Anthropomorphism From Self-Extension and Self-Expansion Processes: an Assemblage Theory Approach to Interactions Between Consumers and Smart Devices

Donna Hoffman, George Washington University, USA
Thomas Novak, George Washington University, USA
Hyunjin Kang, George Washington University, USA

We use an assemblage theory framework to evaluate anthropomorphism experiences from self-extension and self-expansion processes when consumers and smart devices interact. Results show that overall, anthropomorphism is greater when the consumer has less compared to more control. Additionally, device complexity moderates whether anthropomorphism occurs through a self-extension or self-expansion process.

[to cite]:

[url]:
http://www.acrwebsite.org/volumes/1022160/volumes/v44/NA-44

[copyright notice]:
This work is copyrighted by The Association for Consumer Research. For permission to copy or use this work in whole or in part, please contact the Copyright Clearance Center at http://www.copyright.com/.
Human-like Robots and Robot-like Humans:
Anthropomorphism and Dehumanization in Consumption

Chairs: Noah Castelo, Columbia University, USA
Johannes Boegershausen, University of British Columbia, Canada

Paper #1: Anthropomorphism and Anthropocentrism
Russell Belk, York University, Canada

Paper #2: Cyborg Consumers: When Human Enhancement Technologies are Dehumanizing
Noah Castelo, Columbia University, USA
Nick Fitz, University of British Columbia, Canada
Bernd Schmitt, Columbia University, USA
Miklos Sarvary, Columbia University, USA

Alexander Henkel, Maastricht University, the Netherlands
Johannes Boegershausen, University of British Columbia, Canada
Karl Aquino, University of British Columbia, Canada
Jos Lemmink, Maastricht University, the Netherlands

Donna L. Hoffman, George Washington University, USA
Thomas P. Novak, George Washington University, USA
Hyunjin Kang, George Washington University, USA

SESSION OVERVIEW
The attribution and denial of humanness is a fundamental process of consumer behavior, one whose implications are becoming increasingly important in light of recent technological developments. Attributing humanness to non-human objects is known as anthropomorphism, and has been studied in the context of brands (e.g., Puzakova, Kwak and Rocereto 2013) and products (e.g., Kim and McGill 2011). Denying humanness to human beings is known as dehumanization, and has been studied in the context of ethnicity, race, gender, and more (Haslam 2006; Haslam and Loughman 2014). In general, anthropomorphizing a product or brand improves consumers’ evaluations of those things, whereas dehumanizing a person leads consumers to discriminate against and act antisocially towards that person. These processes can therefore play important roles in many domains of consumer behavior.

The papers in this interdisciplinary session enrich our understanding of the antecedents, interplay, and consequences of consumers’ anthropomorphism and dehumanization. The papers approach these issues in the context of consumers’ encounters and interactions with both novel consumption stimuli (e.g., smart devices, human enhancement technologies) as well as more common stimuli (e.g., brands and customer service representatives). In addition to shedding new light on the processes of anthropomorphism and dehumanization, each of the three empirical papers also demonstrates novel consequences of those processes for consumer behavior, while the conceptual paper raises several important questions about the future of these phenomena in light of rapid technological progress.

The conceptual paper, by Belk, begins our session by providing a sweeping view of how advances in artificial intelligence and robotics are creating anthropomorphic computers and robots, while simultaneous advances in human enhancement technologies are allowing consumers to become more like machines or robots. The next paper, by Castelo et al., explores the consequences of enhancement technologies for perceived humanness in more depth, showing that currently available products can indeed lead the enhanced consumers to be dehumanized and that dehumanization has important marketing implications. The third paper, by Henkel et al., focuses on dehumanization in a more traditional marketing context, showing that brand positioning can lead to the dehumanization and mistreatment of the brand’s employees. Finally, Hoffman et al. return to a theme that Belk introduced – that computers and machines are increasingly anthropomorphized – by studying “smart devices” in the context of the Internet of Things. They show that both features of the devices and characteristics of the consumer determine how such anthropomorphism occurs.

Taken together, the four papers provide multifaceted insights into perceptions of humanness (or lack thereof) of the self, products, other consumers, and employees. Collectively, they address the following questions: (i) which factors are important in shaping consumers’ (de-) humanization of the self, others, or products and (ii) what are the consequences of such processes for how consumers see themselves, other people, and products. This session is of interest to a diverse audience as it appeals to those interested in what it means to be human, and how the answers to that fundamental question shape consumer behavior.

