

# Smiling Signals Intrinsic Motivation

Yimin Cheng

Anirban Mukhopadhyay

Patti Williams

Yimin Cheng is a PhD candidate and Anirban Mukhopadhyay is a Professor of Marketing and Associate Dean, both at the Hong Kong University of Science and Technology. Patti Williams is the Ira A. Lipman Associate Professor of Marketing at the Wharton School, University of Pennsylvania. We thank Shawn Zamechek for developing the photo-taking program, Agnes Chan, Sheren Ku, and Angela Rice for excellent research assistance, and Iris Hung and Jiewen Hong for their helpful comments. This research was supported by the Hong Kong Research Grant Council (Grant GRF692413 to the second author) and the Wharton Behavioral Lab.

## CONTRIBUTION STATEMENT

The motivation literature has extensively investigated how the nature of a person's motivation, intrinsic vs. extrinsic, influences their performance, and what factors foster or undermine a person's intrinsic motivation. This research takes a different angle to examine intrinsic motivation as important social information that can be communicated between actors and observers. We base our investigation in, and contribute to, the emotion literature by supporting and extending the social functional view of human emotions (Keltner and Haidt 1999). This emerging stream of research has shown that other people's emotions signal not only their affective states, but also their traits (Barasch et al. 2014; Feinberg et al. 2012), attitudes (Ames and Johar 2009), and expectations (Van Kleef et al. 2006). Our research is the first to show that the emotions that people express (e.g., enjoyment) can signal fine nuances about the nature of their motivation to observers. Moreover, previous research has shown that context-specific discrete emotions (e.g. happiness vs. anger; guilt vs. disappointment) can signal social information (Van Kleef et al. 2011). The current research shows that the intensity of the same emotion (e.g., big vs. small smile) can also signal fine social information. Last but not least, limited experimental research has directly tested whether actors proactively and strategically display certain emotions to observers during social interactions, with existing research being limited to verbally stated negative emotions (e.g., stated anger, Andrade and Ho 2009). We show that actors strategically and non-verbally display positive emotions to signal the nature of their motivation to others.

## ABSTRACT

The nature of a person's motivation (whether it is intrinsic or extrinsic) is a key predictor of how committed they are to a task, and hence how well they are likely to perform at it. However, it is difficult to reliably communicate and make inferences about such fine nuances regarding another person's motivation. Building on the social functional view of emotion and the evolutionary and psychophysical characteristics of facial expression of emotions, this research suggests that displayed enjoyment, as evidenced by the size of someone's smile, can serve as a strong non-verbal signal of intrinsic motivation. Across four studies, taking the perspective of both actors and observers, we find that people infer greater intrinsic motivation when they see others display big (vs. small) smiles, and that actors intuit this relationship, strategically displaying bigger smiles if they are given a goal to signal intrinsic (vs. extrinsic or no specific) motivation.

Imagine a photograph of two smiling celebrities getting married. What would you infer – is this a marriage of convenience, or do they truly love one another? Alternately, what if you need to hire a real estate agent, and the agent has some favorable customer testimonials on her website. Were these testimonials willingly provided or not? How about a luxury company advertising its donation to a charitable organization, would you infer the company intrinsically cares about the social cause, or does it simply want to impress consumers or obtain a tax deduction? People often ask themselves questions like these because as social animals we care about why others do what they do and thus the nature of their motivation (intrinsic vs. extrinsic, Ryan and Deci 2000a). Making inferences about the nature of other people's motivation is important because it helps us to predict their future behaviors (Jones and Davis 1965), which influences our decisions, choices, and investments in relationships, be they social or commercial, relational or transactional.

However, making inferences about the finer nuances of other people's motivation is an enterprise riddled with potential pitfalls, because a given behavior (e.g., getting married) often looks exactly the same to an observer, regardless of whether the motivation underlying the behavior is intrinsic (e.g., for love) or extrinsic (e.g., for the person's wealth). Moreover, verbal claims regarding motivation may simply be cheap talk. So, behaviors and proclamations aside, what other signals may help to assess the nature of other people's motivation? From the second most viewed TED talk by Amy Cuddy to the highly rated hit show *Lie to Me*, it appears that non-verbal cues may be a good candidate. The current research focuses on the facial expression of emotion, and specifically on an individual's smile. Building on the social functional view of emotions (Keltner and Haidt 1999; Keltner and Kring 1998; Van Kleef et al. 2011) and the evolutionary and psychophysical characteristics of facial expressions of emotion (e.g., Ekman

1993; Tracy, Randles and Steckler 2015), we propose that a person's smile as a consequence of engaging in an activity may be used to communicate his or her intrinsic motivation for that activity. Because all communications are two-sided in nature, our prediction is also two-fold. On one hand, observers may use other people's displayed smiles to make inferences about their intrinsic motivation. Correspondingly, actors may proactively display large smiles to signal their intrinsic motivation to observers.

Previous literature on intrinsic motivation has mainly examined the factors that foster or undermine intrinsic motivation at the personal level (e.g., tangible rewards, choice autonomy), or the consequences of intrinsic vs. extrinsic motivation (e.g., task performance). The current research takes a novel angle and studies intrinsic motivation as important social information that can be communicated between actors and observers via the facial expression of smiling. In so doing, we connect the intrinsic motivation literature with that on emotions, demonstrating that people can and do communicate (i.e., signal as well as infer) intrinsic motivation with smiles, in contexts that are social as well as commercial.

We begin by reviewing literature on intrinsic vs. extrinsic motivation and the social functional view of emotions. Next, we develop our hypotheses. We then present four studies that test these hypotheses. The first two studies show that observers infer greater intrinsic motivations from individuals with bigger smiles, if the smiles are perceived as a consequence of engaging in that activity. The next two studies then show that communicators seem to intuit how their facial expressions are perceived by others, and thus strategically display bigger smiles to signal intrinsic motivation to potential observers. We conclude with a discussion of the contributions, limitations and implications of this research.

## THEORETICAL FRAMEWORK

### **Intrinsic Motivation as Important Social Information**

Motivation not only varies in level but also in its nature (Ryan and Deci 2000a), which can range from intrinsic to extrinsic. Intrinsic motivation refers to doing something because it is inherently rewarding, whereas extrinsic motivation refers to doing something to achieve a separable outcome, such as money or fame (Deci, Benware and Landy 1974; Ryan and Deci 2000b). This distinction is important because research has shown that relative to extrinsic motivation, intrinsic motivation predicts desirable outcomes such as enhanced performance, persistence, creativity (Deci and Ryan, 1991; Sheldon et al. 1997), heightened vitality (Nix et al. 1999), self-esteem (Deci and Ryan, 1995) and better general well-being (Kasser and Ryan 1993, 1996), to name a few.

The nature of a person's motivation has important implications not only for himself or herself, but also for other people who interact with this person, because joint outcomes of interactions, be they commercial or social, can depend on whether the other party's motivation is intrinsic or extrinsic. For example, parents may wonder if their future son-in-law intrinsically loves their daughter, or whether he wants to marry her for extrinsic incentives (e.g., money, citizenship). A potential customer may wonder if a testimonial from a previous customer was sincerely made or paid for. An investor may wonder if an entrepreneur is intrinsically motivated to work on launching a start-up and will stay passionate and persevere in the face of potential challenges.

Besides these objective benefits associated with it, intrinsic motivation is also generally

perceived as more socially desirable than extrinsic motivation. Pelletier and Vallerand (1996) found that even though the actual performances of subordinates were not different, superiors evaluated performance more positively if they were led to believe that their subordinates were intrinsically (vs. extrinsically) motivated to perform the task. Yoon, Gürhan-Canli and Schwarz (2006) found that attributions of sincere vs. insincere motives qualified the effectiveness of corporate social responsibility (CSR) activities on consumer attitude toward the company. Fuchs, Schreier and van Osselaer (2015, p.109) also found that handmade products were evaluated higher only for producers having intrinsic (vs. extrinsic) motivation.

### **The Challenge of Assessing the Nature of Someone Else's Motivation**

Because the nature of one's motivation reveals such important information for social interactions, coordination, and commercial transactions, it is important to know how to assess another person/organization's intrinsic motivation. However, this can be difficult because a given behavior (e.g., getting married) often looks exactly the same to an observer, regardless of whether the underlying motivation is intrinsic (e.g., for love) or extrinsic (e.g., for the person's wealth). Moreover, verbal claims related to motivation (e.g., "I married him/her because I love him/her") may simply be cheap talk. The nature of one's motivation is a fine internal state whose nuances observers might find difficult to accurately assess (Heath 1999).

Little research has specifically examined how observers assess the nature of other people's motivation. One such endeavor asked participants to consider college students who spent three hours coloring pictures for either high or low reward, with the reward being either contingent on their performance or not (Deci, Benware and Landy 1974). Results showed that

participants inferred lower intrinsic motivation for the picture-coloring task if a resulting reward was high (vs. low) and contingent (vs. not contingent) on performance. In many situations, however, observers do not have the opportunity to manipulate rewards and contingencies, and then observe an actor's responses. Neither are they always able to observe a sufficient number of natural occurrences (or absences of natural occurrences) of reward-response covariations to infer intrinsic motivation. Therefore, how do observers assess the nature of other people's motivation? In the current research, we suggest that one way observers may infer the fine nuances of other people's motivation is from the emotions they display while engaging or having engaged in an activity.

### **The Social Functional View of Emotions**

Emotions not only influence intrapersonal judgments (e.g., affect as information, Schwarz and Clore 1983), but also serve to coordinate interpersonal interactions (Keltner and Haidt 1999). Emotions guide social interactions through three major functions: evocative, incentive and informative (Keltner and Kring 1998). A person's emotion can influence other people's behavior by evoking assimilative or complementary emotions—the evocative function. For example, the sadness of a poor child in an advertisement for a charitable organization facilitates donation by inducing sadness and sympathy in the viewer (Small and Verrochi 2009). Alternately, a person's positive or negative emotions can condition another person's response—the incentive function. For example, displaying anger in an ultimatum game or negotiation makes the counterpart give larger concessions (Andrade and Ho 2009; Van Kleef, De Dreu and Manstead 2004). Finally, emotions can signal certain information about the actor via the

observers' inference making process—the informative function.

There are many examples of this informative function. The facial expression of embarrassment in response to a compliment may signal pro-social traits (Feinberg, Willer and Keltner 2012). Positive or negative expressed emotion accompanying a pro-social or anti-social action may signal the actor's true attitude (Ames and Johar 2009). A negotiator tends to make larger concessions to a counterpart who they believe feels disappointed rather than guilty, because disappointment signals that the other party is close to the highest he or she could possibly offer (Van Kleef, De Dreu, and Manstead 2006). The current research builds on this emerging research on the social informational function of emotions. We also extend this stream of research by showing, for the first time, that the facial expression of emotion (e.g., smile) can signal the nature of one's motivation to others (e.g., intrinsic motivation).

