# Digitally Mediated Marketing Relationships

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# ABSTRACT

Changes in technology are shifting the way people form and maintain relationships. Marketers need to understand how these relationship dynamics are evolving in order to stay relevant within consumers lives and to continue to provide value. The work presented here examines two different types of marketing relationships and seeks to understand how those relationships are evolving in the face of changing technology.

The first chapter focuses on consumer relationships with service providers. Within this context, text message communication is replacing either face-to-face or voice only communication messages and emojis have become a common linguistic tool. I demonstrate how a smiling emoji can be used in this context to convey positive emotion and, further, that emotional signal can transfer from sender to receiver in the same way a smile does in a face-to-face exchange.

The second chapter looks at consumer relationships with products when the product is automated. Automation shifts the fundamental level and type of interaction that the consumer has with the end product. I show how automation negatively affects the consumer-product relationship by disrupting the routes to psychological ownership of the product. These lowered feelings of ownership, in turn, result in negative consequences for marketers such as lower customer satisfaction and brand loyalty upon repurchase. Finally, I establish how anthropomorphism can help mitigate the negative consequences of automation on psychological ownership.

Together these essays illustrate two ways relationships are being impacted by changes in technologies and strategies that marketers can take to navigate these changes. New technologies

will continue to transform the way we communicate and form relationships. Marketers need to be aware of how new technologies will impact relationships and adapt accordingly.

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# INTRODUCTION

It has been estimated that smartphone owners touch their phones an average of 2,217 times per day (Nelson 2016). The frequency with which consumers interact with their phones has been compared to a new type of addiction because of the constant urge to check and the feeling of anxiety that emerges when phones aren't available (Archer 2013). This connection to our phones is due to both the increase in availability and frequency of messages that we receive as well as the increased functionality that is enabled in managing our lives.

Although communication is still the primary function of smartphones (Pew Research Center 2015), they also allow us to organize and manage many other tasks and, increasingly, other products as well. When communication is mediated through digital communication, such as smartphones, instead of traditional direct contact, relationship dynamics are also transformed. Understanding how consumers communicate to form relationships in this digital environment is imperative for marketers to be able to stay relevant in their lives and continue to form relationships with new consumers.

This dissertation examines two types of consumer relationship dynamics that have been influenced by the shift to more digital communication. Previous research in computer mediated communication has proposed social information processing theory, which explains that relationship development takes longer due to the lack of nonverbal cues (Walther 1992). However, the theory goes on to say that because people are motivated to pursue relationships, communication will evolve to fill in this missing information (Walther 1992). This dissertation examines how the process of digitally mediated relationship development differs from traditional processes for both consumers in interpersonal relationships with service providers and consumer relationships with the products they own.

The first chapter focuses on digitally mediated interpersonal relationship development between consumers and service providers. Specifically, I look at how using a smiling emoji, as an emotional expression, impacts the consumer perception of the service relationship. Chapter one relies on Emotion as Social Information Theory (EASI). EASI explains how an emotional expression by the sender results in both affective and inferential responses in the receiver, which lead to downstream consequences such as relationship strength (Van Kleef 2009).

Previous research on emojis in marketing contexts has focused on the inferential path, showing the conditions under which the use of emojis can lead to inferences of greater warmth or lower competence of the sender (Li, Chan, and Kim 2018). Chapter one, instead, focuses on affective responses to the smiling emoji and shows that the positive emotional expression from the sender is essentially caught by the receiver as in emotional contagion (Hatfield, Cacioppo, and Rapson 1994). Additionally, the emotional response will be stronger when a communal relationship has been established, because stronger affective reactions may be elicited when the sender and receiver have a previous relationship (Bagozzi, Gopinath, and Nyer 1999). Communal relationships are characterized by stronger trust and reciprocity which typically evolve over time.

I test this emoji effect experimentally by utilizing text messages initiated by a service provider to demonstrate that the presence of a smiling emoji generates a matching positive affective response in the receiver when the norms of a communal relationship have been established. This, in turn, enables the receiver to feel closer to the sender of the message. In short, emojis fulfill a social-functional role of facilitating relationship development between the sender and receiver once the relationship has been established but would not be expected to help in new relationship formation. This chapter demonstrates how communication has evolved to

allow for relationship development to progress when interactions between the sender and receiver are digitally mediated instead of in traditional face-to-face settings.

In chapter two, I investigate relationship dynamics between consumers and the products they own when those products are operated through digitally mediated communication. As new connected products are developed, smartphones play an increasingly prominent role in controlling and managing our interactions with them. Currently about 32% of US households have begun to adopt some form of smart technology and that is forecasted to reach 53.1% of households by 2022 (Statista 2018). For consumers, product automation allows for managing routine tasks more conveniently and efficiently. These advantages will continue to propel the growth of automation in consumer goods. However, the way the consumer interacts with the product and the relationship that forms thereby will be quite different for automated or digitally operated products than with traditional products. These differences are important for marketers to understand in order to find new ways for the consumer to connect with the product. Just as interpersonal relationship dynamics are impacted by digital mediation (Walther 1992), so too will be the consumer relationship with the end product.

Prior research has investigated how product love (Lastovicka and Sirianni 2011) and emotional attachment to products (Kleine and Baker 2004) develops in a context where consumers have direct contact with products. I apply psychological ownership theory (Pierce, Kostova, and Dirks 2003) to understand how the consumer-product relationship develops differently for traditional versus automated products, as well as the consequences of those differences. Thus far, this stream of research in marketing has focused on the result of mere touch (or anticipated touch) leading to feelings of control over the product (e.g. Peck and Shu 2009; Atasoy and Morewedge 2017) and subsequently higher psychological ownership and

valuation of the object pre-purchase. I extend this line of research to understand how automation impacts development of psychological ownership after actual usage. Specifically, I demonstrate that when contact with the product is mediated through digital control instead of direct contact, psychological ownership will be hindered.

Importantly, psychological ownership has downstream consequences which are of value to marketers (Jussila et al. 2015). Psychological ownership has been shown to lead to many positive consequences such as greater word-of-mouth (Asatryan and Oh 2008) and greater valuation (Atasoy and Morewedge 2017). I focus on the consumer-product relationship and how it may differ from traditional products in ways that will have implications for customer lifetime value. Attitudinal consequences such as satisfaction and attachment as well as behavioral consequences of proactive maintenance and future brand loyalty intentions will be lower as psychological ownership decreases (Jussila et al. 2015).

I further propose that anthropomorphizing automated products will alleviate or at least attenuate these negative consequences by strengthening the consumer-product relationship. When products are anthropomorphized, norms and expectations of the social world are more readily applied to the relationship with the product (Aggarwal and McGill 2011) leading to greater connection to the product and subsequent psychological ownership. Some of the longer-term consequences of psychological ownership will require more time to formulate than can be captured after a single usage. Therefore, in addition to testing hypotheses experimentally, a field test demonstrates the differences in satisfaction, attachment, maintenance, and future brand loyalty intentions that develop after products are legally owned.

Together these essays showcase two types of consumer relationships that are changing due to advances in technology. This dissertation fits within an emerging stream of research that

explores how digital mediation will change relationship dynamics. As new interpersonal communication and product interfaces continue to emerge, communication and relationships will inevitably be impacted. The human drive to form relationships will persist (Walther 1992) but the process and outcomes will differ from those that form with traditional direct contact. Understanding these changes and differences is important for marketers to successfully manage the consumer experience.

# CHAPTER I

# SERVICE WITH A SMILEY FACE: EMOJIONAL CONTAGION IN DIGITALLY MEDIATED RELATIONSHIPS

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https://www.sciencedirect.com/science/article/abs/pii/S0167811619300655

I was the lead author. I had primary responsibility for all data collection, analysis, and writing Randall Rose advised me throughout the process and assisted in writing and revisions for publication.

## ABSTRACT

The lack of typical nonverbal cues in digitally mediated marketing communication (e.g., text messages, social media etc.) creates special challenges for marketers desiring to manage customer relationships. To overcome these limitations, marketers have turned to emojis to convey subtle meaning regarding the message sender (often a service provider) and to elicit positive emotion in the message recipient. Relying on theories of emotion as social information and emotional contagion, we present three studies that provide initial evidence of a positive conscious and unconscious affective response to smiley-face emojis that mediates relational outcomes when relationships are communal in nature, but not when relationships are based on simple exchange. We also make a methodological contribution by employing biometric measurement of smiling in order to capture unconscious affect and to demonstrate novel emotional contagion effects in a customer service message. We close with a discussion of the average emoji effect observed across reported and unreported studies, which is modest but reliable, as well as discussion of future research opportunities and managerial implications.

## INTRODUCTION

The Oxford English Dictionary annually chooses its "word of the year" to reflect changes in language (Oxford Dictionary 2016). In 2015, for the first time ever, the winner wasn't a word, but an emoji called Face with Tears of Joy (Ayers 2015). The image's popularity, along with that of emojis in general, led to this recognition. Since their introduction, emojis have quickly become a popular linguistic signal used in place of text or to supplement textual communication. On average, emojis are used over 12 million times per day on Twitter alone (Rothenberg 2016).

Some linguists have referred to emojis as a new language because they carry meaning that can both replace words and convey feelings (Thompson 2016). Marketers have tried to capitalize on the popularity of emojis by including them in both online and offline communications. However, these efforts have sometimes led to unintended negative consequences (Dua 2016), suggesting that there is much left to learn about what effects emojis can elicit and how they can be deployed more successfully.

Research addressing how digital smiles impact consumer-marketer relationships has only recently begun to emerge. Thus far, only the ability of emoticons and emojis to impact satisfaction and inferences about the sender has been investigated (Glickson, Cheshin, and Van Kleef 2017; Li, Chan, and Kim 2018). Marketing software company Hubspot claims that emojis can help convey feelings in an online service encounter when used in conjunction with appropriate text (Decker 2018). In the current research, we examine whether emojis can result in emotional contagion, or a transfer of emotion from sender to receiver, similar to reactions observed from smiling in an in-person context. Smiling has been the focal facial expression in other research focusing on emotional contagion in service with a smile (e.g. Pugh 2001). Additionally, facial expressions are some of the most commonly used emojis, especially those

conveying a happy expression which make up three of the top ten most commonly used emojis (Rothenberg 2016). Therefore, we focus on smiling emojis as an appropriate starting point for determining if emotional contagion effects occur with these digital smiles in a service communication.

We attempt to answer three different questions. Namely, can smiley-face emojis used in digital messages mimic the emotional contagion effects observed for smiles in face-to-face encounters? Can the emotions that are generated by smiley-face emojis help strengthen marketing relationships? Is the affective mediation of smiley-face emoji effects dependent on relationship type?

We conducted research to better understand the functions that smiley emojis serve in interpersonal, digitally mediated communication, how they transfer affect to receivers, and how they influence important downstream marketing outcomes. Specifically, we report three studies in which we tested 1) whether a smiling emoji in a digital message contributes to the perceived strength of the relationship between sender and receiver, 2) how social factors strengthen or weaken this effect, and 3) how affective mechanisms in particular explain emoji effects on relationships and purchase intentions. None of these contributions have been demonstrated in prior research to our knowledge. Finally, in an abundance of caution and to avoid any possible file drawer effects, we provide a link to a single-paper meta-analysis that estimates average effect sizes and confidence intervals for those effects across a total of seven studies, including the three studies reported in full in this paper.

## THEORY AND LITERATURE REVIEW

When email and internet communication started becoming mainstream in the 1990s, it was believed the level of communication would be limited because of a lack of nonverbal cues

(Walther 1992). First, emoticons, and more recently emojis, were developed as a means to fill the gap in nonverbal communication cues (Walther 1992) by serving as a signal of senders' meaning and emotion in digital communications. While prior research has demonstrated that smiles by service providers during in-person interactions elicit positive downstream effects on relationship variables such as rapport (Hennig-Thurau et al. 2006), we seek to understand if digital smiles through a smiling emoji can elicit positive affective reactions within customers that translate to positive downstream consequences.

Recent research on emoticons shows that within the context of work emails, emoticons can lead to inferences that undermine perceptions of sender competence (Glickson et al. 2017). This same research also demonstrated that in a less formal work context, the presence of a smiley face in a message increased inferences of warmth and had no effect on perceptions of competence (Glickson et al. 2017). Thus, the emoticon effect depended on the formality of the communication between sender and receiver in work contexts. Li et al. (2018) established that emojis, when used in a marketing context, increase consumer inferences regarding sender warmth within communal relationships but lower perceptions of competence in exchange relationships. These inferences about the sender led to greater satisfaction and patronage intentions in communal but not exchange relationships. While these two recent studies were set in different contexts, both investigated the ability of social factors related to the formality of the relationship to moderate emoji/emoticon effects and relied on inferential processing to explain the effects observed.

We focus on text message communications from service providers to consumers because of their popularity and because it is perceived to be a more informal mode of communication than email (Lufkin 2018). The fact that texts are less formal than email should counteract the

negative formality effects observed by Glickson et al. (2017). Glickson et al. (2017) found emoticons had negative effects when included in formal messages such as work emails but positive effects in informal contexts such as social emails, leading us to believe that an informal communication should lead to positive effects. Of note, we go beyond the very limited prior research in this research stream (e.g., Li et al. 2018) by showing that 1) a smiley-face emoji can generate a positive affective reaction within the receiver through emotional contagion, 2) this positive affective reaction helps to strengthen the relationship between sender and receiver, 3) this positive affective reaction elicits managerially useful downstream effects, and 4) the affective mediation of emoji effects occurs in communal relationships, but not exchange relationships. Importantly, we show for the first time that the effect of a smiling emoji in a text message mirrors effects found in previous research regarding smiles in face-to-face service encounters (e.g. Hennig-Thurau et al. 2006).

Emotion as Social Information (EASI)

Emotion as social information (EASI) theory (Van Kleef 2009) provides a framework for understanding how emojis enhance both the meaning of a message as well as the relationship between sender and receiver (Figure 1). Previous studies of emotion in a marketing context have primarily focused on the intrapersonal effects of emotion, such as when consumers' experienced emotions such as happiness, fear, disgust, shock or guilt influence their own decision-making processes (e.g. Schwarz and Clore 1983; Coulter, Cotte, and Moore 1999; Morales, Wu, and Fitzsimons 2012; Parry et al. 2013; Ruiter et al. 2014). In contrast, EASI considers emotional

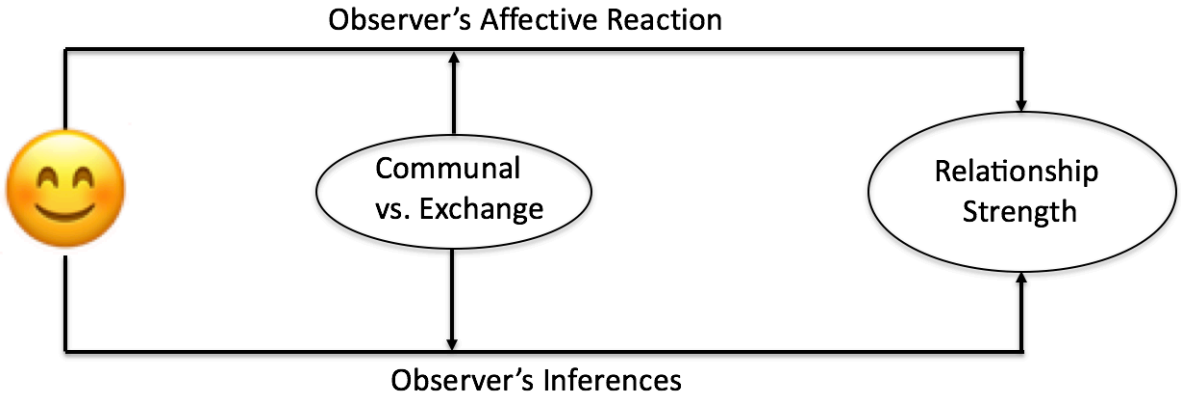



**Figure 1: Chapter 1 Conceptual Model**

expression to be an interpersonal process (Van Kleef 2009). The focus is on the sender's emotional expression and how that expression influences both the recipient's emotions as well as the inferences they make about the sender.

Because we are interested in the development of mediated relationships in a marketing context, relationship strength was selected as the primary dependent variable in all studies herein reported, although in Study 1 we introduce purchase intention as another managerially relevant consequence of the strengthened relationship. Relationship strength in service settings has previously been shown to lead to important marketing outcomes such as customer satisfaction and loyalty (e.g. Hennig-Thurau et al. 2006, Beatty et al. 1996) and is therefore a critical element of effective marketing strategy. Similar to previous definitions of relationship quality, we define relationship strength as the result of trust, commitment, and relationship satisfaction between the service provider and consumer (Palmatier, Dant, Grewal, and Evans 2006).

EASI theory proposes that the sender's emotion can activate both affective and inferential mechanisms of influence on the receiver's perception of the relationship (Van Kleef 2009); however, only the latter has been reported in recent emoticon and emoji literature. Previous research has demonstrated the inferential mechanism by showing that emojis change perceptions of the sender's warmth and competence (Li et al. 2018; Glickson et al. 2017). However, these studies have not accounted for the potential impact of emojis on customer affective responses. Additionally, rather than focusing on the reaction to an isolated transaction as in Li et al. (2018), we demonstrate the influence of smiling emojis on relationship development between service providers and consumers. Therefore, our work provides a necessary complement to prior research in this emerging literature stream by focusing on the unstudied affective mechanism of relationship development.

Affective reactions, as specified by emotions as social information theory, rely on a transfer of emotion from the sender to receiver consistent with emotional contagion (Van Kleef 2009). Emotions are conceptualized as brief affective reactions to elements within one's external environment. They are often expressed physically (Bagozzi, Gopinath, and Nyer 1999) and are viewed as reactions to stimuli that can occur instantaneously and independent of cognitive processing (Zajonc 1980). The sharing of one's emotions can affect the emotions of another through verbal and nonverbal communication between the sender and receiver in a process akin to contagion (Schoenewolf 1990). These emotions expressed in other individuals prime social interactants to experience a similar emotion.

