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***GIF ME A BREAK: THE INFLUENCE OF REACTION GIFS ON
OVERHEARERS' JUDGEMENTS OF HUMOR AND IRONY IN
COMPUTER-MEDIATED COMMUNICATION***

A dissertation submitted in partial satisfaction
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

PSYCHOLOGY

by

Patrawat Samermit

September 2018

The Dissertation of Patrawat Samermit
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Vice Provost and Dean of Graduate Studies

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2018

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Abstract

GIF Me a Break: The Influence of Reaction GIFs on Overhearers’ Judgements of Humor and Irony in Computer-Mediated Communication

Patrawat Samermit

Humor in face-to-face interactions regularly exploits multimodal cues such as emotional facial expressions as social cognitive tools that help us coordinate our beliefs with others’. The encryption theory of humor (Flamson & Barrett, 2008) states that humorous acts are encrypted and we need a common “key” to understand what’s funny and humor acts a marker of internal similarity. We communicate this shared knowledge with laughter, which denotes affiliative interactions and shared underlying assumptions about the world (e.g., “This is socially okay, so I can believe it’s funny”; Flamson & Bryant, 2013) while cringing away indicates an affective stance of “this is not okay”.

These interactions are prevalent in every day face-to-face conversations, but are difficult to express in computer-mediated communication (CMC). However, the regular use and presence of GIFs in online mediums such as text messaging newly affords a similar style of multi-party interactions where one’s commentary on another person’s jokes may change someone’s opinion of the joke and interaction itself. If these multimodal cues exist in face-to-face group interactions, can CMC afford the same socioemotional cuing? GIFs, which re-present looped animations of embodied actions and are commonly used as reactions to everyday occurrences (Herring, 2015)

have been found to act as embodied depictions that demonstrate one's own current reactions in text-messaged conversations (Tolins & Samermit, 2016).

With the *affordances*, the possibilities for action that an agent directly perceives in an object or an environment (Gibson, 1979), provided with GIFs, this dissertation aims to answer the following broad question: How does the presence of a reaction GIF change how funny people perceive “overheard” text-messaged jokes? And does the way the GIF is understood as ironic (a combination of different dimensions of irony, such as how hyperbolic, understated, sarcastic, playful, performative, and humorous people find something; Gibbs & Samermit, 2017) have a predictive relationship with how funny they might find the joke itself?

This dissertation addressed these broad question in two experiments. In Experiment 1, participants acted as “overhearers” in a text-messaged group chat where they received a joke from one member of the group, and viewed either another member’s positive or negative GIF response, another member’s positive or negative Text response, or no response at all, before rating how funny they found the joke, and how ironic (sarcastic, hyperbolic, critical, and playful) they found the response. In Experiment 2, participants did the same as Experiment 1, but also saw static or animated GIF or Text responses. The two experiments tested two hypotheses: *the passive observer hypothesis*, where overhearers do not integrate valence with ironic information into their judgments of humor, and the *active negotiator hypothesis*, where they do. Results across both experiments support the active negotiator hypothesis, indicating overhearers in text messaged conversations conduct

metarepresentational reasoning and integrate valence with ironic information about responses to make judgments of humor. This finding supports the encryption theory of laughter and humor.

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¹ I'm all about multimedia and the sharing of experiences, so here's some mood music for the acknowledgements: <https://www.youtube.com/watch?v=7btsuRT3M1Q>

And thank you, parents, for instilling in me from a very young age the value of community. It was the key to our success and survival in America, as it has been here for me in grad school. แม่ พ่อ ขอขอบคุณที่ปล่อยให้ฉันโตขึ้น
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ไม่มีวันไหนที่ฉันจะไม่คิดถึงพ่อกับแม่ ฉันรักแม่กับพ่อ

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CHAPTER I

Introduction

Imagine you are scrolling through your Facebook newsfeed and come across Annie's post² and the subsequent comments, which you may or may not find funny. You are not an active participant in this interaction, so you act as an *overhearer*, or witness to this conversation. It may seem very natural for an overhearer like yourself to find this interaction humorous, but when breaking down the process it takes to understand whether it is funny or not, there is a lot that is happening simultaneously that contributes to your judgment of humor. What type of process occurs for us to understand something as simple as this Facebook comments thread as funny?



² I received consent to include this post and some of its responses from all parties of the interaction displayed in this paper. Additionally, this interaction was spontaneous and not planned for the purpose of this paper despite the three of us being the three best friends that anybody has ever had.