Anthropomorphism and Anthropocentrism

EXTENDED ABSTRACT
Justin Leiber (1985) provides the transcript of a meeting of the United Nations Space Administration Commission concerning a Humanico Corporation plan to shut down its space station. Over the period when the station was in operation, human astronauts came and went, but a female chimpanzee named Washoe-Delta remained for years and adapted to weightlessness. The human crew members taught her a portion of American sign language. She came to think of the space station as her kingdom. Also accompanying the astronauts on the space station was a Turing 346 computer that they called “A.I.”. It helped solve problems at the station and assist with official projects. It came to recognize astronauts individually and respond to them. The crews came to think of both A.I. and Washoe-Delta as persons and friends. When Humanico announced it would shut down the station and A.I., and let Washoe-Delta die in space (for she could no longer function in earth’s gravity), Amnesty International and the International Civil Liberties Union objected before a dubious UNSA Commission. The organizations maintained that both A.I. and Washoe-Delta had the right not to be abandoned in space. Leiber’s book is a record of the debates that ensued regarding the question of whether or not the computer and the chimpanzee could be considered to be persons with legal rights according to the UN charter.

Were the members of the space station crew and human rights organizations merely anthropomorphizing A.I. and Washoe-Delta? Or were the skeptical UN Commission members who objected to granting these entities personhood merely being anthropocentric in insisting on an uneven ontology in which only human beings can be persons and possess rights? After all, corporations, nations, and certain organizations are treated as legal persons. And it is clear from the
relatively recent historically momentous granting of full personhood and legal rights to women and slaves that societal views on who can be a person can change and evolve.

Traditionally humans have compared themselves to non-human animals as a way of understanding what it means to be human. During the Industrial Revolution people began comparing themselves to the dumb machines that were replacing them. And in the emerging age of computers and robotics we may be shifting to comparing ourselves to smart machines that are now replacing us. In each case we are coming to appreciate that abilities that we once thought were uniquely human -- strength, cunning, language, memory, emotions, intellect, sentience, forward thinking, and morality -- may not be exclusive to humans (e.g., Brooks 2002; Daston and Mitman 2005; Haraway 1991; 2003; Kurzweil 1999; Mazis 2008; Philo and Wilbert 2000). For example when IBM’s Deep Blue beat world chess champion Garry Kasparov in Chess and IBM’s Watson beat Jeopardy champions Ken Jennings and Brad Rutter in Jeopardy, these examples of unique human intellectual superiority fell by the wayside. Given such losses to machines, it is perhaps understandable that humans are beginning to adapt through aids and devices such as exoskeletons, distributed online memory through our devices, biological enhancements such as surgical implants and performance boosting drugs, and soon perhaps nanotechnology and genetic engineering of humans.

In this presentation I address the contention that our machines are becoming more human-like and we are becoming more machine-like. In the former case of machines becoming like us, this is aided by our anthropomorphism of human-appearing androids (or the female equivalent, gynoids) and animal-emulating robots. There is a growing literature suggesting that we respond better to such seemingly living creatures. Even sextbots are a part of the emerging robotics market (e.g., Levy 2007). But there is also a hypothesized “uncanny valley,” where too great a similarity to humans creates discomfort. Moreover there are fears of “the singularity,” or the point where our devices become smarter than us and potentially find us humans unnecessary (e.g., Kurzweil 1999; Moravec 1999). In these cases we are moving from mere anthropomorphism to the point where our smart machines are not only persons but super-beings with whom we can no longer compete. There are several different scenarios through which this could happen (e.g., Kurzweil 2013) as well as many science fiction portrayals of various outcomes. And the field variously labeled robot-, machine-, and computer-ethics is working both to attempt to instill morality in future machines and to consider the rights that such machines might be granted (e.g., Lin, Abney, and Bekey 2012).

Either in an effort to keep up with robots or out of a striving for perfection and even immortality, the human enhancement or human augmentation movement is proceeding apace with the developments in robotics and artificial intelligence (e.g., Chu 2014; More and Vita-More 2013). Whereas the attempt to make humans more like machines can be seen as dehumanizing (Belk 2014b), proponents of transhumanism envision making humans more god-like, with super strength, super intellect, and super longevity. The comparison to religion is often explicit (e.g., Cole-Turner 2011; Mercer and Trothen 2015).

