of insight into whether and how AR might help customers address two pertinent sources of imagination gaps they frequently encounter on the path to purchase: 1) evaluating combinations of multiple products together; and 2) experiencing physical distance to the point-of-sale. In practice, firms already use AR to present product bundles to customers at different stages of the purchase funnel, but research has yet to study the effects of AR under these conditions. To address this knowledge gap, we set out to offer a more nuanced understanding of how AR can help bridge customers' imagination gaps. Through a series of field and experimental studies, we contribute to the emerging marketing literature on AR in three ways.

First, we address the relative paucity of knowledge about AR's suitability for helping customers evaluate multiple products that are presented together as a bundle. Previous research suggests that an inability to mentally simulate the experiential relations between multiple products in a real-life consumption context reduces the likelihood of purchase (Zhao & Xia, 2021). However, thus far, researchers have almost exclusively studied how AR might improve customer evaluation and purchase intentions of a single product (e.g., Javornik, 2016; Hilken et al., 2017; Poushneh & Vasquez-Parraga, 2017). We extend this literature by explaining and evidencing that AR-generated imagery of product bundles outperforms conventional marketing tools (i.e., product pictures) in stimulating purchase intentions. We also show that AR-generated imagery of bundled (vs. individual) products drives actual purchases at the point-of-sale. We argue that these effects derive from AR's ability to assist customers in gaining a more holistic and contextualized understanding of the relations between products (e.g., when viewing holograms of different coffee and food bundles projected into the physical environment). In doing so, we contribute to the growing evidence base that customers offload mental imagery more effectively to AR compared with conventional marketing tools (Heller et al., 2019a; Park & Yoo, 2020). However, we also note a potential boundary condition to this advantage, which might help reconcile mixed findings in the literature in relation to customer purchase behavior in AR contexts (e.g., Kowalczuk et al., 2020; Yim et al., 2017). Specifically, compared to pictures, we do not observe significantly increased purchase intentions when simple, familiar products are presented individually in AR. This suggests that customers might benefit more from the use of AR when they face increased cognitive load—in our case from evaluating multiple products—and thus need to rely more on the technology to bridge their imagination gap.

Second, we conceptualize and empirically validate how AR helps customers bridge distance to the point-of-sale, as a second source of imagination gaps. Although researchers have documented customers' use of AR early in the purchase funnel, its effects on purchase

intentions and behavior in the later stages of the funnel have not been empirically assessed (Hilken et al., 2018; Jessen et al., 2020). We test the deployment of AR at consecutively earlier points in the purchase funnel (i.e., out-of-store, at-home settings) to uncover customer self-projection as a crucial underlying mechanism for such effects. Extending previous research on customer mental imagery (Escalas, 2004; Yim et al., 2018), we demonstrate that when customers view AR-generated imagery of product bundles away from the point of sale, this supports them in 'seeing' themselves purchasing the products at the point of sale (i.e., self-projection). This, in turn, drives intended and actual purchases of product bundles at the physical point-of-sale. However, our findings in Study 3 also point towards out-of-store (vs. in-store) settings as a potential channel-related boundary condition. Here the impact of AR-generated imagery on the purchase of product bundles appears to decrease, whilst still persuading customers to buy from a more expensive category (i.e., up-selling food rather than the core product of coffee).

Third, we advance research on customer-related boundary conditions to the benefits of AR use. We demonstrate that a customer's disposition for holistic (vs. analytic) thinking suppresses AR's positive impact on self-projection, when customers evaluate multiple products away from the point-of-sale. In doing so, we extend previous research that has primarily studied differences in how customers process AR (or its specific features) vis-à-vis conventional media (Heller et al., 2019a; Hilken et al., 2017). Specifically, we find that holistic thinkers benefit less from AR-generated imagery of product bundles for their self-projection. We argue that this is due to the fact that these customers are better able to mentally simulate the experiential relations between themselves, the products, and the physical point-of-sale 'all at once', rather than in an independent, piecemeal manner (i.e., analytic thinking). Demonstrating this effect further substantiates the crucial mediating role of self-projection when customers are faced with imagination gaps from evaluating multiple products together away from the point-of-sale. Vice versa, our findings also suggest that product bundles might

create increased cognitive load for analytic thinkers, as they have the tendency to imagine the individual product relations inherent in such bundles. To manage this load, these customers might simplify decision making by disregarding product interactions (Rutkowski & Saunders, 2018). However, this inevitably exacerbates imagination gaps, impeding self-projection and subsequent purchase intent. Accordingly, we demonstrate that analytic thinkers have the most to gain from using AR, as they can offload more mental imagery effort to bridge the imagination gap.

