

Humanizing Products with Handwritten Typefaces

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ABSTRACT

The loss of a sense of humanness that stems from increasing mechanization, automation, and digitization gives firms an impetus to develop effective ways to humanize products. On the basis of knowledge activation theory, this article systematically investigates a novel humanization approach: the use of typefaces that appear to be handwritten. Across several laboratory and field studies, the authors provide evidence of the positive effect of handwritten typefaces, reveal the mechanisms that lead to these outcomes, and outline some boundary conditions. Specifically, the results show that handwritten typefaces create perceptions of human presence, which lead to more favorable product evaluations (and behavior) by enhancing the emotional attachment between the consumer and the product. However, these effects are mitigated for brands to which consumers already feel a sense of attachment. Finally, the effects reverse when the products are functionally positioned or functional in nature. The present article thus extends understanding of humanization processes and provides guidelines for how and when brands should use handwritten typefaces.

Keywords: handwritten typeface, humanization, product packaging, human presence, emotional attachment

The increasing mechanization, automation, and digitalization of modern lives has produced some loss of a sense of humanness. Yet the desire for human connection is a basic need (Baumeister and Leary 1995), leading marketers in various industries to seek ways to humanize their offerings, such as when they post pictures of employees on their website contact pages or require support personnel to add their initials to their responses on Twitter (Wainwright 2012). Another potential humanization option involves the typeface used in communications. Most companies use sans serif typefaces (e.g., Helvetica, Gill Sans, Futura) on their packaging, advertising, and websites, which we refer to as machine-written typefaces. But other firms use typefaces that appear handwritten. Although they are actually created by machines, they appear to have been written by humans, so we distinguish them as “handwritten” in this article. Some recent examples include Danone’s and Dreyer’s websites, product packaging for Evolution Fresh and Lindt Chocolate, and print advertising by Oreo, McDonald’s, Whole Foods, and Marlboro (see web appendix). Yet it is not clear whether these handwritten typefaces really enhance the humanization of the presented product or provide any competitive advantage.

Prior research offers some conflicting insights regarding whether consumers evaluate products featuring handwritten typefaces favorably or not. Handwritten typefaces tend to be regarded as friendlier and more personalized than machine-written typefaces, but they also can invoke a sense of being less professional and more childish, such that they might not be appropriate for professional contexts (Mackiewicz 2005; Mackiewicz and Moeller 2004). Therefore, it would be beneficial to know when handwritten typefaces create positive effects and which brands/products benefit from using them.

In response, this article offers a systematic investigation of the effects of handwritten typefaces on consumers’ product evaluations. With a series of studies, we consider the effects

across diverse products (food and non-food) and consumer populations (European and U.S. samples). We focus on product packaging as a pertinent communication medium and marketing tool that signals product benefits (Underwood and Klein 2002; van Rompay and Velthuis 2014). Information on packaging is easy to manipulate, and it often is the first touchpoint consumers have with products. Thus, we start by demonstrating a positive effect of handwritten typefaces in two field studies that measure actual purchase behavior (studies 1a and 1b). The next two studies uncover the serial mediation process underlying this effect (typeface → human presence → emotional attachment → evaluation), by drawing on the concept of human presence, or a medium's ability to convey perceptions of human contact, warmth, and sensitivity (Gefen and Straub 2003; Short, Williams, and Christie 1976). Studies 2a and 2b show that using handwritten (vs. machine-written) typefaces increases perceptions of human presence, which lead to more favorable product evaluations by enhancing consumers' emotional attachment to the product. Studies 3–5 offer additional process evidence, using moderation-of-process designs: study 3 manipulates the first mediator (human presence), and studies 4 and 5 manipulate the second mediator (emotional attachment). The results show that the positive effect of handwritten typefaces is less pronounced for brands (study 4) and products (study 5) to which consumers are already emotionally attached. Finally, with study 6, we demonstrate that the results reverse when the product is functionally positioned or primarily functional in nature.

These findings contribute to several research streams. Most notably, we extend product evaluation literature by introducing a novel way to humanize objects. Existing research has focused on the anthropomorphization of products, involving the attribution of human-like qualities (e.g., smiling face) to nonhuman objects (Aggarwal and McGill 2007, 2011; Epley, Waytz, and Cacioppo 2007). Our idea that handwritten typefaces humanize a product by creating

feelings of human presence is related to but different from anthropomorphism.

Anthropomorphism refers to the attribution of human-like qualities to nonhuman objects (Aggarwal and McGill 2007; Epley et al. 2007), by making a product appear alive (Waytz, Cacioppo, and Epley 2010). The two constructs can be viewed as different strategies that humanize the product and create emotional attachment. Whereas anthropomorphism humanizes a product by making it appear alive, handwritten typefaces endow it with a sense of human contact, warmth, and sensitivity. We advance this line of research by showing that objects can be humanized by creating perceptions of human presence. In so doing, we extend the scope of social presence theory and the applications of emotional attachment theory. This broader perspective not only enhances theoretical understanding of humanization processes but also provides a novel way for companies to endow their offerings with a more human feel.

THEORETICAL BACKGROUND

Typeface Design

A word written in a typeface conveys two kinds of meanings: denoted and connotative. The denoted meaning reflects the definition of the word; the connotative meaning goes beyond this literal sense to include the semantic associations of the physical characteristics of the typeface (Celhay, Boysselle, and Cohen 2015). Through assimilation, semantic associations can spill over to other objects, as demonstrated for both advertisements (Childers and Jass 2002) and brands (Doyle and Bottomley 2009) (for an overview of studies examining typeface, see table 1). For example, Childers and Jass (2002) demonstrate that using a luxurious typeface in advertisements increases consumers' perceptions of the luxuriousness of the advertised brands. Hagtvædt (2011) also shows that incomplete (vs. complete) typeface logos are perceived as more

interesting, such that they increase consumers' perceptions of the company's innovativeness. Although relatively few studies address the connotative meanings of handwritten typefaces, Mackiewicz (2005) and Mackiewicz and Moeller (2004) establish that handwritten typefaces are perceived as more friendly and individual, less professional, and more childish than non-handwritten typefaces. To the best of our knowledge, how the use of handwritten typefaces affects consumers' product evaluations has not been investigated.

Insert table 1 about here

Human Presence and Emotional Attachment

According to knowledge activation theory, the humanization of a nonhuman object entails a three-stage process of inductive inference: (1) acquire knowledge about humans, (2) activate that knowledge through a stimulus, and (3) apply the knowledge to a target (Epley et al. 2007; Higgins 1996). Because knowledge about what it means to be human is readily and richly available to humans, the question of humanization really revolves around the latter two functions: whether a stimulus activates this knowledge and to what extent it gets applied to a target.

The notion of elicited agent knowledge (Epley et al. 2007) underlies a central proposition of our study, namely, that handwritten typefaces increase the accessibility of and activate knowledge about humans. If consumers regard this activated knowledge as appropriate for a target (e.g., product, brand), they apply it and humanize that target. In a sense, the process is similar to anthropomorphism, but to anthropomorphize a nonhuman object, consumers would need to infer human-like features or emotions (Epley et al. 2007). In contrast, our conceptualization builds on the idea that consumers humanize a nonhuman object by inferring a

sense of human presence. We present this psychological concept of *human presence* as the perception that a product has been imbued with a personalized touch of humanity, such that consumers sense the presence or involvement of a human being, even though no other humans are or need to be physically present. Therefore, our conceptualization of human presence entails how a product or communication conveys the presence of a human being, so that the consumer perceives that the medium signals human contact, sensitivity, or warmth (Gefen and Straub 2003, 2004; Short et al. 1976).

Research in technology-mediated environments suggests that the presence of others can be conveyed by cues that imply human characteristics. Perceptions of human presence in technology media such as websites can be elicited by the inclusion of pictures (Gefen and Straub 2003), human audio (Lombard and Ditton 1997), human video (Kumar and Benbasat 2006), and personalized greetings (Gefen and Straub 2003; Kumar and Benbasat 2006). Such a concept has been termed “social presence” in technology research. However, in consumer behavior research, the term social presence refers to the co-presence of others in the same environment (e.g., Argo, Dahl, and Manchanda 2005; Dahl, Manchanda, and Argo 2001; Jiang, Hoegg, and Dahl 2013; Ramanathan and McGill 2007). For example, Dahl et al. (2001) study how the real and imagined physical presence of another human being affects consumers’ purchases of embarrassing products. They manipulate social presence as the presence or absence of a confederate during the purchasing process. Our conceptualization of social presence is different; it does not refer to being in the same location with another human being. Thus, we use the terminology “human presence,” in a psychological sense.

Handwriting or handwritten cues can be viewed as an extension of the self (Chen et al. 2008), such that product packaging that appears to feature handwritten text will seem to have a

more human quality (i.e., human presence). In turn, we propose that handwritten (vs. machine-written) typefaces on product packages can convey greater perceptions of human presence, even if the consumer is aware that the typeface used on the packaging has been created by a machine. A handwritten typeface serves as a cue to activate a human knowledge, without necessarily anthropomorphizing the product, and can result in more positive product evaluations.

We predict in turn that human presence perceptions enhance emotional attachment to the product. Thomson, MacInnis, and Park (2005) conceptualize emotional attachment as a multifaceted construct that captures consumers' affection, passion, and connection. The central element of this emotional attachment is a cognitive and emotional connection of the brand or product with the self (MacInnis and Folkes 2017; Park et al. 2010). Perceptions of human presence should enhance emotional attachment for several reasons. A sense of social presence leads to intimacy (Argyle and Dean, 1965; Short et al. 1976), defined as feelings of closeness, bondedness, and connectedness, which arise when people experience a sense of warmth (Yim, Tse, and Chan 2008). In addition, consumers are more likely to develop feelings of connectedness to human than to nonhuman entities. For example, Tam, Lee, and Chao (2013) demonstrate that humanizing nature (e.g., referring to it as "Mr. Nature") increases consumers' feeling of connectedness to it and thereby enhances conservation behavior. Similarly, we argue that the more consumers sense that a product has been imbued with a personalized touch of humanity (i.e., human presence), the greater their feeling of connectedness to it. As is true in interpersonal relationships, the more closely connected consumers feel to a product or brand, the stronger their emotional attachment should be (Park et al. 2010; Thomson et al. 2005).

Conventionally, such emotional attachment results from long-term relationships (Park et al. 2010; Thomson et al. 2005; Wallendorf and Arnould 1988), though recent research suggests it

can develop quite quickly (Dunn and Hoegg 2014). Thus, consumers may feel an immediate emotional attachment to products featuring handwritten (vs. machine-written) typefaces, due to their enhanced perceptions of human presence. This emotional attachment then should evoke stronger responses to products, involving their attitudes, loyalty, purchase intentions, and willingness to pay a price premium (Hadi and Valenzuela 2014; Jiménez and Voss 2014; Thomson et al. 2005).

In summary, we anticipate that using handwritten typefaces humanizes products by creating a sense of human presence. The higher this perception of human presence, the more closely connected consumers should feel to the product, which strengthens their emotional attachment and, ultimately, results in more favorable product evaluations.

Pretest of Typefaces

Before beginning our investigation, we performed a pretest to affirm which typefaces are perceived as handwritten and which are machine-written, with the initial assumption that casual script typefaces appear handwritten, whereas more formal sans serif typefaces (e.g., Helvetica, Futura, Gill Sans) represent machine-written versions.

All the typefaces we used lack serifs, appear in block letters (cf. some casual scripts), take normal weight, use upper and lower cases, and are not in italics. Thus, the main distinction between typeface styles rests on the design characteristic, namely, that casual script typefaces appear handwritten, whereas sans serif typefaces appear machine-written (or typed). In particular, sans serif typefaces are characterized by regular spacing between letters, regular sizes across letters, regular thickness across and within letters, and evenly drawn lines. Casual script typefaces instead feature more irregular spacing between letters, irregular sizes across letters,

irregular thickness across and within letters, and some unevenly drawn lines. These imperfections help make the casual script typefaces appear handwritten (Mackiewicz 2005).