### **The Characteristics of Facial Expression of Emotions in Social Communication**

The current research focuses on facial expressions of emotion not only because they are highly accessible in social interactions, but also because they are usually perceived as diagnostic sources for social inference making due to their hardwired nature and spontaneity (Ekman 1993). Researchers going back to Darwin (1872) have argued that emotion expressions and their recognition are hardwired in primates and human beings. Firstly, emotion expressions facilitate survival, hence are selected by evolution. For example, fear makes primates open eyes wider, allowing them to see more threats and hence avoid danger (Lee, Susskind and Anderson 2013). Secondly, the basic emotions have unique facial configurations and are universally recognized across cultures (Ekman and Friesen 1971; Ekman , Sorenson and Friesen 1969; Ekman et al.

1987; Elfenbein and Ambady 2002). Thirdly, even infants who have not developed language skills react to adults' emotional expressions in response to visual cliffs (Sorce et al. 1985). Because the display, recognition and reaction to facial expression of emotions are so hardwired, emotional expressions are likely to be used as a reliable source of social communication and social inferences.

The diagnosticity of expressed emotions in social inference also arises from their relative spontaneity and irrepressibility (Ekman 1993). Firstly, basic emotions are characterized by their quick onset, automatic appraisal, and unbidden occurrence (Ekman 1992), hence people may spontaneously display them even before they are aware of them and try to control them. For example, blind athletes display similar facial expressions as sighted athletes, evidence that emotional expression is usually spontaneous and instinctive rather than catering to observers (Matsumoto and Willingham 2009). Secondly, because people usually cannot see their own faces the way observers do, they are to some extent deprived of on-line information regarding their own facial expressions. This makes it difficult for them to regulate their emotional expressions on a moment-to-moment basis (DePaulo 1992). As Schneider, Hastorf and Ellsworth (1979) suggested, although observers are not totally naïve to the possibility that nonverbal behaviors can be deliberately regulated, they seem to be generally more "taken" by the spontaneity and trustworthiness of such behaviors.

### **Smiling as a Signal of Intrinsic Motivation**

*The basic hypotheses.* Given that emotions convey rich social information and facial expressions of emotion are diagnostic, how do they inform us about the nature of another

person's motivation? Previous literature suggests that intrinsic motivation arises from basic psychological needs for competence, autonomy and relatedness, which are principal sources of enjoyment and vitality throughout life (Ryan and Deci 2000a). Deci (1975) argues that if an activity is internally rewarding, the end state should be positive affect. Indeed, intrinsic motivation is sometimes defined as doing something for its inherent enjoyment or satisfaction (Ryan and Deci 2000b). Therefore, we suggest that observers may use another person's displayed enjoyment (e.g., smile) as a signal to infer that person's intrinsic motivation, if the observer perceives the smile as being a direct consequence of engaging in that activity (H1). If an individual's face displays enjoyment during or after an activity, an observer may infer that the activity creates enjoyment, consistent with an underlying intrinsic motivation. Furthermore, because greater intrinsic motivation for engaging in an activity is often associated with enhanced performance (Deci and Ryan, 1991; Sheldon et al. 1997), we also hypothesize that observers may anticipate better long-term outcomes of an activity if people engaging in the activity display bigger smiles, and this effect should be mediated by inferences of stronger intrinsic motivation (H2). We test these hypotheses in studies 1 and 2.

*Extrinsic motivation.* Although intrinsic motivation has traditionally been conceptualized against extrinsic motivation in the literature, their individual relationships with smiling may not correspond exactly. This is because intrinsic motivation is defined more precisely than extrinsic motivation. Intrinsic motivation is doing something for its inherent enjoyment, whereas extrinsic motivation is doing something for any motive other than inherent enjoyment – this may include money, fame, image, status, pressure, avoidance of punishment, social comparison, social norms, etc. Self-Determination Theory further divides extrinsic motivation into several sub-categories that range along a continuum – External Regulation, Introjected Regulation, Identified

Regulation and Integrated Regulation – with each being more similar to intrinsic motivation than the former (Ryan and Deci 2000a). As a result, different extrinsic motives may be associated with different emotional responses, ranging from depression and anxiety to even relief or mild delight. Due to this relative non-specificity of the definition of extrinsic motivation, the relationship between smiling and extrinsic motivation is much less clear than that between smiling and intrinsic motivation. Consequently, we do not make any specific hypothesis regarding the relationship between inferences of extrinsic motivation and smiling.

*Persuasion Knowledge.* Inference making usually occurs when there is uncertainty in the context. Consequently, smiles should only be used as a cue to infer intrinsic motivation if there is some uncertainty. For example, people who see testimonials may wonder if the featured endorsers intrinsically wanted to endorse the firm or were paid or required to do so. Similarly, someone who receives a compliment from a salesperson may wonder whether it is sincere or not. In both cases, the inferential process is triggered if there is a sufficient amount of ambiguity regarding the nature of the motivation. If the inference is not favorable, the effectiveness of the communication is substantially discounted. Research on persuasion knowledge has shown in commercial contexts that although consumers are not always skeptical, when persuasion knowledge is accessible and processing resources are available, they become skeptical and may judge a piece of communication as less sincere (Campbell and Kirmani 2000). We propose that because bigger smiles signal greater intrinsic motivation, bigger smiles by a marketing communicator (e.g., an endorser) may alleviate the negative impact of active persuasion knowledge (H3). We test this hypothesis in study 2.

*Strategic signaling.* As argued earlier, not only do observers have the incentive to infer actors' nature of motivation, actors may also have the incentive to communicate or signal the

nature of their motivation to observers (particularly if it is intrinsic). An observer in one context can be a communicator in another context. If observers infer stronger intrinsic motivation from bigger smiles, do they intuit this relationship and strategically display bigger smiles to signal their own intrinsic motivation if they are in a communicator's role? Some research has suggested that people may proactively and strategically use their emotions to influence other people's behaviors, but little research has directly tested this. For example, a qualitative study found that bill collectors were trained to display urgency emotions to debtors (Sutton 1991). Another interview-based investigation suggested that bosses sometimes deliberately displayed anger at work to intimidate their subordinates (Fitness 2000). Andrade and Ho (2009) showed that game players strategically disclosed stated anger to influence a counterpart's concession in the subsequent round. Although emotions are mostly spontaneous and thus diagnostic, people may strategically leverage them and display emotions to signal motivation. In the current research, we hypothesize that a communicator who has a goal to signal intrinsic (vs. extrinsic or no specific) motivation for engaging in an activity may proactively and strategically display a bigger smile to potential observers (H4). We test this hypothesis in studies 3 and 4.

## **Overview of Current Research**

We now present four studies that test the effect of displayed smiles in communicating intrinsic motivation. Study 1 tests whether observers infer greater intrinsic motivation and predict better long-term outcomes for actors who display big (vs. small) smiles in a photo, contingent upon perceiving the smiles as a consequence of engaging in the activity. It also tests whether predictions regarding the actor's performance in the activity are mediated by the

inference of intrinsic motivation. Study 2 tests whether bigger (vs. smaller) smiles displayed by customer endorsers help mitigate the negative influence of persuasion knowledge on the observers' inferences regarding the nature of the endorser's motivation. Study 3 shifts the examination to the actor side and tests whether customer endorsers given a goal to signal intrinsic (vs. extrinsic or no specific) motivation proactively display bigger smiles in self-taken photos that accompany testimonials. Study 4 provides additional process evidence for such strategic smiling in the context of start-up funding.

## **STUDY 1: OBSERVERS INFER INTRINSIC LOVE AND PREDICT MARRIAGE QUALITY FROM A COUPLE'S DISPLAYED SMILES**

The aim of Study 1 was to establish the basic effect that observers inferred stronger intrinsic motivation from a bigger displayed smile, if the smile was perceived as a consequence of engaging in the activity (H1). If a smile is observed before rather than after an activity, it is less likely to be perceived as a direct consequence of engaging in that activity and therefore is a less diagnostic indicator of intrinsic motivation. Therefore in study 1, apart from varying the sizes of smiles (big vs. small), we manipulated the timing of the smiles (before vs. after an activity) as a boundary condition. We also examined whether the size and timing of smile have similar effects on the observer's predictions for the target's performance in the activity, and the mediating role of intrinsic motivation inferences on these outcome predictions (H2). Study 1 tested these hypotheses in the context of love and marriage.

### **Method**

Undergraduate students ( $N = 171$ ) from a major Asian university participated in this study for course credit. Seven students whose responses were self-contradictory were eliminated from analysis (e.g., they clicked the same answer, such as “1,” for all questions of which half measured inferred intrinsic motivation and the other half measured inferred extrinsic motivation), leaving a total of 164 participants (71% female; median age = 20).

The study used a 2 (Smile size: small vs. big)  $\times$  2 (Timing: photo taken before event vs. photo taken after event) between-subjects design. Participants read a short description of a newly wedded couple, Linda and George. Both Linda and George were successful in their own careers. George had founded his own business and served as CEO. Linda was a famous columnist and her articles were often published in newspapers and magazines. The couple first met each other one year ago and got married last week. After reading the description, participants were randomly assigned to one of the four conditions in which smile size and timing were manipulated. Participants saw a photo of Linda and George embracing each other, and displaying either small smiles or big smiles (Appendix A). They were told that the photo was taken either the day before or the day after their wedding. Participants were asked to examine the photo and then answered several questions regarding their inferences. First, we asked them to rate their agreement with several statements that represented possible reasons why George and Linda married each other. There were fourteen statements (see Appendix A), of which seven corresponded to intrinsic motivations (e.g., George married Linda because he is so in love with Linda) and the other seven corresponded to extrinsic motivations (e.g., George married Linda for her fame). For each statement, participants indicated an answer from “1 = Does not correspond at all” to “7 = Corresponds exactly.” The intrinsic and extrinsic motivation statements were

randomly presented. Participants then made predictions about the quality of the couple's marriage by responding to four questions (*Q1: How likely will George and Linda be satisfied with their marriage? 1 = Very unlikely, 7 = Very likely; Q2: How do you think is their marriage quality? 1 = Very bad, 7 = Very good; Q3: How likely will this couple still be married one year from now? 1 = Very unlikely, 7 = Very likely; Q4: How likely will this couple still be married 7 years from now? 1 = Very unlikely, 7 = Very likely*). They then responded to four manipulation check questions regarding the degree of the smile in the photo. Demographic information was collected at the end of the study, following which participants were thanked and debriefed.