Managerial Implications

Nowadays, managers face challenging decisions about what and how (much) to present to customers in order to maximize sales potential in a crowded, multi-channel marketplace. With regards to AR, managers seek evidence-based advice on whether to invest and how to deploy the technology (BCG, 2018). However, while previous studies generally report positive effects of AR use on customers' intended and actual purchases, this support is not univocal, and, notably, most studies have focused on customer evaluation of individual products in a single stage of the purchase funnel (i.e., online product evaluation). Furthermore, despite some exceptions (Tan et al., 2021), previous research lacks ecological validity being predominantly set within controlled laboratory experiments or quasi-field studies with noticeably incentivized designs. In answer, our combination of lab and field research provides a more nuanced understanding of how AR addresses two important sources of imagination gaps on the path to purchase and impacts customer purchase behavior. This offers a basis for the following managerial implications.

First, we offer evidence that managers can successfully stimulate customer purchases of multiple products together by presenting these as AR-generated images of bundles, rather than as conventional product pictures. Tools for creating holograms are readily available (e.g., Qlone, Capture, Heges 3D Scanner) and the integration of AR into web browsers (e.g., Google Chrome, Safari) is rapidly progressing, which offers firms manifold opportunities to

seamlessly integrate AR into their existing marketing communications. We show that providing customers with such AR-generated imagery leads to expanded purchase baskets, by steering customers' decisions towards the purchase of multiple products, without the need to price these at a discount (e.g., '3 for 2', Stremersch & Tellis, 2002). However, our findings also reveal that there might be a threshold for achieving these benefits. Specifically, it seems that AR requires the purchase decision to entail some form of increased cognitive load, without which AR does not outperform conventional marketing tools. We thus advise managers to carefully assess when customers need support in generating mental imagery. We show that this is the case when customers evaluate product bundles (e.g., food and drink); but previous research also emphasizes products that are evaluated on the basis of personal or environmental 'fit' as a source of imagination gaps (e.g., makeup, clothing, furniture; see Table 1), and so managers should take the type of product into consideration when deciding whether to deploy AR.

Second, with a shift in customer behaviors towards mobile- and e-commence, out-of-store sales strategies are increasingly relevant to continued bottom-line performance. We thus note that accounting for different purchase funnel stages is crucial for deploying AR as a customer-facing technology. We demonstrate that AR can stimulate purchase intentions early in the purchase funnel, when customers use the technology out-of-store or at home. Selling products bundles typically is challenging in these settings, as customers face two pertinent sources of imagination gaps. However, we show that AR-generated imagery of product bundles enables customers to offload mental imagery to the technology, which encourages customers to self-project, and subsequently visit and purchase bundles at the point-of-sale. In this way AR shifts the focus of out-of-store sales from individual products to selling an entire 'look and feel' created through multiple products in a bundle. This is not to discount the use of AR at the point of sale though; we observe significant direct effects of AR-generated imagery on purchases of product bundles.

Third, our work also underlines the benefits of targeting an appropriate customer segment with AR. Extending prior research showing that AR's effectiveness improves for customers who are less prone to forming holistic mental images (Heller et al., 2019a; Hilken et al., 2017), we find a positive indirect effect of AR-generated imagery of product bundles on intended purchases for analytic (vs holistic) customer thinking styles. Managers should thus consider customers' natural thinking style as an important segmentation criterion. That is, while AR likely benefits most customers, those disposed to analytic thinking respond more positively with greater self-projection and subsequent purchase intentions. Analytic thinkers represent a sizeable customer segment that can feasibly be marketed to. Previous studies not only show that customers have a culturally dominant thinking style (e.g., east—holistic and west—analytic; Monga & John, 2007), but also reveal significant within-culture individual differences (Monga & John, 2010) as well as susceptibility of thinking styles to contextual cues (e.g., focusing on objects vs. contexts, self vs. group; Monga & John, 2008). This offers opportunities for deploying AR across and within different markets and implies that communication strategies around AR should be designed to appeal to these customers.