Contemporary consumption may seem distant from these future scenarios, but it may be closer than we think; there is a postulated exponential growth in computer intelligence once our devices possess the equivalence of human intelligence and begin reprogramming themselves. Robots are in our factories and are entering our homes and offices. They can work for us or they can replace us. Envisioning the ethical and moral considerations of human-like machines and machine-like humans is critical now if we hope to shape our future. I offer no solutions, but will layout these issues and attempt to engage consumer researchers in addressing them.

Cyborg Consumers: When Human Enhancement Technologies are Dehumanizing

EXTENDED ABSTRACT

We show that users of human enhancement technologies are dehumanized, even when the enhanced traits are central to humanness. The perceived naturalness of the means and outcome of the enhancement drives this effect. Dehumanization in turn decreases consumers’ interest in using the technology themselves, and affects how the enhanced consumer is treated.

In our first study we focused on a technology called transcranial direct current stimulation (tDCS), because it is already available to consumers, and because it is capable of enhancing a range of abilities that are widely considered central to humanness (Cohen Kadosh et al. 2015; Haslam, Bastian and Bissett 2004). We works by passing a mild electrical current through a specific area of the brain to improve that area’s functioning. 145 MTurk users read a vignette asking them to imagine that they had an acquaintance who had started using either tDCS or an herbal supplement to enhance their creativity and self-control. Participants then reported how natural and how artificial the enhancement seemed, how human the acquaintance seemed and whether they seemed more or less human than before they started using the enhancement, and finally how much they thought creativity and self-control reflect human nature.

We confirmed that participants considered creativity and self-control to be part of human nature ($M_{creative} = 6.05, M_{self-control} = 5.11$, both significantly higher than the scale midpoint of 4, $t(143)$’s > 9, $p$’s < .0001). We then showed that the acquaintance in the vignette was perceived as significantly less human when using tDCS ($M = 71.9$) compared to an herbal supplement ($M = 87.57$, $t(143) = 3.93$, $p = .0001$). Furthermore, compared to pre-enhancement, the acquaintance seemed less human when using tDCS ($M = 47.09$) but more human when using an herbal supplement ($M = 52.95$, $t(143) = 1.96$, $p = .052$), suggesting that enhancement technologies can be dehumanizing. We also showed that perceived naturalness of the enhancement mediated this effect: the bootstrapped indirect effect was $-13.5, 95\% CI = -23.8$ to $-7.3$. Finally, perceived naturalness and humanness together mediated consumers’ interest in using the enhancement themselves ($\beta = -8.12, 95\% CI = -16.7$ to $-3.4$).

In our subsequent study, we sought to explore the concept of naturalness and its relationship to dehumanization in more detail. 237 MTurk users read one of four vignettes asking them to imagine a specific acquaintance, John, an ambitious, type-A personality who keeps up with the latest technology trends, and who had recently decided to enhance his mind using a supplement. The vignettes were organized in a 2x2 between-subjects design, in which the naturalness of the means and the naturalness of the outcome of enhancement were manipulated independently. Means naturalness was manipulated by describing the natural supplement as made from ingredients extracted from plants and minimally processed, whereas the unnatural supplement was made from ingredients synthesized in a lab and highly processed. Outcome naturalness was manipulated by describing the outcome of enhancement as enabling vs. embellishing the user’s true abilities (Williams and Steffel 2014). In the natural outcome condition, the supplement was described as allowing John to perform up to his true intellectual abilities, whereas in the unnatural outcome condition it allowed him to perform beyond his true abilities.
We confirmed that the natural supplement seemed more natural (M = 70.4) than the unnatural supplement (M = 25.6, t(235) = 14.9, p < .0001), and the “enabling” outcome seemed more natural (M = 57.9) than the “embellishing” outcome (M = 45.0, t(237) = 3.7, p = .0002). These two dimensions of naturalness also impacted dehumanization. An ANOVA using perceived humanness of the acquaintance as the dependent variable revealed main effects for both means (F(1, 233) = 10.8, p = .001) and outcome (F(1, 233) = 7.6, p = .006), but no interaction (F < 1). Specifically, the acquaintance seemed less human when the means were unnatural (M = 70.1) vs. natural (M = 81.0), and when the outcome was embellishing (M = 71.5) vs. enabling (M = 80.6). In both cases, perceived naturalness fully mediated the effect between means/outcome of enhancement and perceived humanness (indirect effect for means: 15.64, 95% CI = 8.37 to 23.96; for outcome: 6.32, 95% CI = 2.73–10.43).