We pretested several handwritten and machine-written typefaces, all downloaded from dafont.com: six casual script typefaces (All Things Pink, Moon Flower, DJB This is Me, Chalkboard, Hipsterish, and Talking to the Moon) and three common machine-written typefaces (Futura, Gill Sans, Helvetica; Rose 2014) (see appendix A). The 479 U.S. consumers who participated in this pretest (MTurk sample, $M_{\text{age}} = 36$ years, 45% female) were assigned randomly to one of the nine typeface conditions. Following an established procedure (Brumberger 2003), subjects viewed the complete alphabet and number set in a given typeface, together with the sentence “The quick brown fox jumps over the lazy dog,” which uses all letters from the alphabet. The participants evaluated each typeface according to the degree to which it appears handwritten, with two 7-point differential scales (“looks machine-written/looks handwritten,” and “written by machine/written by hand”; $r = .87$). The six casual script typefaces all were perceived as significantly more handwritten than the three machine-written typefaces (for mean values, see the web appendix). Even the casual script typeface that was perceived as least handwritten ($M_{\text{Chalkboard}} = 3.99$) still appeared significantly more handwritten than the machine-written typeface that was perceived as most handwritten ($M_{\text{Futura}} = 2.39$, $p < .001$). In our studies, we alternated three handwritten and the three machine-written typefaces, to enhance the validity and generalizability of our findings (see appendix A).

Pretest of Human Knowledge Activation

In another pretest, we investigated consumers’ semantic associations with handwritten (vs. machine-written) typefaces, as well as whether handwritten typefaces activate human

knowledge. Therefore, we conducted an open association task in which 60 U.S. consumers (MTurk sample, $M_{\text{age}} = 36$, 45% female) saw either a handwritten typeface (DJB This is Me) or a machine-written typeface (Helvetica) and indicated any associations, in response to the prompt, “What comes to your mind when you look at this typeface?” The associations were coded by two independent coders (interrater reliability = .96).

On the one hand, associations of handwritten typefaces contained more human references than associations of machine-written typeface (65% vs. 3% of associations; $z = 4.96$; $p < .001$). For example, one participant explained, “When I look at the typeface, natural handwriting comes to mind. This typeface looks a lot like a human has written it. It looks very neat and gives me the sense of someone writing me a personal letter.” Other respondents made associations such as, “It looks like a person's handwriting. I like how casual it is,” “It reminds me of handwriting,” and “What comes to mind is a teacher writing on a chalkboard.” Still others regarded the handwritten typeface as cute (e.g., “Super cute typeface; I would actually want to know what it is for my own personal use”) or friendly (e.g., “I like this font. It's a friendly, casual font”). Thus, as potential alternative mechanisms, we control for perceived cuteness and friendliness, to isolate the proposed human presence mechanism. On the other hand, the machine-written typeface was perceived as significantly more professional (0% vs. 31% of associations; $z = 3.36$; $p < .001$) and clean/simple (10% vs. 45% of associations; $z = 3.08$; $p < .001$) than the handwritten typeface. For example, participants said that it “looks very clean and simple” and “is a very common font.” These pretest results increase confidence in our assumption that handwritten typefaces activate human knowledge. In the following studies, we investigate whether, why, and in what conditions this typeface-induced activation of human knowledge affects product evaluations.

STUDY 1A AND 1B

With studies 1a and 1b, in which we measure actual purchase behavior, we seek to obtain evidence pertaining to our prediction that using handwritten typefaces enhances consumers' product evaluations. For both studies, we first conducted a pretest to select typefaces that would be equally appropriate for the products (web appendix).¹ Then we completely redesigned the product packaging for both products, in cooperation with the companies' designers (see appendices B and C).

Study 1a was run with cooperation of a local bakery, and the product packaging was redesigned for one of its products (crispbread), to test whether a higher percentage of consumers purchased the product with packaging featuring the handwritten (vs. machine-written) typeface. By completely redesigning the product packaging, we avoided any familiarity effects. No brand name or logo appeared on the packaging. The only difference between the two packages was the typefaces on the front; the product information on the back remained the same (appendix B).

This single-factor (typeface: machine-written [Gill Sans] vs. handwritten [DJB This is Me]) between-subjects design relied on 100 student participants ($M_{\text{age}} = 24$ years; 41% female) from a German-speaking university. We created a cover story, suggesting that the bakery was conducting a product test. A research assistant who was not aware of the purpose of the study randomly approached students, showed them one of the two crispbread packages, and asked them whether they wanted to sample it. Each packaging version was presented multiple times during the day; we randomly assigned 15-minute time slots to each condition. The research assistant was instructed to roll a die every 15 minutes and change packages (i.e., even number =

¹ A typeface is appropriate if it shares the same connotative meaning with the entity on which it appears, that is, if their meanings are congruent. Consumers respond more favorably to products and brands that are presented in appropriate typefaces than to those that are presented in inappropriate typefaces (Childers and Jass 2002; Doyle and Bottomley 2004; van Rompay and Pruyn 2011).

handwritten packaging was shown; uneven number = machine-written packaging was shown). After sampling the crispbread, participants had the option to purchase the product for €1. They also provided some basic demographic data (age, gender). The purchase choice (yes/no) served as our dependent variable.

Results

In total, 100 consumers sampled the crispbread. The z-test of proportions for purchases revealed a significant effect of typeface ($z = 3.30$; $p < .001$). Specifically, 30.4% of consumers made a purchase in the handwritten condition, but only 5.6% of consumers did so in the machine-written condition.

These findings were replicated in a second field study (study 1b) using a different product category (chocolate) in a local chocolate store. The typefaces were Helvetica (machine-written) and Moon Flower (handwritten) (see appendix C). All the participants ($n = 117$) were actual customers of the store (68% female). After sampling the chocolate, these customers could purchase it at its regular retail price of €3.90. The z-test of proportions revealed a significant effect of typeface ($z = 2.47$; $p = .014$). Specifically, 17.2% of customers made a purchase in the handwritten condition, but only 3.4% of them did in the machine-written condition.

Discussion

Studies 1a and 1b provide evidence, gathered from different real-world settings, of our main prediction: Using a handwritten (vs. machine-written) typeface on product packaging positively affects purchase behavior. With these two field studies, we could not establish appropriate controls to explicate exactly how handwritten typefaces influence consumers'

product evaluations. Furthermore, the package design for study 1b was somewhat simplistic. Therefore, we turn to more internally valid methods to gather process evidence about the proposed mechanism of handwritten (vs. machine-written) typefaces.

STUDY 2A

To investigate the mechanism underlying the positive effect of handwritten typefaces, we apply a measurement-of-mediation design (Spencer, Zanna, and Fong 2005). We investigate whether the use of a handwritten (vs. machine-written) typeface enhances human presence perceptions, which in turn increase participants' emotional attachment to the product and ultimately lead to more favorable product evaluations. In addition, we measure several constructs to rule out alternative mechanisms. For example, handwritten typefaces might prompt consumers to believe that the product is handmade or more natural; anthropomorphize the product; or make it appear more unique, friendly, cute, or interesting.

Method

Design, Participants, and Stimuli. A total of 100 U.S. consumers (MTurk sample, $M_{\text{age}} = 34$ years, 53% female) participated in study 2a, which was a single-factor (typeface: machine-written [Futura] vs. handwritten [All Things Pink]) between-subjects design. We used hand soap as our stimulus, to extend our findings beyond food products (appendix D). We again conducted a pretest to rule out the confounding effects of typeface appropriateness; the results of the pretest (web appendix) prompted us to use the handwritten typeface All Things Pink and the machine-written typeface Futura for the main study.

Procedure and Measures. After processing the target stimulus, participants evaluated the

product on six 7-point scales: “Please evaluate this product on the following dimensions: dislike/like, bad/good, unappealing/appealing, unfavorable/favorable, and low quality/high quality” and using the following item: “How likely would you be to buy this product?” (“very unlikely/very likely”) ($\alpha = .94$). Our focal product evaluation dependent variable thus encompasses attitudinal measures (e.g., liking), assessments of quality, and purchase intentions, as also used in recent studies (Fuchs, Schreier, and van Osselaer 2015; Sweldens, Van Osselaer, and Janiszewski 2010).

In addition, participants indicated how emotionally attached they felt to the product (Thomson et al. 2005), in response to the following prompt: “Please describe the extent to which the following 10 words describe your feelings toward this product from 1 (‘not at all’) to 7 (‘very much’): affectionate, friendly, loved, peaceful, passionate, delighted, captivated, connected, bonded, and attached” ($\alpha = .97$). The emotional attachment scale developed by Thomson et al. (2005) consists of three dimensions (passionate, affectionate, connected), but in line with prior research (Dunn and Hoegg 2014; Fedorikhin, Park, and Thomson 2008; Hadi and Valenzuela 2014), our factor analysis produced a single factor explaining 77.45% of the variance.

Human presence perceptions were measured by adapting Gefen and Straub’s (2004) five-item 1 (“totally disagree”) to 7 (“totally agree”) scale: “There is a sense of human contact in this product,” “There is a sense of personalness in this product,” “There is a sense of sociability in this product,” “There is a sense of human warmth in this product,” and “There is a sense of human sensitivity in this product” ($\alpha = .93$). In addition, participants evaluated several items that captured possible alternative mechanisms (i.e., handmade, anthropomorphized, unique, friendly, cute, natural, interesting, and approachable; see web appendix for items). Finally, they responded

to a manipulation check question and rated the extent to which they perceived the typeface as handwritten (1 = “looks machine-written” to 7 = “looks handwritten”).

A principal component factor analysis with Varimax rotation of the three main constructs (product evaluation, emotional attachment, human presence) revealed the expected three-factor solution, which explained 79.88% of the total variance. To establish discriminant validity among the three constructs, we performed a confirmatory factor analysis. For each construct, the average variance extracted (AVE) exceeded .50 (product evaluation = .73, human presence = .72, emotional attachment = .75). Fornell-Larcker (1981) tests also revealed that, among all pairs of constructs, the AVE was higher than the shared variance between constructs.

Results

Manipulation Check. Participants perceived the handwritten typeface as more handwritten than the machine-written typeface ($M_{\text{handwritten}} = 4.28$, $M_{\text{machine-written}} = 2.04$; $t(98) = 6.57$, $p < .001$).

Product Evaluation, Emotional Attachment, and Human Presence. A multivariate analysis of variance (MANOVA) with typeface as a between-subjects factor revealed that participants evaluated the product featuring the handwritten typeface more favorably than the product featuring the machine-written typeface ($M_{\text{handwritten}} = 5.40$, $M_{\text{machine-written}} = 4.69$; $F(1, 98) = 8.47$, $p = .004$). They also felt significantly more emotionally attached to the product featuring the handwritten typeface ($M_{\text{handwritten}} = 4.46$, $M_{\text{machine-written}} = 3.72$; $F(1, 98) = 5.68$, $p = .019$) and indicated higher perceptions of its human presence ($M_{\text{handwritten}} = 4.73$, $M_{\text{machine-written}} = 4.00$; $F(1, 98) = 6.29$, $p = .014$). The results were replicated with a similar study, with 110 respondents (web appendix, study 2a replication).