Limitations and Future Research

Our studies are set within the context of food sales, such that there is a scope for research to determine the applicability and replicability of our findings in other contexts. We deliberately chose this context due to its familiar and not overly complex products, which allowed a manipulation of cognitive load through product bundling. We expect that the underlying processes hold across multiple contexts, and might even be amplified for more hedonic offerings (e.g., fashion and cosmetics) or complex physical goods (e.g., furniture sets) that need to 'fit' customers personally or within their personal spaces. However, future research should explicitly contrast the effects of AR across multiple product categories. There might also be important nuances for less tangible goods and services. For example, experiential services (e.g., holiday bundles) do not have an 'in-store' option. AR may be even more

important for such offerings, given the exacerbated imagination gaps from more complex bundle offerings, the probable lack of familiarity that customers may have with the offerings, and the associated difficulties in imagining the experience.

Our employed experimental stimuli and control variables also offer opportunities for future research. We present coffee in a closed cup, as this provided the most experimental control, but recent research has shown that displaying packaged (vs. served) products in AR improves customers' purchase intentions to a greater extent (Petit et al., 2021). While this suggests that our observed effects offer a conservative estimate of the actual purchase impact of AR-generated imagery, future research could test our proposed effects with different packaging (and/or labels). Furthermore, we control for brand familiarity in two studies, and assume reasonable levels of familiarity of participants in our field studies; yet research could investigate differences in our observed effects for new versus existing customers or different levels of loyalty. Our results suggest that the effects might be stronger for customers who are more familiar with the brand as they find it easier to self-project.

We study AR use at different stages of a prototypical purchase funnel, which necessarily entails some simplification. Extant research, however, has established as a general principle that early purchase stages imply increased cognitive distance (Humphreys et al., 2021). We thus believe our findings related to AR's ability to bride imagination gaps and facilitate self-projection are robust across different paths to purchases, but future research could explore the use of AR across different journey types (e.g., starting in-store with the point-of-sale at-home by shopping online). Furthermore, we focus on the individual customer's perspective, but customers frequently complete the path to purchase with others (Hamilton et al., 2020). Emerging "Social AR" applications connect customers in real time (Hilken et al., 2020), for instance when one is in-store and the other is out-of-store, such that the potential for impacting sales should be further explored.

Relatedly, our findings in Study 3 offer some initial evidence that AR use at earlier purchase funnel stages might present a potential boundary condition to the technology's impact on customer purchase behavior. We account for up-selling (rather than a full bundle purchase) in our analysis, but more research is needed to fully establish these nuances. In this context, continued study should also formally contrast AR's purchase impact across different purchase funnel stages as well as different journey types (e.g., offline-to-online; multiple touchpoints; Herhausen et al., 2019; Hilken et al., 2021).

We identify holistic (vs. analytic) thinking style as a relevant a boundary condition to the benefits of AR when customers evaluate food products in out-of-store settings. Yet, further research is needed to establish the influence of this customer trait also within in-store settings, as well as for other product categories (e.g., furniture, holidays). We expect that the effects might follow the compensatory effect that we observe in our research, where AR is most beneficial when customers' natural thinking style is not optimally suited for grasping the products and purchase context. Beyond thinking styles, research should also explore additional customer characteristics that allow firms to identify market segments with favorable responses to AR use. These might include not only traits such different decision-making styles (maximizing vs. satisficing; Chowdhury et al., 2009), but also behaviors such as channel preferences or mobile device usage (Herhausen et al., 2019)

References

Baek, T. H., Yoo, C. Y., & Yoon, S. (2018). Augment yourself through virtual mirror: the impact of self-viewing and narcissism on consumer responses. *International Journal of Advertising*, *37*(3), 421-439.

Beck, M., & Crié, D. (2018). I virtually try it… I want it! Virtual Fitting Room: A tool to increase on-line and off-line exploratory behavior, patronage and purchase intentions. *Journal of Retailing and Consumer Services*, *40*, 279-286.

Benoit, I. D., & Miller, E. G. (2017). The mitigating role of holistic thinking on choice overload. *Journal of Consumer Marketing*, *34*(3), 181-190.

Biswas, D. (2019). Sensory Aspects of Retailing: Theoretical and Practical Implications. Journal of Retailing, 95(4), 111–115.

Boston Consulting Group (BCG) (2018). *Augmented reality: Is the camera the next big thing in advertising?*. Retrieved from: https://www.bcg.com/de de/publications/2018/augmented-reality-is-camera-next-big-thing-advertising.aspx. Accessed August 23, 2020.