Both emotional contagion and EASI theoretical perspectives allow for affective reactions to be varied emotional responses depending upon a host of contextual and relational factors (Hatfield, Cacioppo, and Rapson 1994; Van Kleef 2016). Research within marketing contexts has demonstrated how affiliative emotions such as happiness lead to relationship development though primitive emotional contagion (e.g. Hennig-Thurau et al. 2006; Howard and Gengler 2001). Other emotional expressions may generate non-matching effects through a more conscious process, such as an expression of aggression leading to a fearful reaction. However, as a starting point, we focus on effects found in previous marketing literature related to emotional contagion in order to understand how these effects translate into the digital realm. Therefore, we focus on emotions elicited by smiles and seek to demonstrate that this effect, or something similar, can be obtained in digital communications with the commonly used smiley-face emoji.

According to Barsade (2002), the transfer of emotion occurs at both the conscious and subconscious levels. Primitive emotional contagion is a two-step process which begins when individuals subconsciously mimic emotional and behavioral cues from others resulting in

automated imitative responses that mirror the original sender's emotions and behaviors (Hatfield et al. 1994, pg. 5). For example, when individuals smile in response to a smile elicited from someone greeting them, such emotive responses occur automatically and below the level of conscious awareness. The second step of emotional contagion, then, occurs as the mimicked expression provides internal feedback, and the recipient begins to feel the automatically expressed emotion (Hatfield et al. 1994). Ekman, Levenson, and Friesman (1983) found support for this by demonstrating that the same emotional state could be achieved by either instructing people to mentally relive an emotional experience or to form a specific facial expression matched with that emotion. Their work demonstrates that facial expressions provided internal feedback leading to a consciously accessible emotional response.

> $H_1$: A smiling emoji will generate positive affect through emotional contagion by first generating a) a smiling facial expression followed by b) a conscious affective reaction within the receiver of a message.

**Relationship Strength**

Relationship dynamics between consumers and service providers have been widely studied in marketing literature through the lenses of rapport, commercial friendships, and service provider commitment (Gremler and Gwinner 2000; Hennig-Thurau et al. 2006; Price and Arnould 1999). Each of these constructs looks at various qualities of the relationship between two parties and has positive implications for long term satisfaction and loyalty. In a service provider context, Li et al. (2018) demonstrated that smiling emojis can positively affect customer satisfaction when the marketer-customer relationship is characterized by a higher degree of

communality, but not when the relationship is largely based on commercial exchange. We investigate the use of an emoji in building or maintaining those relationships between consumers and service providers through an affective mechanism.

EASI posits that these affective reactions will generate automatic effects particularly on relationship development (Van Kleef 2009). In the case of emotional contagion effects, once an emotion transfers from sender to receiver, the behavioral response occurs automatically. Being with others who express matching emotions validates one's own appraisals and feelings (Anderson and Keltner 2004) and helps one feel understood by the other party (Hatfield et al. 1994). Emotionally similar reactions allow the two parties to feel closer and more comfortable together (Anderson and Keltner 2004; Zablah et al. 2017). Therefore, it would be expected that the matched response should generate greater feelings of comfort and intimacy with the sender that are reflected in enhanced perceived relationship strength.

$H_2$: A smiling emoji in a customer service message will increase perceptions of relationship strength.

Previous emotional contagion research has primarily focused on the transfer of emotion in face-to-face interactions. For example, previous work has examined the emotions of one individual affecting another in a face-to-face social interaction (e.g. Howard and Gengler 2001; Tsai and Huang 2002). Recently, Hasford, Hardesty, and Kidwell (2015) extended this work by demonstrating that the emotional state that is 'caught' by the receiver can transfer to an unrelated stimulus, such as a product, which then can provide information in the evaluation process for that product. However, thus far, emotional contagion has not yet been shown in the marketing and

consumer research literature to extend to a digital communications environment in a customer service context.

If an emoji replaces a facial expression as a nonverbal cue, then the receiver will also feel closer in the relationship through their own affective reaction. Studies of emotional contagion have shown that emotional expressions in an interpersonal context increase perceived rapport and increased customer satisfaction (e.g. Hennig-Thurau et al. 2006). If the emoji serves the same function as a facial expression, then it may have a similar effect on perceptions of the relationship that should be mediated by affective responses.

> $H_3$: The effect of a smiling emoji in a customer service message on relationship strength will be mediated first by a) a smiling facial expression and subsequently by b) a positive conscious affective reaction.

**Patronage or Purchase Intentions**

Research on relationships between service providers and consumers has demonstrated many positive long-term consequences to marketers. Price and Arnould (1999) identify commitment, service loyalty, and positive word of mouth as associated with commercial friendships. We propose that a customer service message with a smiling emoji can be used to build relationships, as well as generate these previously studied downstream consequences. Importantly, employee-consumer rapport established through authentic emotional displays between service providers and consumers engenders higher satisfaction and future loyalty (Hennig-Thurau et al. 2006). Therefore, it is reasonable to propose that relationship strength precedes these downstream responses. Formally stated:

$H_4$: The positive influence of a smiling emoji in a customer service message on future purchase intentions will be serially mediated by a) smiling facial expressions, b) positive affect, and finally by perceived c) relationship strength.

**Boundary Conditions**

EASI theory acknowledges two broad categories of moderating effects that can influence which path (affective or inferential) dominates and the relative strength of each path: the level of information processing and social relational factors. In the current research we limit our investigation of moderating factors to one social relational variable, relationship type. Previous work on relationships has demonstrated two broad categories of relationships relevant to a marketing context: communal and exchange (Clark and Mills 1994). The key characterizing features of each, are the levels of trust and expected reciprocity. Communal relationships are expected to be based on higher levels of trust. Benefits are given freely in a communal relationship without expectation of immediate reciprocity (Clark and Mills 1994). Instead, the relationship is characterized by a compact of mutuality and social welfare. However, in exchange relationships, the overall level of trust is typically lower (Clark and Mills 1994). Expectations of an enduring relationship may not be present, and therefore it is important to maintain a balance so that neither party is indebted to the other. Reciprocity for favors or benefits is expected upon receipt (Clark and Mills 1994).

Within the bounds of communal relationships, the expression itself may be deemed more appropriate and therefore have a stronger effect than if the expression were made outside the communal relationship context (Van Kleef 2016). Additionally, research by Clark and Taraban

(1991) has shown that emotional expressions, regardless of the valence of emotion, increase liking in a communal relationship, but not in an exchange relationship due to greater levels of appropriateness and trust. They demonstrate that the norms of a communal relationship increase intentions to maintain the relationship and lead to greater expressions of emotions as a way of relationship maintenance (Clark and Taraban 1991). Further, greater receptivity to an expressed emotion, within bounds of communal relationships, is due to the desire to care for the other person (Clark and Taraban 1991).

Additionally, if the sender and receiver have a previously established relationship and are more deeply invested in the relationship, a stronger affective reaction may be elicited regardless of the reason for the emotional expression of the sender (Bagozzi et al. 1999). Greater facial mimicry and emotional contagion should be observed when the two parties have an established relationship (Hatfield et al. 1994). Thus, the affective reaction should be stronger in a communal relationship due to the increased likelihood of emotional contagion when the relationship is more personal (Hatfield et al. 1994). This moderated-mediation conjecture, stated formally below, has not been tested previously in the literature.

$H_5$: Within a communal (but not exchange) relationship the influence of a smiling emoji in a customer service message on perceptions of relationship strength will be mediated by a positive affective reaction.

**Current Research**

I next describe three experiments designed to test these conjectures. Study 1 provides an initial demonstration of emoji-driven emotional contagion using biometric and self-report

measures of affect ($H_1$) and subsequent effects on relationship strength ($H_2$) within a customer service context. Study 1 also provides support for the proposed causal chain of emoji effects as reflected in the mediation hypotheses ($H_3$) and ($H_4$) while eliminating alternative causal chains. Studies 2 and 3 investigate relationship type as an important boundary condition of emoji generated affective and relationship strength responses and test the full moderated-mediation model proposed in $H_5$ using different operationalizations of the proposed moderator.

## METHOD AND RESULTS

### Study 1

Study 1 is situated in a communal marketing service context in order to understand what effect the presence of a smiling emoji can have on affective responses, perceptions of a service relationship, and subsequent future patronage intentions. This study also connects spontaneous, behavioral, affective reactions to conscious reports of felt emotion. Further, this study provides insights into how both of these affective reactions impact perceptions of relationship strength and future purchase intentions. Additionally, by demonstrating the unconscious behavioral reaction, through smiling, we provide further evidence that emotional reaction from smiling emojis are generated through emotional contagion as opposed to the possibility that differences in affect were due to an unrelated source in the context or from affect as information about the sender (Schwarz and Clore 1983).

#### Method

One hundred and thirteen participants (57.5% female) were recruited from an undergraduate student subject pool in exchange for course credit. As justified in section 1, we limit our scope to happy-valanced face emojis in this study and all subsequent studies. Messages differed only in the presence or absence of happy emojis. Research participants were randomly

assigned to either the emoji or the control treatment condition within the context of an ongoing customer service relationship. The experimental method was quite labor intensive as it required participants to be seated at a single computer station equipped with a webcam. Thus, data could only be collected one participant at a time.

The context selected was that of a reminder message for an upcoming haircut. This was chosen because most consumers would be familiar with this type of service interaction and because such service providers often use text-message reminders for appointments. Participants were told to imagine they received a text message about an upcoming hair cut appointment from their regular service provider and that they had been to this service provider many times previously. As hypothesized, emotional contagion effects are stronger among people who are already acquainted (Hatfield et al. 1994). Therefore, the instructions provided a context in which participants had an existing relationship with the service provider rather than a first-time encounter. Next, they saw the image of a text message conversation revealed one message at a time (see Appendix A for stimuli).

Previous research on digital communications has shown that men and women differ in their impression management strategies and reactions to digital communication depending on whether they are talking to someone of the same or different gender (Walther 2007). Therefore, participants in this study were first asked to identify their gender. This allowed the message sender to be gender matched with the receiver. Instructions and message content were the same except for the gender of the sender (Jane vs. John) and the name of the company (City Salon vs. City Barber). The conversation content was an appointment reminder and was the same across all participants except for the sender and the presence (emoji condition) or absence (control condition) of a smiling emoji.

Unconscious affective response was assessed using iMotions software. The software operates through a digital camera that captures biometric data via automatic sensors to measure facial muscle movements and resulting expressions. This software then matches facial expressions to the emotional profiles developed by Ekman and Friesman (1978). Previous research on emotional contagion has used facial expressions as a key indicator but has relied on human coding of facial expressions (e.g. Howard and Gengler 2001). Automated technology has been shown to be as sensitive as human coders by Bartlett, Hager, Ekman, and Sejnowski (1999). Smiling responses were detected using biometrically measured facial expression profiling. The key dependent variable was calibrated as the time expressing joy in terms of 33 millisecond frames. We focused on the exposure to the emoji and fixed measurement during the three seconds after the emoji appeared (or would have appeared) in order to control for idiosyncratic differences that could contribute to within-cell variation (such as reading speed) in the experiment. This allowed us to control for total time exposed to the emoji in the experimental setup instead of in the analysis.

After exposure to the message, participants next responded to the self-report variables of interest. Self-reported affect was captured using two-items (good, happy) taken from a scale by Elliot and Devine (1994) and measured on a visual analog scale (VAS), ranging from 0 (not at all) to 100 (extremely). This is consistent with measurement in other studies testing the EASI model (Van Kleef, van den Berg, and Heerdink 2015). Scores from the affect items were averaged to form the affect measure ($r$ = .58).

Relationship strength perceptions were measured using a scale from Krishna and Ahluwalia (2008). This scale consists of three semantic differential items asking participants to rate their relationship with the message sender as: friendly/formal, personal/impersonal, close

like family/distant. Responses were recorded on a seven-point scale and coded such that higher values reflected a closer relationship. Items were averaged to form an index of relationship strength ($\alpha$ = .74). Additionally, in this study we assessed smiley-face emoji effects on another managerially relevant outcome, repeat patronage intentions. Participants were asked how likely they would be to return to the same service provider in the future on a 9-point semantic differential scale (ranging from 1= not at all likely to 9 = extremely likely).[1]

Finally, we included normative appropriateness as a covariate related to the self-reported affective response and to relationship strength. The perceived appropriateness and authenticity of an emotional expression has been shown in previous literature to contribute to affective reactions in a service context (e.g. Hennig-Thurau et al. 2006). Price, Arnould, and Tierney (1995) explain that emotional displays by a service provider must be perceived as authentic to produce the affective content necessary to develop the relationship. Additionally, Price, Arnould, and Deibler (1995) show authenticity as a predictor of positive emotional responses to service encounters. Normative appropriate usage of emojis would likely vary across respondents as a result of age, previous exposure to emojis, and frequency of personal emoji usage. Therefore, the perceived normative appropriateness of the message may influence how participants evaluate the message and was included as a covariate when assessing self-reported affect and relationship strength. As biometric facial responses are automatic reflections of spontaneous affect and occur before inferences about appropriateness, we did not include the covariate in tests of smiling. Normative appropriateness of the message was captured on three items using 7-point, semantic differential scales (authentic/inauthentic, appropriate/inappropriate, and realistic/unrealistic $\alpha$ =.65).

[1] The inclusion of this additional managerially meaningful dependent variable was suggested by an anonymous reviewer. Patronage intentions are not assessed in Studies 2 or 3 because Study 1 was actually conducted last.

Results

*Manipulation Checks*. We used an instructional manipulation check to verify participants had paid attention to instructions. We asked participants how many times they had previously been to the hair stylist/barber on a seven-point semantic differential scale ranging from one time to many times. Participants did not differ in their rating of visit frequency regardless of whether they were in the control ($M_{control}$ = 5.55) or emoji ($M_{emoji}$ = 5.60) condition ($t$ = -.16, $p$ = .870), indicating that presence of emoji was not confounded with recall of instructions. Recall of emoji presence was lower in the control condition ($M_{control}$ = 3.6%) than the emoji condition ($M_{emoji}$ = 96.6%) providing evidence the emoji manipulation was successful ($\chi^2$ = 101.34, $p$ < .001). We did not exclude any participants based on responses to the manipulation check.[2]

*Affect and Relationship Strength.* The ANOVA revealed main effects of emoji on time spent smiling ($F$(1,111) = 3.96, $p$ = .049), self-reported positive affect ($F$(2,110) = 7.21, $p$ = .008), and relationship strength ($F$(2,110) = 38.09, $p$ < .001) (see Table 1). Participants spent more time smiling in the emoji condition ($M_{emoji}$ = 5.41 frames, SD = 16.47) than the control

[2] Prior to study 1, we also conducted a pilot study to determine the sensitivity of facial recognition software to the presence or absence of smiley-face emojis in digital messages following a procedure similar to that used in Study 1, but using an interpersonal context simulating conversations on Facebook Messenger. Facial expressions were significantly affected by the emoji manipulation, based on the biometric data. Consistent with the happy emojis used, the facial expression profiling revealed that participants in the emoji condition expressed joy for more time than in the control condition ($F$(1,50) = 4.149, $p$ = .047). Participants received three messages with smiley-face emojis during the conversation in the pilot study. Thus, Study 1, with only one emoji presented, is a systematic replication of the pilot study and a very conservative test of emoji influence on spontaneous and self-reported affect. Details are available from the first author upon request.

**Table 1**

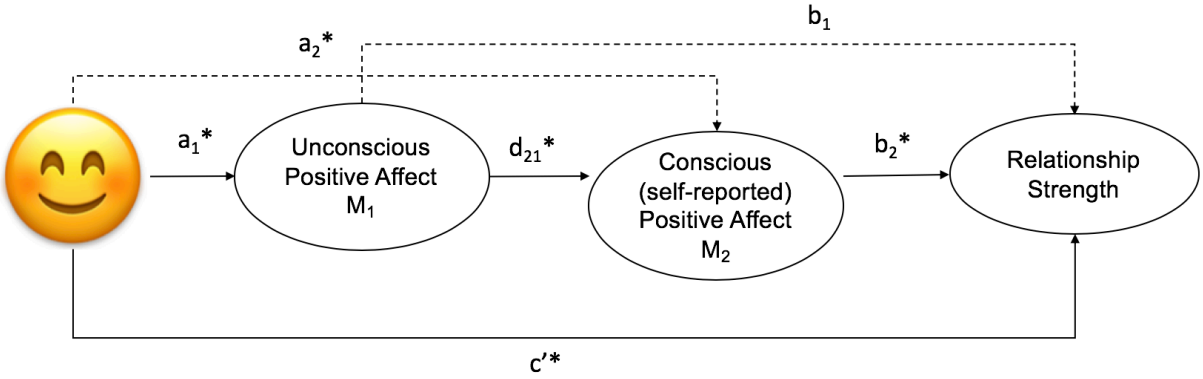
Study 1 Model Summaries

| | Smiling Expression | | Self-Reported Affect | | Relationship Strength | |
|---|---|---|---|---|---|---|
| | *F* | *p* | *F* | *p* | *F* | *p* |
| Overall Model | 3.96 | .049 | 5.41 | .006 | 19.34 | .000 |
| Intercept | 7.37 | .008 | 21.01 | .000 | 51.69 | .000 |
| Norms | n/a | n/a | 6.65 | .011 | .98 | .323 |
| Emoji | 3.96 | .049 | 7.21 | .008 | 38.09 | .000 |

condition ($M_{control}$ = 0.84 frames, SD = 4.61). Similarly, participants reported feeling higher levels of positive affect ($M_{emoji}$ = 74.68, SD = 18.78 vs. $M_{control}$ = SD = 64.99, SD =18.80) and rated the relationship as stronger ($M_{emoji}$ = 5.25, SD = 1.19 vs. $M_{control}$ = 3.97, SD = .92) in the emoji condition than the control condition.