## Results

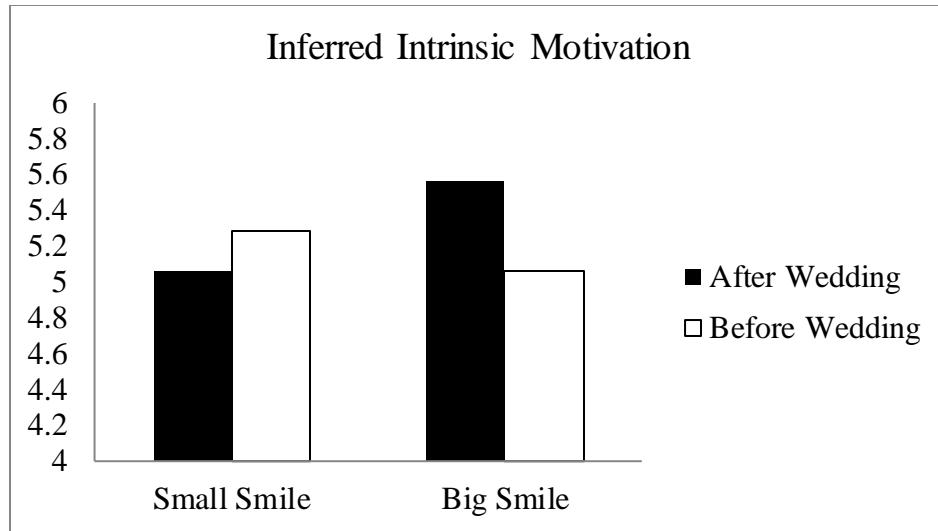
*Manipulation check.* The smile manipulation check questions loaded on a single factor and were averaged (Cronbach's  $\alpha = .92$ ). Participants perceived significantly greater enjoyment if the couple displayed big vs. small smiles ( $M_{\text{small}} = 4.23$ ,  $M_{\text{big}} = 5.59$ ,  $F(1, 160) = 68.45$ ,  $p <.001$ ). Timing of smile did not have a main effect ( $M_{\text{before}} = 4.90$ ,  $M_{\text{after}} = 4.92$ ,  $F(1, 160) = .06$ , NS) and did not interact with size of smile ( $F(1, 160) = .42$ , NS) on perceived enjoyment.

*Inferred intrinsic motivation.* Both sets of items assessing inferred motivation showed high internal consistency (intrinsic motivation  $\alpha = .92$ ; extrinsic motivation  $\alpha = .84$ ) and hence were averaged separately to form indices of inferred intrinsic motivation and inferred extrinsic motivation. An ANOVA on inferred intrinsic motivation with smile size and timing of smile as between-subjects factors revealed no main effects of smile size or timing ( $Fs < 1$ ) on inferred intrinsic motivation but a significant interaction ( $F(1, 160) = 5.23$ ,  $p < .05$ , Figure 1A). Planned contrasts revealed that when the photo was ostensibly taken after the wedding, participants

inferred stronger intrinsic motivation ( $M_{\text{small}} = 5.06$ ,  $M_{\text{big}} = 5.59$ ,  $F(1, 160) = 5.18$ ,  $p < .05$ ) for the marriage if the couple displayed big (vs. small) smiles. Participants did not infer stronger intrinsic motivation from bigger smiles if the photo was ostensibly taken before the wedding ( $M_{\text{small}} = 5.28$ ,  $M_{\text{big}} = 5.06$ ,  $F(1, 160) = .93$ , *NS*), as predicted.

*Inferred extrinsic motivation.* Although we did not make any predictions regarding the effect of smile size and timing on inferred extrinsic motivation, the following analysis was performed as a comparison to that of intrinsic motivation. Intrinsic and extrinsic motivation inferences were negatively correlated but not greatly ( $r(162) = -.19$ ,  $p < .05$ ), suggesting they are not opposite poles of the exact same construct. An ANOVA on inferred extrinsic motivation with smile size and timing of smile as two factors revealed a negative main effect of smile size ( $M_{\text{small}} = 3.33$ ,  $M_{\text{big}} = 3.02$ ,  $F(1, 160) = 4.35$ ,  $p < .05$ ), a marginal main effect of timing ( $M_{\text{before}} = 3.32$ ,  $M_{\text{after}} = 3.03$ ,  $F(1, 160) = 3.87$ ,  $p < .1$ ), but no interaction ( $F(1, 160) = 1.06$ , *NS*). Participants inferred lower extrinsic motivation from big (vs. small) smiles regardless of whether the smiles happened before or after the wedding.

**FIGURE 1A: INFERRED INTRINSIC MOTIVATION FOR MARRIAGE AS A FUNCTION OF SMILE SIZE AND TIMING**



*Predicted marriage quality.* These four questions loaded on a single factor and were averaged to create an index of predicted marriage quality (Cronbach's  $\alpha = .86$ ). The pattern of results on predicted marriage quality resembled that observed on inferred intrinsic motivation. ANOVA revealed no main effects of smile ( $F(1, 160) = 1.16, NS$ ) or timing ( $F(1, 160) = 1.85, NS$ ) on predicted marriage quality, but a marginally significant interaction ( $F(1, 160) = 3.33, p = .07$ , Figure 1B). Planned contrasts revealed that when the photo was ostensibly taken after the wedding, participants predicted higher marriage quality ( $M_{small} = 4.84, M_{big} = 5.26, F(1, 160) = 4.26, p < .05$ ) if the couple displayed big (vs. small) smiles. The effect disappeared if the photo was ostensibly taken before the wedding ( $M_{small} = 4.91, M_{big} = 4.80, F(1, 160) = .28, NS$ ).

*Mediated Moderation.* Hayes' (2013) PROCESS Model 8 was used to test whether inferred intrinsic motivation mediated the Smile  $\times$  Timing interaction on predicted marriage quality. When intrinsic motivation was added to the model, it significantly predicted marriage quality ( $B = .51, SE = .07, t = 6.91, p < .001$ ), while the Smile Size  $\times$  Timing interaction was no longer significant ( $B = .04, SE = .06, t = .63, NS$ ). This result indicated that the intrinsic motivation inference fully mediated the effect. Specifically, smile size had a significant indirect

effect on predicted marriage quality through inferred intrinsic motivation after the wedding ( $B = .13$ ,  $SE = .06$ ,  $CI = [.02, .26]$ ) but not before ( $B = -.06$ ,  $SE = .06$ ,  $CI = [-.16, .05]$ ). The indirect effect of highest order interaction was significant ( $B = .09$ ,  $SE(Boot) = .04$ ,  $CI = [.02, .17]$ ). When the intrinsic motivation inference and extrinsic motivation inferences were entered simultaneously in PROCESS Model 8 to test mediation, only intrinsic motivation mediated the Smile Size  $\times$  Timing interaction on predicted marriage quality ( $B = .09$ ,  $SE(Boot) = .04$ ,  $CI = [.01, .17]$ ). Extrinsic motivation, although marginally predicting worse marriage quality ( $B = -.12$ ,  $SE = .06$ ,  $t = -1.94$ ,  $p < .1$ ), did not mediate the Smile Size  $\times$  Timing interaction ( $B = -.01$ ,  $SE(Boot) = .01$ ,  $CI = [-.046, .004]$ ). All mediated moderation results held when we used PROCESS Model 7, which imposed an additional assumption that there was no moderation on the direct effect of smile size on predicted marriage quality.

**FIGURE 1B: PREDICTED MARRIAGE QUALITY AS A FUNCTION OF SMILE SIZE AND TIMING OF SMILE**



## Discussion

In study 1, participants who saw big (vs. small) smiles displayed by a newly married couple inferred stronger intrinsic motivation for their marriage and predicted higher marriage quality, especially when the smiling photographs were taken after (vs. before) their marriage. These results support our theory that observers indeed infer intrinsic motivation from facial expression of enjoyment. Bigger smiles signal greater intrinsic motivation only if the smile is perceived as a consequence of engaging in the focal activity (e.g., getting married). When the smile ostensibly occurs before the focal activity, observers are less likely to attribute the smile to the engagement in the activity, which has not happened yet. Additionally, there are more alternative causes of the smiles before a wedding. For example, smiles before a wedding might be caused by a motive to humor the prospective partner until the knot is legally tied. This alternative motive is logically absent after the wedding, when the knot is already tied. Because a smile before a wedding can be attributed to such other motivations, it is a less diagnostic signal and hence its signaling effect is compromised.

This interaction also rules out many alternative explanations. For example, participants might infer more favorable traits (e.g., good personalities) from those who displayed big (vs. small) smiles (Harker and Keltner 2001) and then possibly assume people with favorable traits were more intrinsically motivated due to a “halo effect” (Nisbett and Wilson 1977). If this mechanism was responsible for our results, we should have observed no moderating effect of timing of the smile because a smile should have signaled favorable traits regardless of timing. Another alternative explanation is that a bigger smile contagiously triggered positive mood

among participants, and participants who were in positive mood tended to make positive interpretation of everything, including the nature of motivation underlying a marriage. However, the mood contagion mechanism could not explain the moderating effect of timing, since a bigger smile should have induced positive mood among participants regardless of the timing condition. The Smile Size  $\times$  Timing interaction suggests that participants made fine-tuned inferences about the temporal and causal relationship between the focal activity (i.e., getting married) and the displayed emotional expression (i.e., enjoyment as reflected by smile).

## **STUDY 2: BIGGER SMILES OF ENDORSERS DEFEND AGAINST THE NEGATIVE IMPACT OF PERSUASION KNOWLEDGE**

Study 1 showed that observers inferred stronger intrinsic motivation from bigger smiles. What is the marketing implication of this finding? As argued earlier, there are many situations in which consumers care about the intrinsic motivation of a marketing communication (customer testimonials, salesperson's compliments). If consumers doubt the intrinsic motivation of the marketing communication (e.g., testimonials, compliments), the effectiveness of that marketing communication should be substantially discounted. One factor that triggers such doubt is persuasion knowledge (Campbell and Kirmani 2000). Research has shown that although consumers are not always skeptical, when persuasion knowledge is accessible and processing resources are available, they become skeptical and may judge a marketing communication as less sincere (Campbell and Kirmani 2000). We propose that because bigger smiles signal greater intrinsic motivation, bigger smiles by a marketing communicator (e.g., customer endorser) may alleviate the negative impact of persuasion knowledge (H3). We test this hypothesis in study 2.

Study 2 tested this in the context of customer testimonials.