Brengman, M., Willems, K., & Van Kerrebroeck, H. (2019). Can't touch this: the impact of augmented reality versus touch and non-touch interfaces on perceived ownership. *Virtual Reality*, *23*(3), 269-280.

Carrozzi, A., Chylinski, M., Heller, J., Hilken, T., Keeling, D. I., & de Ruyter, K. (2019). What's mine is a hologram? How shared augmented reality augments psychological ownership. *Journal of Interactive Marketing*, *48*, 71-88.

Choi, I., Koo, M., & Choi, J. A. (2007). Individual differences in analytic versus holistic thinking. *Personality and social Psychology Bulletin*, *33*(5), 691-705.

Chowdhury, T. G., Ratneshwar, S., & Mohanty, P. (2009). The time-harried shopper: Exploring the differences between maximizers and satisficers. *Marketing Letters*, *20*(2), 155-167.

Chylinski, M., Heller, J., Hilken, T., Keeling, D. I., Mahr, D., & de Ruyter, K. (2020). Augmented reality marketing: A technology-enabled approach to situated customer experience. *Australasian Marketing Journal (AMJ)*, *28*(4), 374-384.

de Ruyter, K., Heller, J., Hilken, T., Chylinski, M., Keeling, D. I., & Mahr, D. (2020). Seeing with the customer's eye: Exploring the challenges and opportunities of AR advertising. *Journal of Advertising*, *49*(2), 109-124.

Escalas, J. E. (2004). Imagine yourself in the product: Mental simulation, narrative transportation, and persuasion. *Journal of Advertising*, *33*(2), 37-48.

Escalas, J. E., & Luce, M. F. (2004). Understanding the effects of process-focused versus outcome-focused thought in response to advertising. *Journal of Consumer Research*, *31*(2), 274-285.

Hamilton, R., Ferraro, R., Haws, K. L., & Mukhopadhyay, A. (2021). Traveling with companions: the social customer journey. *Journal of Marketing*, *85*(1), 68-92.

Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd ed.). Guilford Press.

Heller, J., Chylinski, M., de Ruyter, K., Mahr, D., & Keeling, D. I. (2019a). Let me imagine that for you: Transforming the retail frontline through augmenting customer mental imagery ability. *Journal of Retailing*, *95*(2), 94-114.

Heller, J., Chylinski, M., de Ruyter, K., Mahr, D., & Keeling, D. I. (2019b). Touching the untouchable: exploring multi-sensory augmented reality in the context of online retailing. *Journal of Retailing*, *95*(4), 219-234.

Herhausen, D., Kleinlercher, K., Verhoef, P. C., Emrich, O., & Rudolph, T. (2019). Loyalty formation for different customer journey segments. *Journal of Retailing*, *95*(3), 9-29.

Hildebrand, D., Harding, R. D., & Hadi, R. (2019). Culturally contingent cravings: how holistic thinking influences consumer responses to food appeals. *Journal of Consumer Psychology*, *29*(1), 39-59.

Hilken, T., de Ruyter, K., Chylinski, M., Mahr, D., & Keeling, D. I. (2017). Augmenting the eye of the beholder: exploring the strategic potential of augmented reality to enhance online service experiences. *Journal of the Academy of Marketing Science*, *45*(6), 884 905.

Hilken, T., Heller, J., Chylinski, M., Keeling, D. I., Mahr, D., & de Ruyter, K. (2018). Making omnichannel an augmented reality: the current and future state of the art. *Journal of Research in Interactive Marketing*, *12*(4), 509-523.

Hilken, T., Keeling, D. I., de Ruyter, K., Mahr, D., & Chylinski, M. (2020). Seeing eye to eye: social augmented reality and shared decision making in the marketplace. *Journal of the Academy of Marketing Science*, *48*(2), 143-164.

Hilken, T., Chylinski, M., Keeling, D. I., Heller, J., de Ruyter, K., & Mahr, D. (2021). How to strategically choose or combine augmented and virtual reality for improved online experiential retailing. *Psychology & Marketing*, available online 4 October 2021, in press.

Hossain, M. T. (2018). How cognitive style influences the mental accounting system: role of analytic versus holistic thinking. *Journal of Consumer Research*, *45*(3), 615-632.

Hoyer, W. D., Kroschke, M., Schmitt, B., Kraume, K., & Shankar, V. (2020). Transforming the customer experience through new technologies. *Journal of Interactive Marketing*, *51*, 57-71.