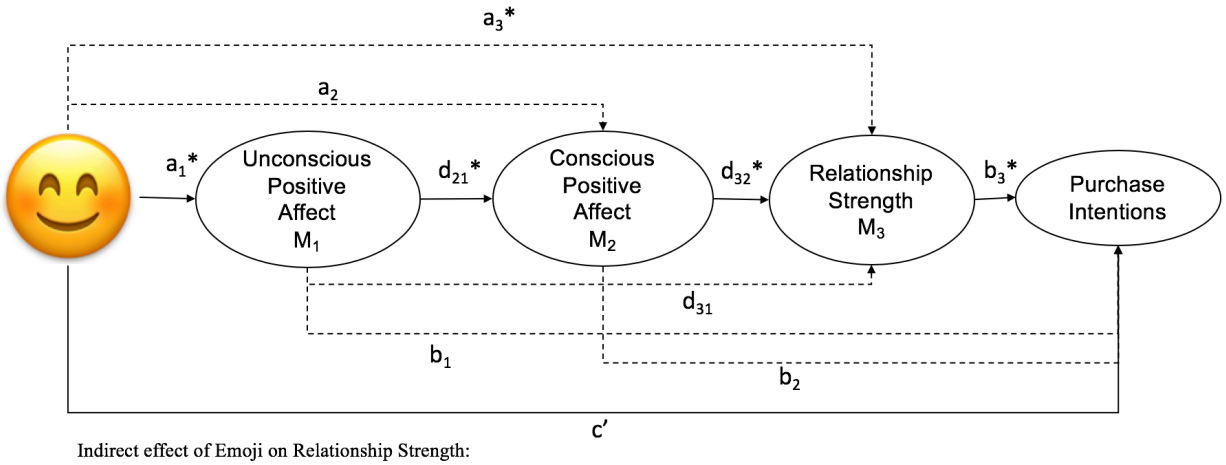
Serial mediation using both smiling and conscious affect was tested using Hayes Process Macro Model 6 (2013). The effect of emoji on relationship strength was serially mediated first through smiling, then through self-reported positive affect sequentially ($\beta$ = .0143, 95% CI = .0002 to .0554), providing support for emotional contagion effects of a smiling emoji on relationship strength. Additionally, the effect of the smiling emoji on relationship strength through conscious positive affect alone was also positive in this study ($\beta$ = .0891, 95% CI = .0001 to .2817), allowing for future detection of the effect without the need to use biometric sensors. The indirect paths through affect partially mediates the effect on relationship strength, meaning the direct effect on relationship strength is still significant ($\beta$ = 1.1257, 95% CI = .7242 to 1.5271) after controlling for affective mediation, providing support for $H_2$ and $H_3$ (see Figure 2). Given the work by Li et al. (2018), we believe that inferences about the message sender serve as a likely complementary mediator not accounted for in our models.

The presence of a smiley-face emoji in the text conversation did not affect future purchase intentions directly ($F(1,111) = .96$, $p = .329$). However, the emoji did impact future purchase intentions through an affectively mediated mechanism. The serial mediation path through smiling, conscious affect, and relationship strength (see Figure 3) was positive and significant ($\beta$ =.0065, 95% CI = .0002 to .0290), thereby providing support for $H_4$. In this mediated model, the direct effect on future purchase intentions remains non-significant ($\beta$ =




Indirect effect of Emoji on Relationship Strength:
Mediation path through $M_1 = a_1 b_1$ = .0246, 95% CI -.0114 to .1061
Serial path through $M_1$ and $M_2$, = $a_1 d_{21} b_2$ = .0143, 95% CI .0002 to .0554
Mediation path through $M_2$, = $a_2 b_2$ = .0891, 95% CI .0001 to .2817
Direct effect $c'$ = 1.1257, 95% CI .7242 to 1.5271
* Indicates significant $p < .05$

**Figure 2: Serial Mediation Effect on Relationship Strength**




Indirect effect of Emoji on Relationship Strength:
Mediation Path through $M_1$ only = $a_1 b_1$ = .0435, 95% CI -.0097 to .1539
Serial Mediation through $M_1$ and $M_2$ = $a_1 d_{21} b_2$ = .0035, 95% CI -.0130 to .0380
Serial Mediation through $M_1$ and $M_3$ = $a_1 d_{31} b_3$ = .0106, 95% CI -.0045 to .0523
Serial Mediation through $M_1$, $M_2$, and $M_3$ = $a_1 d_{21} d_{32} b_2$ = .0065, 95% CI .0002 to .0290
Mediation Path through $M_2$ only = $a_2 b_2$ = .0153, 95% CI -.0607 to .1436
Serial Mediation through $M_2$ and $M_3$ = $a_2 d_{32} b_3$ = .0283, 95% CI -.0015 to .1272
Mediation Path through $M_3$ only = $a_3 b_3$ = .5186, 95% CI .2201 to .9008
* Indicates significant $p < .05$

**Figure 3: Serial Mediation Effect on Purchase Intentions**

-.3571, 95% CI = -.9570 to .2428). This is an example of indirect-only mediation, as described by Zhao, Lynch, and Chen (2010).

As a further test of the proposed order of effects, we reversed the order of the variables in the serial mediation chain to see if the smiling emoji first improved perceptions of relationship strength which in turn influenced the positive affective reactions. The indirect mediation path in this model with the causal order reversed was not significant ($\beta$ = .3313, 95% CI = -.0208 to 1.1330). This observation supports our theorizing that affective reactions to smiling emojis lead to improved relationships and not the reversed causal order. Similarly, and in an abundance of caution, we tested a third competing causal ordering, namely with emojis leading directly to future purchase intentions followed by relationship strength and positive affect. This reversed serial mediation path was also not significant ($\beta$ = .0122, 95% CI = -.0058 to .1962). We conclude that our proposed causal ordering is superior to alternative causal orderings based both on theory and empirical observations.

## Discussion

By utilizing biometric measurement, Study 1 reveals a novel effect of positive emojis on spontaneous affect as reflected in participants' facial expressions. This supports our theorizing that emojis can lead to emotional contagion effects. This study also supports a more nuanced model of emoji effects on important managerially relevant consequences in a service provider context that has not been previously tested. It is important to note that testing a direct effect of emojis on repeat purchase intent would have led to incorrect inferences regarding the emoji's beneficial impact. Only by examining a mediated model could the indirect effect of the emoji on purchase intentions be revealed. As Zhao, Lynch, and Chen (2010) have argued, truncating an empirical investigation of a well-supported process model due to the observation of no direct

effect on a focal dependent variable will often leave important indirect effects unrecognized and hinder theory development. Thus, this study involved a more thorough investigation of the process underlying smiley-face emoji effects. We demonstrated that emojis elicit a behaviorally mimicked response, which sequentially mediates conscious affect, relationship strength, and future purchase intentions.

**Study 2**

Study 1 demonstrates that emojis can generate affective responses through emotional contagion and thereby drive important managerially relevant consequences. Study 2 explores an important boundary condition to this effect. Li et al. (2018) found differences in the inferences about the sender generated by emojis based on the presence of communal vs. exchange relationships. Therefore, Study 2 was conducted to determine whether the presence of an exchange relationship (versus a communal relationship similar to Study 1) would undermine the effectiveness of an emoji in producing an affective response, as suggested by EASI theory. Because Study 1 demonstrated that both spontaneous behavioral affective responses and self-reported affect can be affected as hypothesized by emojis in customer service messages, we are able to rely on more easily measured self-reported affect in Studies 2 and 3.

As hypothesized, smiley-face emojis should elicit stronger positive feelings if the recipient has a communal relationship with the sender compared to an exchange relationship (Van Kleef 2016). An online study was conducted to understand how the presence or absence of emojis changes perceptions of a relationship between sender and receiver. In this study, the perceived strength of the relationship between sender and receiver is the key dependent variable, with self-reported affect as the proposed mediator.

Method

A 2x2 between-participants experimental design was used with emoji (present/absent) and relationship type (communal/exchange) as the orthogonal treatments. Participants were recruited using Amazon Mechanical Turk (MTurk) for participation in the study, ostensibly to understand digital communication habits, and randomly assigned to treatment conditions. The sample was restricted to respondents in the US who had 95% or better acceptance rates for their previous work on MTurk. Participation in the study took approximately six minutes and respondents were compensated $0.75 for their time.

Goodwin (1996) characterizes one determining factor of a communal relationship to be the longevity of the relationship. Additionally, consumers and hairstylists are more likely to develop stronger ties over time than other types of service providers such as plumbers or mechanics (Umashanker, Ward, and Dahl 2017). Therefore, type of relationship (communal vs. exchange) was primed by providing instructions (see Appendix B) to imagine that they had visited this hairstylist either once before (exchange) or many times before (communal).

A separate pretest of the relationship manipulation (Mturk sample = 231) revealed the longevity of the relationship was sufficient to prime a communal versus exchange mindset. A 14-item scale adopted from Clark (1986) was used to assess communality. The scale contained seven items to assess the level of communality of the relationship and seven exchange-oriented items. Participants in the pretest read the instructions and then completed the 14-item communality scale. The sum of the exchange items was subtracted from the sum of the communal items to form a net communality score such that the higher the score, the more communal the relationship. Participants then completed the Positive and Negative Affect Scale (PANAS, Watson, Clark, and Tellegen 1988) to ensure the two conditions were not confounded

with affect. Communality was perceived to be higher in the communal condition than in the exchange condition ($M_{exchange}$ = - 4.88 vs. $M_{communal}$ = 1.57, $t$ = -3.18; $p$ = .002), thereby supporting the manipulation. Additionally, the two conditions did not differ significantly on either positive affect ($M_{exchange}$ = 2.78 vs. $M_{communal}$ = 3.07; $t$ = -1.50, $p$ = .137) or negative affect ($M_{exchange}$ = 1.31 vs. $M_{communal}$ = 1.27; $t$ = .44, $p$ = .664).

In the main study, the instructions were followed by a screenshot of a text message conversation from the service provider to the participant. This was the same appointment reminder context used in Study 1. The gender of the sender was again matched to the gender of that of the participant. The only difference in presentation of stimuli was that the message was shown as a static screenshot, rather than the messages appearing sequentially (see Appendix C).

Consistent with recommendations of Goodman, Cryder and Cheema (2013), an attention check in the survey instrument was used to identify unengaged participants. The attention check was presented after the focal dependent variables. It consisted of one item reading "Please click the button for "strongly agree" to show you are paying attention." Failure to follow explicit instructions by clicking "strongly agree" is direct evidence that the participant is not paying attention. Passage of the attention check did not differ by condition (exchange x control = 87.9%, exchange x emoji = 82.8%, communal x control = 86.0%, communal x emoji = 84.1%; $\chi^2$ = .72, $p$ = .868). We analyzed the data both with and without attention check failures, and the conclusions did not change. Therefore, we left all participants in the analysis reported, regardless of whether they passed the attention check. The final sample consisted of n = 248 participants (48.8% female, $M_{age}$ = 35.6, SD = 12.0).

Self-reported measures of affect, relationship strength, and normative appropriateness (as a covariate) were taken, using the same scales as Study 1. Scores from the affect items were

averaged to form the affect measure ($r$ = .93). Relationship strength items were averaged to form an index of relationship strength ($\alpha$ = .87). Normative appropriateness items were also averaged, as in the previous study, ($\alpha$ =.76), and used as a covariate in all analyses involving affect as the dependent variable. Understanding of the relationship instructions was assessed by using an instructional manipulation check asking participants how many times they were supposed to have previously visited the service provider on a 7-point scale ranging from once before to many times.

Results

*Manipulation Checks*. Manipulation checks were conducted to ensure the success of each treatment. Those in the communal condition reported higher previous visit frequency ($M_{communal}$ = 5.62) than those that were in the exchange condition ($M_{exchange}$ = 1.82; $t$ = -17.19, $p$ < .001). Additionally, those in the emoji condition ($M_{emoji}$ = 57.1%) were more likely to remember the presence of an emoji than those in the control condition ($M_{control}$ = 2.9%; $\chi^2$= 94.62, $p$ < .001). Correctly remembering the presence of emoji did not differ between those in the exchange x emoji condition and the communal x emoji condition ($M_{exchange\ x\ emoji}$ = 50.0% vs. $M_{communal\ x\ emoji}$ = 63.8%; $\chi^2$ = 2.83, $p$ = .243). Thus, there were no cross-factor confounding effects. The manipulation check was performed to ensure that the manipulations were successful overall. No participants were excluded based on responses to the manipulation checks.

*Relationship Strength*. The overall model with perceived relationship strength as the dependent variable was significant ($F$(4,243) = 10.20, $p$ <.001; see Table 2). The overall effect was driven by the main effect of relationship type ($F$(1,243) = 31.04, $p$ < .001) and a marginally significant emoji x relationship type interaction ($F$(1,243) = 3.44, $p$ = .052). The main effect of emoji was not statistically significant ($F$(1,243) = .69, $p$ = .408). The main effect of relationship

**Table 2**

Study 2 Model Summaries

| | Affective Reaction | | Relationship Strength | |
|---|---|---|---|---|
| | *F* | *p* | *F* | *p* |
| Overall Model | 10.96 | .000 | 10.20 | .000 |
| Intercept | 23.27 | .000 | 68.85 | .000 |
| Norms | 40.65 | .000 | 1.78 | .184 |
| Relationship Type | .96 | .329 | 31.04 | .000 |
| Emoji | .50 | .480 | .69 | .408 |
| Relationship*Emoji | 4.27 | .040 | 3.81 | .052 |

reveals that those in a communal relationship with the message sender rate the relationship as stronger than those in the exchange condition.

Deconstructing the emoji x relationship type interaction effect on relationship strength through planned contrasts revealed a significant simple main effect of emoji within the communal relationship condition ($F(1,243) = 3.93$, $p = .049$). However, within the exchange condition, there is no emoji effect ($F(1,243) = .63$, $p = .429$). Using an emoji enhanced perceptions of relationship strength only when a communal relationship had been established ($M_{emoji} = 5.42$, SD = 1.18 vs. $M_{control} = 4.96$, SD = 1.20; $p = .049$), (see Figure 4). In the exchange relationship scenario, there was no difference in perceptions of relationship strength. ($M_{emoji} = 4.17$, SD = 1.17 vs. $M_{control} = 4.36$, SD = 1.21; $p = .429$). This finding shows that relationship type changes the ability of the emoji to influence a managerially relevant, dependent variable in relationship strength that has not been previously studied in this emerging research stream.

*Affect.* The overall model with positive affect as the dependent variable was significant ($F(4,243) = 10.96$, $p < .001$, see Table 2). There was no main effect of emoji ($F(1,243) = 0.50$, $p = .480$) or relationship type ($F(1,243) = .96$, $p = .329$) on affect. However, in line with our hypothesis, the emoji x relationship interaction was obtained for affect ($F(1,243) = 4.27$, $p = .040$). Deconstructing the interaction reveals no effect of emoji within the exchange condition ($M_{exchange\ x\ control} = 77.36$, SD = 16.63 vs. $M_{exchange\ x\ emoji} = 74.29$, SD = 16.07; $F(1,243) = .916$, $p = .340$). However, in the communal condition, there was a positive effect of the smiling emoji ($M_{communal\ x\ control} = 70.48$, SD = 16.43 vs. $M_{communal\ x\ emoji} = 76.74$, SD = 16.19; $F(1,243) = 3.91$, $p = .049$). This supports our expectation that an emoji generates a positive affective reaction within communal relationships, but not exchange relationships.

*Mediation by affect*. To test whether affect mediated the impact of the emoji on relationship strength in the communal condition, we ran a mediation analysis by using the PROCESS macro for SPSS (Model 8, Hayes 2013). We modeled the presence of the smiley-face emoji as the independent variable,

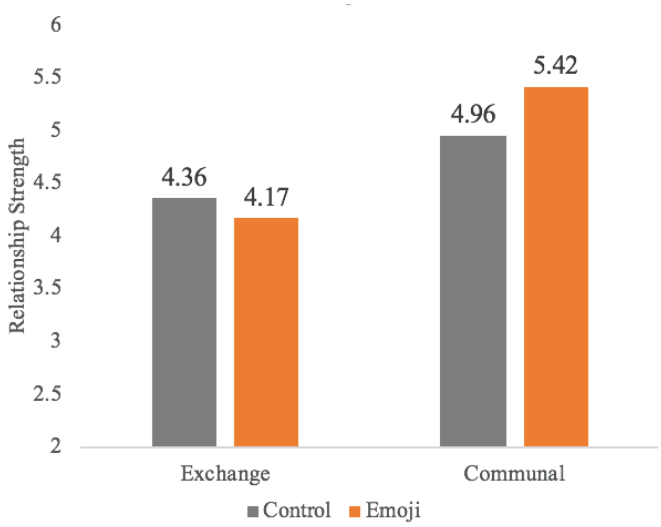



**Figure 4**: **Post-Message Perceptions of Relationship Strength**

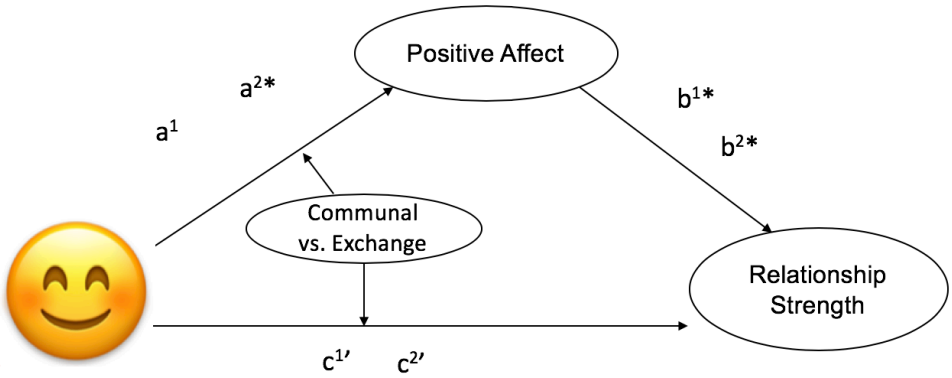
relationship type as the moderator, affective reaction as the mediator, and relationship strength as the dependent variable. The conditional indirect effect of emoji within communal relationships on relationship strength through affect is positive and significant ($\beta$ = .1718, 95% CI = .0033 to .4108). Within the exchange condition, the conditional indirect effect is not significantly different than zero ($\beta$ = -.0843, 95% CI = -.2618 to .0809), thereby supporting moderated mediation via an affective mechanism. The moderated direct effect of emoji is not significant when affect is included as a mediator (see Figure 5).