For study 3, 58 undergraduate students came to the lab one at a time and were asked to evaluate an ad that was ostensibly developed for a new product, a tDCS brain-enhancement device. After evaluating the ad, participants met a confederate who was either wearing the enhancement device they just learned about or was not wearing the device. After briefly interacting with the confederate, participants completed a measure of dehumanization of the confederate. Participants also completed a measure of social distance that we thought might mediate any effect of dehumanization on prosocial behavior. Finally, as participants were signing a debriefing form the confederate “accidentally” knocked a jar of 20 pens off of the desk in front of the participant, and then discretely counted how many pens the participant helped him pick up from the floor. This measure has been used in past research as a measure of prosocial helping behavior (Twenge et al. 2007).

When the confederate was not wearing the enhancement device, participants helped him pick up an average of 7.5 pens, compared to only 4.7 pens when he was wearing the device, t(57) = 2.63, p = .01. We identified a two-stage mediation process in which condition (presence vs. absence of device) predicted dehumanization, which in turn predicted how distant participants felt from the confederate. This felt distance measure in turn predicted how many pens they helped to pick up. The indirect effect was .17, 95% CI = .006 to .83. This study therefore provides evidence for the notion that using enhancement technologies can result in negative social consequences for the enhanced consumer.

Ongoing studies generalize these results to include additional forms of enhancement, showing that technologies including Google Glass, Oculus Rift, genetic engineering, prosthetic limbs, and steroids are also dehumanizing, thus demonstrating the broad relevance of technological dehumanization for marketers.

The Undesired Discounting Effect of Budget Brands: How Brand Positioning Affects Perceptions of Customer Service Representatives’ Human Qualities

EXTENDED ABSTRACT

We live in a branded world; virtually not a single company operates without a brand name. Employees are crucial in making these brands come alive. In general, interactions with employees can provide rich information about brands to consumers (e.g., Matta and Folkes 2005), and employee–brand alignment might improve brand evaluations (Sirianni et al. 2013). Hitherto, research into brands and employees has focused exclusively on how perceptions of employees and their behavior influence consumers’ brand perceptions and evaluations. We argue that the effects also work in the opposite direction: brands shape consumers’ perceptions of the human qualities of employees and social interactions between consumers and employees.

While brands may differ on many dimensions, one of the most fundamental positioning distinctions is budget (i.e., low-cost) versus non-budget (i.e., differentiated) (Porter 1980). The positioning of a brand exerts pervasive effects on consumer behavior. Neuroscientific research suggests that budget brands activate different brain regions than up-market brands (Schaef and Rotte 2007). As budget brands inherently focus on economic aspects related to brand consumption, exposure to a budget (vs. up-market) brand induces consumers to spend less (more) in a subsequent task (Laran, Dalton and Andrade 2011). In line with other work showing that brand primes can lead to unintended outcomes (e.g., Berger and Fitzsimons 2008; Brasel and Gips 2011), we propose that a budget positioning exerts unintended effects on consumer-employee interactions.

Specifically, budget brands lead to a focus on market-pricing principles, which emphasize maximizing personal monetary gains, often at the expense of interpersonal sensitivity. Mere reminders of money may increase social distance and unethical behavior (Vohs 2015). A market-pricing approach to social relations thus may counteract recognizing others as humans and interacting compassionately (e.g., Molinsky, Grant and Margolis 2012). Consequently, we predict that budget brands may attenuate consumers’ perception and recognition of employees as fully human relative to employees of non-budget brands and individuals without any brand affiliation. This process is called dehumanization and entails attributing less mind (e.g., Gray, Gray and Wegner 2007; Kozak, Marsh and Wegner 2006) or denying individuals traits that make them human (Haslam 2006). We also examine the consequences of dehumanization for employees. Discounting others’ humanness leads to reduced prosociality toward them (Cuddy, Rock and Norton 2007). As interpersonal sensitivity decreases, we predict that consumers are less likely to offer support to employees in need when these work for budget (versus non-budget) brands. In sum, we predict that consumers are more likely to dehumanize employees of budget brands and are less likely to help budget employees in need.