## Method

Undergraduate students ( $N = 141$ ) from a major Asian university participated in this study for course credit. Eight participants who failed an attention check question at the beginning of the study, and two participants who had previously participated in a pilot study for stimulus development, were dropped from the analysis, leaving 131 participants (47% female, median age = 20).

Study 2 was a 2 (Persuasion knowledge: primed vs. not primed)  $\times$  2 (Smile size: small vs. big) between-subjects design, consisting of two parts. In the first part, participants were randomly assigned to either a persuasion knowledge priming condition or a control condition. In the priming condition, participants read a short paragraph about “customer endorsements” and then answered two questions based on the paragraph. The paragraph read, *“Companies often show their prospective customers endorsements from previous satisfied customers. Such customer endorsements can be very informative. However, there have been cases in the past when companies have gotten customers to endorse them even though the customers were not sincerely willing to do so.”* The two questions asked them how they felt about costumer endorsements (*1 = Most customer endorsements are unreliable/insincere, 4 = There are equal number of reliable and unreliable/ sincere and insincere endorsements, 7 = Most customer endorsements are reliable/sincere*). In the control condition, participants were not given any paragraph or questions and they directly entered the second part of the study. In the second part, all participants imagined going to Phoenix, AZ (not the city where they were in) for a 6-month

exchange study. Due to limited housing capacity, they needed to hire a real estate agent to find an off-campus place for them to live. They imagined visiting the websites of real estate agents and randomly opening one. We presented participants with a snapshot of a website (see Appendix B). The website contained the real estate agent's name (Kelly Robinson), address, phone, a welcome message, a picture of the downtown area and a few navigation buttons. In the lower part of the website, two customer testimonials were presented along with each endorser's first name and headshot. One testimonial by Anna read, "Kelly provides the best service" and the other testimonial by Rebecca read, "She is the person you are looking for." All information and images from the websites were identical across smile size conditions except that we manipulated the size of smiles (big vs. small) in the two headshots. After they viewed the website, participants completed measures to assess their inferred motivations underlying the customer testimonials, indicating their agreement or disagreement ( $1 = \text{strongly disagree}$ ,  $7 = \text{strongly agree}$ ) with six statements, three corresponding to intrinsic motivation ("They really want to endorse this agent with no reservations;" "They sincerely think this agent is worth endorsing;" "Even if the agent didn't ask, these previous customers would voluntarily give positive word-of-mouth of this agent among their family and friends"), and the other three corresponding to extrinsic motivation ("The agent probably paid them to provide the positive endorsement;" "The agent asked them to say good things about her service;" "If the agent hadn't asked, these previous customers would not have provided recommendations"). The order of the six questions was randomly determined for each participant. Then participants answered a few questions that measured covariates including mood ("How are you feeling at this moment?"  $1 = \text{very bad}$ ,  $4 = \text{neither good nor bad}$ ,  $7 = \text{very good}$ ), past experience ("How often in the past have you hired a real estate agent to find you a house or apartment?"  $1 = \text{Never}$ ,  $7 = \text{Always}$ ), knowledge ("How

*much do you know about the housing market in Phoenix?" 1 = I have no idea, 7 = I know a lot),* liking of the endorsers (*"How much did you like these endorsing customers?" 1 = I liked them very much, 4 = I neither liked nor disliked them, 7 = I disliked them very much*) and liking of website design (*"How good or bad is the design of this website?" 1 = very bad, 7 = very good*). Participants completed a manipulation check question about displayed enjoyment (*"How happy did the endorsing customers look on the website?" 1 = very unhappy, 4 = neither happy nor unhappy, 7 = very happy*), as well as demographic questions at the end of the study.

## Result

*Manipulation check.* An ANOVA of smile size and persuasion knowledge priming on perceived enjoyment revealed a main effect of smile size ( $M_{\text{small}} = 4.91$ ,  $M_{\text{big}} = 5.52$ ,  $F(1, 127) = 15.50$ ,  $p < .001$ ). Persuasion knowledge priming had neither main effect ( $M_{\text{PK}} = 5.32$ ,  $M_{\text{control}} = 5.11$ ,  $F(1, 127) = 1.91$ , *NS*) nor moderating effect on perceptions of displayed enjoyment in the photographs ( $F(1, 127) = .04$ , *NS*). Therefore, participants saw the endorsing customers as having greater enjoyment if they displayed big smiles instead of small smiles, as intended. It is worth noting that endorsing customers looked happy even in the small smile condition ( $M_{\text{small}} = 4.91$  vs.  $4 = \text{neither happy nor unhappy}$ ,  $t(64) = 8.68$ ,  $p < .001$ ), hence the results were not driven by the valence of the displayed emotion (i.e., happy vs. unhappy).

*Inferred intrinsic motivation.* Consistent with our prediction, the six questions regarding the nature of motivation loaded on two factors, intrinsic motivations and extrinsic motivations. Therefore, we averaged them separately to generate one index of inferred intrinsic motivation and one of inferred extrinsic motivation. An ANOVA was performed on intrinsic motivation

with smile size and persuasion knowledge priming as between-subjects factors. There was neither main effect of persuasion knowledge ( $M_{control} = 4.23, M_{pk} = 4.06, F(1, 127) = 1.15, NS$ ) nor main effect of smile size ( $M_{small} = 4.02, M_{big} = 4.27, F(1, 127) = 2.45, NS$ ), but we found a significant interaction ( $F(1, 127) = 4.50, p < .05$ ). To interpret the interaction, we first looked at the simple effects of persuasion knowledge. Similar to previous research, making persuasion knowledge accessible significantly lowered the perceived intrinsic motivation underlying the customer testimonials ( $M_{control} = 4.27, M_{pk} = 3.75, F(1, 127) = 5.06, p < .05$ ). However, this effect manifested only when endorsers displayed small smiles. When endorsers displayed big smiles, priming persuasion knowledge had no effect on perceptions of intrinsic motivation ( $M_{control} = 4.18, M_{pk} = 4.35, F(1, 127) = .55, NS$ ). Therefore, customer endorsers displaying big (vs. small) smiles effectively defended the negative potential impact of persuasion knowledge on the inferred intrinsic motivation of customer testimonials. The interaction can also be interpreted from a different angle by looking at the simple effects of smile size. In the control condition, participants did not seem to be automatically skeptical hence smile size had no influence on inferred intrinsic motivation ( $M_{small} = 4.27, M_{big} = 4.18, F(1, 127) = .16, NS$ ). In contrast, when persuasion knowledge was made accessible, participants seemed to actively look for signals to help them infer the motivation behind the testimonial. As a result, participants inferred stronger intrinsic motivation from big (vs. small) smiles of endorsers ( $M_{small} = 3.75, M_{big} = 4.35, F(1, 127) = 6.74, p < .05$ ). To test the robustness of the findings and to rule out alternative explanations, we performed an ANCOVA, statistically controlling for mood ( $F(1, 122) = .62, NS$ ), past experience ( $F(1, 122) = .87, NS$ ), knowledge ( $F(1, 122) = 3.05, p = .08$ ), liking of the endorsers ( $F(1, 122) = 3.78, p = .05$ ) and perceived design of the website ( $F(1, 122) = 15.44, p < .01$ ). All the above significant effects held robustly when these covariates were controlled for.

*Inferred extrinsic motivation.* Although we did not make any predictions regarding smile size and persuasion knowledge on perceived extrinsic motivation, a similar ANOVA found that persuasion knowledge priming directionally increased inferred extrinsic motivation ( $M_{\text{control}} = 4.32$ ,  $M_{\text{PK}} = 4.53$ ,  $F(1, 127) = 1.82$ ,  $NS$ ) and a bigger smile directionally decreased inferred extrinsic motivation ( $M_{\text{small}} = 4.51$ ,  $M_{\text{big}} = 4.34$ ,  $F(1, 127) = 1.07$ ,  $NS$ ). However, neither effect was significant, nor was the persuasion knowledge  $\times$  smile size interaction ( $F(1, 127) = .09$ ,  $NS$ ). As in study 1, participants seemed to rely on smile sizes to make inferences about intrinsic motivation, but not extrinsic motivation.

## Discussion

Study 2 replicated the basic effect that observers inferred stronger intrinsic motivation from larger smiles, especially when they were skeptical of about the communicator's true motivation (i.e., when persuasion knowledge was made salient). Past literature has found that persuasion knowledge hurts marketers because it negatively impacts perceived sincerity (Campbell and Kirmani 2000). The current study offers marketers one solution to this problem, namely, presenting bigger smiles of communicators. We found that although persuasion knowledge lowered the inferred intrinsic motivation underlying customer testimonials, this negative effect was alleviated if endorsers displayed big (vs. small) smiles. Apart from customer testimonials, there are many other marketing contexts in which communicators could easily manipulate their smiles to signal intrinsic motivations, such as personal sales, customer service, advertisement, corporate social responsibility photos or videos, etc., suggesting wide-ranging applicability for the present results.

### **STUDY 3: ENDORSERS STRATEGICALLY DISPLAY BIGGER SMILES TO SIGNAL INTRINSIC MOTIVATION**

Communication is two-sided in nature. Studies 1 and 2 demonstrated that observers infer greater intrinsic motivation from an actor's bigger smiles. As discussed earlier, it is likely that actors themselves may be aware of this relationship (since they are observers in other situations), and hence may strategically display bigger smiles if they want to signal their own intrinsic motivation to observers (H4). Past literature has shown that people strategically disclose stated anger to condition their game counterpart's responses (e.g., the incentive function of social emotion, Andrade and Ho 2009). However, to our knowledge, no extant research has shown that people strategically display expressed emotion as a social signal about the finer nuances of the nature of their motivation (e.g., the informational function of social emotion). We test this possibility in studies 3 and 4. Similar to study 2, study 3 used the context of customer testimonials. Unlike study 2, here participants were asked to play the role of an endorser (i.e., motivation communicators), and asked to provide a headshot for their endorsement of the agent. We manipulated the endorser's motivation and hypothesized that endorsers who were given a goal to signal intrinsic motivation (vs. extrinsic motivation or no specific goal) would display bigger smiles in their headshots.

#### **Method**

Students from a major East Coast university ( $N = 170$ , 69% female, median age = 20)

participated in the study for course credit. This study followed a single factor between-subjects design, with endorser's motivation manipulated at three levels – intrinsic vs. extrinsic vs. control.