### Discussion

This study provides the first evidence of an affective mechanism working to produce heightened perceptions of service relationships resulting from emoji usage, thus providing support for $H_5$ and our overall theoretical model. In this scenario, a smiling emoji led to a positive affective response which strengthened relationship perceptions within the communal relationship condition, but not the exchange condition. Our demonstration that the ability of smiling emojis to impact relationship strength through customer affective responses is dependent on relationship type, communal vs. exchange, is a novel contribution.

## Study 3

Study 2 replicates the positive effect of emojis on affective responses and relationship strength first demonstrated in Study 1. Further, Study 2 supports positive affect's causal mediation of emoji's influence on strength of the relationship as well as an important boundary condition for the effect, the presence of a communal, rather than exchange, relationship. Study 3 provides a necessary, systematic replication of important boundary conditions based on relationship type. By providing an alternative manipulation of relationship type, we strengthen construct validity inferences for our proposed moderator.




Conditional Indirect Effects:
Exchange Condition: -.0843, 95% CI: -.2618 to .0809
Communal Condition: .1718, 95% CI: .0033 to .4108
Index of Moderated Mediation: 2561, 95% CI .0227 to .5817
Superscript "1" indicates the exchange condition; superscript "2" indicates the communal condition
* Indicates significant $p < .05$

**Figure 5: Moderated Mediation in Study 2**

Thus far, relationship type has been manipulated through a simple description of relationship duration. Communal and exchange relationships differ on many other dimensions besides duration, such as level of trust, self-disclosure, and expected reciprocity (Goodwin 1996). Therefore, this study utilized a different manipulation of communality to bolster our claim that communality (or lack thereof) is, in fact, what is moderating the emoji effect on relationship strength.

## Method

The study was conducted online with 152 US undergraduate college students participating (43.4% female) in exchange for extra course credit and in full compliance with institutional review board standards. Study design and methods were identical to that of Study 2 with the only difference being the relationship manipulation. Participants were randomly assigned to a 2 (emoji: control vs. present) x 2 (relationship type: communal vs. exchange) design.

*Relationship Manipulation*. Communal and exchange relationships were primed using descriptions of each relationship type that were adapted from Aggarwal and Law (2005, see Appendix D). The relationship descriptions used as primes were unrelated to the text message stimuli. The description for communal relationships described a friendship based on trust. The exchange description described a relationship based on expectations of immediate reciprocity. After reading the assigned description (communal or exchange), participants answered an open-ended question pertaining to the scenario as well as the 14-item communality scale used in the pretest reported in Study 1. After completing the manipulation check, participants then switched to a seemingly unrelated task in which they saw the same text message stimuli as in Study 2.

*Measurement*. Communality scores were computed by subtracting the sum of exchange items from the sum of the communal items. This net communality score was then utilized to assess the success of the relationship manipulation. Affective reactions were captured using the same 2-items (good, happy) as in studies 1 and 2 ($r$ = .70) using a 100-point VAS scale. Relationship strength was measured with the same three-items used in studies 1 and 2 and ($\alpha$ = .81). As in the previous studies, the three-item measure of normative appropriateness of emoji usage ($\alpha$ =.54) was assessed for covariate purposes.

Results

*Manipulation Checks*. Participants in the communal condition reported higher levels of communality compared to those in the exchange condition ($M_{exchange}$ = -5.86 vs. $M_{communal}$ = 4.91; $t$ = 8.28, $p$ < .001), confirming the success of the relationship type manipulation. Additionally, those in the emoji condition recalled the presence of an emoji (72.4%) more than those in the control condition (3.9%) indicating that the emoji manipulation was successful ($\chi^2$ = 101.814, $p$ = .000). Correctly remembering the presence of the emoji did not differ based on relationship priming (exchange x emoji = 75.7% vs. communal x emoji = 69.2%, $\chi^2$ = 3.079, $p$ = .215). Thus, the manipulations were successful. No participants were deleted based on these manipulation check responses.

*Relationship Strength*. To test the effects on relationship strength we ran an ANOVA with relationship type, emoji presence, and their interaction as the independent variables ($F$(4,147) = 3.72, $p$ = .006, see Table 3). In this study, the significant overall ANOVA model was driven by the main effect of relationship type ($F$(1,147) = 3.82, $p$ = .052), an emoji main effect ($F$(1,147) = 8.32, $p$ = .005), and a marginally significant emoji x relationship type interaction ($F$(1,147) = 2.81, $p$ = .096). Planned contrasts reveal that, consistent with our hypothesis, the

**Table 3**

Study 3 Model Summaries

| | Affective Reaction | | Relationship Strength | |
|---|---|---|---|---|
| | *F* | *p* | *F* | *p* |
| Overall Model | 8.31 | .000 | 3.72 | .006 |
| Intercept | 1.54 | .216 | 26.13 | .000 |
| Norms | 21.00 | .000 | .50 | .482 |
| Relationship Type | 1.32 | .253 | 3.82 | .052 |
| Emoji | 9.73 | .002 | 8.32 | .005 |
| Relationship*Emoji | 3.76 | .054 | 2.81 | .096 |

smiling emoji did not improve relationship strength within the exchange condition ($M_{exchange\ x\ control}$ = 3.92, SD = 1.32, $M_{exchange\ x\ emoji}$ = 4.17, SD = 1.32; $F(1,147) = .72$, $p = .396$). However, as expected, within the communal condition the emoji increased perceived relationship strength ($M_{communal\ x\ control}$ = 3.32, SD = 1.32 vs. $M_{communal\ x\ emoji}$ = 4.12, SD = 1.32; $F(1,147) = 10.34$, $p = .002$).

*Affect*. Turning to positive affect as the dependent variable, the overall model was significant ($F(4,147) = 8.31$, $p < .001$, see Table 3). This overall model was driven by a main effect of emoji ($F(1,147) = 9.73$, $p = .002$) and an emoji x relationship type interaction ($F(1,147) = 3.76$, $p = .054$). There was no main effect of relationship type ($F(1,147) = 1.32$, $p = .253$). Planned contrasts reveal that within the exchange condition, the emoji did not impact positive affect ($M_{exchange\ x\ control}$ = 66.01, SD = 22.93, $M_{exchange\ x\ emoji}$ = 70.38, SD = 22.95; $F(1,147) = .69$, $p = .408$). However, within the communal relationship condition, the emoji increased positive affect ($M_{communal\ x\ control}$ = 54.49, SD = 22.97 vs. $M_{communal\ x\ emoji}$ = 73.35, 23.02; $F(1,147) = 12.73$, $p < .001$), as predicted.

*Mediation by affect*. To test the affective mediation path, PROCESS model 8 was again used as a test of moderated mediation (Hayes 2013). A test of the affective path shows the positive indirect effect of emoji presence on relationship strength through positive affect in the communal relationship condition ($\beta = .2039$, 95% CI .0400 to .4609) but not in the exchange relationship condition ($\beta = .0472$, 95% CI = -.0484 to .2221). When controlling for the affective path, the direct effect is not significant in the exchange condition ($\beta = .2091$, 95% CI -.3806 to .7987). However, the direct effect is observed in the communal condition ($\beta = .7805$, 95% CI .1757 to 1.3853). This partial mediation result provides support for $H_5$. The fact that the direct effect is still positive and significant in the communal condition indicates the presence of at least

one additional complementary mediator. EASI theory would suggest that inferences about the message sender (i.e., customer service provider) may be the other mediator of emoji effects on relationship strength (Li et al. 2018).

Discussion

Study 3 provided another test of the relationship type moderator with a different manipulation of relationship type. The pattern of results replicated the findings in Study 2 whereby an emoji within the presence of a communal relationship strengthens the affective path of influence on perceived relationship strength. These effects were not significant in the exchange condition. Thus, our inferences regarding the moderating role of relationship type on smiling emojis impact on affect were strengthened by showing that different operationalizations of the proposed moderator led to similar patterns of effects.

## GENERAL DISCUSSION

Our work provides initial evidence for an affective path of influence for smiling emojis used in digital service messages directed to consumers. However, we also show for the first time that affect generated in response to a smiling-face emoji mediates the relationship between emojis and perceptions of relationship strength. This mediation process was captured using both self-report and biometric measures of unconscious affect. Thus, the current research offers novel theoretical, empirical, and practical contributions while also opening up a new approach to investigating the use of emojis by marketers.

### Single-paper Meta-analysis

Meta-analysis has been strongly encouraged by methods experts as a better way of discovering empirical regularities across sets of related studies than traditional applications relying exclusively on single-study, null hypothesis statistical testing (Rosenthal 1984, 1990).

We investigated the hypothesized effects of smiley-face emojis on affect and relationship strength in four additional experiments, generally following the procedures described in studies 1 - 3. We provide the results of a single-paper meta-analysis following procedures described by McShane and Böckenholt (2017) in order to assess the overall average effect size for the seven studies and ensure transparency by clearing our "file drawer." Table 4 provides an overview of the seven studies.

Across seven studies, the meta-analysis confirmed an emoji x relationship type interaction on relationship strength with effect size (ES) of .65 (95% Confidence Interval (CI): .14 to 1.16). This means that the emoji effect is different within communal relationships than it is within exchange relationships (see Figure 6 contrast 1). Within the communal relationship condition, using a smiling emoji in a digital service communication leads to significantly stronger relationships than when no emoji is used for digital service messaging. The average simple effect size is 0.60 (95% CI: .25 to .93), which should be interpreted as meaning that the effect is approximately .6 scale points on a seven-point scale of relationship strength (see Figure 6 contrast 3). Consistent with expectations, the simple effect of emoji within an exchange relationship is not significantly different than zero (ES = -.06, 95% CI: -.44 to .32; 90% CI: -.19 to .07, see Figure 6 contrast 2).

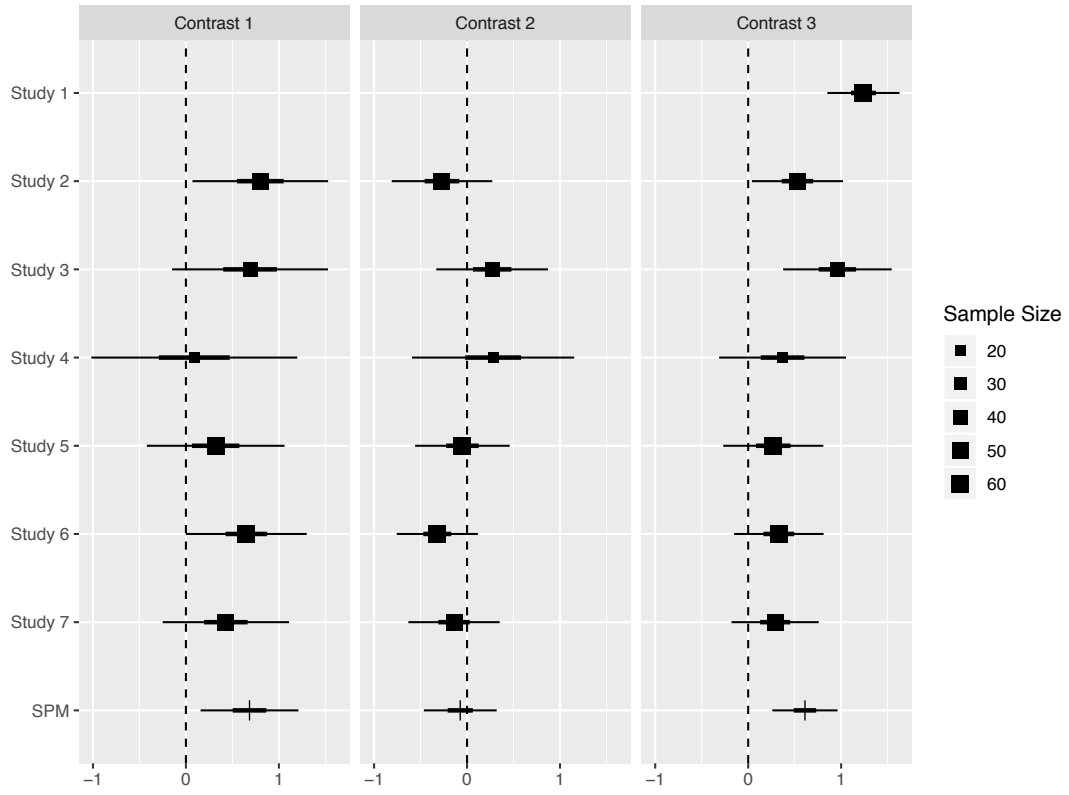
Although the single-paper meta-analysis method is not currently capable of analyzing mediation models (McShane and Böckenholt 2017), we examined the emoji effect on the affective mediator alone, because this effect is necessary to the proposed affective mediation mechanism. The meta-analysis reveals a small interaction effect with affect as the dependent

**Table 4**

Studies Included in Meta-Analysis

| Study | Relationship Manipulation | Emoji Stimulus | Sample Source | Sample Size | Key Measures Included | Affect Scale Items | Study Design[2] |
|---|---|---|---|---|---|---|---|
| Study 1 | Many times | 😊 | Student | 113 | Affect**<br>Relationship Strength** | Good, Happy<br>100-point scale | 2 conditions<br>(both communal) |
| Study 2 | One time vs.<br>Many times | 😊 | Mturk | 248 | Affect**<br>Relationship Strength** | Good, Happy<br>100-point scale | 2 x 2 |
| Study 3 | Adapted from Aggarwal and Law 2005 | 😊 | Student | 152 | Affect**<br>Relationship Strength** | Good, Happy<br>100-point scale | 2 x 2 |
| Study 4 | One time vs.<br>Many times | 😊 | Student | 69 | Affect*<br>Relationship Strength | Good, Happy<br>100-point scale | 2 x 2 |
| Study 5 | One time vs.<br>Many times | 😊 | Mturk | 237 | Affect<br>Relationship Strength | PANAS[1]<br>5-point scale | 2 x 2 |
| Study 6 | One time vs.<br>Many times | 😊 | Mturk | 245 | Affect<br>Relationship Strength* | Good, Happy<br>7-point scale | 2 x 2 |
| Study 7 | Mechanic vs. Hair stylist Umashankar, Ward, and Dahl 2017 | 😊 | Mturk | 218 | Affect<br>Relationship Strength | Good, Happy<br>100-point scale | 2 x 2 |

** Indicates a significant effect at $p < .05$
*Indicates a significant effect at $p < .10$
[1]PANAS refers to the Positive and Negative Affect Scale (Watson, Clark, and Tellegen 1988)
[2] 2 x 2 denotes between-participants design with two orthogonal factors: relationship type (communal/exchange) and emoji (present/absent)
Studies 1 – 3 were described in detail in the main paper




*The confidence intervals depict the size of the overall interaction (Contrast 1), the simple effect within the exchange condition (Contrast 2) and the simple effect of emoji within the communal condition (Contrast 3). The thicker lines represent 90% confidence intervals; the thin lines represent 95% confidence intervals. The dashed vertical line denotes "no effect."

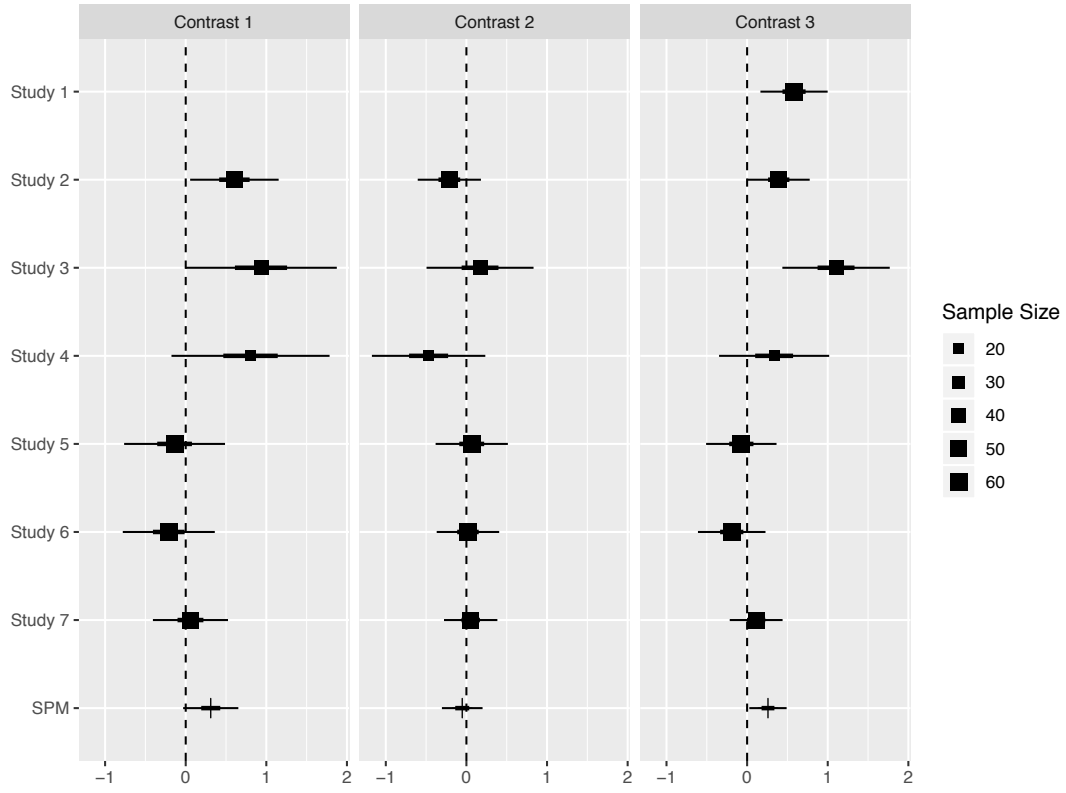
**Figure 6: Effect Size of Emoji Influence on Relationship Strength***

variable that is reliable across studies at 90% confidence (ES = .30, 90% CI: .18 to .42 see Figure 7 contrast 1). Deconstructing this interaction shows no reliable effect within the exchange condition (ES = -.03, 90% CI: -.12 to .05, see Figure 7 contrast 2). However, within the communal condition, the effect of the smiling emoji is small but reliable at both the 90% and 95% confidence levels (ES = .27, 90% CI: .19 to .35, 95% CI: .03 to .51, see Figure 7 contrast 3).