Alternative Mechanisms. We ran another MANOVA for the alternative mechanisms. The typeface manipulation did not have a significant effect on any of these alternative mechanisms (all p s > .05), as detailed in the web appendix. Notably, the effect of typeface on product evaluations remained significant, even after we controlled for all alternative mechanisms.²

Serial Mediation Analyses. We predicted that using a handwritten (vs. machine-written) typeface on product packaging creates perceptions of human presence, which makes consumers more emotionally attached to the product, which ultimately leads to more positive product evaluations (i.e., typeface → human presence → emotional attachment → product evaluation). To test this theoretical framework, we conducted a serial mediation analysis (Hayes 2013, Model 6, $n = 5,000$) that uncovered a positive, significant indirect effect of the suggested serial mediation pathway ($b = .32$, $SE = .15$; 95% confidence interval [$CI_{95\%}$] = .08, .68). Specifically, (1) typeface had a positive effect on human presence ($b = .74$, $SE = .29$; $CI_{95\%} = .15, 1.32$), (2) human presence had a positive effect on emotional attachment ($b = .82$, $SE = .07$; $CI_{95\%} = .68, .96$), and (3) emotional attachment had a positive effect on product evaluation ($b = .53$, $SE = .10$; $CI_{95\%} = .34, .72$). Neither of the other indirect pathways in this model (i.e., from typeface to product evaluation through human presence [$CI_{95\%} = -.28, .12$] or emotional attachment [$CI_{95\%} = -.14, .33$], as single mediators) was significant. When we switched the order of the two mediators (i.e., typeface → emotional attachment → human presence → product evaluation), the indirect effect of typeface on product evaluation was not significant ($b = -.03$; $SE = .07$; $CI_{95\%} = -.22, .08$; see table 2). This indirect effect remained significant after controlling for the alternative mechanisms (see the web appendix).

Insert table 2 about here

² Specifically, the effect of typeface on product evaluations remained significant after controlling for handmade ($p = .010$), anthropomorphism ($p = .004$), uniqueness ($p = .007$), friendliness ($p = .011$), naturalness ($p = .009$), interestingness ($p = .012$), cuteness ($p = .012$), and approachability ($p = .015$).

Discussion

Study 2a uncovers the mechanism by which handwritten typefaces increase consumers' product evaluations. With a serial mediation analysis, we demonstrate that a higher level of emotional attachment, due to the use of handwritten (vs. machine-written) typefaces, stems from perceptions of human presence. Using handwritten typefaces thus increases consumers' perceptions of human contact, warmth, and sensitivity, which prompts their stronger emotional connection with the product and ultimately makes consumers evaluate the product more favorably. Study 2a also rules out several potential alternative explanations, by showing that the suggested pathway remains significant even when we control for perceptions of a handmade production mode, naturalness, anthropomorphism, uniqueness, friendliness, interestingness, and cuteness, and approachability.

STUDY 2B

The main purpose of study 2b is to increase confidence in the proposed mechanism. We aim to replicate the findings of study 2a using a different product and different typefaces. In addition, we measure and control for several alternative mechanisms. Specifically, it could be argued that handwritten typefaces transfer the essence of the creator (Newman and Dhar 2014) or that handwritten typefaces create the perception that the product was made with love (Fuchs et al. 2015).

Method

Design, Participants, and Stimuli. A total of 100 U.S. consumers (MTurk sample, $M_{\text{age}} = 32$ years, 49% female) participated in study 2b, which was a single-factor (typeface: machine-written [Helvetica] vs. handwritten [DJB This is Me]) between-subjects design. We used ice cream as the focal product (see appendix E). We again conducted a pretest to rule out the confounding effects of typeface appropriateness (see the web appendix).

Procedure and Measures. After processing the target stimulus, participants evaluated the product ($\alpha = .94$). Next, they responded to several control measures (i.e., creator's essence, love, anthropomorphism, and handmade) using agreement scales (1 = "totally disagree" to 7 = "totally agree"; see the web appendix for items). Participants indicated their emotional attachment to the product ($\alpha = .96$) and their perceptions of human presence ($\alpha = .96$), using the scales from study 2a. Finally, they rated the extent to which they perceived the typeface as handwritten, as in study 2a.

Results

Manipulation Check. Participants perceived the handwritten typeface as more handwritten than the machine-written typeface ($M_{\text{handwritten}} = 4.73$, $M_{\text{machine-written}} = 2.36$; $t(98) = 6.57$, $p < .001$).

Product Evaluation, Emotional Attachment, and Human Presence. A MANOVA with typeface as a between-subjects factor revealed that participants evaluated the product featuring the handwritten typeface more favorably than the product featuring the machine-written typeface ($M_{\text{handwritten}} = 5.34$, $M_{\text{machine-written}} = 4.59$; $F(1, 98) = 8.41$, $p = .005$). They also felt significantly more emotionally attached to the product featuring the handwritten typeface ($M_{\text{handwritten}} = 4.48$,

$M_{\text{machine-written}} = 3.65$; $F(1, 98) = 8.23$, $p = .005$) and indicated higher perceptions of its human presence ($M_{\text{handwritten}} = 4.51$, $M_{\text{machine-written}} = 3.50$; $F(1, 98) = 11.78$, $p = .001$).

Alternative Mechanisms. We ran another MANOVA for the alternative mechanisms. The typeface manipulation significantly affected participants' perceptions that the product contained the creator's essence ($M_{\text{handwritten}} = 4.04$, $M_{\text{machine-written}} = 3.42$; $F(1, 98) = 4.21$, $p = .043$).³ However, the typeface did not significantly influence perceptions of the product being made with love ($M_{\text{handwritten}} = 4.12$, $M_{\text{machine-written}} = 3.79$; $F(1, 98) = 1.09$, $p = .299$), anthropomorphism ($M_{\text{handwritten}} = 3.32$, $M_{\text{machine-written}} = 2.79$; $F(1, 98) = 2.56$, $p = .113$), or being handmade ($M_{\text{handwritten}} = 4.40$, $M_{\text{machine-written}} = 3.96$; $F(1, 98) = 1.79$, $p = .183$). The effect of typeface on product evaluations remained significant after controlling for the creator's essence ($p = .015$), made with love ($p = .008$), anthropomorphism ($p = .008$), and handmade ($p = .011$).

Serial Mediation Analyses. A serial mediation analysis (typeface \rightarrow human presence \rightarrow emotional attachment \rightarrow product evaluation; Hayes 2013, Model 6, $n = 5,000$) produced a significant indirect effect ($b = .20$, $SE = .10$; $CI_{95\%} = .07, .49$). Specifically, (1) typeface had a positive effect on human presence ($b = 1.01$, $SE = .29$; $CI_{95\%} = .43, 1.59$), (2) human presence had a positive effect on emotional attachment ($b = .54$, $SE = .08$; $CI_{95\%} = .38, .71$), and (3) emotional attachment had a positive effect on product evaluation ($b = .37$, $SE = .10$; $CI_{95\%} = .17, .57$). Neither of the other indirect pathways in this model (i.e., from typeface to product evaluation through human presence [$CI_{95\%} = -.22, .25$] or emotional attachment [$CI_{95\%} = -.07, .38$], as single mediators) was significant. When we switched the order of the two mediators (i.e., typeface \rightarrow emotional attachment \rightarrow human presence \rightarrow product evaluation), the indirect effect

³ This effect is not surprising; writing is a manual process and would require the person to touch the product, creating a potential contagion effect. However, the creator's essence does not mediate the effect of typeface on product evaluation (see the web appendix). This non-significant, indirect effect also is not surprising; we provided no information about who the creator was. The results might differ if the handwriting represented a specific person with positive association (e.g., celebrity; Newman, Diesendruck, and Bloom 2011).

of typeface on product evaluation was not significant ($b = .01$; $SE = .05$; $CI_{95\%} = -.09, .12$). This indirect effect remained significant after controlling for the alternative mechanisms (see the web appendix).

Discussion

Study 2b replicates the findings from study 2a, with a different product and different typefaces. We again find that handwritten typefaces increase perceptions of human presence, which increase emotional attachment and product evaluations. Furthermore, study 2b rules out handmade production and anthropomorphism as alternative mechanisms, and it shows that the positive effect of handwritten typefaces is not driven by perceptions of a creator's essence or love.

STUDY 3

With study 3, we aim to provide further support for our proposed mechanism, using a moderation-of-process design (Spencer et al. 2005), such that we gather experimental evidence related to human presence, as the first mediator in our causal chain. Specifically, we manipulate human presence (high vs. low) to determine the effects of handwritten typefaces on emotional attachment and product evaluation (see the web appendix). Several cues, such as personalized greetings (Gefen and Straub 2003) or pictures of human beings (Hassanein and Head 2005), create perceptions of human presence. In the presence of such cues, the positive effect of handwritten typefaces on product evaluation through emotional attachment likely vanishes, because perceptions of human presence already have been evoked. Without any such additional cues, the positive effect of handwritten typefaces should hold.

Method

Participants, Design, and Stimuli. A total of 300 consumers from a German online consumer panel called clickworker ($M_{\text{age}} = 33$ years, 51% female) participated in this 2 (typeface: machine-written [Helvetica] vs. handwritten [DJB This Is Me]) \times 3 (human presence: low vs. high vs. control) between-subjects design. Milk was the focal product. A pretest confirmed that both typefaces were perceived as equally appropriate for the product and packaging (see the web appendix).

In the high human presence condition, the packaging featured a picture of a farmer, because displaying a human being is a common procedure to create perceptions of human presence (e.g., Fan, Liu, and Zhang 2013; Hassanein and Head 2005; Wang et al. 2007). The control condition featured no picture. Then, in the low human presence condition, we added a picture of a cow (see appendix F); with this condition, we sought to verify that the effects were not driven by the mere introduction of a picture on the product packaging. We expected the low human presence condition to be viewed similarly to the control condition. Many dairy producers highlight cows on their product packaging, so adding this condition also enabled us to make a direct comparison of the persuasiveness of these two realistic marketing tactics (i.e., high vs. low human presence operationalized as a picture of a farmer vs. a cow).

In a separate pretest, we assigned 130 different participants from the same population ($M_{\text{age}} = 37$ years, 45% female) randomly to one of the three human presence manipulations in the machine-written condition and asked them for their perceptions of human presence, using the same scale ($\alpha = .89$). These pretest participants also noted their perceptions of naturalness. As expected, they indicated higher perceptions of human presence in the high human presence

condition ($M = 4.98$) than in the low human presence condition ($M = 3.12$; $t(85) = 7.64$, $p < .001$) or in the control condition ($M = 2.80$; $t(85) = 9.66$, $p < .001$). The low human presence condition did not differ from the control condition ($t(84) = 1.26$, $p = .211$). Furthermore, the three conditions did not differ in naturalness perceptions ($M_{\text{high}} = 4.42$, $M_{\text{low}} = 4.34$, $M_{\text{control}} = 4.13$; all $ps > .300$).

Procedure and Measures. After being exposed to the randomly assigned target stimulus, participants evaluated the product ($\alpha = .92$) and indicated their emotional attachment ($\alpha = .94$), perceptions of human presence ($\alpha = .92$), and whether they perceived the typeface as handwritten, using the same scales as in our previous studies.

Results

Manipulation Checks. First, a 2×3 analysis of variance (ANOVA) for typeface perception produced a significant main effect of typeface ($M_{\text{handwritten}} = 4.37$, $M_{\text{machine-written}} = 1.72$; $F(1, 294) = 771.86$, $p < .001$). Neither the main effect of human presence ($F(2, 294) = 1.33$, $p = .267$) nor the interaction effect ($F(2, 294) < 1$) was significant. Second, a 2×3 ANOVA for perceived human presence produced a significant main effect of typeface ($M_{\text{handwritten}} = 4.02$, $M_{\text{machine-written}} = 3.54$; $F(1, 294) = 8.84$, $p = .003$). The main effect of the human presence manipulation was significant ($F(2, 294) = 43.84$, $p < .001$). Perceived human presence was higher in the high human presence condition ($M = 4.85$) than in the low human presence condition ($M = 3.36$; $t(198) = 7.70$, $p < .001$) or the control condition ($M = 3.12$; $t(197) = 8.59$, $p < .001$). We found no difference between the low and control conditions ($t(199) = .945$, $p = .346$). The interaction between typeface and human presence was significant ($F(2, 294) = 4.19$, $p = .016$). Planned contrasts further showed that in the low human presence condition, the product featuring the

handwritten typeface created higher perceptions of human presence than the product featuring the machine-written typeface ($M_{\text{handwritten}} = 3.74$, $M_{\text{machine-written}} = 2.98$; $F(1, 294) = 7.38$, $p = .007$). The same pattern emerged for the control condition ($M_{\text{handwritten}} = 3.56$, $M_{\text{machine-written}} = 2.69$; $F(1, 294) = 9.53$, $p = .002$). In the high human presence condition, we found no effect of typeface ($M_{\text{handwritten}} = 4.76$, $M_{\text{machine-written}} = 4.94$; $F(1, 294) < 1$). Because we detected no differences between the low human presence and control conditions, we collapsed them for subsequent analysis (i.e., low human presence condition). The 2×3 design results are available in the web appendix.