Humphreys, A., Isaac, M. S., & Wang, R. J. H. (2021). Construal Matching in Online Search: Applying Text Analysis to Illuminate the Consumer Decision Journey. *Journal of Marketing Research*, *58*(6), 1101-1119.

Javornik, A. (2016). 'It's an illusion, but it looks real!'Consumer affective, cognitive and behavioural responses to augmented reality applications. *Journal of Marketing Management*, *32*(9-10), 987-1011.

Jessen, A., Hilken, T., Chylinski, M., Mahr, D., Heller, J., Keeling, D. I., & de Ruyter, K. (2020). The playground effect: How augmented reality drives creative customer engagement. *Journal of Business Research*, *116*, 85-98.

Kowalczuk, P., Siepmann, C., & Adler, J. (2021). Cognitive, affective, and behavioral consumer responses to augmented reality in e-commerce: A comparative study. *Journal of Business Research*, *124*, 357-373.

Li, H., & Ma, L. (2020). Charting the Path to Purchase Using Topic Models. *Journal of Marketing Research*, *57*(6), 1019-1036.

Lutz, K. A., & Lutz, R. J. (1978). Imagery-Eliciting Strategies: Review and Implications of Research. In Hunt, K. (Ed.), *NA - Advances in Consumer Research* (pp. 611–620). Association for Consumer Research.

MacInnis, D. J., & Price, L. L. (1987). The role of imagery in information processing: Review and extensions. *Journal of Consumer Research, 13*(4), 473-491.

MacKenzie, S. B., & Lutz, R. J. (1989). An empirical examination of the structural antecedents of attitude toward the ad in an advertising pretesting context. *Journal of Marketing, 53*(2), 48-65.

Marketing Science Institute (MSI) (2020). *Research priorities 2020-2022.* Retrieved from: https://www.msi.org/articles/2020-22-msi-research-priorities-outline-marketers-top concerns/. Accessed December 15, 2020.

Monga, A. B., & John, D. R. (2007). Cultural differences in brand extension evaluation: The influence of analytic versus holistic thinking. *Journal of Consumer Research, 33*(4), 529-536.

Monga, A. B., & John, D. R. (2008). When does negative brand publicity hurt? The moderating influence of analytic versus holistic thinking. *Journal of Consumer Psychology, 18*(4), 320-332.

Monga, A. B., & John, D. R. (2010). What makes brands elastic? The influence of brand concept and styles of thinking on brand extension evaluation. *Journal of Marketing, 74*(3), 80-92.

Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: holistic versus analytic cognition. *Psychological Review, 108*(2), 291-310.

Park, M., & Yoo, J. (2020). Effects of perceived interactivity of augmented reality on consumer responses: A mental imagery perspective. *Journal of Retailing and Consumer Services, 52*, 101912.

Pearson, J., Naselaris, T., Holmes, E. A., & Kosslyn, S. M. (2015). Mental imagery: functional mechanisms and clinical applications. *Trends in Cognitive Sciences, 19*(10), 590-602.

Petit, O., Velasco, C., & Spence, C. (2019). Digital sensory marketing: Integrating new technologies into multisensory online experience. *Journal of Interactive Marketing, 45*, 42–61.

Petit, O., Javornik, A., & Velasco, C. (2021). We Eat First with Our (Digital) Eyes: Enhancing Mental Simulation of Eating Experiences via Visual-Enabling Technologies. *Journal of Retailing*, available online 28 April 2021, in press.

Petrova, P. K., & Cialdini, R. B. (2005). Fluency of consumption imagery and the backfire effects of imagery appeals. *Journal of Consumer Research, 32*(3), 442-452.

Phillips, D. M., Olson, J. C., & Baumgartner, H. (1995). Consumption Visions in Consumer Decision Making. In Kardes, F. R. & Sujan, M. (Eds.), *NA - Advances in Consumer Research* (pp. 280–284). Association for Consumer Research.

Philips, B. J. (2017). Consumer imagination in marketing: a theoretical framework. *European Journal of Marketing, 45*(11/12), 2138–2155.

Plotkina, D., & Saurel, H. (2019). Me or just like me? The role of virtual try-on and physical appearance in apparel M-retailing. *Journal of Retailing and Consumer Services, 51*, 362-377.

Poncin, I., & Mimoun, M. S. B. (2014). The impact of "e-atmospherics" on physical stores. *Journal of Retailing and Consumer Services, 21*(5), 851-859.