While the seven studies revealed a similar pattern of results, not all studies reached conventional levels of statistical significance for all hypothesized effects and effect sizes varied. Importantly, the single-paper meta-analysis results, with all seven studies included, support the hypothesis that a smiling emoji can positively impact affect and perceptions of relationship strength when a communal relationship has been established, but not when the consumer's relationship with the service provider is best characterized by an exchange mindset.

**Theoretical Insights**

Prior research has demonstrated that service providers communicating with an existing client base can use emojis tactically as a meaning-laden symbol of the sender's affective state. Consistent with Van Kleef 's (2009) Emotions as Social Information model, Li et al. (2018) showed that emojis can facilitate certain types of positive inferences related to the warmth of the message sender in a customer service message when marketer-customer relationships can be characterized by communality. The emoji, if fitting with overall communication strategy, can help increase customer satisfaction by encouraging these positive inferences. In making a new contact or in the early stages of a relationship, emojis should not be expected to have a strong effect because the early relationship norms are closer to those experienced in an exchange relationship.




*The confidence intervals depict the size of the emoji effect (vs. no emoji) within the communal condition. The thicker lines represent 90% confidence intervals; the thin lines represent 95% confidence intervals. The dashed vertical line denotes "no effect."

**Figure 7: Effect Size of Emoji Influence on Affect***

However, Van Kleef's (2009) EASI model suggests a complementary mechanism for building and maintaining relationships through emoji-generated affect. We demonstrate that positive affective responses to a smiling emoji are also generated only under communal relationship conditions. Additionally, based on Study 1 findings, emojis can elicit spontaneous affect without the need for cognitive mediation through a process akin to emotional contagion. Zajonc, Pietromonaco, and Bargh (1982) differentiate between the expression and experience of emotion. Emotional expressions occur automatically, without conscious awareness while the experience of emotion is associated with conscious awareness (Zajonc et al. 1982). Because we were able to detect the emotional expression through time spent smiling and self-reported emotional response, further evidence is provided for primitive emotional contagion as the underlying process. Without this spontaneous response, it would be difficult to determine whether the observed effects on self-reported affect were due to emotional contagion effects (Hatfield et al. 1994) or merely affect as information (Schwarz and Clore 1983).

As one of our reviewers pointed out, this does not mean that emojis cannot also generate affect as a function of inferences made about the message sender and/or the customer-service provider relationship. For example, inferring that a service provider is a warm person and that one's relationship with that person is strong may lead customers to experience positive affect in the form of liking for the salesperson. Although this causal chain is unlikely in our research because we show a spontaneous affective response through biometric measurement, it is a plausible complementary mechanism that may be present in some contexts. In effect, our research can be viewed as completing the initial exploration of Van Kleef's model begun by Li et al. (2018) in their recent paper and by Glikson, Cheshin, and van Kleef (2017) in a different context.

**Managerial Implications**

Managers considering adding emojis to their tactical communications should first consider the nature of the relationship existing between marketer and customer. Effective use of smiley-face emojis would only be expected under communal relationship conditions, particularly in one-to-one service provider-customer relationships. When communicating to a larger audience, such as on a marketer social media webpage, the number of audience members could be quite large, making it less likely that the receiver would attribute the emotional expression as personally directed. Thus, it behooves the marketer to enhance perceived communality even in communication contexts that are one-to-many. For example, Bank of America used the tagline, "Life's Better When We're Connected." Priming personal connectedness could enhance the effectiveness of smiley-face emojis.

Our works shows that emojis can also elicit spontaneous positive emotional responses, thereby increasing the effectiveness of digital messages between customer service providers and customers as a tool for building and maintaining marketing relationships. Because spontaneous emotional responses may persist for only a short time, managers would to do well to consider smiley-face emoji use in contexts that ask the consumer for a managerially relevant response in close proximity to message reception.

In addition, with respect to the affective mechanism, emojis allow for a broader range of emotional expressions than could be studied in current research. We focused on the affiliative response of a smile. This was chosen to fit the appointment reminder context because many service providers utilize text messages for this purpose and because such emojis are among the most commonly used types in practice. However, emojis that elicit different emotional responses

may be more appropriate in other situations. For example, emotional responses to complaints will likely be very sensitive to perceptions of appropriateness and authenticity (Van Kleef 2016).

Service failures violate consumer expectations of service quality, thereby leading to more thorough processing of the information contained in any subsequent message from the offending service provider. Higher levels of information processing should lead to a greater emphasis on the inferential route over affective reactions (Van Kleef 2016). Paradoxically, a sad emoji could evoke more positive affect and/or elicit more positive inferences about the sender than a happy emoji in some contexts. For example, a sad emoji used in response to a service failure may lead to an inference that the sender feels bad about the situation and lead to a positive impression. Thus, managers must pay careful attention to matching the communication context and objective to the valence of emojis being considered.

Finally, the interpersonal context of this research is most relevant for an individual service provider. It remains to be seen how an emoji as a signal of emotion from a company or brand would be perceived. It may be naturally acceptable for individuals to express emotions, but it may not be as appropriate for a brand to do so on social media or in text messages in all contexts. Brands get credit for emotional messages on social media which also convey authenticity (Kolowich 2016). However, some brands have been criticized for emotional posts on social media perceived to be exploiting a tragedy (Burton 2016). For these reasons, normative appropriateness should be assessed prior to employing emojis in marketing communications. The role of usage norms in digitally mediated marketing relationships has not been explored systematically and represents a potentially fruitful and important direction for future research.

**Limitations and Future Research**

Van Kleef et al. (2015) demonstrated that a receiver's response to an emotional signal within a news story directed to a broad audience was totally mediated by the inferential path. Therefore, the topic of the message itself, as it varies in personal relevance to the receiver, may influence the strength of any affective reaction, as well as influence the depth of elaborative processing as suggested by other dual process models of persuasion (Petty, Cacioppo, and Schumann 1983). Hudson et al. (2016) demonstrated that cultural differences in uncertainty avoidance may moderate the effectiveness of social media in building brand relationships. Thus, other cultural differences are likely to exist with respect to the impact of non-verbal/textual cues such as emojis on digitally mediated marketing relationships. Additional research is needed to determine the effects of emoji usage by marketers in a broader communication context such as social media posts and to investigate how the effectiveness of such communication tools may vary cross-culturally.

Other than the current paper, the limited prior research in this emerging research stream related to emoji use by marketers has focused exclusively on inferences generated by emojis used in digital communications. However, to date, only warmth and competence inferences have been studied (Li et al. 2018). It is an open question as to whether or not these two types of inferences capture the range of possible inferences elicited by marketers' use of emojis. Further, our work and that of Li et al. (2018) support the importance of communal relationships for an emoji to have positive effects. However, it is plausible that some inferences, such as competence, are more commonly elicited in other types of customer service relationships such as exchange relationships. It is also possible that competence inferences could be more common in response to messages related to customer service failure. Li et al. (2018) observed service failures shifted

consumers' focus to make exchange norms more salient, subsequently producing a negative effect of emojis in that context. Clearly, there is much work to be done to identify additional possible inferential mediators of emoji effects and on the possible moderators of these mediators, as suggested by the EASI.

Finally, the use of emojis by marketers in digital communications could also have unexplored cognitive effects. For example, emojis may attract attention to the message, thereby enhancing message processing. If attention to the message is enhanced, recall of key message content and any arguments intended to persuade may be improved as well. Whether or not these effects on attention and memory are effective would depend on the intent of the message sender. Recall alone can be a valuable objective for marketers. However, if there is persuasive intent, the tendency of an emoji to attract attention to message arguments in the digital communication could lead to positive or negative persuasion depending on the strength of the arguments presented in the message, as has been clearly demonstrated in persuasion research based on the Elaboration Likelihood Model (Petty et al. 1983).

The research presented here focused on emojis because of their timeliness and the lack of research guiding their effective use in marketing. As channels of communication are evolving, so will the signals that are used within the communication. Emojis may dominate digital signaling for many years, but it is also likely that other communication trends such as memes, gifs, or something entirely new will replace or augment the presence of emojis within a digital marketing message. It is reasonable to expect that the effects found in this research would extend to other such tools, as long as they serve as a signal of the sender's emotional state, relate personal characteristics, and/or generate affect in the message recipient.

## CHAPTER CONCLUSION

Digital technologies will continue to shape how consumers relate to one another and to marketers. Service providers need to understand the dynamics of how these technologies provide meaning in order to effectively develop and manage online relationships. We hope that knowing that emojis strengthen marketing relationships by generating positive affect when such relationships are characterized by higher degrees of communality can help service providers actively manage relationships with their consumers using digital communications.

# CHAPTER II

# WHEN CONNECTED PRODUCTS FAIL TO CONNECT

## ABSTRACT

Product automation increases efficiency for consumer tasks, thereby affording marketers a new means of product differentiation. However, are there possible negative consequences to automation? I propose that a product controlled through digital mediation (e.g., through a smart phone or voice control instead of through direct contact) lowers consumers' overall physical connection and reduces psychological ownership. Psychological ownership leads to increased attitudinal (satisfaction and attachment) and behavioral (product maintenance behaviors and brand loyalty) consequences of interest to marketers. Thus, if digital mediation negatively impacts psychological ownership, this may lead to lower aftermarket sales to maintain products and decreased repurchase intentions. I suggest anthropomorphizing products may help to attenuate the negative consequences of product automation on consumer psychological ownership and subsequent marketing outcomes.


## INTRODUCTION

"Alexa, begin vacuuming the living room." This simple verbal command accomplishes a previously routine task by delegating it to an automated product. Increasingly, such tasks are being accomplished by a verbal command to a smart home device or by a tap on a smartphone application without ever coming in contact with the end product.

Consumers achieve greater efficiency by not having to invest their own time and effort into routine tasks such as cleaning the floors or mowing the lawn. However, as this separation from products becomes more commonly integrated into consumers' lives, it also disturbs the normal consumer-product relationship development process. Just as digitally mediated communication changes how human relationships develop (Walther 1992), it will also impact how consumers perceive and relate to products. I propose that automation of products will lower

consumers psychological ownership of the target product and disrupt both the natural attitudinal and behavioral consequences that develop as a result.

## THEORETICAL BACKGROUND

Psychological ownership, is a cognitive and affective state of 'felt' ownership that develops towards a target, separate from any claims of legal ownership (Pierce et al. 2003). These feelings of ownership lead to positive attitudinal, motivational, and behavioral consequences related to the target (Pierce et al. 2003).

In marketing, psychological ownership has been used to explain how the ability to touch an object (or expected touch of an object) increases perceptions of ownership, and subsequent valuation pre-purchase (e.g. Atasoy and Morewedge 2017; Peck and Shu 2009). However, other routes to psychological ownership, along with other potential consequences have largely been unexplored. Additionally, research has shown both contextual and individual differences play a role in how psychological ownership develops (Folse, Moulard, and Raggio 2012). Such differences are highlighted in previous research on psychological ownership of places (Asatryan and Oh 2008) and are proposed in the context of robotic service encounters (Van Doorn et al. 2017). I seek to demonstrate how mediated product interactions disrupt the process of psychological ownership development post-purchase and produce predictable downstream consequences of relevance to marketers.

Smart technology has been extended to a variety of product categories including lighting, appliances, and many others. In many cases, such as thermostats and security systems, connected products offer greater capabilities than were possible before which actually increases the frequency of interaction. Under these conditions, psychological ownership may actually increase vs. traditional products because smart products are offering more information and enabling

consumers to come to know the product intimately. However, automated products are those that reduce or replace the need for human interaction. Automated versions of traditional consumer products are already available for vacuum cleaners and lawn mowers, with self-driving cars on the immediate horizon. My research investigates how the automation of products impacts human interactions and the development of product relationships.

**Psychological Ownership**

Developing predictions regarding how automation can disrupt psychological ownership requires an understanding of how ownership perceptions develop. As Pierce et al. (2003) explain, psychological ownership can develop via three processes: (1) through perceptions of control, (2) through acquisition of intimate knowledge of the target, or (3) as a consequence of investment of the self into the target. Psychological ownership can develop through one or some combination of the three mechanisms. Automated products operate independently, meaning without direct interaction. Although this may imply greater flexibility and convenience for the consumer, automated operation may undermine these routes to psychological ownership.

To illustrate, think about traditional and robotic vacuum cleaners. A robotic vacuum cleaner can operate while the legal owner is away from home, allowing for convenience and multi-tasking. However, the operating experience may negatively influence psychological ownership via one or more of the three routes. For example, a traditional vacuum can be guided to directly address a problem area or go back over areas to pick up debris missed on the first pass. Robotic vacuums, by contrast, spend a predetermined amount of time covering all areas of the room equally rather than addressing a specific mess or high traffic area that may need extra attention. Debris left behind on the first pass will likely not be addressed in a second attempt. This may lead to feelings of a loss of control over how the product operates, especially if it

means extra effort to repeat the cycle or picking up left behind pieces manually. Further, the same task done with a traditional vacuum provides direct feedback during operation. The operator can feel the weight of the vacuum in their hand, the noise provides confirmation of particles being picked up, the pull of resistance indicates the level of suction power. All of these help the operator to know the product more intimately and are absent when the product is automated. As the consumer interacts directly and repeatedly with the product, investment of the self into the product becomes more likely. All three routes to psychological ownership can be disrupted when products are automated, thereby leading to overall weaker psychological ownership perceptions (see Figure 8). Formally stated:

> $H_1$: Automated (traditional) products will undermine (enhance) psychological ownership of a target.

**Attitudinal and Behavioral Outcomes**

Psychological ownership leads to positive attitudinal, behavioral, and motivational consequences related to the target (Jussila et al. 2015; Pierce et al. 2003). I focus on four discrete attitudinal and behavioral outcomes expected as a result of automation.

As a product becomes psychologically owned it develops a closer association with the self (Pierce et al. 2003; Dittmar 1992). This self-extension leads to more positive evaluations of the product (Belk 1988) because evaluating it is similar to evaluating oneself, resulting in higher product satisfaction. Additionally, Kleine and Baker (2004) describe psychological appropriation as a necessary antecedent for forming an emotional attachment to a specific object. As

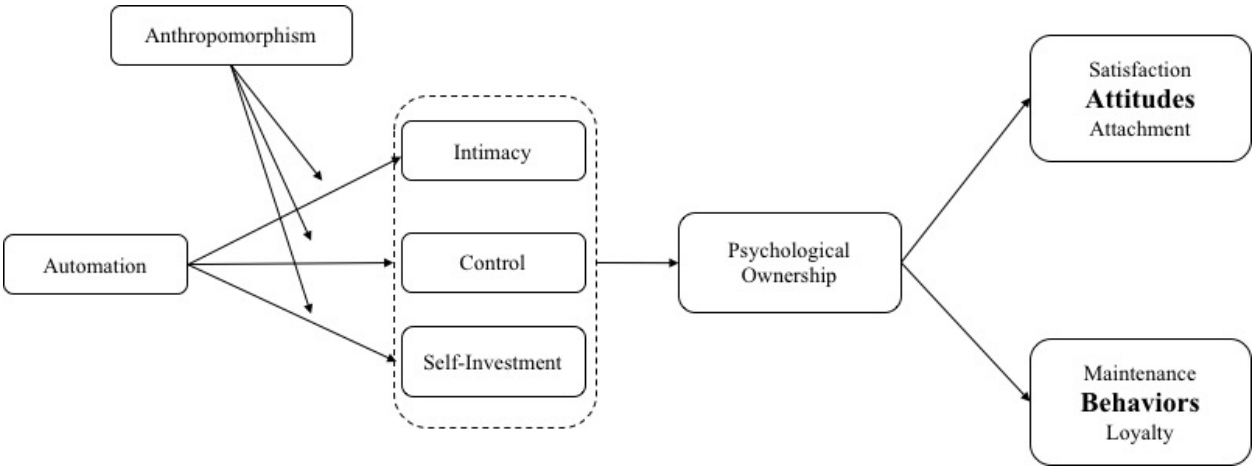



**Figure 8: Framework of Automation Effects on Consumer Outcomes**

automation disrupts the process of forming psychological ownership, it also disrupts the formation of these positive product related attitudes.

$H_2$: Automated (traditional) products will have a negative (positive) impact on a) product satisfaction and b) emotional attachment, mediated by psychological ownership.

Concurrently, behavioral outcomes of psychological ownership may also be disrupted by automation. Perceiving a product as part of the extended self also motivates consumers to preserve the object as a way of preserving the self (Belk 1988). This desire to preserve the product relationship may lead consumers to extend the life of that product through proactive maintenance behaviors. Proactive maintenance behaviors are the amount of time, money, or effort spent caring for the product. Additionally, these preservation motives may motivate consumers to extend the relationship at time of replacement, leading to greater loyalty upon repurchase. These behavioral outcomes allow consumers to prolong and sustain the product relationship.

$H_3$: Automated (traditional) products will have a negative (positive) impact on a) proactive maintenance behaviors and b) repurchase intentions, mediated by psychological ownership.

**Attenuating Effect**

The discussion thus far has focused how automation may interfere with the way consumers interact with products and how that ultimately impacts the consumer-product relationship. However, understanding the process and routes to ownership allows marketers and

designers to open new routes to psychological ownership. I believe anthropomorphizing automated products mitigates the negative effects of automation.