Product Evaluation. A 2×2 ANOVA of product evaluation produced a nonsignificant main effect of human presence ($F(1, 296) = 2.67$, $p = .104$) and a significant main effect of typeface ($M_{\text{handwritten}} = 5.05$, $M_{\text{machine-written}} = 4.67$; $F(1, 296) = 5.86$, $p = .016$); the interaction was also significant ($F(1, 296) = 15.97$, $p < .001$; figure 1, panel A). In the planned contrasts, participants in the low human presence condition evaluated the product featuring the handwritten typeface more favorably ($M_{\text{handwritten}} = 5.23$, $M_{\text{machine-written}} = 4.23$; $F(1, 296) = 31.18$, $p < .001$), whereas we found no difference in the high human presence condition ($M_{\text{handwritten}} = 4.86$, $M_{\text{machine-written}} = 5.11$; $F(1, 296) < 1$).⁴

Emotional Attachment. The 2×2 ANOVA for emotional attachment produced significant main effects of human presence ($M_{\text{high}} = 4.34$, $M_{\text{low}} = 3.73$; $F(1, 296) = 15.24$, $p < .001$) and typeface ($M_{\text{handwritten}} = 4.29$, $M_{\text{machine-written}} = 3.77$; $F(1, 296) = 11.49$, $p = .001$). The main effect was qualified by a significant interaction effect ($F(1, 296) = 10.77$, $p = .001$; figure 1, panel B). Planned contrasts revealed that participants in the low human presence condition indicated higher emotional attachment to the product featuring the handwritten (vs. machine-written)

⁴ With 2×3 ANOVAs featuring product evaluation and emotional attachment, we confirm that there are no differences between the low human presence condition and the control condition (see the web appendix).

typeface ($M_{\text{handwritten}} = 4.25$, $M_{\text{machine-written}} = 3.21$; $F(1, 296) = 33.69$, $p < .001$). No difference arose in the high human presence condition ($M_{\text{handwritten}} = 4.35$, $M_{\text{machine-written}} = 4.33$; $F(1, 296) < 1$).

Moderated Mediation Analysis. Finally, we predicted that the positive effect of handwritten typefaces on participants' product evaluations, through emotional attachment, would vanish in the high human presence condition but hold in the low human presence condition. A moderated mediation analysis (Hayes 2013, Model 7, $n = 5,000$) confirmed this prediction, according to the significant index of moderated mediation ($b = -.64$; $SE = .20$; $CI_{95\%}: -1.06, -.27$). Emotional attachment mediated the effect of typeface on product evaluation in the low ($b = .65$, $SE = .14$; $CI_{95\%}: .39, .95$) but not in the high ($b = .01$, $SE = .14$; $CI_{95\%}: -.28, .28$) human presence condition.

Insert figure 1 about here

Discussion

The moderation-of-process approach in study 3 enhances our confidence in the proposed mechanism underlying the positive effect of handwritten typefaces. In the low human presence condition, the results replicate the findings of study 2a and 2b, such that handwritten (vs. machine-written) typefaces lead consumers to evaluate the product more favorably. However, in the high human presence condition, no differences in participants' product evaluations existed between the two typeface conditions. Thus, the results support our prediction that the positive effect of handwritten typefaces on product evaluation through emotional attachment diminishes in the presence of a signal of high human presence, achieved by using a picture of a farmer. Beyond revealing that emotional attachment mediates these effects, the results provide strong support for our prediction that handwritten (vs. machine-written) typefaces trigger perceptions of

human presence, and these perceptions lead to more favorable product evaluations by creating an emotional connection between the consumer and the product. Finally, the effect of the typeface on evaluation in the control condition ($M_{\text{handwritten}} = 6.06$, $M_{\text{machine-written}} = 4.07$; $t(98)=3.66$, $p < .001$, $\eta^2 = .35$) is stronger than the effect of the human picture (vs. low human presence = cow) on evaluation in the machine-written condition ($M_{\text{farmer}} = 5.11$, $M_{\text{cow}} = 4.37$; $t(99) = 2.93$, $p < .01$, $\eta^2 = .28$). These results reinforce the strength of the handwritten typeface cue relative to another human presence cues (i.e., picture of a human).

STUDY 4

Study 3 manipulated the first mediator in our causal chain (human presence); study 4 manipulates the second (emotional attachment). If, as our model indicates, perceptions of human presence created by handwritten typefaces increase consumers' emotional attachment to the product, which then leads to more favorable product evaluations, then the effect of typeface on product evaluations should be attenuated among participants who are already emotionally attached to the brand (see the web appendix). In this case, handwritten typefaces may still create perceptions of human presence, but these perceptions would not increase consumers' emotional attachment any further. For brands and products to which consumers are not emotionally attached, handwritten typefaces remain a viable cue for enhancing product evaluations, through perceptions of human presence and emotional attachment.

In study 4, we manipulate emotional attachment by placing the logo of either a highly popular brand (Minute Maid) or a fictitious brand (Market Juice) on an orange juice container. We expect a positive effect of handwritten typefaces for the Market Juice brand, whereas for the Minute Maid brand, this positive effect should diminish, because consumers already feel

emotionally attached to the product, and the handwritten typeface cannot enhance their attachment or evaluations further.

Method

Participants, Design, and Stimuli. A total of 218 U.S. consumers (MTurk sample, $M_{\text{age}} = 34$ years, 56% female) participated in this 2 (emotional attachment: low vs. elevated) \times 2 (typeface: machine-written [Gill Sans] vs. handwritten [DJB This is Me]) between-subjects design. By creating four orange juice containers, we manipulated the typeface and emotional attachment (appendix G). A pretest confirmed that both the handwritten and machine-written typefaces were perceived as equally appropriate (see the web appendix). The containers also featured the logo of either the popular brand Minute Maid (elevated attachment condition) or the fictitious brand Market Juice (low attachment condition). In a second pretest, 75 U.S. consumers (MTurk sample, $M_{\text{age}} = 37$ years, 52% female) were randomly assigned to observe one of the brand logos and indicated their emotional attachment ($\alpha = .96$) to the brand, using the scale from our previous studies. As expected, the elevated attachment condition resulted in higher levels of attachment ($M_{\text{elevated}} = 4.15$, $M_{\text{low}} = 2.92$; $F(1, 73) = 11.49$, $p = .001$).

Procedure and Measures. After processing the stimulus, participants evaluated the product on the same evaluation ($\alpha = .95$) and human presence ($\alpha = .94$) scales as in our previous studies. As a manipulation check, participants indicated their emotional product attachment ($\alpha = .96$) and their perception of the typeface, using the same scales as in previous studies. Furthermore, they completed control measures related to the potential alternative mechanisms, using agreement scales (1 = “totally disagree” to 7 = “totally agree”). Specifically, we measured perceptions of

the product as handmade, anthropomorphism, uniqueness, naturalness, general social presence, and co-presence (see the web appendix for items).

Results

Manipulation Checks. First, a 2×2 ANOVA of typeface perception produced a significant main effect of typeface ($M_{\text{handwritten}} = 4.48$, $M_{\text{machine-written}} = 1.80$; $F(1, 214) = 156.65$, $p < .001$). Neither the main effect of attachment ($F(1, 214) < 1$) nor the interaction effect ($F(1, 214) = 1.58$, $p = .210$) was significant. Second, a 2×2 ANOVA of emotional attachment produced a significant main effect of attachment ($F(1, 214) = 4.88$, $p = .028$). As intended, participants were more attached to the product featuring the Minute Maid brand ($M = 4.08$) than that featuring the fictitious Market Juice brand ($M = 3.62$). Neither the main effect of typeface ($F(1, 214) < 1$) nor the interaction effect ($F(1, 214) = 1.46$, $p = .228$) was significant.

Product Evaluation. The 2×2 ANOVA of product evaluation produced a marginally significant main effect for typeface ($M_{\text{handwritten}} = 5.78$, $M_{\text{machine-written}} = 5.49$; $F(1, 214) = 3.29$, $p = .071$) and a significant main effect for emotional attachment ($M_{\text{elevated}} = 5.82$, $M_{\text{low}} = 5.44$; $F(1, 214) = 5.37$, $p = .021$), qualified by the significant interaction between typeface and emotional attachment ($F(1, 214) = 5.26$, $p = .023$; see figure 2). Planned contrasts showed that in the low attachment condition, participants evaluated the product featuring the handwritten typeface more favorably than the product featuring the machine-written typeface ($M_{\text{handwritten}} = 5.78$, $M_{\text{machine-written}} = 5.11$; $F(1, 214) = 8.44$, $p = .004$). This effect remained significant when controlling for the alternative mechanisms (see the web appendix). We found no significant product evaluation differences in the elevated attachment condition ($M_{\text{handwritten}} = 5.78$, $M_{\text{machine-written}} = 5.86$; $F(1, 214) < 1$).

Moderated Mediation Analysis. We predicted that the magnitude of the indirect effect of handwritten typefaces on participants' product evaluations through human presence would depend on existing levels of emotional attachment. A moderated mediation analysis (Hayes 2013, Model 14, $n = 5,000$) confirmed this prediction, as indicated by the significant index of moderated mediation ($b = -.33$; $SE = .14$; $CI_{95\%}: -.68, -.09$). Human presence mediated the effect of typeface on product evaluations in the low attachment ($b = .41$; $SE = .14$; $CI_{95\%}: .18, .75$) but not in the elevated attachment ($b = .09$; $SE = .06$; $CI_{95\%}: -.02, .23$) condition.

The index of moderated mediation also remained significant when we simultaneously controlled for all alternative mechanisms ($b = -.22$; $SE = .11$; $CI_{95\%}: -.51, -.05$). Human presence mediated the effect of typeface on product evaluation in the low attachment ($b = .27$; $SE = .11$; $CI_{95\%}: .10, .55$) but not in the elevated attachment ($b = .05$; $SE = .05$; $CI_{95\%}: -.04, .16$) condition.

Insert figure 2 about here

Discussion

The positive effect of handwritten typefaces vanishes for brands consumers are already emotionally attached to, but it holds for brands to which consumers are less emotionally attached. This finding provides further evidence in support of emotional attachment as the second mediator in our causal chain. Study 4 also clarifies a boundary condition of these effects, in that participants evaluated the product from the Minute Maid brand more favorably than the product from a fictitious brand in the machine-written condition ($M_{\text{elevated}} = 5.86$, $M_{\text{low}} = 5.11$; $F(1, 214) = 10.25$, $p = .002$). In the handwritten condition, they rated the product from the fictitious brand just as favorably as the product from the Minute Maid brand ($M_{\text{elevated}} = 5.78$, $M_{\text{low}} = 5.78$; $F(1, 214) < 1$). Therefore, novel brands might compete successfully with established

and popular brands, simply by using handwritten typefaces on their packaging. We also replicated the moderation effects of emotional attachment in two other studies, using honey and another juice brand (see the web appendix for these replications).

STUDY 5

With study 5, we investigate the moderating role of consumers' existing attachment to brands further, by instructing participants to imagine that they felt about a given product (ice cream) the same way they feel about a product by a brand to which they were strongly or weakly attached. For the participants who were already emotionally attached, the positive effect of the handwritten (vs. machine-written) typeface on product evaluation should be less pronounced. Among participants who were only weakly attached, this positive effect should hold.