Poushneh, A., & Vasquez-Parraga, A. Z. (2017). Discernible impact of augmented reality on retail customer's experience, satisfaction and willingness to buy. *Journal of Retailing and Consumer Services*, *34*, 229-234.

Rutkowski, A-F., & Saunders, C. (2018). *Emotional and Cognitive Overload: The Dark Side of Information Technology*. Routledge.

Scholz, J., & Duffy, K. (2018). We ARe at home: How augmented reality reshapes mobile marketing and consumer-brand relationships. *Journal of Retailing and Consumer Services*, *44*, 11-23.

Smink, A. R., van Reijmersdal, E. A., van Noort, G., & Neijens, P. C. (2020). Shopping in augmented reality: The effects of spatial presence, personalization and intrusiveness on app and brand responses. *Journal of Business Research*, *118*, 474-485.

Stremersch, S., & Tellis, G. J. (2002). Strategic bundling of products and prices: A new synthesis for marketing. *Journal of Marketing*, *66*(1), 55-72.

Tan, Y. C., Chandukala, S. R., & Reddy, S. K. (2021). Augmented Reality in Retail and Its Impact on Sales. *Journal of Marketing*, *86*(1), 48-66.

Wilcox, K., Roggeveen, A. L., & Grewal, D. (2011). Shall I tell you now or later? Assimilation and contrast in the evaluation of experiential products. *Journal of Consumer Research*, *38*(4), 763-773.

Yim, M. Y. C., Chu, S. C., & Sauer, P. L. (2017). Is augmented reality technology an effective tool for e-commerce? An interactivity and vividness perspective. *Journal of Interactive Marketing*, *39*, 89-103.

Yim, M. Y. C., Baek, T. H., & Sauer, P. L. (2018). I see myself in service and product consumptions: measuring self-transformative consumption vision (SCV) evoked by static and rich media. *Journal of Interactive Marketing*, *44*, 122–139.

Yoo, J., & Kim, M. (2014). The effects of online product presentation on consumer responses: A mental imagery perspective. *Journal of Business Research*, *67*(11), 2464-2472.

Zemack-Rugar, Y., & Rabino, R. (2019). The impact of visualizing use versus acquisition of a product on the appeal of its complement. *Psychology & Marketing*, *36*(4), 251-265.

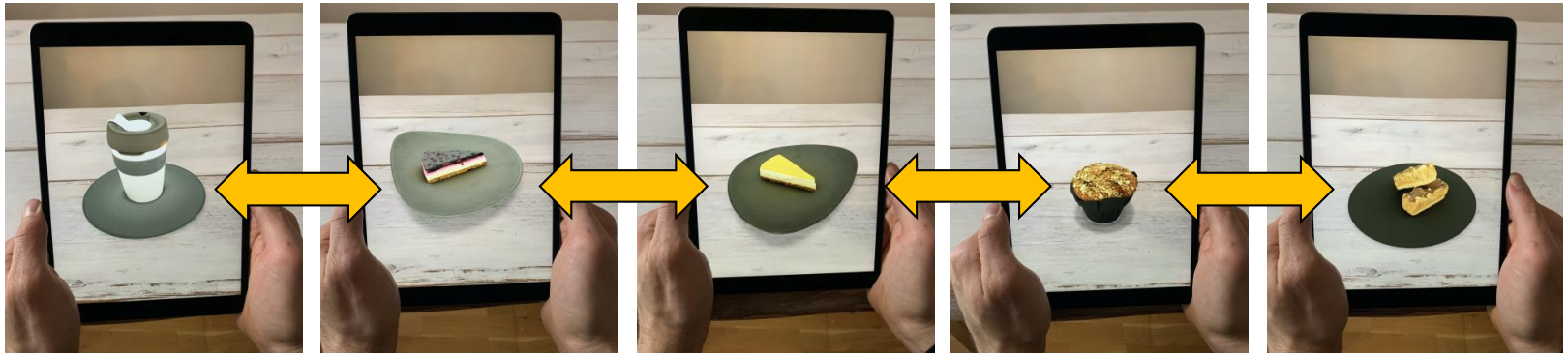
Zhao, M., Hoeffler, S., & Dahl, D. W. (2009). The role of imagination-focused visualization on new product evaluation. *Journal of Marketing Research*, *46*(1), 46-55.

Zhao, M., & Xia, L. (2021). Joint or separate? The effect of visual presentation on imagery and product evaluation. *International Journal of Research in Marketing*, *38*(4), 935 952.