Anthropomorphism occurs when people perceive humanlike characteristics in nonhuman creatures or objects (Epley, Waytz, Akalis, and Cacioppo 2008). People naturally anthropomorphize objects when driven by effectance motives, as a way of promoting feelings of control (Epley et al. 2008). If, as hypothesized, automated products threaten feelings of control, anthropomorphizing the product may be a natural reaction.

Automated products have the capability to act independently, to respond, and to adapt which make them more readily anthropomorphized than traditional products. When products are anthropomorphized, norms and expectations of the social world are more readily applied to the relationship with the product (Aggarwal and McGill 2011, Kim and McGill 2014).

Waytz Heafner, and Epley (2014) found that anthropomorphizing a car led to higher perceptions of trusting the product. As trust is related to intimacy (Larzelere and Huston 1980), I believe anthropomorphizing the product strengthens the intimacy route to subsequent psychological ownership. Additionally, anthropomorphism helps alleviate feelings of loss of control. Perceiving that the product as another living being helps consumers to feel that someone is in control rather than the product just acting randomly. Waytz et al. (2010) demonstrate that anthropomorphizing allows people to feel that the target is more predictable and understandable. Finally, anthropomorphism often leads people to take actions to care for a target, such as naming the product or talking to the product which increases feelings of self-investment. Therefore, anthropomorphism will ameliorate the negative impact of automation on psychological ownership.

Recent research has found that anthropomorphizing service robots has led to negative effects by triggering the uncanny valley response (Mende et al. 2019). That is that by appearing too human-like, these robots evoked feelings of creepiness. However, in the context of automated products, current designs do not approach the point of visually appearing almost human and therefore should not evoke the uncanny valley effect seen in that research.

Anthropomorphizing a product may have a direct additive direct effect on psychological ownership because anthropomorphism in itself activates the routes to psychological ownership, or, because consumers are more likely to anthropomorphize automated products, it may have an interaction effect on the disrupted paths to ownership.

$H_4$: Anthropomorphism of products will attenuate the negative effect of automation on psychological ownership.

**Current Research**

Unlike previous studies of psychological ownership in marketing which focus on willingness to pay for an object prior to acquisition (e.g. Atasoy and Morewedge 2017), I focus on the relationship dynamics that develop after purchase and usage. The differences in the way consumers experience traditional and automated products during ownership will change how psychological ownership develops and its downstream consequences.

To illustrate this effect, I first turn to Amazon reviews to examine the affective component of psychological ownership. Next, through a simulated usage scenario of traditional and automated products, I show the difference in psychological ownership that develops after initial product usage and how that translates to lower initial satisfaction. Finally, through the use

of field data, I illustrate how automation impacts the routes to psychological ownership development, the downstream effects of automation on product satisfaction, attachment, proactive maintenance, and loyalty intentions, and the reparative effect of anthropomorphism.

## METHOD AND RESULTS

### Study 1

#### Method

As an initial test of the hypotheses, I collected Amazon reviews of traditional and automated products to test for differences in the affective dimension of psychological ownership. I scraped a one-month census of Amazon reviews from 5 top selling products for both traditional and robotic vacuum cleaners. Traditional and robotic vacuum cleaners vary in terms performance (suction power, dust bin capacity etc.). Therefore, the sample was restricted to 5-star reviews to control for those functional differences. This approach produced a sample of 738 reviews and provided a conservative test of the theoretical expectations. The text of the combined reviews was analyzed using Linguistic Inquiry and Word Count software (LIWC; Pennebaker et al. 2015). LIWC classifies words according to an internal, proprietary algorithm or dictionary. I used emotional tone as a proxy for the affective component of psychological ownership. The emotional tone of each message is the net number of the positive emotional words minus the negative emotional words, with higher numbers indicating a more positive emotion (Cohn, Mehl, and Pennebaker 2004; Pennebaker et al. 2015).

#### Results

As expected, the emotional tone of the reviews for traditional vacuums was significantly more positive (98.95%) than those for robotic vacuums (85.59%, $p < .01$, see Figure 9). This result suggests a weaker emotional connection to the automated product, even when initial

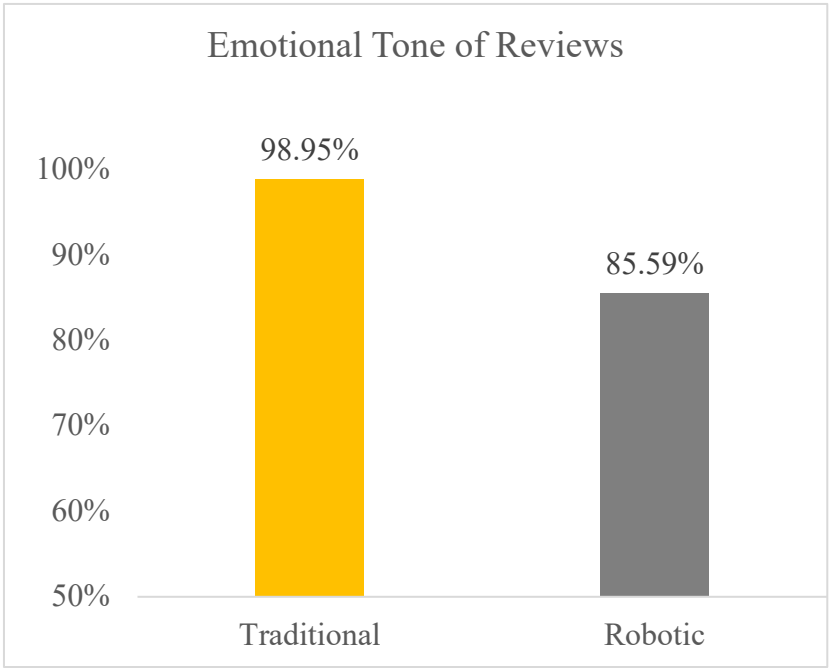



**Figure 9: Text Analysis of Consumer Reviews**

satisfaction is high and provides initial support for $H_1$. The more positive tone of the traditional product is indicative of the emotional characteristics of psychological ownership.

### Discussion

This study provides initial evidence of differences emerging in emotional connection to products when they are automated. While the emotional tone is not a direct measure of psychological ownership, the result is as hypothesized. Subsequent studies will provide a more robust measurement of psychological ownership and the downstream consequences that would be expected.

## Study 2

Study 2 simulated the experience of product usage to understand the process of psychological ownership ($H_1$) development and its implications on attitudinal consequences of satisfaction ($H_{2a}$). In this study, a virtual driving experience was used to simulate product usage of either a traditional or self-driving car resulting in a one factor (traditional vs. automated) experimental design.

### Method

Participants were recruited from a departmental subject pool in which they received extra credit for participation (n=86, 63% female). The virtual test drive was conducted using a Sony Playstation VR headset along with a steering wheel and pedals. Participants were instructed to take a virtual test-drive of the car by driving two laps around the virtual track. Those in the automated condition were also told that it was a self-driving car. Therefore, they did not have to interact with any of the car's controls directly and only operated the car through voice commands. In reality, they were watching a replay of someone else driving the car. Participants in the traditional car condition controlled the car with the steering wheel and pedal controllers.

After the virtual test drive, participants answered questions about their psychological ownership and satisfaction with the car. Attachment requires a personal history with the product that is unlikely to develop after a single usage (Kleine and Baker 2004). Therefore, only satisfaction ($H_{2a}$) was assessed after initial usage.

*Measures.* Participants rated their psychological ownership of the car by indicating their agreement on a nine-point scale with five-items adapted from Fuchs, Prandelli, and Schreier (2010) including: “Although I do not legally own this car yet, I feel like this is "my" car,” “This car incorporates part of myself,” “I feel that this car belongs to me,” “I feel connected to this car,” and “I feel a strong sense of closeness with this car.” ($\alpha$ = 91).

Satisfaction for the car that they “drove” were assessed using a single-item measure “Based on this test drive, how satisfied are you with this car?” on a nine-point scale ranging from “not at all” to “extremely.” After assessing the primary variables of interest, participants were asked about their previous driving experience, attitudes about driving, attitudes about technology, previous experience with video games similar to the one used to test the study, as well as demographics. Attitudes toward technology as well as category-specific identity motives may influence preference for automated products pre-purchase (Lueng, Paolacci, and Putini 2018) and may also impact how psychological ownership develops (Jussila et. al 2015). Therefore, these measures were included as control variables in this study.

Results

A one-way ANOVA with car type as independent variable, psychological ownership as the dependent variable, and the identity motives (importance of technology, enjoyment of driving) as control variables revealed a significant effect of automation ($F(1,82) = 5.00$, $p = .03$, see Figure 10). As expected, psychological ownership was significantly higher for those in the

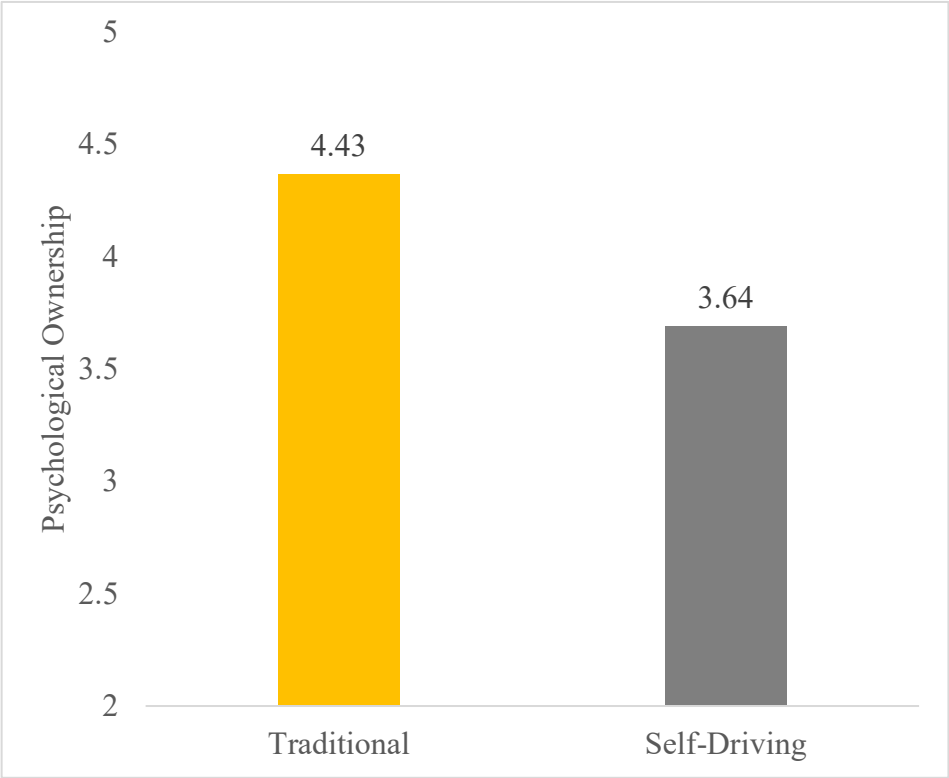



**Figure 10: Psychological Ownership by Car Type**

traditional car condition ($M$ = 4.43) than in the self-driving car condition ($M$ = 3.64), providing support for $H_1$ (see Table 5 for full results). Similarly, satisfaction was higher for those who drove the traditional car than the self-driving car ($M_{traditional}$ = 6.57 vs. $M_{self\text{-}driving}$ = 6.17; $F(1,82) = 5.05$, $p$ = .03).

Further, the indirect effect was tested using Hayes (2016) Process macro model 4 with the car type as the independent variable, psychological ownership as the mediator, and satisfaction as the dependent variable. Both driving enjoyment and importance of technology were included as control variables. Results of the test reveal the negative effect of automation on satisfaction was mediated by psychological ownership ($\beta$ = -.2480, 95% CI: -.4837 to - .0393). Providing support for $H_{2a}$ (see Figure 11) . The effect on satisfaction was fully mediated by psychological ownership meaning the direct effect was no longer significant when controlling for the indirect path ($\beta$ = -.1938, 95% CI: -.5287 to .1411)

Discussion

Study 2 provides support for the hypothesized effects of automation on psychological ownership after an initial product usage. Participants reveal lower levels of psychological ownership when using an automated product versus a traditional version of the same product. Additionally, this study provides a demonstration of how psychological ownership impacts one downstream product attitude, satisfaction. The remaining questions of how psychological ownership forms and develops post-purchase, and ways of mitigating the negative effects are addressed in study 3.

**Table 5**

Chapter 2 Study 2 Model Summaries

| | Psychological Ownership | | Satisfaction | |
|---|---|---|---|---|
| | *F* | *p* | *F* | *p* |
| Overall Model | 16.68 | .001 | 3.39 | .022 |
| Intercept | 5.40 | .023 | 35.80 | .000 |
| Technology Importance | 7.31 | .008 | 3.85 | .053 |
| Driving Enjoyment | 4.00 | .049 | .804 | .372 |
| Car | 5.00 | .028 | 5.05 | .027 |

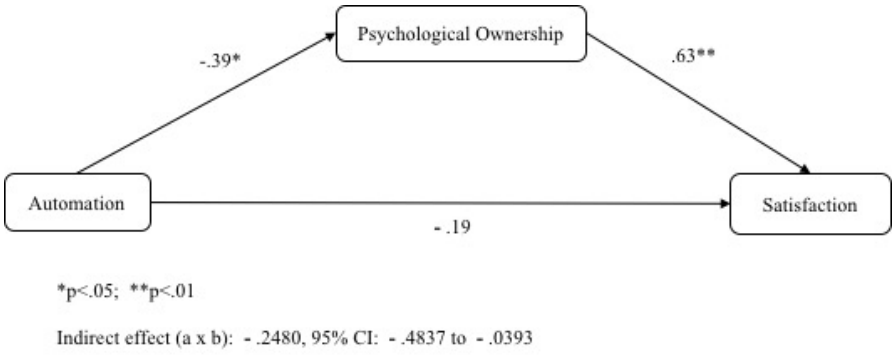



**Figure 11: Automation Effect on Satisfaction ($H_{2a}$)**

**Study 3**

While study 2 shows the negative effect of automation on psychological ownership and initial attitudes after an initial usage, Study 3 provides a full test of the model ($H_1$ -$H_4$), with actual owners of traditional and automated versions of the same product, vacuum cleaners. Study 3 examines how automation impacts the routes to developing psychological ownership, longer-term satisfaction, attachment, and other marketer-valued behavioral outcomes, as well as the compensatory role of anthropomorphism. As hypothesized, robotic vacuum usage should lower overall psychological ownership and subsequent outcomes of interest compared to traditional vacuum cleaners. This study draws on a sample of actual owners to examine the post-purchase relationships that form with products.

Method

Vacuum cleaners were chosen for the product context for this study because they are currently the most widely adopted automated product with 8% of vacuum consumers owning one (Mintel 2017). The sample was obtained through AYTM marketing research which maintains a consumer panel of verified product owners. To qualify for the study, participants were required to be a current owner of the product and have either primary or shared responsibility for using the vacuum cleaner. The final sample consisted of six hundred current owners of traditional (n=301) and robotic (n=299) vacuum cleaner owners who were surveyed in a quasi-experimental design (67.2% female; $M_{age}$ = 45.3, SD = 13.2).

*Measures.* Participants first responded to scale items designed to measure their psychological ownership of the product, using four of the items from study 2. One item ("although I do not legally own the product..") was excluded because it was not relevant for this study of vacuum owners. These four items were combined to form a measure of psychological

ownership ($\alpha$ = .81). Next, to understand the impact of each of the routes of psychological ownership, participants rated their control, self-investment, and intimacy with the product. These were each assessed using single item measures of agreement on a seven-point scale ("I have complete control over the vacuum," "It requires an investment of my time and effort," "I am intimately familiar with how it operates").

Satisfaction was measured using the same single item measure of satisfaction as Study 2, on a seven-point scale. Attachment was measured by assessing their agreement (on a seven-point scale ranging from "strongly disagree" to "strongly agree") with three items adapted from Sivadas and Venkatesh (1995) possession attachment ("I am emotionally attached to my vacuum," "I am sentimental about my vacuum," "I have no feelings for my vacuum" reverse coded). These three items were averaged to form a measure of emotional attachment to their vacuum ($\alpha$ = .77).

Product maintenance behaviors were assessed by asking participants the frequency with which they empty the dust bin, change filters, clean the brush roll, and perform other maintenance behaviors (on a five-point scale ranging from "Never" to "Every time I use it"). These four items were averaged to form a measure of maintenance behaviors ($\alpha$ = .75).

To understand the impact on future purchases ($H_{3b}$), I focused on brand loyalty for future purchases. As emerging technology enables additional features, I would not expect consumers to repurchase an identical product. Staying loyal to the brand would serve as a way to prolong the product relationship while still allowing consumers to take advantage of newly available features. Therefore, future purchase intentions in this study asked consumers their likelihood of repurchasing the same brand as their current product (on single item, five-point scale ranging from "Extremely unlikely" to "Extremely likely").

Technology and product category specific identity motives were again assessed as control variables to remove variation due to the product category and to focus on formation of psychological ownership of the product. Participants rated both the importance of owning the latest technology as well as the importance of having a clean home on a seven-point scale (ranging from not at all important to extremely important).

Within the sample of current owners, I measured differences in anthropomorphism by asking how much they think the product felt like a person/was thought of like a person (Kim and McGill 2011), as well as whether or not they gave their vacuum a name, a behavioral indicator of anthropomorphism.

Results

*Psychological ownership.* An initial test of psychological ownership was conducted with vacuum type as the independent variable and psychological ownership as the dependent variable. As hypothesized, anthropomorphism should mitigate the negative effect of automation on formation of psychological ownership, so it was included as a control variable in a test of the main effect along with the identity motives (importance of technology and clean home). The results showed that traditional vacuum owners ($M_{traditional} = 4.57$) had significantly higher psychological ownership than robotic vacuum owners ($M_{automated} = 4.37$; $F(1,595) = 4.68$, $p = .03$) supporting $H_1$ (see Table 6).