*Stimulus interface.* We developed a computer program that allowed participants to take and submit headshots using the built-in cameras of the lab computers. The interface of the program contained instructions, a camera view area, three buttons ("Take", "Delete & Reset" and "Submit") and a countdown timer. Within a specified time period, participants could take as many headshots as they wanted but could only ultimately submit one. Because participants were not familiar with the photo-taking program and might have difficulty using it, upon arrival at the lab, they first familiarized themselves with the program, completing a tutorial and submitting two practice headshots in a row (i.e., "Practice Photo 1" and "Practice Photo 2"). At the end of the tutorial, we asked them how easy or complicated this program was for them to use ( $1 = \text{easy}$ ,  $5 = \text{complicated}$ ). Participants' responses were not different across motivation conditions ( $M_{\text{Extrinsic}} = 1.14$ ,  $M_{\text{Control}} = 1.14$ ,  $M_{\text{Intrinsic}} = 1.13$ ,  $F(2, 167) = .03$ , NS). After the tutorial, participants entered the main study named "Interaction Study."

*Procedure.* Participants imagined graduating and moving to another city to start a new job and new life, and asking a real estate agent to help them locate an apartment to rent. They were told that during their interaction with the agent, they found her to be very professional and patient, and with her help, they eventually found an apartment. Six months had since passed and they felt satisfied with this apartment, and they then received an email from the agent asking for a favor. She was collecting photos of previous clients to promote her business. If a participant agreed to help, his or her photo and name would appear on the agent's website. No other personal information would be disclosed. Following this came the motivation manipulation. In the control condition, participants read, "*You decide to send a photo to the agent for her use.*" In

the intrinsic motivation condition, participants read, “*You decide to send a photo to the agent for her use. And you want potential clients who see your photo to believe that you really want to endorse this agent and have no reservation doing so.*” In the extrinsic motivation condition, participants read, “*You decide to send a photo to the agent for her use. And you want potential clients who see your photo to believe that you feel an obligation to endorse this agent.*” Then participants saw the photo-taking program again and were asked to submit a headshot (the “Final Photo”) within one minute. After submitting a headshot, participants completed two manipulation check questions (“*To what extent do you want to let the real estate agents’ future clients believe that you genuinely want to endorse the agent?*” (intrinsic motivation) and “*To what extent do you want to let the real estate agents’ future clients believe that you feel obligated to endorse the agent?*” (extrinsic motivation) 1 = *No, I don’t want them to believe so*, 7 = *Yes, I want them to believe so*). Demographic information was collected and participants were thanked and debriefed.

## Results

*Manipulation check.* An omnibus ANOVA found that the motivation manipulation significantly changed participants’ goals of signaling intrinsic motivation ( $F(2, 167) = 10.79, p < .001$ ) and extrinsic motivation ( $F(2, 167) = 4.77, p < .01$ ) across conditions. Participants in the intrinsic motivation condition ( $M = 6.32$ ) had a stronger goal of signaling intrinsic motivation than those in the control ( $M = 5.58, t(167) = 2.71, p < .01$ ) or extrinsic motivation condition ( $M = 5.05, t(167) = 4.63, p < .001$ ). The latter two conditions were marginally different from each other ( $t(167) = 1.93, p < .07$ ). Participants in the extrinsic motivation condition ( $M = 3.93$ ) had a

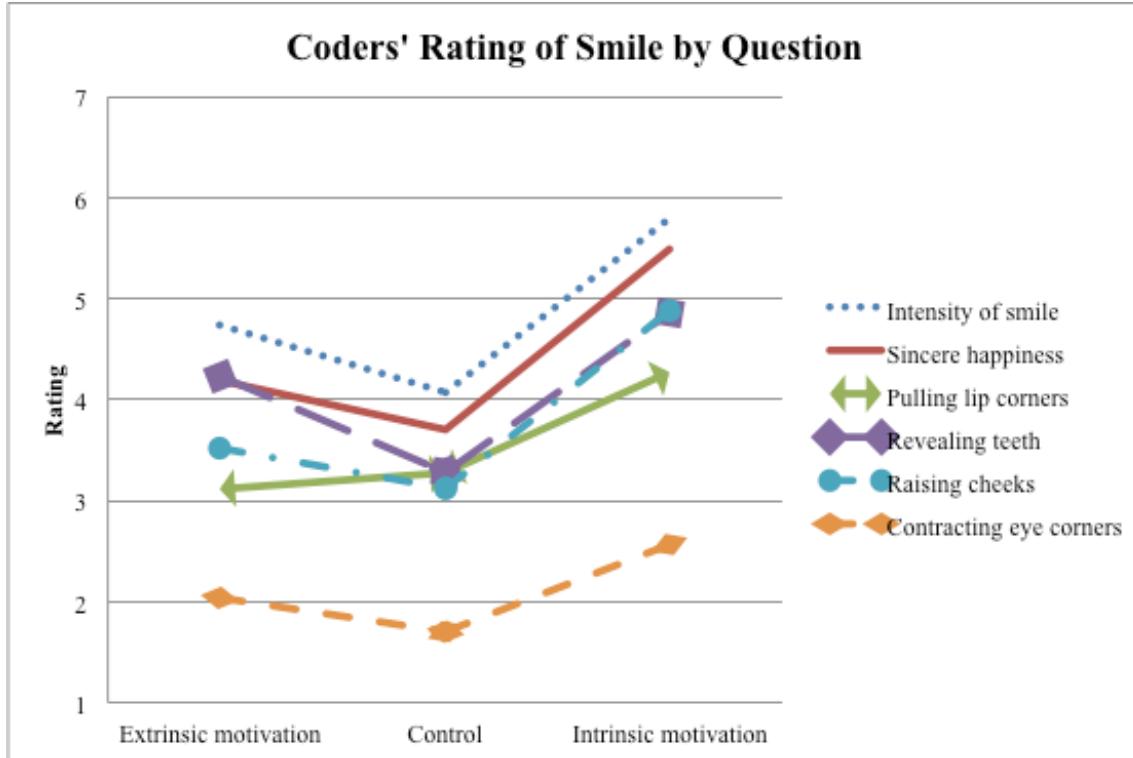
stronger goal of signaling extrinsic motivation than those in the control ( $M = 3.30$ ,  $t(167) = 1.79$ ,  $p = .08$ ) or intrinsic motivation condition ( $M = 2.84$ ,  $t(167) = 3.08$ ,  $p < .01$ ). The latter two conditions were not different from each other ( $t(167) = 1.29$ ,  $NS$ ).

*Degree of smiling.* Following a coding manual (see Appendix C), two coders blind to both hypotheses and condition coded the Final Photos which participants submitted ostensibly for the agent's use. For each photo, coders rated two items which measured the intensity of the smile displayed in the photo ( $1 = \text{There is no smile at all}$ ,  $10 = \text{There is a very intense smile}$ ), sincere happiness ( $1 = \text{This person does not look sincerely happy at this moment}$ ,  $10 = \text{This person looks sincerely happy at this moment}$ ), and four items pertaining to facial actions related to smiling (also on 10 point scales). Three of the four facial actions of smiling came from Ekman and Friesen (1976, 1978)'s Facial Action Coding System (FACS). Ekman and colleagues studied human emotions by decomposing facial expressions of emotions into a total of 44 generic facial muscle movements (called "Facial Action Units (FAU)"). Each emotion is a combination of a few facial muscle movements. According to Ekman and colleagues, a smile of enjoyment (i.e., The Duchenne Smile, Ekman, Davidson and Friesen 1990) includes pulling the corner of one's lips upward (FAU12), raising one's cheeks (FAU6) and contracting the external corners of one's eyes (FAU7). Although Ekman and colleagues' research did not indicate that revealing one's teeth was a necessary element of enjoyment-related smiling, we included one question to test this as well, because people often reveal their teeth while smiling.

Our main dependent variable was the degree of smiling in the Final Photo that participants submitted for the agent's use, as assessed by our coders. The inter-rater reliability was high (ICC = .93) and disagreements were resolved by discussion. The six ratings (i.e., intensity of smile, sincere happiness, pulling lip corners, raising cheeks, contracting eye corners,

revealing teeth) loaded on a single factor (72.51% variance explained), hence were averaged to form an overall index of degree of smiling ( $\alpha = .92$ ). Motivations of the endorsers significantly influenced the degree of smiles displayed in the Final Photos ( $F(1, 167) = 7.14, p = .001$ ). Specifically, endorsers in the intrinsic motivation condition ( $M = 4.64$ ) displayed significantly greater smiles than endorsers in the control ( $M = 3.19, t(167) = 3.69, p < .001$ ) or extrinsic motivation condition ( $M = 3.63, t(167) = 2.57, p < .05$ ). The control and extrinsic motivation conditions did not differ in the degree of smiles ( $t(167) = -1.12, NS$ ). This pattern held robustly when analyses were performed separately on intensity of smile, sincere happiness, pulling of lip corners, raising cheeks, and contractions of eye corners (Figure 2). Interestingly, the pattern on revealing teeth was somewhat different. Although endorsers in the intrinsic motivation condition revealed their teeth to a greater extent than those in the control condition ( $M_{control} = 3.23, M_{intrinsic} = 4.86, t(167) = 2.92, p < .01$ ), they did not do so more than those in the extrinsic motivation condition ( $M_{extrinsic} = 4.23, t(167) = 1.17, NS$ ). The fact that revealing teeth deviated from the other dimensions of smiling supports Ekman et al. (1990)'s framework in that revealing teeth is not a necessary element of smiling, and suggests an interesting way in which people smiled to signal extrinsic motivation.