Method

Participants, Design, and Stimuli. Three hundred U.S. consumers (MTurk sample, $M_{\text{age}} = 37$ years, 47% female) participated in this experiment, which used a 2 (typeface: machine-written [Helvetica] vs. handwritten [DJB This is Me]) \times 2 (emotional attachment: low vs. elevated) between-subjects design. We used the same ice cream containers as in study 2b (see appendix E). To manipulate emotional attachment to the product, we adapted a scenario-based approach from Fedorikhin et al. (2008). Thus, before presenting the picture of the ice cream container for the fictitious brand CAMPINA, we provided participants in the elevated (low) attachment condition with the following instructions:

Imagine that there is a brand of ice cream on the market called CAMPINA. Imagine that you feel about CAMPINA the same way you feel about an ice cream brand with which you (do not) feel a close emotional connection. It is the kind of product that, if taken off the market,

would (not) make you feel upset, sad, or angry. Now imagine that this is exactly how you feel about the CAMPINA brand of ice cream.

In a pretest, 60 U.S. consumers (MTurk sample, $M_{\text{age}} = 33$ years, 50% female) were randomly assigned to one of the two attachment manipulations and indicated their emotional attachment ($\alpha = .97$) to the brand CAMPINA on the scale from our previous studies. As expected, participants in the elevated attachment condition were significantly more attached to the brand than those in the low attachment condition ($M_{\text{elevated}} = 5.10$, $M_{\text{low}} = 2.07$; $F(1, 58) = 90.35$, $p < .001$).

Procedure and Dependent Measure. After the attachment manipulation, we presented participants with the ice cream container. They evaluated the product using the same evaluation ($\alpha = .95$), perceived human presence ($\alpha = .95$), and typeface evaluation items used in the previous studies.

Results

Manipulation Check. A 2×2 ANOVA for typeface perception produced a significant main effect of typeface ($M_{\text{handwritten}} = 4.21$, $M_{\text{machine-written}} = 1.39$; $F(1, 296) = 634.29$, $p < .001$). Neither the main effect of attachment ($F(1, 296) < 1$) nor the interaction effect ($F(1, 296) < 1$) was significant.

Product Evaluation. A 2×2 ANOVA for product evaluation produced a significant main effect for typeface ($F(1, 296) = 4.91$, $p = .028$), such that participants evaluated the product more favorably in the handwritten condition ($M = 5.03$) than in the machine-written condition ($M = 4.71$). The main effect of attachment was significant ($F(1, 296) = 82.59$, $p < .001$). Participants in the elevated attachment condition evaluated the product more favorably than participants in the low attachment condition ($M_{\text{elevated}} = 5.54$, $M_{\text{low}} = 4.21$). This main effect was qualified by a

significant interaction effect ($F(1, 296) = 9.05, p = .003$; see figure 3). Planned contrasts revealed that participants in the low attachment condition evaluated the product with the handwritten typeface more favorably than the product featuring the machine-written typeface ($M_{\text{handwritten}} = 4.59, M_{\text{machine-written}} = 3.83; F(1, 296) = 13.83, p < .001$). No such significant difference existed in the elevated attachment condition ($M_{\text{handwritten}} = 5.48, M_{\text{machine-written}} = 5.59; F(1, 296) < 1$).

Moderated Mediation Analysis. Finally, we predicted that the magnitude of the indirect effect of handwritten typefaces on participants' product evaluations through human presence depended on existing levels of emotional attachment. A moderated mediation analysis (Hayes 2013, Model 14, $n = 5,000$) confirmed this prediction. Human presence mediated the effect of typeface on product evaluations in both the low ($b = .25; SE = .09; CI_{95\%}: .09, .45$) and elevated ($b = .14; SE = .06; CI_{95\%}: .05, .28$) emotional attachment conditions. However, the conditional indirect effect of typeface on product evaluations through human presence was significantly stronger in the low than the elevated emotional attachment condition, as indicated by the significant index of moderated mediation ($b = -.12; SE = .07; CI_{95\%}: -.29, -.02$).

Insert figure 3 about here

Discussion

Study 5 provides additional evidence of our proposed typeface effect, using a moderation-of-process design. The positive effects of handwritten typefaces depend on consumers' existing emotional attachment to the brand. Our analysis reveals that handwritten (vs. machine-written) typefaces increase consumers' product evaluations only if those consumers are not already attached to the given brand. For consumers who already feel an emotional connection with a brand, the handwritten typeface does not further enhance emotional attachment and,

consequently, does not increase product evaluations.

It is important to note that in study 4 and study 4b (web appendix), we find a non-significant indirect effect through human presence in the elevated attachment condition, whereas in this study, the indirect effect was significant. Yet these results also are consistent with our prediction that the effect of typeface on product evaluation diminishes in the elevated (vs. low) attachment conditions.

STUDY 6

In our systematic investigation of the effects of handwritten typefaces, we contrast them with machine-written typefaces for a variety of products, all of which might be considered hedonic in nature (i.e., crispbread, chocolate, hand soap, milk, orange juice, honey, ice cream). For all of them, pretests also confirmed that consumers perceived the handwritten and machine-written typefaces as equally appropriate for the product.

Recall that the process of humanizing a nonhuman object involves the application of the activated knowledge to the target. If the activated knowledge is perceived as inappropriate or irrelevant for a given target, even if stored knowledge gets activated, it might not be used to assign meaning to a stimulus. Moreover, if consumers perceive the activated knowledge as inappropriate and irrelevant, the incongruity between activated knowledge and the stimulus may result in worsened evaluations (Martin 1986). For example, copycat strategies that imitate a leading brand's perceptual features or themes activate knowledge of the leading brand, but consumers often regard imitation as an inappropriate strategy, so they react negatively to the copycat (Van Horen and Pieters 2012). Because typeface appropriateness increases the spillover from semantic typeface associations to perceptions of the product (Childers and Jass 2002; van

Rompay and Pruyn 2011), machine-written typefaces arguably could convey higher quality for functional or functionally positioned products, because they are likely to be viewed as more appropriate for such products (e.g., light bulbs, batteries). In an early study, Poffenberger and Franken (1923) show that, compared with typefaces that appear handwritten, typefaces that appear typed are more appropriate for displaying practical items, such as building material, because of their associations with qualities like cheapness, economy, or strength. Similarly, Mackiewicz and Moeller (2004) find that machine-written typefaces are perceived as technical and professional, but handwritten typefaces are perceived as not technical and unprofessional. Because typeface–product appropriateness relates to the congruity between the meaning of a typeface and the meaning of a product (Childers and Jass 2002; Doyle and Bottomley 2004), machine-written typefaces should be more appropriate for displaying functional products than are handwritten typefaces.

In sum, we expect human knowledge to be activated by handwritten typefaces for both hedonic and functional products, but we also predict that consumers will regard the activated human knowledge as inappropriate for their evaluations of functional products, leading to less favorable responses.⁵ With a product manipulation that primes a hedonic versus functional positioning through the product description (e.g., Dhar and Wertenbroch 2000; Roggeveen et al. 2015), we test whether the prior effects generalize. We expect the handwritten (vs. machine-written) typefaces to result in more favorable evaluations for a hedonically positioned product, whereas the machine-written (vs. handwritten) typeface should result in more favorable evaluations for a functionally positioned product.⁶

⁵ Some companies certainly humanize functional products (e.g., Mr. Clean). However, our conceptualization of humanness is based on intimacy and warmth, which differs from anthropomorphism. We elaborate on this difference in the General Discussion section.

⁶ We thank the review team for suggesting these studies.

Method

Participants, Design, and Stimuli. Two hundred ten U.S. consumers (MTurk sample, $M_{\text{age}} = 34$ years, 49% female) participated in study 6, which featured a 2 (typeface: machine-written [Helvetica] vs. handwritten [DJB This is Me]) \times 2 (product type: hedonic vs. functional) between-subjects design. We used a candle as the focal stimulus (Klein and Melnyk 2016). The hedonic version was a scented, decorative candle; the functional product was an insect repellent candle. The product packaging remained the same across both conditions (see appendix H).

In a pretest, 150 U.S. consumers (MTurk sample, $M_{\text{age}} = 35$ years, 62% female), randomly assigned to one of four experimental conditions, rated the product (1 = “definitely hedonic” to 7 = “definitely functional”) in response to the prompt: “Hedonic products are products that are predominantly fun, enjoyable, and appeal to the senses. Functional products are products that are primarily useful, functional, and help you achieve a goal. How would you rate this candle?” (Dhar and Wertenbroch 2000). A 2×2 ANOVA of product category perceptions revealed a main effect of product type ($M_{\text{hedonic}} = 3.28$, $M_{\text{functional}} = 5.93$; $F(1, 146) = 104.51$, $p < .001$). Neither the main effect of typeface ($F(1, 146) < 1$) nor the interaction effect ($F(1, 146) < 1$) was significant.

Procedure and Measures. After being exposed to the randomly assigned target stimulus, the participants evaluated the product ($\alpha = .95$), indicated their perceptions of human presence ($\alpha = .94$), and rated how appropriate the typeface was for that product (1 = “totally inappropriate,” 7 = “totally appropriate”). They also answered manipulation check questions, indicated if they perceived the typeface as handwritten, and identified the product as hedonic or functional, using the previously described items.

Results

Manipulation Checks. First, a 2×2 ANOVA of typeface perception produced a significant main effect of typeface ($M_{\text{handwritten}} = 3.97$, $M_{\text{machine-written}} = 1.52$; $F(1, 206) = 129.55$, $p < .001$). Neither the main effect of product type ($F(1, 206) < 1$) nor the interaction effect ($F(1, 206) < 1$) was significant. Second, the 2×2 ANOVA of product category perception produced a significant main effect of product type ($M_{\text{hedonic}} = 2.67$, $M_{\text{functional}} = 5.73$; $F(1, 206) = 213.18$, $p < .001$). Neither the main effect of typeface ($F(1, 206) < 1$) nor the interaction effect ($F(1, 206) = 1.54$, $p = .216$) was significant.

Product Evaluation. A 2×2 ANOVA of product evaluation produced only a significant interaction between typeface and product type ($F(1, 206) = 16.67$, $p < .001$; see figure 4). The main effects of typeface ($F(1, 206) < 1$) and product type ($F(1, 206) < 1$) were not significant. Planned contrasts revealed that participants in the hedonic condition evaluated the product with the handwritten typeface more favorably than the product featuring the machine-written typeface ($M_{\text{handwritten}} = 4.96$, $M_{\text{machine-written}} = 4.14$; $F(1, 206) = 9.75$, $p = .002$). Conversely, participants in the functional condition evaluated the product with the machine-written typeface more favorably than the product with the handwritten typeface ($M_{\text{handwritten}} = 4.04$, $M_{\text{machine-written}} = 4.77$; $F(1, 206) = 7.08$, $p = .008$).

Human Presence. A 2×2 ANOVA of human presence produced significant main effects of product type ($M_{\text{hedonic}} = 3.64$, $M_{\text{functional}} = 2.94$; $F(1, 206) = 11.77$, $p = .001$) and typeface ($M_{\text{handwritten}} = 3.52$, $M_{\text{machine-written}} = 3.07$; $F(1, 206) = 4.77$, $p = .030$), as well as a significant interaction between typeface and product type ($F(1, 206) = 11.64$, $p = .001$). Planned contrasts revealed that participants in the hedonic condition indicated greater perceptions of human presence when the product featured a handwritten typeface than when it featured a machine-

written typeface ($M_{\text{handwritten}} = 4.22$, $M_{\text{machine-written}} = 3.06$; $F(1, 206) = 16.28$, $p < .001$). No difference emerged in the functional condition ($M_{\text{handwritten}} = 2.81$, $M_{\text{machine-written}} = 3.06$; $F(1, 206) < 1$).

Appropriateness. A 2×2 ANOVA of typeface–product appropriateness only revealed a significant interaction between typeface and product type ($F(1, 206) = 6.48$, $p = .012$). The main effects of typeface ($F(1, 206) < 1$) and product type ($F(1, 206) < 1$) were not significant. According to the planned contrasts, participants in the hedonic condition perceived the handwritten typeface as equally appropriate as the machine-written typeface ($M_{\text{handwritten}} = 4.39$, $M_{\text{machine-written}} = 4.38$; $F(1, 206) = 1.53$, $p = .218$). Participants in the functional condition instead perceived the handwritten typeface as less appropriate than the machine-written typeface ($M_{\text{handwritten}} = 3.53$, $M_{\text{machine-written}} = 4.38$; $F(1, 206) = 5.49$, $p = .020$).