Three studies tested these hypotheses. In study 1, 129 participants completed nine dehumanization items (Bastian et al. 2013). Following Laran, Dalton and Andrade (2011) Walmart and Nordstrom served as budget and non-budget brands, respectively, and participants indicated to which of the two brands the dehumanization items applied more (e.g., “I feel like employees are mechanical and cold, like a robot”, “I feel like employees lack self-restraint, like an animal”). As we used a nine-point scale with the brand logos as anchors, participants could attribute equal humanness to the employees of the two brands by choosing the midpoint of the scale. However, participants significantly dehumanized the employees of the budget brand (p < .001).

Study 2 (n = 208) tested the underlying mechanism of this effect. Participants were randomly assigned to a budget (Ryanair), non-budget (Lufthansa), or neutral control condition. After reporting their brand associations, participants received printed, photoshopped advertisements displaying the same flight attendant. The neutral condition rated the same person unrelated to a commercial context. Ratings on the stimulus’s capacity to think, feel, and plan served as our dependent measure of dehumanization (Kozak, Marsh and Wegner 2006). Consistent with our predictions, participants in the budget condition ascribed less humanness to the employee than those in the non-budget (p = 0.006) and the control condition (p < .001). Moreover, participants in the non-budget condition attributed less humanness to the person than subjects in the control condition (p = .011). Two independent raters coded whether the associations contained
market-pricing connotations. A mediation analysis with market-pricing focus as a dichotomous mediator (Imai, Keele and Tingley 2010) revealed that the increased market-pricing focus mediates 91.7% of the effect of the low-cost brand (vs. non-budget and neutral control) on dehumanization. A follow-up study (n=180) employing the same paradigm replicated the effect in a supermarket context.

In our final study, 75 participants were randomly assigned to the same two brands as in study 2. Subsequently, they were presented with a manipulated image depicting a budget or non-budget airline cabin. The image featured a stewardess, who had toilet paper stuck to her shoe, walking along the aisle. Our dependent measure of prosocial behavior was participants’ intentions to help the stewardess by informing her about the toilet paper. In line with predictions, participants were significantly less likely to help the budget than the non-budget stewardess (p = .025).

Taken together, three studies suggest that a budget brand positioning has pervasive, unintended consequences for consumers’ perceptions of the humanness of employees associated with such brands. Across different industries and measures, we consistently demonstrate that consumers fail to fully recognize the human qualities of budget employees and are also less likely to offer interpersonal support to these employees when in need. Additional studies are currently in progress, examining further control conditions (e.g., low-status brands), additional outcomes, and potential intervention strategies for budget brand managers.

**Anthropomorphism From Self-Extension and Self-Expansion Processes: An Assemblage Theory Approach to Interactions Between Consumers and Smart Devices**

**EXTENDED ABSTRACT**

Hoffman and Novak (2015) have proposed using assemblage theory (DeLanda 2006) to conceptualize consumer experience in the Internet of Things (IoT). Their framework formally identifies consumer experience as emerging from consumer interactions with smart devices in IoT assemblages. Paired capacities exercised in these interactions specify how consumers and smart devices can affect and be affected by each other. This conceptualization links self-extension (Belk 1988) and self-expansion theories (Aron and Aron 1986) in a larger theoretical framework, where anthropomorphism is an outcome of self-extension and self-expansion.

Recently, Connell and Schau (2013) noted there is some confusion in the marketing literature over the distinction between self-expansion and self-extension. Belk’s (1988) self-extension theory largely deals with how brands can bring more meaning to consumers’ lives through a process where the self is extended into those brands. Through the self-extension process, consumers invest the object with emotions or feelings, so that the object takes on significance beyond a mere possession. In self-expansion theory (Aron et al. 1991), people are motivated to form close relationships with others because it expands their ability to accomplish goals. Self-expansion through close relationships contributes to the formation of our own identities and is achieved by incorporating the resources, perspectives and identities of a close other into one’s self (Aron et al. 2004). Connell and Schau (2013) and Belk (2014a) conclude that both self-extension and self-expansion are useful for understanding the relationships that people have with objects.