**FIGURE 2: RATING OF THE FINAL PHOTO AS A FUNCTION OF ENDORSERS' MOTIVATION**

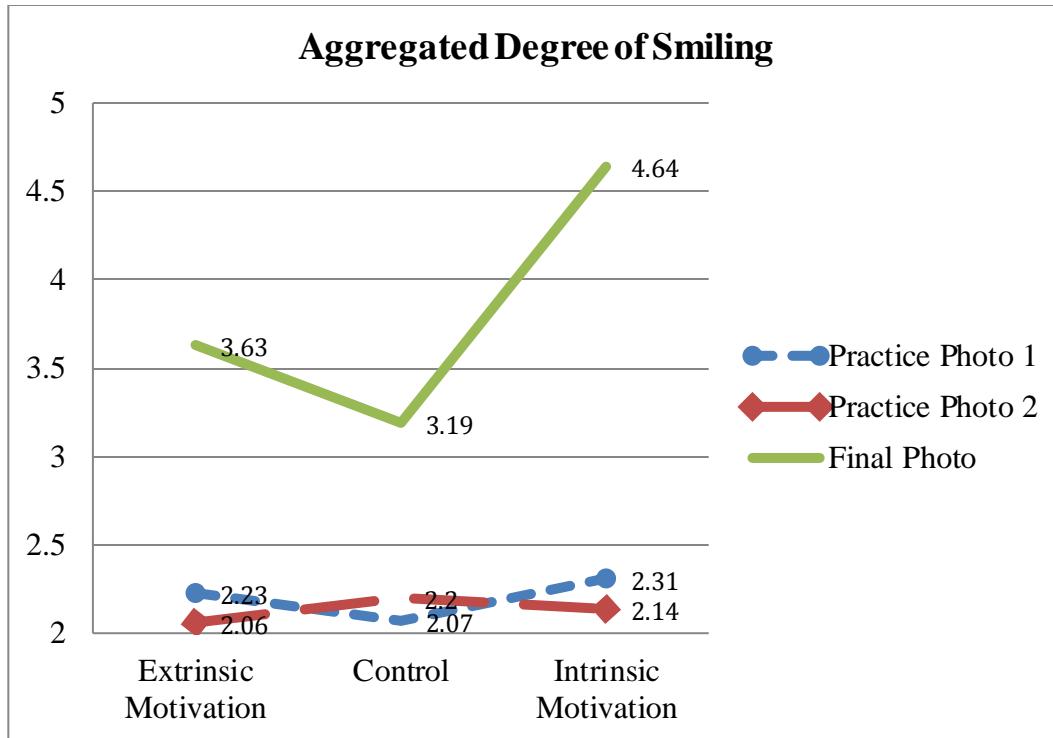


*Robustness check.* Though we randomly assigned participants to different motivation conditions, results might be driven by systematic differences in participants' baseline smile tendencies across conditions. To rule out this explanation, we conducted a robustness check by controlling for a baseline degree of smile in the two photos (Practice Photo 1 and Practice Photo 2) shot during the tutorial, before participants entered the main study about realtor endorsers. First, we performed an ANCOVA on the overall smile in the Final Photos with motivation as the between-subjects factor, and the overall smiles in Practice Photo 1 and Practice Photo 2 (coded by the same coders following the manual in Appendix C) as two covariates. Both Practice Photo 1 smile ( $F(1, 165) = 12.78, p < .001$ ) and Practice Photo 2 smile ( $F(1, 165) = 6.62, p = .011$ ) significantly predicted the smile in the Final photo, indicating that participants who displayed bigger smiles during the tutorial photos were also likely to display bigger smiles in the endorsement headshots. Importantly, however, the motivation manipulation still significantly

influenced the smile in the Final photos ( $F(1, 165) = 8.29, p < .001$ ) after baseline smiles were statistically controlled for. Planned contrasts held as well ( $M_{\text{intrinsic}} = 4.60, M_{\text{control}} = 3.22, p < .001; M_{\text{intrinsic}} = 4.60, M_{\text{extrinsic}} = 3.64, p = .006$ ). To examine this in another way, we treated the smiles in the three photos as repeated-measure of dependent variable, hence the entire study became a 3 (Motivation: intrinsic vs. control vs. extrinsic)  $\times$  3 (Photo: Practice Photo 1 vs. Practice Photo 2 vs. Final Photo) mixed design. Repeated-measures ANOVA revealed a within-subjects main effect of photo ( $F(2, 334) = 82.16, p < .001$ ), no between-subjects main effect of motivation ( $F(2, 167) = 1.81, NS$ ), and a significant motivation  $\times$  photo interaction ( $F(4, 334) = 4.99, p < .001$ ). Participants did not show different degrees of smiles in their Practice Photo 1 and Practice Photo 2. However, after they were assigned to signal different types of motivation, they displayed a bigger smile in the Final Photo if their goal was to signal intrinsic motivation versus extrinsic motivation or no goal (see Figure 3).

It is possible that our extrinsic motivation manipulation suggested to participants that they were not satisfied with the real estate agent. Hence, the smaller smiles in the extrinsic motivation condition might be due to dissatisfaction, rather than differences in motivation. However, we do not think this was the case. First, participants in all conditions read that the agent was professional and patient and they were very satisfied with her service. Second, if the extrinsic motivation manipulation made participants dissatisfied with the agent, they should have displayed a smaller smile than in the control condition. However, participants in the extrinsic motivation condition actually displayed directionally bigger smiles than in the control condition.

**FIGURE 3: RATING OF SMILE AS A FUNCTION OF MOTIVATION AND PHOTO**



#### **STUDY 4: KICKSTARTERS STRATEGICALLY CHOOSE PROFILE PHOTOS WITH BIGGER SMILES TO SIGNAL INTRINSIC MOTIVATION**

The aim of study 4 was to try and replicate study 3 with a different, more subtle manipulation of motivation. We also tested our hypothesis in another business context where the concern of intrinsic motivation matters, namely, that of entrepreneurs seeking funding from possible backers. More importantly, although participants who assumed intrinsic motivation displayed bigger smiles in study 3, it was unclear whether they did so consciously and strategically. Study 4 was designed to provide direct evidence about this possibly strategic behavior by actors. Specifically, we manipulated the nature of motivation and asked participants (who played the role of Kickstarters) to choose between a profile photo featuring a big smile and

one featuring a small smile, to upload. We then asked them to explain their choice in an open-ended question. Our prediction was that participants who were asked to signal intrinsic motivation (vs. extrinsic motivation or no specific motivation) would be more likely to choose the profile photo with the big smile, and they would be more likely to consciously explain their choice as being because big smiles signal intrinsic motivation. Consequently, the open-ended explanations should mediate the effect of motivation on choice.

## Method

One hundred and twenty US citizens (59% female, median age = 33) were recruited on Amazon Mechanical Turk to participate in a short study in return for \$0.40. Study 4 followed a 3 (Motivation: intrinsic vs. extrinsic vs. control)  $\times$  2 (Photo order counterbalancing: big smile on the left vs. big smile on the right) between-subjects design. Participants first read a brief description of Kickstarter.com. They were told that Kickstarter.com is a crowdfunding website on which individuals introduce themselves and their business ideas and ask for investments from the public. They were reminded that every investment was to some extent risky, and investors should examine the information on a business owner's Kickstarter page to decide whether it is worth investing in. We then described Barbara, an entrepreneur who makes mobile apps, and wanted to raise money on Kickstarter.com. As part of setting up her profile, Barbara needed to upload a profile photo. In the control condition, participants read, "*Imagine that you are Barbara. Now please choose a photo to upload.*" Two headshots of Barbara (stimuli from study 3) were presented side-by-side, one displaying a small smile and the other big smile. The order of the two headshots was counterbalanced. Participants in the intrinsic and extrinsic motivation

conditions saw the same pair of photos and were asked to make the choice, except that in the intrinsic [extrinsic] motivation condition participants read, “*Imagine that you are Barbara. You want to signal to potential investors that you are highly motivated to work on your apps because you genuinely want to make great apps [because you want to make a lot of money for yourself and your investors]. Now please choose a photo to upload.*” Participants in all conditions chose one profile photo of the two, explained their choice in an open-ended question, and completed demographic questions.

## Result

*Choice of photo.* Three dummy variables were generated for analysis (DummyExtrinsic = 0 or 1; DummyControl = 0 or 1; DummyIntrinsic = 0 or 1). First, a binary logistic regression was performed on photo choice (0 = small smile headshot, 1 = big smile headshot) with five predictors, namely DummyControl, DummyExtrinsic, Order (0 = big smile on the left, 1 = big smile on the right), DummyControl×Order and DummyExtrinsic×Order. Order had no interactive effects (*Wald*'s (1) < 1.35, NS) hence we collapsed the data across order conditions for the following analysis. The likelihood of choosing the big smile headshot was significantly different across motivation conditions ( $\chi^2 (2) = 9.29, p < .01$ ). Pairwise comparisons were performed with two binary regressions. Participants were more likely to choose the big smile headshot as Barbara's profile photo if they were given the goal to signal Barbara's intrinsic motivation ( $M = 82.5\%$ ) than extrinsic motivation ( $M = 51.2\%$ , *Wald* (1) = 8.33,  $p < .01$ ) or in the control condition ( $M = 59.0\%$ , *Wald* (1) = 5.05,  $p < .05$ ). The extrinsic motivation and control conditions were not different from each other (*Wald* (1) = .49, NS) in terms of choice of photo.

*Evidence for strategic signaling.* Two coders blind to motivation conditions coded the open-ended explanations of photo choice to a dummy variable named “strategic signaling”. They were instructed that strategic signaling should be coded as “1” if participants articulated that they chose the big smile because it signaled Barbara was passionate, enthusiastic, genuine, motivated about her business and enjoyed what she did (e.g., intrinsically motivated), and “0” otherwise. Sample explanations for strategic signaling = 1 included, *“I love her smile. It makes her look like she enjoys what she does”*, *“I like this photo because it looks like Barbara is excited about her work; she seems highly motivated to do a good job”*, and *“She looks happy and enthusiastic which means maybe she has the enthusiasm needed to kickstart a great business.”* The two coders showed high inter-rater reliability (ICC = .86) and disagreements were resolved by discussion. First, strategic signaling was regressed on DummyControl and DummyExtrinsic. Participants who were given a goal to signal intrinsic motivation were more likely than participants in the extrinsic motivation ( $B = -1.25$ ,  $SE = .55$ ,  $Wald (1) = 5.20$ ,  $p < .05$ ) or control condition ( $B = -1.66$ ,  $SE = .62$ ,  $Wald (1) = 7.14$ ,  $p < .01$ ) to consciously explain their choice as because smile signaled intrinsic motivation. Next, choice of smile was regressed on DummyControl, DummyExtrinsic and strategic signaling. Strategic signaling significantly predicted choice of smile ( $B = 2.74$ ,  $SE = 1.05$ ,  $Wald (1) = 6.77$ ,  $p < .01$ ), whereas the effect of DummyControl ( $B = -.82$ ,  $SE = .55$ ,  $Wald (1) = 2.19$ , NS) and DummyExtrinsic ( $B = -1.25$ ,  $SE = .55$ ,  $Wald (1) = 5.16$ ,  $p = .02$ ) became either non-significant or less significant than before, indicating mediation effects.

## Discussion

Study 4 replicated the pattern observed in study 3 in a different setting. Participants who role-played Kickstarter entrepreneurs were more likely to choose a big (vs. small) smile profile photo for their crowdfunding web page, if they had a goal to signal intrinsic motivation (vs. extrinsic motivation vs. control) in their businesses. More importantly, open-ended explanations provided direct evidence that communicators did so consciously and strategically. It is possible that not all participants who strategically relied upon the smile to signal intrinsic motivation provided a written answer indicating so. As a result our open-ended question had modest power in capturing the true degree of strategic signaling. Therefore, we believe the above mediation analysis was a conservative test. Even so, we found that participants consciously mentioned that they strategically used smiles to signal intrinsic motivation and their explanations at least partially mediated the effect of signaling goal on choice of smile.