The routes to psychological ownership were assessed by using Hayes (2016) process macro model 4 with vacuum type as the independent variable, the routes to psychological ownership (intimacy, control, self-investment) as parallel mediators, psychological ownership as the dependent variable, along with the previously mentioned control variables. In this model, automation had negative indirect effects on psychological ownership through two of the

**Table 6**

Chapter 2 Study 3 Model Summary

| | Psychological Ownership | |
|---|---|---|
| | *F* | *p* |
| Overall Model | 116.74 | .000 |
| Intercept | 15.78 | .000 |
| Technology Importance | 55.93 | .000 |
| Clean Importance | 25.08 | .000 |
| Anthropomorphism | 176.99 | .000 |
| Vacuum | 4.68 | .031 |

proposed routes: intimacy ($\beta$ = -.0456, 95% CI: -.0984 to -.0107) and control ($\beta$ = -.1834, 95% CI: -.2713 to -.1048). Automation had a negative impact on self-investment ($\beta$ =.61, $p < .001$) but self-investment did not lead to psychological ownership in this model ($\beta$ = -.0183, 95% CI: -.0548 to .0134). After mediation, the remaining direct effect from was not significant ($\beta$ = .0385, 95% CI: -.1526 to .2296) indicating complete mediation. This supports $H_1$ and shows that automation negatively impacts psychological ownership through both lowered feelings of control and lower intimacy as compared to traditional product counterparts (see Figure 12).

*Attitudinal consequences.* To understand the impact of automation, on attitudinal variables such as satisfaction and emotional attachment, I used Hayes (2016) Process Macro model 4 with automation as the independent variable, psychological ownership as the mediator, and satisfaction and emotional attachment respectively as the dependent variables in separate models (see Figure 13). Because I expect anthropomorphizing the product to mitigate the negative effect, I included it as a control variable (along with the identity related controls discussed earlier) to understand the main effect of automation on my dependent variables.

Results for satisfaction

reveal a negative effect of automation on satisfaction, mediated through psychological ownership ($\beta$ = -.0970, 95% CI: -.1888 to -.0095), providing support for $H_{2a}$. After controlling for the indirect effect, the direct effect on satisfaction is not significant ($\beta$ = .0463, 95% CI: -.1459 to .2384). Similarly, the effect on emotional attachment was mediated through psychological ownership ($\beta$ = -.1452, 95% CI: -.2771 to -.0178), providing support for $H_{2b}$. The direct effect for emotional attachment was not significant ($\beta$ = .0903, 95% CI: -.0801 to .2606, see Figure 14).

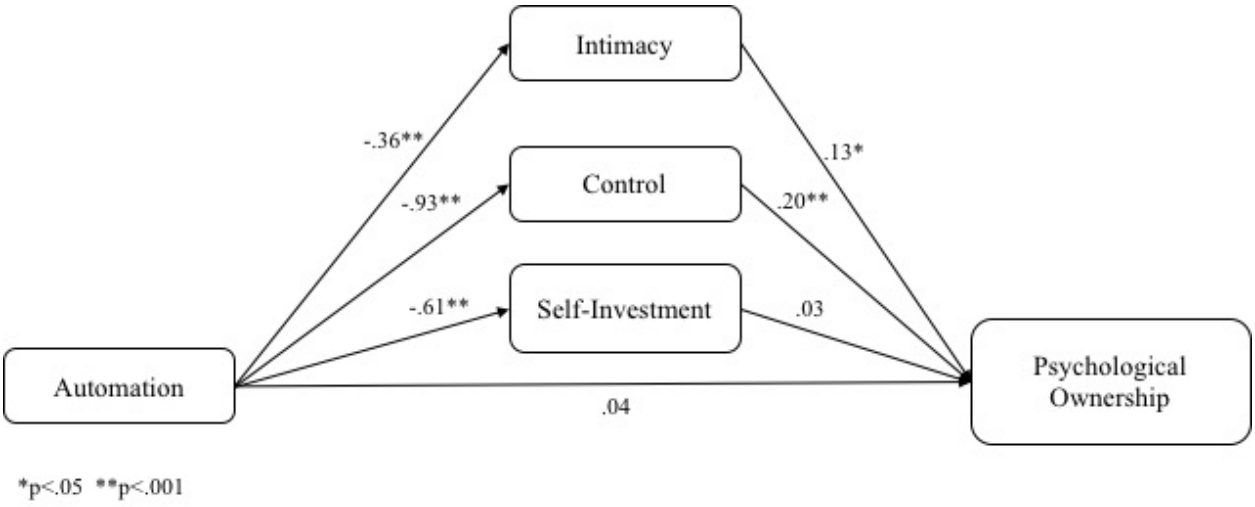



**Figure 12: Automation Effect on Routes to Psychological Ownership**

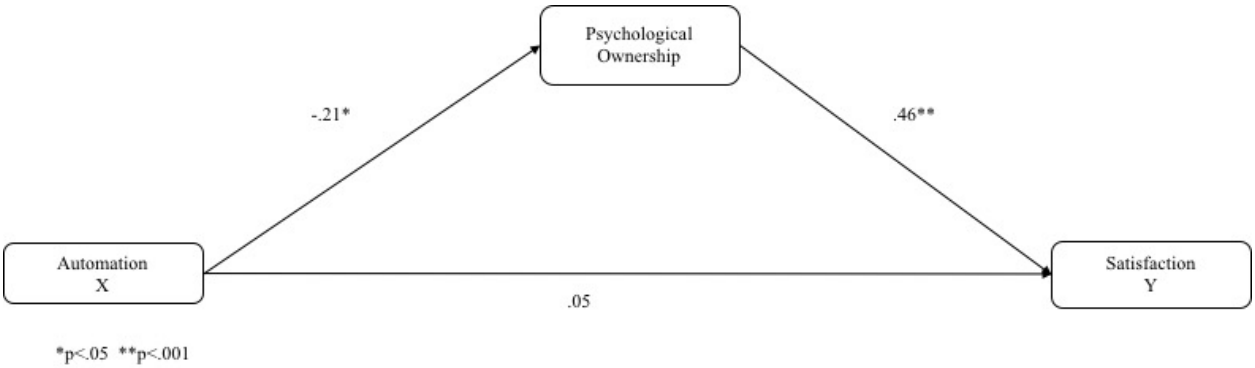



**Figure 13: Automation Effect on Satisfaction through Psychological Ownership ($H_{2a}$)**

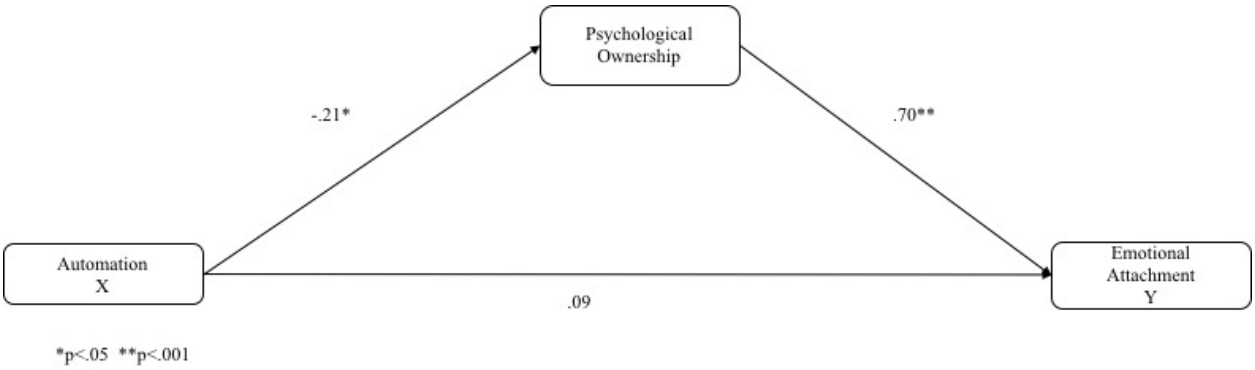



**Figure 14: Automation Effect on Attachment through Psychological Ownership ($H_{2b}$)**

*Behavioral Consequences.* To understand the downstream effects of automation on the proposed behavioral outcomes, I repeated the previous analysis using the Hayes (2016) Process Macro model 4 with maintenance behaviors and brand loyalty as the dependent variables in separate models. There is a negative indirect effect of automation on maintenance behaviors through psychological ownership ($\beta$ = -.0239, 95% CI: -.0498 to -.0025). However, the direct effect is still positive and significant ($\beta$ = .1599, 95% CI: .0518 to .2680) indicating that another mechanism is contributing positively to maintenance of robotic vacuums (see Figure 15). While psychological ownership provides some explanatory power, there may are product characteristics of robotic vacuums which require these vacuums to be maintained more frequently than their traditional counterparts. For example, smaller dust bins on robotic products require that they be emptied more frequently compared to traditional vacuums.

Finally, the same model with brand loyalty as the dependent variable demonstrates the negative indirect effect of automation through psychological ownership ($\beta$ = -.0562, 95% CI: -.1099 to -.0074). After controlling for psychological ownership, the direct effect is no longer significant ($\beta$ = .0327, 95% CI: -.1195 to .1848, see Figure 16) providing support for $H_{3b}$.

*Anthropomorphism.* As expected, levels of anthropomorphism were higher for robotic vacuum owners than for traditional owners using both the attitudinal measure ($M_{traditional}$ =2.07 vs. $M_{automated}$ = 3.38, $p < .001$) as well as the behavioral indicator of naming the vacuum ($M_{traditional}$ = 4.0% vs. $M_{automated}$ = 42.5%; $\chi^2$ = 124.83, $p < .001$).

To further investigate the impact of anthropomorphism on formation of psychological ownership, I ran a moderated mediation model (Hayes 2016 Process Macro model 8) with the vacuum type as the independent variable, psychological ownership as the dependent variable, each of the

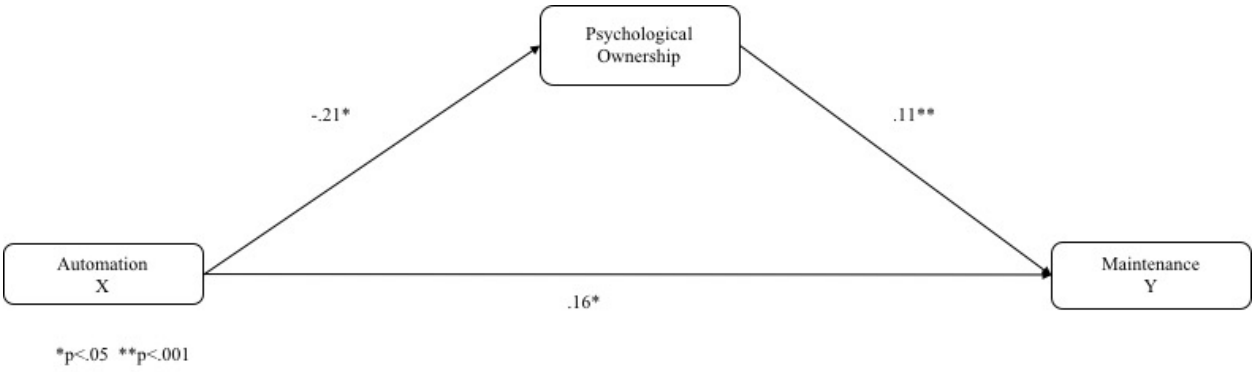



**Figure 15: Automation Effect on Maintenance through Psychological Ownership ($H_{3a}$)**

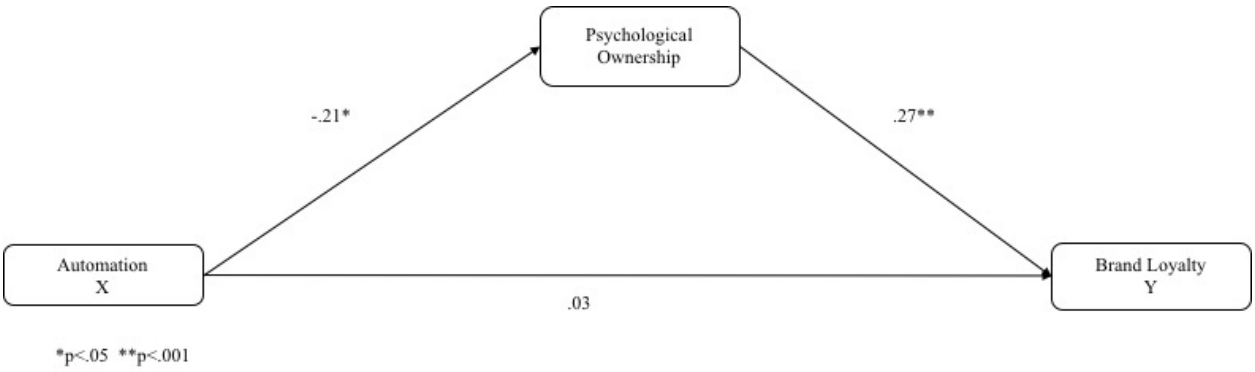



**Figure 16: Automation Effect on Loyalty through Psychological Ownership ($H_{3b}$)**

previously identified routes to ownership (intimacy, control, and self-investment) as parallel mediators, and anthropomorphism as the moderator (see Figure 17).

In this model, anthropomorphism significantly positively interacted with the route of control (index of moderated mediation: .0467, 95% CI: .0220 to 0769). The negative impact of automation on control becomes significantly less negative at higher levels of anthropomorphism providing support for $H_4$. A floodlight analysis using the Johnson-Neyman technique (Spiller et al. 2013; Johnson and Neyman 1936) shows a critical value of 5.07. This means that those that rated their product as being human-like at or above this threshold on a seven-point scale, overcame the negative effects of automation through anthropomorphism. Those that rated the product lower than this level still experienced a significant negative effect of automation. Within this sample, only 12.8% were above this threshold.

Anthropomorphism marginally interacted with the intimacy routes of intimacy (index of moderated mediation: .0116, 95% CI: -.0008 to .0311) and self-investment (index of moderated mediation: .0050, 95% CI: -.0031 to .0180) were not significantly improved at higher levels of anthropomorphism. Neither the direct effect of vacuum type ($\beta$ = .2365, $p$ = .15) nor the direct interaction effect of vacuum x anthropomorphism ($\beta$ = -.0732, $p$ = .13) on psychological ownership are significant when controlling for the indirect paths. There is a significant positive direct effect of anthropomorphism ($\beta$ = .4452, $p$ <.01) on psychological ownership. Because anthropomorphism serves as both a moderator of the paths to ownership as well as a direct effect, it should be considered a quasi-moderator (Sharma, Durand, and Gur-Arie 1981).

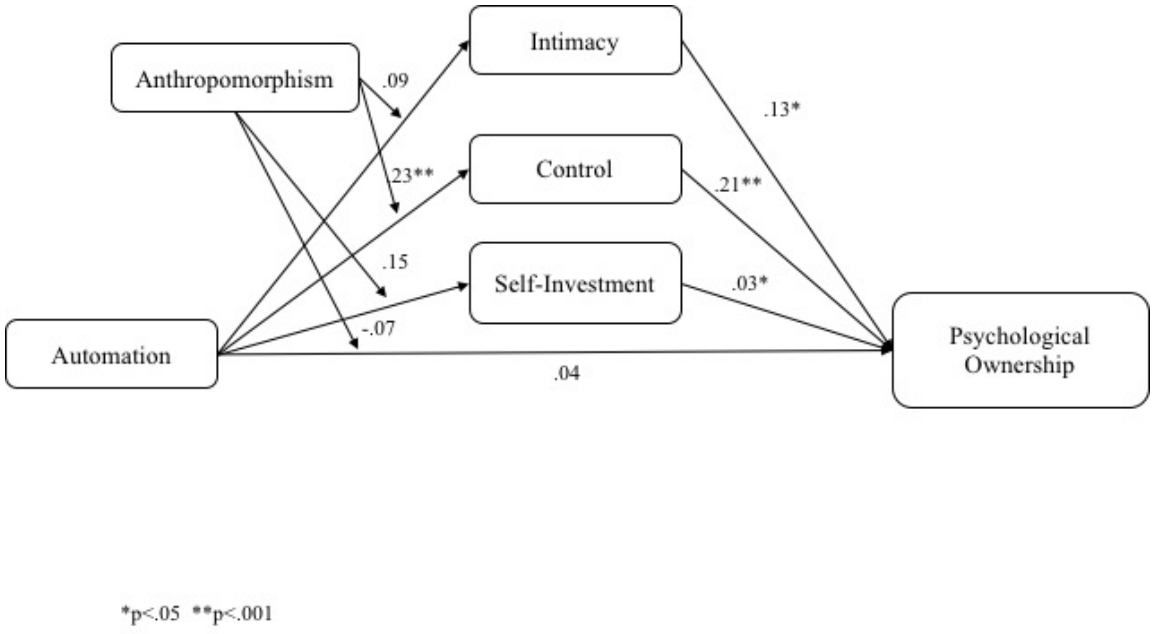


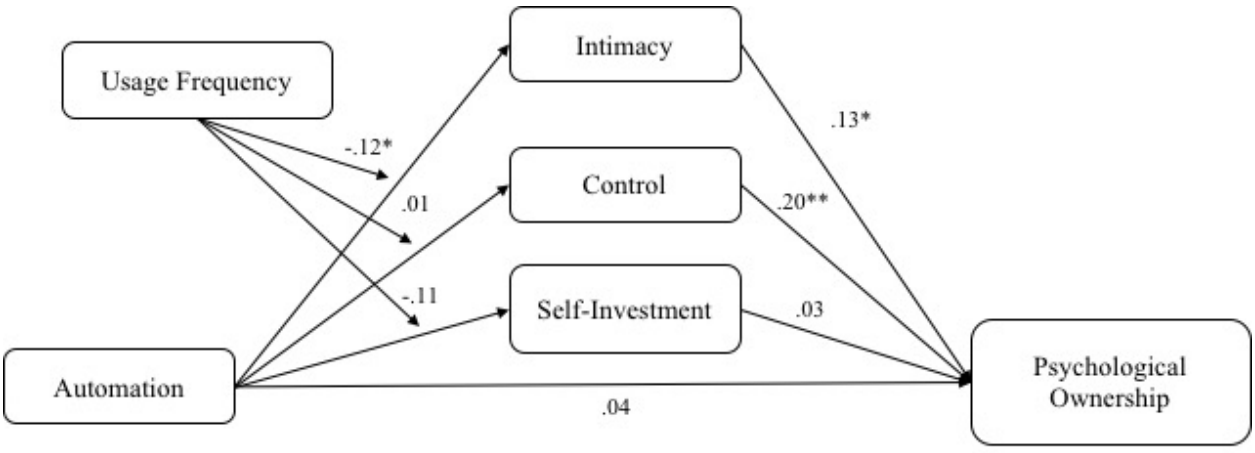

**Figure 17: Interaction of Anthropomorphism with Routes to Ownership ($H_4$)**

*Role of Continued Usage.* Although it not formally hypothesized, previous literature would suggest that time interacting with the product would play a role in psychological ownership (Jussila et al. 2015). Continued usage of a product should make the differences in intimacy, control, and self-investment between traditional and robotic products become more pronounced as people experience more connection with traditional products and greater disconnect with robotic products.