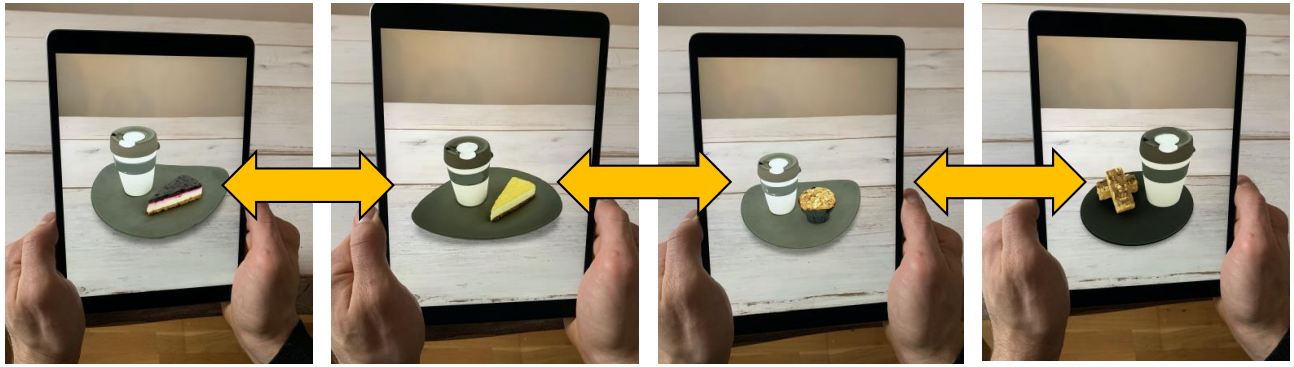
Appendix A

Augmented reality (AR) menu

Individual Products AR Menu



Bundled Products AR Menu



Appendix B

Overview of constructs and measurement items

Construct	Items

Purchase intentions (Study 1)
If you were to go to [the café] right now, how likely would it be that you buy something from the menu?

Purchase intentions (Studies 3 and 4)
If you were to go to [the café] right now, how likely would it be that you buy a food item from the menu in addition to coffee?

Self-projection *adapted from Yim et al. (2018)*
I had images of myself purchasing coffee and food together in my mind.
I pictured myself being there buying coffee and food together.
The mental images that came to mind formed a picture in my mind in which I was purchasing coffee and food.
I could easily construct a story about myself buying the featured products together based on the mental images that came to mind.
I was easily able to project myself into the situation in which I buy food in addition to coffee.

Analytic-holistic thinking style *Choi et al. (2007)*
Everything in the universe is somehow related to each other.
Nothing is unrelated.
Everything in the world is intertwined in a causal relationship.
Even a small change in any element of the universe can lead to significant alterations in other elements.
Any phenomenon has numerous numbers of causes, although some of the causes are not known.
Any phenomenon entails a numerous number of consequences, although some of them may not be known.

Hunger (Studies 1, 3, and 4) – *Wilcox et al. (2011)*
How long ago did you have your last meal (in hours)?

(Study 2)
How hungry do you feel right now?

Familiarity with AR
I am familiar with Augmented Reality applications

Familiarity with the brand
I regularly go to [the café].

Attitude towards the menu (Study 2)
How much did you like or dislike your drinks and/or food at [the café] today?

(Study 3) *adapted from Mackenzie & Lutz (1989)*
Describe your overall feelings towards the new food items:
bad – good
unpleasant – pleasant
unfavorable – favorable

Manipulation check: imagery (bundled vs. individual) *adapted from Heller et al. (2019a)*
Using the augmented reality menu…
… gave me a good understanding of how the products would look as a bundle.
… helped me to imagine how the different products would go together if I ordered them.
… increased my ease in imagining how the different products would look together.
… gave me a full picture of the different products as if they were standing in front of me.

Manipulation check: imagery generation (AR vs. pictures) *adapted from Hilken et al. (2017)*
I felt like the products from the menu were actually there in the real world.
It was as though the true location of the products from the menu had shifted into the real-world environment.
I felt like the products from the menu meshed with the real-world surroundings.
It seemed as if the products from the menu actually took part in the action in the real world.
I had the impression that I could be active with the products from the menu in the real world.
I felt like I could move the products from the menu around in the real world.
The products from the menu gave me the feeling I could do things with them.
It seemed to me that I could do whatever I wanted with the products from the menu.