While studies 1 and 2 showed that observers inferred greater intrinsic motivation from bigger smiles, studies 3 and 4 showed that communicators strategically displayed bigger smiles to signal intrinsic motivation to potential observers. Together, these findings indicate that the relationship between smile size and intrinsic motivation is knowledge shared by both sides in social interactions and communication. Observers and actors both apply this knowledge to solve challenges in interpersonal communication, such as inferring and signaling the nature of one's motivation.

## **GENERAL DISCUSSION**

### **Summary of Findings**

In two studies we find that observers inferred greater intrinsic motivation from actors' bigger smiles if the smiles were perceived as the result of engaging in an activity, while two additional studies suggest that actors strategically displayed bigger smiles if they wanted to signal their intrinsic motivations to potential observers. In study 1, participants inferred greater intrinsic motivation and predicted better marriage quality if a couple displayed bigger (vs. small) smiles. This was not true when smiles took place before wedding because in such case enjoyment was not a direct consequence of marriage. Inferred intrinsic motivation fully mediated the smile size by timing interaction on predicted marriage quality. In study 2, persuasion knowledge lowered the inferred intrinsic motivation underlying customer testimonials, but not if customer endorsers displayed big (vs. small) smiles. In study 3, participants who role-played the customer endorsers submitted headshots with bigger smiles if they were given a goal to signal intrinsic (vs. extrinsic or no specific) motivation for their testimonials. Similarly, in study 4, participants who role-played entrepreneurs chose a bigger smile profile photo for their crowdfunding webpage if they were given a goal to signal intrinsic (vs. extrinsic or no specific). Open-ended explanations of their choice revealed that they did so deliberately and strategically.

## **Theoretical Contributions**

The current research makes several contributions. Firstly, we contribute to the intrinsic motivation literature by examining intrinsic motivation as important social information. Past literature has primarily focused on how a person's intrinsic motivation influences his or her own performance (see review by Ryan and Deci 2000a, 2000b) and what factors foster or undermine a person's own intrinsic motivation, such as tangible rewards (see Deci, Koestner and Ryan 1999

for a review) or autonomous choice (see Pataill, Cooper and Robinson 2008 for a review). The current research takes a different angle and examines intrinsic motivation as important social information that can be communicated between actors and observers. People often need to figure out the nature of other people's motivation in order to coordinate social interactions. How do they do so, particularly when access to another person's internal states is limited and talk can be cheap? We showed that observers could infer intrinsic motivation from displayed enjoyment (e.g., smile). Secondly, we contribute to the emotion literature by supporting and extending the social functional view of human emotions. This emerging stream of research has shown that other people's emotions signal not only their affective state, but also their traits (Barasch et al. 2014; Feinberg et al. 2012), attitudes (Ames and Johar 2009) and expectations (Van Kleef et al. 2006). The current research, for the first time, shows that other people's emotions (e.g., enjoyment) signal the fine nuances of their nature of motivation (e.g., intrinsic motivation). Thirdly, limited experimental research has directly tested whether actors proactively and strategically display certain emotion to observers during social interactions, though qualitative research has suggested this is so (Fitness 2000; Sutton 1991). Among the very few, Andrade and Ho (2009) showed that people faked verbally stated negative emotions (e.g., anger) in the current round of a game to condition their game counterpart's response in the next round. The current study extends this research by showing that communicators strategically display facially expressed positive emotion (e.g., enjoyment) to signal a fine internal state (e.g., intrinsic motivation) to potential observers (Study 3 and Study 4).

Van Kleef and colleagues (2011) found that context-specific discrete emotions (e.g. happy vs. anger; guilt vs. disappointment) signaled social information. The current research shows that the intensity of a single specific emotion (e.g., big vs. small smile) can also signal

fine social information.

In the four studies we have presented, smile size was manipulated at two levels—big vs. small. It is obvious that the degree of smile can vary across a broader range. Would the effect hold if the small smile is even smaller and eventually represents neutral expression? In other words, do our effects hold when comparing smile with neutral expressions? In another study similar to study 1, we asked 242 US MTurkers (97 females, median age = 30) to examine a group photo of a Karate Club. The photo featured 30 club members standing together, dressed in karategi. Participants randomly saw either a smiling photo or a neutral photo that differed in the expressed facial emotions. We manipulated the timing of the emotion display as in study 1, by indicating that this photo was taken either before or after the individuals in the photo completed their Karate training. Participants then completed a 23-item scale adapted from the Sport Motivation Scale (Pelletier et al. 1995), which measured their inferences regarding the club members' intrinsic and extrinsic motivations for practicing Karate. The results showed a significant interaction of displayed emotion and timing of emotion ( $F(1, 238) = 6.91, p < .01$ ), such that if they thought the photo was taken after the training, participants inferred higher intrinsic motivation if the club members displayed smiling rather than neutral expressions ( $M_{\text{neutral}} = 5.14, M_{\text{smile}} = 5.47, F(1, 238) = 4.96, p < .05$ ). The effect disappeared if the photo was purportedly taken before the training ( $M_{\text{neutral}} = 5.42, M_{\text{smile}} = 5.21, F(1, 238) = 2.19, \text{NS}$ ), because the smiles were then less likely to be consequence of practicing Karate. Also, as in Study 1, the smile  $\times$  timing interaction directionally predicted anticipated Karate performance (“*How likely will these people become excellent in Karate?*” 1 = *very unlikely*, 7 = *very likely*.  $F(1, 238) = 2.63, p = .11$ ). Mediated moderation analysis again showed that inferred intrinsic motivation fully mediated the smile  $\times$  timing interaction on anticipated Karate performance ( $B =$

.07,  $SE$  (Boot) = .03,  $CI$  = [.02, .13]). Smile and timing did not have a significant interactive effect on inferred extrinsic motivation ( $F$  (1, 238) = 2.26,  $NS$ ). Neither did extrinsic motivation inference mediate the smile  $\times$  timing on anticipated Karate performance. This study demonstrates the generality of our findings not only in big vs. small smile, but also in comparing a smile with a more neutral emotional expression.

The current research focuses on facial expression of emotions rather than stated emotions, an area less studied in the consumer behavior literature. We believe, however, that facial expressions of emotion are important because they are readily visible to others, and the “leakage” in facial expressions is often more diagnostic than in verbally claimed emotions (Ekman 1993). Ekman and colleagues found that a Duchenne Smile signals true enjoyment, but that absence of the contraction of external corners of the smiler’s eyes signals fake enjoyment (Ekman, Davidson and Friesen 1990). However, the current research differs from Ekman’s research. While Ekman and colleagues focused on the relationship between context-independent generic facial expressions (e.g., smile) and emotional states (e.g., enjoyment), the current research focuses on the relationship between a context-dependent emotional state (i.e., enjoyment as reflected by smile) and inferred motivation for engaging in an activity (e.g., intrinsic motivation).

Last but not least, our findings are robust across cultures. In studies 1 and 2, Eastern participants inferred intrinsic motivation from bigger smiles of Western faces. In the Karate study described above, Western participants inferred intrinsic motivation from bigger smiles of Eastern faces, as 28 out of the 30 Karate practitioners in the photos were Asian. This is consistent with previous research that shows that the basic emotions have unique facial configurations and are universally recognized across cultures (Ekman and Friesen 1971; Ekman,

Sorenson and Friesen 1969; Ekman et al. 1987; Elfenbein and Ambady 2002). Extending previous research, the current research also shows that the relationship between smiling and inference of intrinsic motivation is shared by both Eastern and Western cultures. Within the same culture, the results also held robustly across people with different demographic backgrounds (e.g., American undergraduate students in study 3 and MTurk participants in study 4).

### **Limitations and Boundary Conditions**

*Extrinsic motivation.* It is tempting to view intrinsic and extrinsic motivation as two opposite ends of the same construct. However, their individual relationships with smiling appear to be more complex. In the current research, we found a systematic relationship between smile size and intrinsic motivation inference but not between smile size and extrinsic motivation inference. According to Self-Determination Theory, extrinsic motivation can be further divided into External Regulation, Introjected Regulation, Identified Regulation and Integrated Regulation, with each more similar to intrinsic motivation than the former (Ryan and Deci 2000a). For example, getting an A for a course is considered as integrated regulation rather than intrinsic motivation for study, but students are likely to feel happy after getting an A. Therefore it is likely to be more difficult for observers to assess extrinsic motivation than intrinsic motivation based solely on facial expressions of emotion.

*Timing of emotion.* Enjoyment is a diagnostic signal of intrinsic motivation if it is a consequence of engaging in an activity. Therefore, in study 1 and the Karate study described here in the discussion, we found that participants inferred stronger intrinsic motivation from a big smile after but not before the focal activities. In study 2, we did not manipulate the timing of

emotional expression. Instead, it was assumed that the smiles in the photos were displayed during the endorsement, if one regards shooting photo as part of providing the endorsement to the realtor. Enjoyment displayed “during” the engagement in an activity should have a similar signaling effect as emotion displayed “after” the engagement of an activity because both are consequences of engaging in the activity, and both should be dissimilar to the enjoyment happens before the activity.

*Degree of skepticism.* Smiles would be irrelevant for judging other people’s intrinsic motivation if there were no ambiguity. Consumers do not automatically question a salesperson’s sincerity of compliment unless they have abundant cognitive resources or they have high persuasion knowledge (Campbell and Kirmani 2000). Compared to a salesperson’s compliment, customers’ testimonials are less suspicious as a form of communication. Therefore in study 2, the bigger smiles displayed by customer endorsers did not lead to inferences of greater intrinsic motivation, unless persuasion knowledge was made accessible. This result seems possibly inconsistent with that in study 1, where smiles had an effect in the baseline control condition. The apparent discrepancy is due to the fact that the description of the newly wedded couple in study 1 was crafted in a way that left room for suspicion. George was rich and Linda was famous, and the two were getting married after knowing each other for just a year. Some participants might have found their relationship to some extent suspicious. The degree of skepticism should be influenced by the observers’ chronic tendency and contextual factors that trigger or remove such suspicion. The current research examined the role of persuasion knowledge. Future research can examine other factors.

*Cognitive vs. affective process.* Conceptually, the process through which observers infer intrinsic motivation from another person’s displayed smile is purely cognitive. Because people

learn from their past experiences or observations that intrinsically motivated activities often lead to enjoyment, they use this knowledge to make inferences. We do not assume that observers who see a bigger smile have to first feel greater enjoyment themselves in order to infer greater intrinsic motivation. Hence, the current research is different from Small and Verrochi's (2009) demonstration that sadness in a charity appeal promotes larger donations by contagiously inducing sadness and sympathy in viewers. In study 1, we found that the timing of smiles moderated the inferences, suggesting that the underlying mechanism is a cognitive process involving causal attributions rather than an affective contagion process. Similarly, the effects in study 2 held when self-reported mood was statistically controlled for.