In our assemblage theory framework, the self-extension process captures the paired capacity of the consumer to affect smart devices and the capacity of smart devices to be affected by the consumer. Self-extension implies that the consumer is in control of the identity they project from themselves into the device. But paired capacities can also operate in the other direction. The self-expansion process captures the paired capacity of the device to affect the consumer and the capacity of the consumer to be affected by the device. With self-expansion, the device is in control of the identity that the consumer absorbs into the self. Thus:

**Hypothesis 1:** When the consumer has more control in the interaction, self-extension will be greater than self-expansion; with less control, self-expansion will be greater than self-extension.

We propose that anthropomorphism is a key mediating emergent experience from the interaction among the paired capacities of the consumer with smart devices. Anthropomorphism is the tendency for people to ascribe human-like characteristics, emotions and behaviors to objects (Epley, Waytz and Cacioppo 2007). Waytz et al. (2010) found that more unpredictable devices were seen as more anthropomorphic. Greater unpredictability corresponds to less control, thus:

**Hypothesis 2:** When the consumer has less control in the interaction, anthropomorphism will be greater compared to when the consumer has more control.

Some research has suggested that anthropomorphism lies on a continuum from a minimal kind of anthropomorphism where you attribute human traits to an object, all the way to seeing the object as human with a “mind of its own” (Aggarwal and McGill 2007). We theorize that such device complexity could moderate whether anthropomorphism occurs through a self-extension or self-expansion processes. In the self-extension process, anthropomorphic experience more likely arises from the consumer’s capacity to directly affect simple devices (so-called “long finger” interactions). Consumers might have an easier time extending their essence into the device when it is simple. However, in the self-expansion process, anthropomorphic experience more likely arises from a complex device’s capacity to affect the consumer through autonomous, ambient interactions.

**Hypothesis 3:** For devices that the consumer has the capacity to affect (self-extension), anthropomorphism will be greater for simple compared to complex devices. For devices that have the capacity to affect the consumer (self-expansion), anthropomorphism will be greater for complex compared to simple devices.

Study 1 was a manipulation check for the control manipulation based on 101 participants. Across 32 devices (2 new scenarios and 30 of the devices based on Waytz et al. 2010), participants reported significantly less perceptions of control (M=3.26) when devices behaved unpredictably compared to when the participant could program the device (M=5.34; F (1, 99) = 82.176, p <.001).

Studies 2 and 3 tested H1-H3. In study 2, 201 participants evaluated the same 32 devices in a 2 (low vs. high control) x 2 (self-extension vs. self-expansion) design to test H1. For each device, participants indicated either their perceptions of self-extension (“to what degree do you have the capacity to affect [device]?”) or self-expansion (“to what degree do you have the capacity to be affected by [device]?”). Results supported H1. Self-expansion (M=4.23) was greater than self-extension (M=3.16) for low control, and self-extension (M=4.61) was greater than self-expansion for high control (M=3.97; F(1,197)=51.243, p <.001).
In study 3, 352 participants evaluated device anthropomorphism in a 2 (self-extension vs. self-expansion) x 2 (low vs. high control) x 2 (simple vs. complex device) design. Results supported H2 and H3. There was less anthropomorphism when control was high (M=1.80) compared to when it was low (M=2.25, F (1, 344) = 10.13, p = .002). In the self-expansion conditions, the complex device (M= 2.29) was more anthropomorphic than that simple device (M=1.89 and in the self-extension conditions, the simple device was more anthropomorphic (M= 2.10) than the complex device (M= 1.87) with the corresponding two-way interaction significant (F (1, 344) = 4.13, p = .043).

Our studies support the idea that the self-extension and self-expansion processes can both lead to anthropomorphism. These results, plus an exploratory Study 4 that provides correlational evidence that consumers view interactions with smart devices in terms of paired capacities, lay the groundwork for additional experiments on anthropomorphism arising from paired capacities in different interaction scenarios. Consumers desire for devices to be more “real” than they actually are can satisfy effectance and sociality motivations (Epley et al. 2008). For example, we hypothesize that in the self-expansion process, consumers’ need to feel a sense of mastery over the interaction may increase feelings of anthropomorphism for complex devices. Additional studies are in progress to examine these effects.

REFERENCES