Moderated Mediation Analysis. We predicted that for the hedonic product, the positive effect of handwritten typefaces on product evaluation would be mediated by human presence. For the functional product, we predicted that the negative effect of handwritten typefaces would be mediated by typeface–product appropriateness. A moderated mediation analysis (Hayes 2013, Model 7, $n = 5,000$) confirmed the predictions, as indicated by the significant indices of moderated mediation (human presence: $b = -.51$; $SE = .19$; $CI_{95\%}: -.93, -.19$; appropriateness: $b = -.28$; $SE = .14$; $CI_{95\%}: -.59, -.05$). In the hedonic product type condition, the effect of typeface on product evaluation was mediated by human presence ($b = .42$; $SE = .13$; $CI_{95\%}: .20, .71$) but not by typeface–product appropriateness ($b = .09$; $SE = .08$; $CI_{95\%}: -.03, .28$), whereas in the functional product type condition, the effect of typeface on product evaluation was mediated by typeface–product appropriateness ($b = -.18$; $SE = .10$; $CI_{95\%}: -.42, -.02$) but not by human presence ($b = -.09$; $SE = .12$; $CI_{95\%}: -.34, .12$). This pattern of results replicates our previous

findings for hedonic products and provides insights into why handwritten typefaces decrease product evaluations for functional products.

Insert figure 4 about here

Discussion

With study 6, we investigate whether the product type moderates the effect of handwritten typefaces. For hedonic product, the handwritten typeface led to more favorable product evaluations through perceptions of human presence, in line with our previous studies. Conversely, for the functional product, the machine-written typeface led to more favorable product evaluations. We argue and empirically demonstrate that this is due to higher perceptions of typeface–product appropriateness.

To enhance the replicability of these results, we tested this finding with yogurt too (study 6a: $n = 225$; web appendix). A 2×2 ANOVA of product evaluations produced a significant interaction between typeface and product type ($F(1, 221) = 11.86, p < .01$). Planned contrasts revealed that participants in the hedonic condition evaluated the product with the handwritten typeface more favorably than the product featuring the machine-written typeface ($M_{\text{handwritten}} = 5.34, M_{\text{machine-written}} = 4.81; F(1, 221) = 5.00, p = .026$). Conversely, participants in the functional condition evaluated the product with the machine-written typeface more favorably than the one with the handwritten typeface ($M_{\text{handwritten}} = 4.83, M_{\text{machine-written}} = 5.45; F(1, 221) = 6.72, p = .010$).

Moreover, to increase confidence in this boundary condition, we conducted an additional study (study 6b: $N = 110$; MTurk sample, $M_{\text{age}} = 36$ years, 58% female) that used a 2 (typeface: machine-written [Helvetica] vs. handwritten [DJB This is Me]) $\times 3$ (functional product

replicates: battery vs. light bulb vs. USB charger) mixed model design. The results replicate the findings of studies 6 and 6a as they pertain to the functional positioned products (see the web appendix): Participants evaluated functional products more favorably when the packages featured the machine-written rather than the handwritten typeface ($M_{\text{handwritten}} = 3.83$, $M_{\text{machine-written}} = 4.75$; $t(108) = 3.85$, $p < .001$).

GENERAL DISCUSSION

The present article investigates the effects of handwritten versus machine-written typefaces on consumers' product evaluations. Across a series of 13 studies, with both field and lab experiments, we provide evidence for, uncover the mechanisms of, and outline boundary conditions of the positive effect of handwritten typefaces. In our first two field studies, we show that using handwritten typefaces enhances consumers' purchase behavior. Studies 2a and 2b uncover the underlying mechanisms: Handwritten typefaces lead to more favorable product evaluations, because they humanize the product by creating perceptions of human presence and thereby enhance consumers' emotional attachment to the product. The moderation designs in studies 3–5 increase our confidence in the mediating effects of human presence and emotional attachment (brand and overall attachment). The study 3 results also highlight the importance of human pictures on the package as a viable humanizing strategy.

Handwritten typefaces offer another humanization strategy that has been largely neglected, despite its promise, especially for new brands with hedonic or hedonically positioned products, to which consumers are not already attached (studies 4 and 5). The benefits of using the handwritten typeface for brands that consumers are highly attached to are less pertinent though. Continued research should explore how much experience and attachment to the brand is needed

before the handwritten typeface benefits become non-significant. Finally, we demonstrate that for functionally positioned (studies 6 and 6a) and functional products (study 6b), the effect reverses.

In total, we have reported in the paper and the web appendix 12 studies that assess the effects of how handwritten typefaces (vs. machine-written typefaces) enhance evaluations or behaviors for hedonic or hedonically framed products. We use standard meta-analytic techniques to assess that the results are robust (Rosenthal 1984). The effect sizes were calculated from the 12 studies and were homogenous ($\chi^2(11) = 6.97$, *ns*), with an average weighted η of .28. The overall relationship also was significant ($z = 10.94$, $p < .001$). According to Rosenthal and Rubin's (1982) BESD, consumers are 82.3% more likely to choose the product packaging with the handwritten (vs. machine-written) typeface for hedonic or hedonically framed products. Finally, according to Rosenthal and Rosnow's (2008) file drawer technique, it would take more than 350 null studies to move the significance to the .05 level, further highlighting the robustness of the results.

Our work accordingly contributes to several streams of literature. First, we extend humanization literature by introducing a novel strategy, rather than relying solely on anthropomorphism (e.g., Epley et al. 2007; Puzakova, Kwak, and Rocereto 2013). That is, products might be humanized by attributions of human-like emotions or features (Waytz et al. 2010), but our study shows for the first time that handwritten typefaces also can function as humanization cues. Objects thus can be humanized not only by using human-like features (e.g., faces) but also with more indirect humanization cues, such as a handwritten typeface.

Second, research into typefaces mainly has dealt with the effects of typeface characteristics (e.g., style, size, height), connotative meanings, or appropriateness and

congruency (see table 1). We extend this research line by demonstrating that typefaces alter consumers' product evaluations too. The insights derived from our investigation of the effects of handwritten typefaces on consumers' product evaluations are of notable interest, especially considering previous research that has documented both positive (friendly, individual) and negative (childish, unprofessional) associations of handwritten typefaces (Mackiewicz 2005; Mackiewicz and Moeller 2004). Therefore, the research contributes to aesthetics literature in general, and to product/package design research in particular.

Third, our novel findings signal and suggest the need for more investigations into how marketers can enhance consumers' emotional attachment to products and brands (Park et al. 2010). Previous research has mainly suggested that the emotional connection between consumers and objects results from long relationships (Park et al. 2010; Thomson et al. 2005), though Hadi and Valenzuela (2014) note that affectionate gestures can facilitate immediate emotional attachments. Our findings extend this line of research by showing that using handwritten typefaces on product packaging offers an effective means to facilitate an instant emotional connection between consumers and products through increased perceptions of human presence. A typeface-induced human presence may enhance emotional attachment in several ways, such as through a general sense of human contact, warmth, and sensitivity, or else through the transfer of the creator's essence (see study 2b in the web appendix).

Fourth, our work contributes to social presence theory, which traditionally has applied to technology-mediated communications (Gefen and Straub 2003, 2004; Hassanein and Head 2007). To the best of our knowledge, this study is the first to use social presence theory in a product packaging context. In doing so, we contribute to a growing body of research that demonstrates the usefulness of social presence theory for consumer behavior research.

All the studies reported in this article pertain to the use of handwritten versus machine-written typefaces on product packages. It would be useful to investigate the effect of alternative typefaces in other contexts, such as public announcements, apologies for service failures, or donation solicitations. In these situations, increased human presence similarly might increase trust and ultimately result in more favorable evaluations and behaviors.

Past research establishes that typefaces that appear handwritten tend to be curved, organic, slanted, and active (Henderson et al. 2004). Similarly, Mackiewicz (2005) suggests that handwritten typefaces are perceived as such because they include imperfections (e.g., appearing slightly below baseline levels). We have explored the general role of typefaces that are perceived as handwritten versus machine-written, but the specific nature of different typeface elements that result in such perceptions should be investigated, along with how these individual typeface elements influence perceptions of human presence, emotional attachment, evaluations, and consumption behaviors.

The practical implications of our studies also are notable. Using handwritten typefaces is a viable humanization strategy that managers can apply to enhance consumers' product evaluations. For example, many dairy producers print images of cows on their packaging. Our results (study 3) suggest it would be more effective to use images of farmers or handwritten typefaces instead, because these cues humanize the product, which enhances consumers' emotional attachment to it. The underlying process, involving human presence and emotional attachment, also has direct implications. Specifically, using humanizing cues is an effective way to facilitate an instant emotional connection between consumers and products. However, this positive effect is not ubiquitous. Handwritten typefaces do not enhance emotional attachment to brands that consumers are already strongly attached to (study 4). Thus, using handwritten

typefaces appears especially effective for new brands or existing brands that lack strong emotional connections with customers. Further research might assess the benefits for local, small producers versus big box retailers. We show that they are relevant for food, hygiene, and hedonically positioned categories. The effects might be accentuated for certain types of luxury products (e.g., scent, scarf); we anticipate they might be similar to those we uncover for soap and hedonically positioned candles.

Finally, continued research could address the moderating role of individual difference variables. Anthropomorphism research suggests that chronic loneliness and social disconnection increase people's tendency to anthropomorphize nonhuman objects (Epley et al. 2007). Similarly, the effect of handwritten typefaces on product evaluation might be stronger for consumers who experience loneliness or disconnection, in that they may be especially sensitive to the potential for building emotional connections with products. The participants for all studies came from developed countries, so it would be worthwhile to test whether the benefits of handwritten typefaces for such hedonic products diminish in less developed countries, where consumers might prefer more professional-seeming manufactured products. In addition, further research could investigate signatures as a special form of handwriting. Kettle and Häubl (2011) determine that signing a product primes the person's own self-identity; perhaps signing a product would affect consumers' product evaluations, if this action leads them to humanize the product or sense a transfer of the creator's essence (Newman and Dhar 2014).

CONCLUSION

This research introduces a novel way for companies to humanize their offerings: the use of handwritten typefaces. Communication research acknowledges that these typefaces convey both

positive and negative meaning (Mackiewicz 2005; Mackiewicz and Moeller 2004); the current studies further show that the use of handwritten typefaces increases consumers' product evaluations through perceptions of human presence, which increase consumers' emotional attachment to the product. However, the positive effect of handwritten typefaces is less pronounced when consumers already are attached to a given product or brand; it reverses for functionally positioned or functional products. In summary, this research serves as a foundation for examining humanization efforts in marketing communication that go beyond the use of anthropomorphism. We hope further research in this important area will continue to examine the use of handwritten typefaces in different contexts (e.g., advertising, services) and investigate additional moderators (e.g., individual differences).

DATA COLLECTION INFORMATION

The data for the studies were collected in 2016–2017. For study 1a, a research assistant at the University of Innsbruck collected the data, supervised by the first author, who also analyzed these data. The data for study 1b were collected by store employees of a local chocolate store in Innsbruck. The first author supervised this data collection and analyzed these data. The data for studies 2a, 2a-replication, and 2b came from an Amazon Mechanical Turk (MTurk) panel. The second author managed the data collection and analyzed these data. The data for study 3 resulted from a German online consumer panel (Clickworker). The second author managed this data collection and analyzed these data. The data for study 4 came from the MTurk panel, and again, the second author managed the data collection and analyzed these data. For study 4a, the data collection relied on a newsletter procedure at the University of Innsbruck in Austria. The second author managed the data collection and analyzed these data. The MTurk panel provided the data for studies 4b, 5, and 6, and the second author managed the data collection and analyzed these data. The data for study 6a were collected by a research assistant at the University of Innsbruck, using MTurk. The first author supervised this data collection and analyzed these data. Lastly, the data for study 6b came from the MTurk panel, and the second author managed the data collection and analyzed these data.