*The accuracy of the inference.* The focus of the current research is to show that people use smiles to infer and signal intrinsic motivation. We do not test whether the inference is always accurate or whether the strategic signaling always succeeds. The fact that people sometimes can strategically manipulate their facially expressed emotions, as shown in studies 3 and 4, does not imply that people always manipulate them. This also does not disqualify expressed emotions as largely useful cues for observers, because emotions are usually displayed spontaneously. The accuracy of the inference will naturally vary with the ambiguity inherent in the situation.

## **Future Research**

Future research can be taken in many interesting directions. First, the characteristics of a smile can be studied in more detail. The current research examines just two levels of smiling (big vs. small). Future research might also vary the intensity of smiles across a broader range and test if the relationship with intrinsic motivation is linear or quadratic. Perhaps a smile that is too big

may lead to suspicion, in the same way that too much effort by a marketer can lead to negative inferences (Kirmani 1990). Second, the context of smiling can be studied further. For example, research shows that candid photos generate more favorable impressions among observers than posed photos because the former are perceived as more genuine (Berger and Barasch 2015). Future research can test whether a big smile with eyes looking at the task being performed (vs. directly looking at the observers) signals greater intrinsic motivation. The former may be perceived as less staged and thus more diagnostic. The characteristics of the observers may also influence their inference making. Observers may have different lay theories about emotion (Labroo and Mukhopadhyay 2009), such as to what extent emotional expressions are spontaneous or controlled, and thus as more or less diagnostic signals of internal states. These lay theories may also moderate the signaling effect of smile. Specifically, observers may be more likely to infer intrinsic motivation from other people's bigger smiles if they have a stronger (vs. weaker) lay theory that emotions are spontaneous and uncontrollable. Similarly, an observer's emotional intelligence may also play a role in the inferences made. Because emotional intelligence represents a person's ability to perceive, use, understand and manage emotions (Salovey and Grewal 2005), those of higher (vs. lower) emotional intelligence may be more likely to infer intrinsic motivations from other's smiles, and more likely to display bigger smiles to signal their own intrinsic motivation. Besides positive emotions, negative emotions may also signal one's motivation. For example, different negative emotions may signal different sub-categories of extrinsic motivation (Ryan and Deci 2000a). Whereas anxiety after failure may signal external regulation (e.g., motivated by avoidance of punishment), disappointment after failure may signal identified or integrated regulation (e.g., motivated by achievement).

## Managerial Implications

The current research has important managerial implications. There are many situations in which consumers have concerns about the intrinsic motivation of a marketing communication or business activity (e.g., salesmen's compliment, customer testimonials, corporate social responsibility, venture investment). Our findings suggest that firms or marketers can alleviate this concern by using big smiles to signal intrinsic motivation. For example, past literature shows that persuasion knowledge poses a threat to the processing of marketing communication (Campbell and Kirmani 2000), yet less is known about the solutions to this problem. Study 2 showed that bigger smiles of the customer endorsers effectively alleviated the negative impact of persuasion knowledge on customer testimonials. Moreover, endorsers seemed to know this relationship and strategically displayed bigger smiles if they wanted to signal intrinsic motivation. Similarly, an entrepreneur who wanted to signal her intrinsic motivation for working on her start-up may want to use a big smile profile photo for fund-raising. Human faces are heavily involved in marketing communications (e.g., personal sales, customer service, print ads and public relationship) and facial expressions are easy to manipulate. Marketers can leverage our findings and facilitate their marketing communication by experimenting with smiles portrayed in ads and by salespeople.

## APPENDIX A: STUDY 1 STIMULI AND MEASURES

Small Smile condition



Big Smile condition



1. Linda married George because she is so in love with George (I)
2. George married Linda because he is so in love with Linda (I)
3. Linda married George for his wealth (E)
4. George married Linda for her fame (E)
5. George and Linda got married because they enjoy being with each other more than with any other person (I)
6. George and Linda got married because they love each other for their personalities, not for their prestige (I)
7. George and Linda marry each other because they want to take care of each other, no matter

what happens (I)

8. George and Linda married each other to impress other people (E)

9. George and Linda got married to show others that they are capable of getting married. (E)

10. George and Linda got married because they don't want to disappoint certain people (e.g. family and friends) (E)

11. George and Linda got married because it is happy to be husband and wife of each other (I)

12. George and Linda got married because they love the numerous crazy and amusing moments that they have with each other. (I)

13. George and Linda got married because they want to leverage each other's resources (E)

14. George and Linda got married because the other's social status matches their own social status (E)

NOTE: E = Extrinsic Motivation; I = Intrinsic Motivation

## APPENDIX B: STUDY 2 STIMULI

Small smile condition

The image shows a screenshot of a real estate website. At the top, there is a dark blue navigation bar with white text and icons. The menu items are Home, Property Search, My Listings, About Me, Sellers, Buyers, Blog, and Contact. Below the navigation bar is a large, high-angle photograph of a city skyline with mountains in the background. The city has numerous buildings of various heights, with some prominent skyscrapers. Below the image, the name "Kelly Robinson" is displayed in a large, bold, black font. Underneath the name, the text "Real Estate Agent, Phoenix AZ" is written in a smaller, black font. A short bio follows: "Looking for a house or an apartment to rent? Give me a call at 602-995-5982. As a professional realtor in Phoenix, I'm dedicated to providing the quality of service and peace of mind that you need and expect." A horizontal line separates this section from the next. The next section is titled "My Previous Customers" in a black font. It features two circular profile pictures of women. The woman on the left has long, light-colored hair and is smiling. The woman on the right has dark hair and is also smiling. Below each profile picture is a testimonial. The testimonial for the woman on the left reads: "Kelly provides the best service." --Anna. The testimonial for the woman on the right reads: "She is the person you are looking for." --Rebecca. At the very bottom of the page, in a small, gray font, is the address: 8501 N 27th Ave Phoenix, AZ 85051 | 602-995-5982.

Home Property Search My Listings About Me Sellers Buyers Blog Contact

**Kelly Robinson**

Real Estate Agent, Phoenix AZ

Looking for a house or an apartment to rent? Give me a call at 602-995-5982. As a professional realtor in Phoenix, I'm dedicated to providing the quality of service and peace of mind that you need and expect.

---

My Previous Customers



*"Kelly provides the best service."*  
--Anna

*"She is the person you are looking for."*  
--Rebecca

8501 N 27th Ave Phoenix, AZ 85051 | 602-995-5982

Large smile condition



Home    Property Search    My Listings    About Me    Sellers    Buyers    Blog    Contact

# Kelly Robinson

Real Estate Agent, Phoenix AZ

Looking for a house or an apartment to rent? Give me a call at 602-995-5982. As a professional realtor in Phoenix, I'm dedicated to providing the quality of service and peace of mind that you need and expect.

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My Previous Customers



*"Kelly provides the best service."*  
--Anna

*"She is the person you are looking for."*  
--Rebecca

8501 N 27th Ave Phoenix, AZ 85051 | 602-995-5982

## APPENDIX C: STUDY 3 CODERS' MANUAL

Q1: How intense is the smile in this photo, if there is any?

(Note that for this question, we are asking the intensity of smile only, that is how big the smile is, regardless of whether the smile is sincere or not.)

1. There is no smile at all	2	3	4	5	6	7	8	9	10. There is a very intense smile
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Q2: To what extent does this person look sincerely happy at this moment in this photo?

1. This person does not look sincerely happy at this moment	2	3	4	5	6	7	8	9	10. This person looks sincerely happy at this moment
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Q3: To what extent does this person pull the corners of his or her lips upward?

1. This person does not pull them upward at all	2	3	4	5	6	7	8	9	10. This person significantly pulls them upward
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Q4: To what extent does this person reveal his or her teeth?

1. This person does not reveal teeth at all	2	3	4	5	6	7	8	9	10. This person reveals a large proportion of teeth
---	---	---	---	---	---	---	---	---	---

Q5: To what extent does this person raise his or her cheeks?

1. This person does not raise cheeks at all	2	3	4	5	6	7	8	9	10. This person raises cheeks to a significant degree
---	---	---	---	---	---	---	---	---	---

Q6: To what extent does this person contract the external corners of his or her eyes?

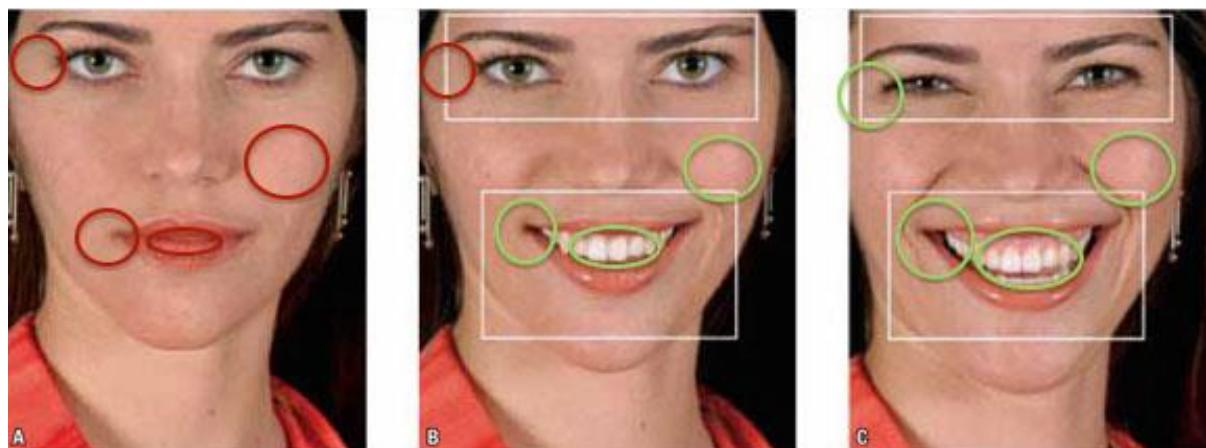
1. This person does not contract the external corners of eyes at all	2	3	4	5	6	7	8	9	10. This person contracts the external corners of eyes to a significant degree
--	---	---	---	---	---	---	---	---	--

An illustration of facial movements (reference for Q3-Q6)

The person in photo A has no signs of the 4 facial movements

The person in photo B pulls her lip corners upward, reveals her teeth, raises her cheeks, but does not contract the corners of her eyes

The person in photo C pulls her lip corners upward, reveals her teeth, raises her cheeks, and contracts the corners of her eyes



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