To understand the role of usage frequency on formation of psychological ownership, I repeated the analysis of the routes to psychological ownership and added the frequency of usage to the model as a moderator of the effect on automation on each mediator (Hayes 2016 Process Macro Model 7). Results show that usage frequency negatively impacts the intimacy route (index of moderated mediation -.0157, 95% CI: -.0374 to -.0009) to psychological ownership, but not the control (index of moderated mediation .0019, 95% CI: -.0205 to .0245) or self-investment (index of moderated mediation -.0034, 95% CI: -.0156 to .0027) routes (see Figure 18). Specifically, as vacuum usage increases, feelings of intimacy increase for traditional vacuum cleaner owners and decrease for robotic vacuum owners. The remaining direct effect is not significant when controlling for mediating variables ($\beta$ = .0385, 95% CI: -.1526 to .2296).

## Discussion

This study provides important contributions to what has been previously published about psychological ownership. First, it illustrates the mechanisms by which automation impacts psychological ownership. Automation undermines two of the three previously identified routes to psychological ownership: intimacy and control. Over repeated usage the route of intimacy becomes significantly more negative indicating that the more the product is used, the greater the negative effect on psychological ownership and subsequent downstream consequences.




*p<.05 **p<.001

**Figure 18: Impact of Repeated Usage on Psychological Ownership**

This study shows that psychological ownership contributes to satisfaction, emotional attachment, maintenance behaviors, and brand loyalty. Satisfaction, attachment, and brand loyalty are negatively affected by automation through lowered psychological ownership. Maintenance behaviors are negatively impacted by psychological ownership, but other product characteristics more than make up for this effect leading to greater maintenance than their traditional counterpart.

Finally, this study demonstrates that anthropomorphizing products helps to restore feelings of control and subsequent psychological ownership for robotic vacuum owners. While the negative effect remains, the effect is significantly less negative at high levels of anthropomorphizing. Anthropomorphizing vacuums also has a remaining positive main effect on psychological ownership for both vacuum types, indicating that there is are benefits of anthropomorphizing to all kinds of vacuum owners. However, for robotic vacuum owners in particular, there is also the positive interaction effect. As seen in this dataset, people are much more likely to anthropomorphize automated products. Managers should encourage this process as a way of avoiding the potential damage to psychological ownership and downstream consequences.

## GENERAL DISCUSSION

Currently about 32% of US households have adopted some form of smart technology, and adoption is forecasted to reach 53.1% of households by 2022 (Statista 2018). For consumers, automation allows for managing routine tasks more efficiently. However, this may lead consumers to feel more connected to the interface device (smartphone or smart home device) rather than the end product itself. The convenience and efficiency of these products will continue to drive the growth of the category. However, the negative implications of automation identified

in this research may make longer term customer relationship management more of a challenge for marketers if customers/users are less satisfied and less attached to their products.

**Theoretical Contributions**

Previous research has explored types of consumer-product relationships and the downstream consequences of those relationships (e.g. Lastovicka and Sirianni 2011). In marketing, research on psychological ownership has focused on the effects of product valuation before a purchase is made (e.g. Atasoy and Morewedge 2017). I extend this line of research to show how differences in psychological ownership develop as a result of the product interface and demonstrate subsequent undesirable effects on important consumer outcomes. Additionally, while previous research on psychological ownership in marketing has focused on feelings of ownership prior to purchase, this work illustrates that post-purchase. Once the product is legally owned, differences in feelings of ownership can be affected by automation.

Psychological ownership in marketing contexts has thus far focused on the control route to ownership through manipulating physical touch (Peck and Shu 2009; Atasoy and Morewedge 2017). Although physical touch leading to feelings of control accounts for some of the automation effect on psychological ownership, I also demonstrate that automation undermines the intimacy route as well. Feelings of intimacy with the product are much lower when the product is automated, further undermining feelings of psychological ownership. Self-investment was not a significant path within my sample of vacuum cleaner owners. Nonetheless, I believe the self-investment route may be undermined by automation in other product categories given the lack of presence that is required for operation.

Importantly, my work also examines one way for marketers to overcome these limitations of automation. Consumers are more likely to anthropomorphize automated products than

traditional products because they seemingly act independently, having a mind of their own. Therefore, product anthropomorphism is already naturally occurring, to some degree, with automated products. This research shows product anthropomorphism helps to mitigate the negative effect of automation on feelings of control. Consumers feel less loss of control compared to non-anthropomorphized products and, thus, have higher psychological ownership. Although it was expected to also have an effect on intimacy, anthropomorphism did not interact significantly with that route to ownership. Anthropomorphism primes social cues and can prompt feelings of social belonging (Mourey, Olsen, and Yoon 2017). If product designers and marketing managers take steps to encourage consumers to anthropomorphize products more, I believe the intimacy route could also be positively impacted by anthropomorphism.

**Managerial Implications**

Colin Angle, co-founder of iRobot, said Roomba was intentionally not given human-like features to avoid perceptions of cuteness, but he realized most consumers still named their vacuum (Wright 2010). This research supports the idea that consumers are more likely to name and anthropomorphize robotic products versus their traditional counterparts along with the benefits of doing so. A named product is more personalized to its owner, and if it responds to its name, the effect becomes stronger by fostering communication and intimacy between the consumer and the product. Product designers should support and facilitate this type of customization that may help mitigate some of the negative effects of automation.

Recent research on product anthropomorphism has revealed that humanizing service robots can lead to negative reactions as the robot becomes too human-like (Mende et al. 2019). This finding suggests that the robots were approaching the “uncanny valley” effect, or the point where the robot starts to become so close to appearing human that a feeling of creepiness is

provoked (Mori, MacDorman, and Kageki 2012). While this uncanny valley may be a risk at some point with automated products, current designs do not reach the point of being too humanlike. Instead, in the case of vacuums and lawn mowers, as they are designed to seem more alive, they may be thought of more as R2-D2 (harmless, cute, droid) and less like the terminator (killer robot capable of destruction).

This research focuses on anthropomorphism as a way to mitigate the negative effect of automation on psychological ownership. However, past research has identified other design cues that may help bolster psychological ownership such as greater recall of preferences, transformation, and periodic signaling (Baxter, Aurisicchio, and Childs 2015). iRobot, and other robotic vacuum manufacturers, have already begun to incorporate some of these into their products. For example, newer models allow consumers to create a map of their room within the app and provide notifications of job completion which should bolster psychological ownership of the product. This indicates that these companies may be recognizing some of the negative effects that result from automation and trying to find ways to mitigate the effect.

**Limitations and Future Research**

Within this research I focused on automated products both because of their increasing popularity and because the method of control and interaction are fundamentally different than their traditional product counterparts. There are many smart products (or connected products) that are out of the scope of the research because, even though they can be controlled through a smart phone on other mediating device, they are not automated. As defined earlier, automation reduces or replaces the need for human interaction. Connected thermostats, lighting, and refrigerators for example, allow for remote access but do not operate independently. It may be that because of additional, remote access, psychological ownership of these products is increased

over traditional products because of greater control and communication that is available. Additional research is needed to establish these effects.

Anthropomorphism was identified in this paper as a way to mitigate negative effects of automation. There are many other unexplored avenues for bolstering psychological ownership. Future research should focus on the routes to ownership to identify new ways to combat the negative effects found here.

Finally, previous theory on psychological ownership has focused on three routes to ownership: intimacy, control, and self-investment (Pierce et al. 2003; Jussila et al. 2015). All of these are inherently cognitive evaluations of the product. By definition, psychological ownership is a "felt" state (Pierce et al. 2003). This indicates that there may be additional, more affective routes to psychological ownership that have not yet been identified. Additional research may identify other routes to how psychological ownership may develop.

## CHAPTER CONCLUSION

Marketers need to understand how consumers interact and relate to products in order to avoid the consumer disconnect that may develop as a result of lowered psychological ownership. Unmanaged, this disconnect may lead to lower proactive maintenance behaviors, meaning lower aftermarket sales, and lower repurchase intent, meaning lower future sales. My research offers clear implications for managing customer lifetime value in the face of a highly automated future. If marketers incorporate affordance principles such as anthropomorphism, they can not only potentially mitigate the negative effects of automation but also provide greater perceived differentiation and value to consumers.

# OVERALL CONCLUSION

The emergence and adoption of smartphones allows consumers unprecedented access to information, communication, and tools to manage their lives. Because of all they can do, consumers are currently more connected to them than any other product previously known. As a result, many of our relationships are now filtered through those devices. Although the digital device itself may change (e.g. smartphone, smartwatch, speaker, glasses), it seems certain that digital mediation of our relationships is here to stay. It is that digital mediation then, that impacts how we form and maintain relationships with other people, products, and places.

Along with the new channels for communication and new tools that digital devices provide, come new norms for usage and communication which inevitably impact how our relationships develop. These two chapters together showcase two marketing relationships and how the relationship dynamics evolve in the presence of new technology. Emojis, when used correctly, can add value to a message and a relationship. Unmanaged, new technology in the form of automated products can undermine the consumer-product relationship development process. In each case, understanding the nuances of the interaction itself, can help understand the consequences for marketers. These chapters focus on affective reactions and cognitive evaluations of interactions which provide meaning to the relationship.

The first chapter examines consumer relationships with service providers when the interaction is mediated by text messaging instead of face to face or telephone communication. The research presented here demonstrates a transfer of emotion can occur in an electronic communication by using a smiling emoji within the text message conversation, similar to that of a smile in face to face communications. However, the effect only occurs once a relationship has been established, not in an initial conversation.

This finding provides guidance for marketers managing their digital communication strategy. Emojis have soared in popularity in recent years however, the pros and cons of using them has not yet fully been explored or understood. This research is a necessary step in filling in one of the potential effects that emojis can generate along with an important boundary condition as to when this emotional contagion effect occurs.

The second chapter shifts to examine how consumers relate to products and how the consumer-product relationship is altered by automation. Automated products provide greater efficiency and convenience than their traditional product counterparts. However, because the way that consumers interact with the product is less direct than traditional products, the overall relationship with the product suffers, along with subsequent outcomes of interest to marketers.

Across both essays, I examine consumer relationships and illustrate ways that those relationships are being impacted by changes in technology. For marketers, it will be important to understand the implications of new technologies to be able to effectively and profitably manage consumer relationships.

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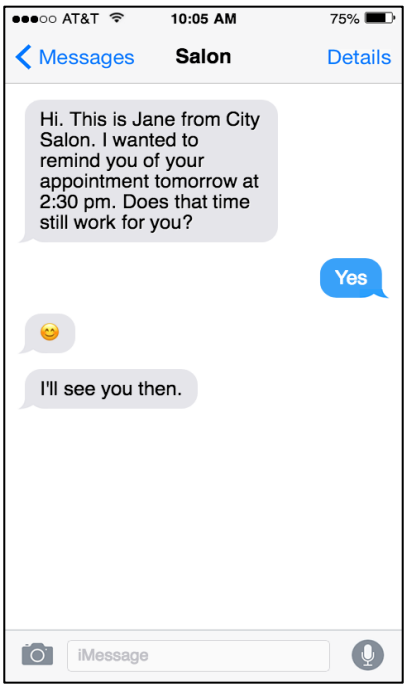
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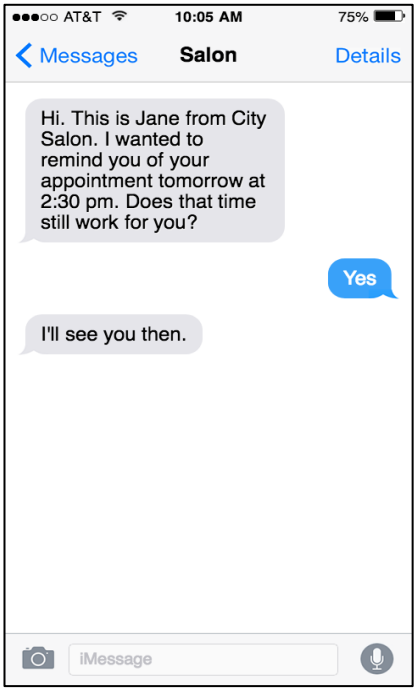
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# APPENDICES

## Appendix A

Stimuli for Study 1



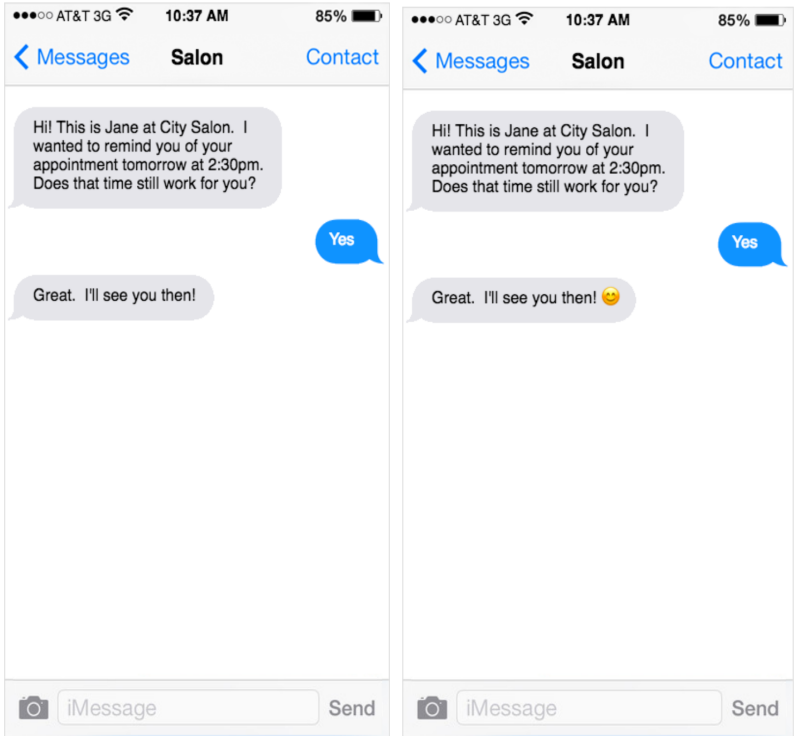
**Appendix B**
**Instructions – Study 2**
Study 2– John was substituted as the name for men and City Barber was substituted for City Salon

*Communal Instructions:* On the next screen you see a screenshot of a text message conversation. Please try to imagine you are the receiver of the first message.
Although they appear to be from City Salon please imagine they are from your regular salon or barber shop where you've been many times before. Pretend your stylist's name is Jane and you know her well.
It is important that you take the time to read the text conversation and all subsequent instructions or you will be not be able to respond to our questions accurately.

*Exchange Instructions:* On the next screen you see a screenshot of a text message conversation. Please try to imagine you are the receiver of the first message.
Although they appear to be from City Salon please imagine you've only been to this salon or barber shop once before and don't know the stylist or barber very well, but you think her name is Jane.
It is important that you take the time to read the text conversation and all subsequent instructions or you will be not be able to respond to our questions accurately.

**Appendix C**

Text message with and without emoji used in studies 2-3 described in detail and studies 4 – 7 in SPM. The message was gender matched: males saw the same message from John at City Barber instead of Jane at City Salon.



**Appendix D**

Relationship Manipulation from Aggarwal and Law 2005 used in Study 3

*Communal*

Chris likes to go to movies with her friends. In fact, Chris is very close to her friends and is always there for them whenever they need her. She is caring and is a good listener. She likes to do things for people just to please them and to show them that she cares for them. In turn, she expects her friends to be there for her when she needs them. Once she called a friend late in the evening and requested him to drive out and give her a ride home when her car got stranded at the shopping center. Her friend asked her to take a cab instead, since he wasn't feeling up to driving (but offered to pay the cab fare). This disappointed Chris, who would have gladly helped this friend out if he had made a similar request to her. She just couldn't imagine how someone who was a friend would not be there for her when she needed some help.

*Exchange*

Chris likes to go to movies with her friends but is careful in her interactions with them. She believes that relationships should be quid-pro-quo. In fact, she always likes to keep things as even as possible and generally monitors exchanges with others. In fact, she is also very uncomfortable if others give her more than what she has been able to give them and tries to find a way to return the favor as early as possible. When she helps other people, she generally makes a mental note and expects them to reciprocate in kind. Once she got very upset when she had lent a book to a friend, but the friend forgot to return the book to the library within the due date. She felt that the least her friend could do was pay the late fee.

# VITA

Leah Smith grew up (Leah Warfield) in Gibson City, IL and graduated from GCMS High school. She holds a Bachelor of Arts degree with a major in Theatre from the University of Indiana. She earned an MBA degree from Wake Forest University in 2008. She spent seven years working in marketing research departments at Alltel, Altria, and Electrolux.

Her research interests were directly inspired by her work experience for Electrolux. Her work focuses on how consumer behaviors are evolving as a result of new technologies. She has presented her work at conferences for the American Marketing Association and Association of Consumer Research. In May 2020 she competed the requirements for the Ph.D. Degree in Business Administration with a major in marketing. After graduation, she plans to move to Fayetteville, Arkansas to become an Assistant Professor of Marketing at the University of Arkansas.