APPENDIX A

Handwritten and Machine-Written Typefaces Actually Used in Studies

Handwritten Typefaces

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

DJB This is Me (used in Studies 1a, 2b, 3, 4, 4a, 4b, 5, 6, 6a, and 6b)

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Moon Flower (used in Study 1b)

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

All Things Pink (used in Study 2a and 2a-replication)

Machine-Written Typefaces

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

Gill Sans (used in Studies 1a, 4, and 4b)

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

Helvetica (used in Studies 1b, 2b, 3, 4a, 5, 6, 6a, and 6b)

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

Futura (used in Study 2a and 2a-replication)

APPENDIX B

Study 1a Stimuli: Product Packaging Featuring a Handwritten (Left) and Machine-Written (Right) Typeface



(Translation: Crispbread, Olive Oil)

APPENDIX C

Study 1b Stimuli: Product Packaging Featuring a Handwritten (Left) and Machine-Written (Right) Typeface



(Translation: Nougat Milk Chocolate, Treat from Tyrol)

APPENDIX D

Study 2a Stimuli: Product Packaging Featuring a Handwritten (Left) and Machine-Written (Right) Typeface



APPENDIX E

Study 2b and 5 Stimuli: Product Packaging Featuring a Handwritten (Left) and Machine-Written (Right) Typeface



APPENDIX F

Study 3 Stimuli: Product Packaging Featuring Handwritten (Top) and Machine-Written (Bottom) Typeface in the High Human Presence (Left), Low Human Presence (Middle), and Control (Right) Conditions



(Translation: Fresh Whole Milk, 3.5% fat)

APPENDIX G

Study 4 Stimuli: Examples of the Handwritten Typeface, Elevated Attachment Brand (Left) and Machine-Written Typeface, Low Attachment Brand (Right)



APPENDIX H

Study 6 Stimuli: Examples of the Functional/Machine-Written (Left) and Hedonic/Handwritten (Right) Stimulus



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TABLE 1
OVERVIEW OF EXISTING TYPEFACE STUDIES

Study	Research Focus	Key Results
<i>Typeface Characteristics</i>		
Poulton (1972)	Effects of typeface characteristics on legibility.	The x-height should not be less than about 6.6 pt. for Univers and for Times New Roman. For Perpetua the minimum body size is about 8.5 pt.
Tantillo, Lorenzo-Aiss, and Mathisen (1995)	Effects of typeface characteristics on consumer responses.	Serif typefaces are perceived as “more elegant, charming, emotional, distinct, beautiful, interesting, extraordinary, rich, happy, valuable, new, gentle, young, calm, and less traditional than sans serif type styles. Serif styles have more personality, freshness, high quality, vitality, and legibility; but the sans serif group is more manly, powerful, smart, upper-class, readable, and louder (p. 452).”
McCarthy and Mothersbaugh (2002)	Effects of typeface characteristics on persuasion.	Serif fonts improve legibility for smaller typefaces but only for faster readers. Increasing x-height improves legibility for smaller typefaces but only for faster readers. Style increases legibility only for larger typefaces. This joint effect of style and x-height has stronger effects on faster readers.
Henderson, Giese, and Cote (2004)	Effects of typeface characteristics on consumer responses.	A font is perceived as pleasing when naturalness, harmony, and flourish are high, it is moderately compressed, and it is not elaborate. A font is perceived as engaging when naturalness, elaborateness, and compression are high, and harmony is low. A font is perceived as reassuring when harmony and flourish are high, and elaborateness is low. Finally, a font is perceived as prominent when weight is high, and naturalness, flourish, and harmony are low.
Mackiewicz and Moeller (2004)	Effects of typeface characteristics on typeface personalities.	The casual script typeface Bradley Hand is perceived as friendly, individual, unprofessional, and not technical. The sans serif typeface Helvetica is perceived as technical and not individual. And the serif typeface Times New Roman is perceived as professional and formal.
Mackiewicz (2005)	Effects of typeface characteristics on perceptions of friendliness and professionalism.	Friendly typefaces are simple, imperfect, and display rounded features, whereas professional typefaces display moderation and balance in their anatomical features.
<i>Typeface Meaning Transfer</i>		
Doyle and Bottomley (2009)	Effect of typeface connotative meaning on product evaluation.	The connotative meaning of a typeface alters the connotative meaning of objects (assimilation).
Childers and Jass (2002)	Effects of typeface connotative meaning on brand perceptions and recall performance; effects of congruence between different ad components.	Connotative meaning of a typeface influences consumers' perceptions of a brand. Moreover, typefaces interact with other ad components (e.g., ad copy, picture) to affect recall performance. Brand benefit information is recalled best when different ad components are congruent.

Hagtvedt (2011)	Associations of incomplete typeface logos and their effects on consumers' perceptions of the firm.	Incomplete typeface logos (i.e., parts of the characters are intentionally missing or blanked out) negatively influence perceived trustworthiness (due to lower clarity) and positively influence perceived innovativeness (due to greater interestingness). In addition, incomplete typeface logos negatively influence overall attitude toward the firm for consumers with a prevention (vs. promotion) focus.
Celhay et al. (2015)	Associations and effects of exotype typefaces.	Exotype typefaces are able to convey the foreign origins when the typeface connoted meaning is congruent with the text denoted meaning.

Typeface Appropriateness / Congruence

Poffenberger and Franken (1923)	Effects of typeface characteristics on appropriateness	Bold, simple, and easy-to-read fonts are appropriate for automobiles, building material, and coffee and are associated with cheapness, economy, and strength. Italicized, scripted, and ornate fonts are appropriate for jewelry and perfume and are associated with luxury and dignity.
Schiller (1935)	Effects of typeface characteristics on appropriateness	The study analyzes to what extent 15 typefaces are appropriate for representing five abstract qualities (i.e., cheapness, dignity economy, luxury, and strength) and five commodities (i.e., automobiles, building material, coffee, jewelry, and perfume). For example, the typeface Broadway is inappropriate for representing luxury, jewelry, and perfume but appropriate to represent building material, strength, and cheapness.
Davis and Smith (1933)	Effects of typeface characteristics on appropriateness	Non-bold, italic, regular, and rather small fonts are appropriate for expressing courtesy, beauty, delicacy, femininity, and dignity. Bold, non-italic, expanded/condensed, and rather large fonts are appropriate for expressing strength, durability, masculinity, danger, importance, and safety.
Doyle and Bottomley (2004)	Effect of congruence between product category and typeface on brand choice.	Products are chosen more often when the brand name appears in an appropriate vs. inappropriate font (i.e., connotative meaning of the product category and typeface are congruent).
Doyle and Bottomley (2006)	Effect of congruence between product category and typeface on brand choice.	Congruence between the product category and the typeface design positively affects brand choice.
Van Rompay and Pruyn (2011)	Effects of congruence between product shape and typeface on brand credibility and price expectations.	Brand credibility and price expectations are influenced by the congruence between the shape of the product and the typeface.
Semin and Palma (2014)	Effects of typeface brightness on classification speed.	Male names are classified faster when presented in darker vs. lighter typefaces. Female names are classified faster when presented in lighter vs. darker typefaces.
Velasco et al. (2014)	Effects of product packaging elements (i.e., shape, typeface, name, sound) on taste perceptions.	Sweet (sour) tastes are better conveyed by rounded (angular) typefaces.

TABLE 2
SERIAL MEDIATION PATHWAY (STUDY 2A)

Measures												
Antecedent	M₁ (Human Presence)				M₂ (Emotional Attachment)				Y (Product Evaluation)			
	Coeff.	SE	<i>t</i>	<i>p</i>	Coeff.	SE	<i>t</i>	<i>p</i>	Coeff.	SE	<i>t</i>	<i>p</i>
X (Typeface)	.74	.29	2.51	< .05	.15	.21	.70	.485	.36	.19	1.81	< .10
M ₁ (Human Presence)	---	---	---	---	.82	.07	11.64	< .01*	-.06	.10	-.62	.536
M ₂ (Emotional Attachment)	---	---	---	---	---	---	---	---	.53	.09	5.55	< .01*
Constant	3.99	.20	19.87	< .01*	.45	.31	1.43	.155	2.99	.29	10.07	< .01*
Model Summary	R ² = .06 F(1, 98) = 6.29, <i>p</i> < .05				R ² = .61 F(2, 97) = 74.44, <i>p</i> < .01*				R ² = .44 F(3, 96) = 25.29, <i>p</i> < .01*			

* *p* < .0001.

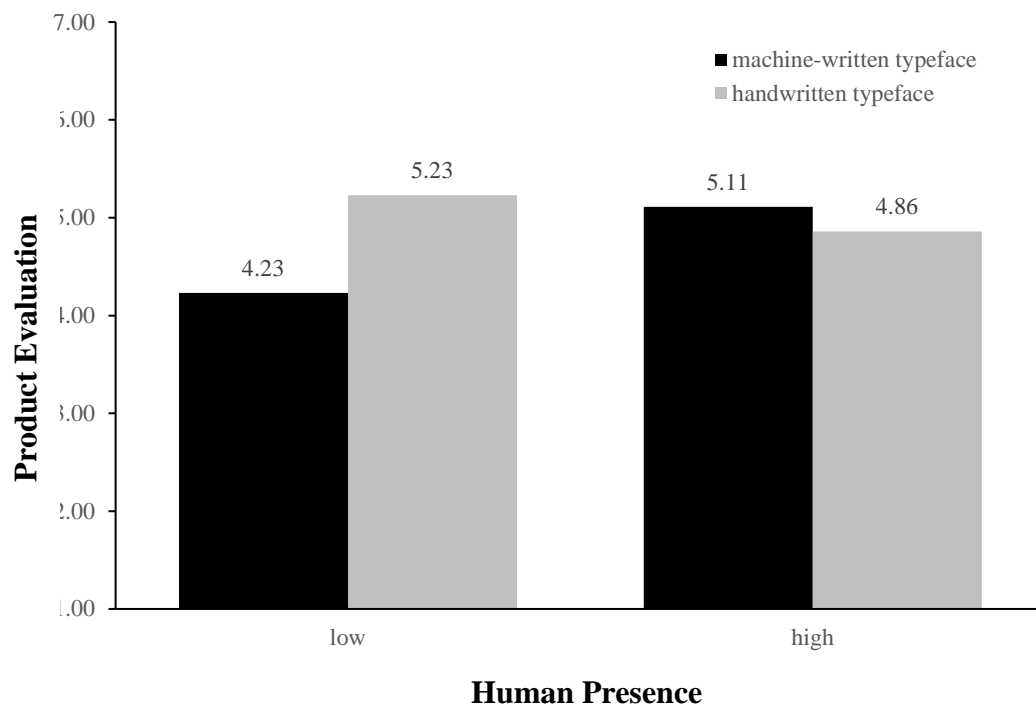
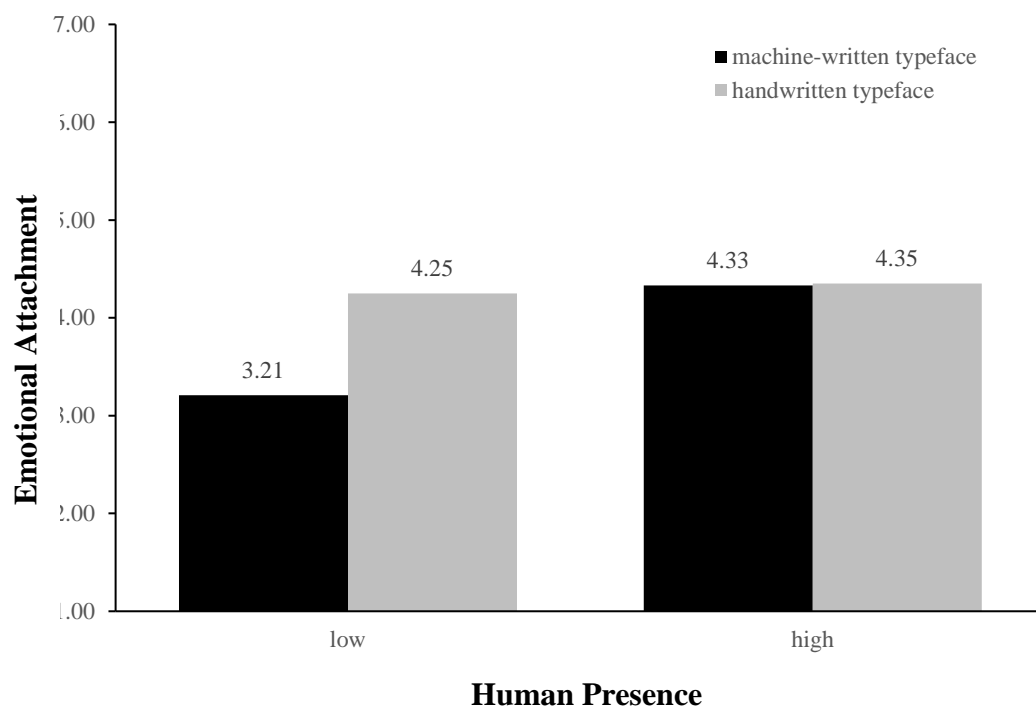
FIGURE 1**STUDY 3: INTERACTION OF TYPEFACE AND HUMAN PRESENCE ON PRODUCT EVALUATION AND EMOTIONAL ATTACHMENT****Panel A: Product Evaluation****Panel B: Emotional Attachment**

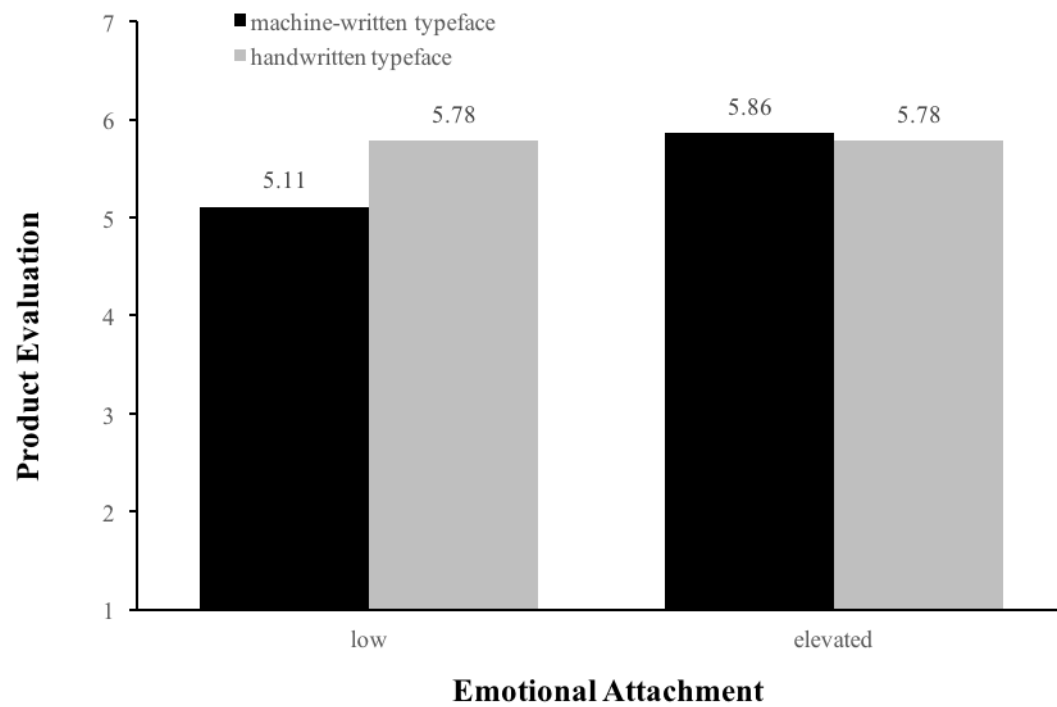
FIGURE 2**STUDY 4: INTERACTION OF TYPEFACE AND EMOTIONAL ATTACHMENT ON
PRODUCT EVALUATION**

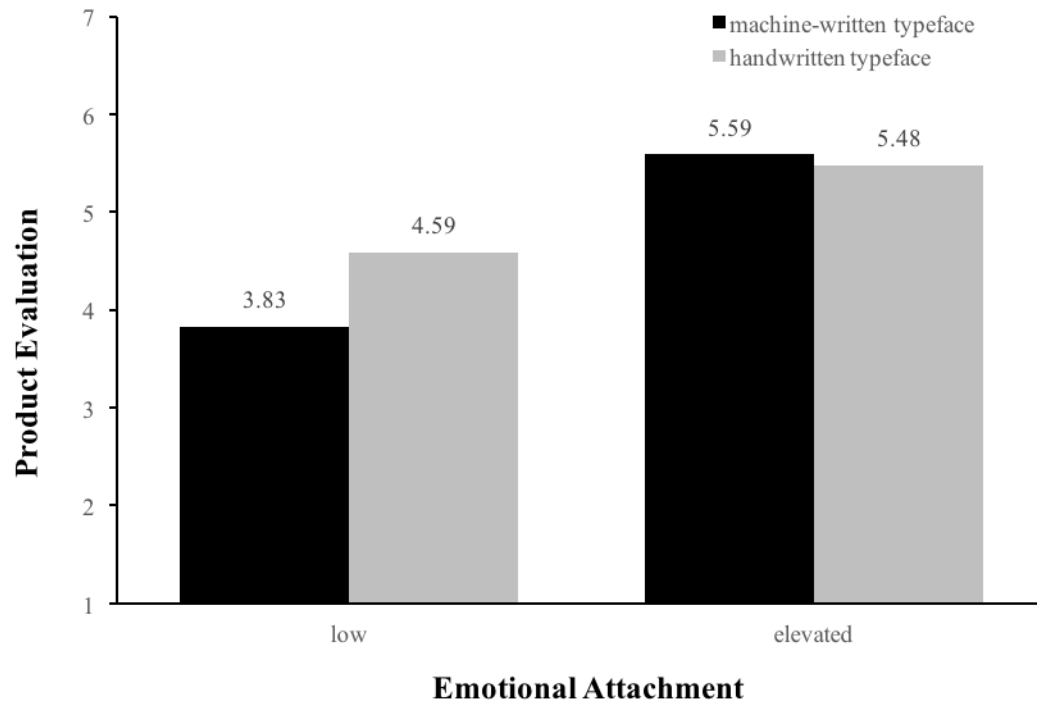
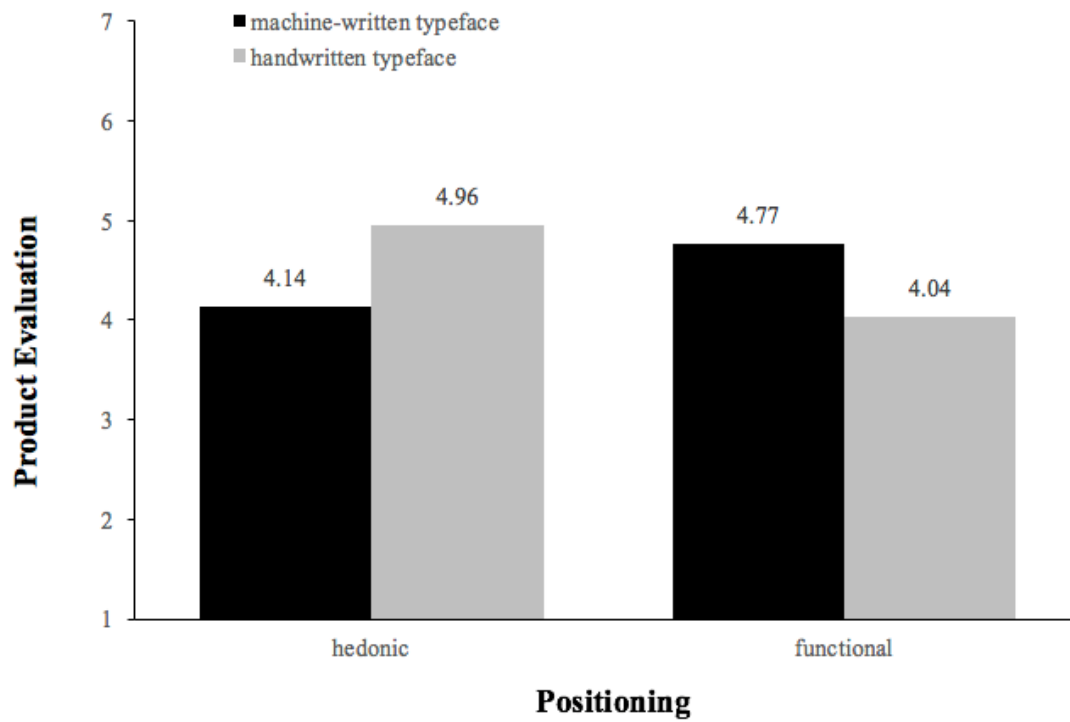
FIGURE 3**STUDY 5: INTERACTION OF TYPEFACE AND EMOTIONAL ATTACHMENT ON
PRODUCT EVALUATION**

FIGURE 4**STUDY 6: INTERACTION OF TYPEFACE AND POSITIONING ON PRODUCT EVALUATION**

HEADINGS LIST

1. THEORETICAL BACKGROUND

- 2. Typeface Design
- 2. Human Presence and Emotional Attachment
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1. STUDY 1A and 1B

- 2. Results
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1. STUDY 2A

- 2. Method
- 3. *Design, Participants, and Stimuli.*
- 3. *Procedure and Measures.*
- 2. Results
- 3. *Manipulation Check.*
- 3. *Product Evaluation, Emotional Attachment, and Human Presence.*
- 3. *Alternative Mechanisms.*
- 3. *Serial Mediation Analyses.*
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1. STUDY 2B

- 2. Method
- 3. *Design, Participation, and Stimuli.*
- 3. *Procedure and Measures.*
- 2. Results
- 3. *Manipulation Check.*
- 3. *Product Evaluation, Emotional Attachment, and Human Presence.*
- 3. *Alternative Mechanisms.*
- 3. *Serial Mediation Analyses.*
- 2. Discussion

1. STUDY 3

- 2. Method
- 3. *Participants, Design, and Stimuli.*
- 3. *Procedure and Measures.*
- 2. Results
- 3. *Manipulation Checks.*
- 3. *Product Evaluation.*
- 3. *Emotional Attachment.*
- 3. *Moderated Mediation Analysis.*
- 2. Discussion

1. STUDY 4

- 2. Method
- 3. *Participants, Design, and Stimuli.*
- 3. *Procedure and Measures.*
- 2. Results
- 3. *Manipulation Checks.*
- 3. *Product Evaluation.*
- 3. *Moderated Mediation Analysis.*
- 2. Discussion

1. STUDY 5

- 2. Method
- 3. *Participants, Design, and Stimuli.*
- 3. *Procedure and Dependent Measure.*
- 2. Results
- 3. *Manipulation Check.*
- 3. *Product Evaluation.*
- 3. *Moderated Mediation Analysis.*
- 2. Discussion

1. STUDY 6

- 2. Method
- 3. *Participants, Design, and Stimuli.*
- 3. *Procedure and Measures.*
- 2. Results
- 3. *Manipulation Checks.*
- 3. *Product Evaluation.*
- 3. *Human Presence.*
- 3. *Appropriateness.*
- 3. *Moderated Mediation Analysis.*
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1. GENERAL DISCUSSION

1. CONCLUSION

1. DATA COLLECTION INFORMATION

1. APPENDIX A

1. APPENDIX B

1. APPENDIX C

1. APPENDIX D

1. APPENDIX E

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1. APPENDIX G

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1. REFERENCES