Figure 1. An example of a naturally occurring online interaction where a GIF was used as a stand-alone response on a Facebook comments thread. This example poses questions of what types of meaning must be construed from the GIF's use and function in the overall interaction in order for humorous content to be understood.

In this interaction, Annie's original post is a very "meta" joke, riffing on the common practice of putting one's witty private thoughts on a public forum like Facebook. Nick's first comment could be taken as a sincere question asking where she may have had this thought. However, Pat's chastising comment is meant to be read as a joke, marked by the change in fonts mid-word to emphasize how seCRET the shower is. Nick's reaction GIF of Homer Simpson acts as a direct response to Pat's chastisement, confirming that her comment was meant to be understood as a joke. Nick's GIF response acts as a specific modifier to Pat's response in multiple ways.

In this instance, Nick's reaction GIF acts as a stand-in for his emotional response towards Pat's chastisement, and may be interpreted as an embodied depiction demonstrating how he wants to disappear after being chastised. It is difficult to express the emotion that Nick is conveying verbally – something akin to metaphorically "shrinking away" from a situation he is embarrassed about, but it is straight forward to demonstrate it with the GIF here. One view might be that the embodied action is only depicting an emotional stance, in which case people passively understand the shrinking away as only conveying a negative reaction such as shame. On the other hand, despite the ineffable nature of the negative emotion he depicts, five people gave positive "reactions" to his response, indicating an implicit understanding of the negative emotional message he was trying to convey as well as

some inferred meaning: The negative action he's portraying may not really be negative.

This depiction can be read as having elements of irony, such as hyperbole, or exaggerating something beyond its literal representation, or even sarcasm, which can be understood as something that contradicts the current state of affairs in a potentially critical way. The GIF enacts an otherwise difficult to describe emotional stance that overhearers see and understand partially through a simultaneously reading of it as hyperbolic and sarcastic. This reading of the reaction as negative *and* ironic lends itself to them leaving *positive* responses on an otherwise *negative* portrayal of Nick's shame. My hypothesis is that overhearers enact *metarepresentational reasoning* where they understand the reaction to contain negative valence at the same time that it conveys a second-order ironic meaning (Colston & Gibbs, 2002; Gibbs, 2000). In this case, metarepresentational reasoning may look like the overhearer recognizing the embodied action as Nick conveying shame, but at the same time understanding that if Nick were really feeling ashamed, he would not use this GIF in response. This leads to an overhearer simultaneously perceiving the pretend shame with sarcasm and hyperbole.

The act of understanding the ironic second-order meaning actively helps overhearers interpret and negotiate the emotional reaction within the larger context of this interaction. The context of the response and its ironic reading contributes to understanding the reaction, as well as Pat's comment, as both being funny. If you were reading through Facebook and saw Pat's comment without the GIF, it is likely

that it would not be understood as a joke and potentially funny in the same way.

Nick's use of a GIF and its subsequent interpretation as ironic may have increased the likelihood of an overhearer recognizing Pat's turn as a joke. This can be seen in the likes that Pat's comment received, indicating people recognize it is not as a true admonishment, but play.

To answer original question, "What type of processes occur for us to understand something as simple as this Facebook comments thread as funny?", the answer is "A lot." Overhearers that are not active participants in conversations need to understand a multitude of information simultaneously. They need to understand: what GIFs are and how they are used culturally; that Nick is using Homer Simpson as a stand-in for his emotional response; that the emotional response of "shame" is represented by metaphorically shrinking away; that Annie, Nick, and Pat are friends; that the GIF conveys sarcasm and hyperbole; what sarcasm and hyperbole even are – tools to negotiate potentially ambiguous social situations (Gibbs & Samermit, 2017); that Pat's admonishment was not serious, but a form of play; that Pat signals the play through a *textism*, a use of text to convey nonverbal content such as yelling through a half caps-locked word; that Nick doesn't actually feel ashamed because he is participating in online play with Pat; and finally, that all of these pieces of information need to be understood simultaneously to read the interaction as humorous.

Research on computer-mediated communication (CMC) often focuses on the functions of different *graphicons*, or graphical communication tools used in online

communication (Herring & Danais, 2017), but do people really pick up and integrate all of this information when reading online conversations and making judgments of humor? If so, they are participating in *metarepresentational reasoning*, where they are attributing second-order meaning about another person's beliefs and intentions (Gibbs, 1999), to interpret the function of the GIF in this context as well as reading the reaction as ironic. But do overhearers really conduct metarepresentational reasoning on reaction GIFs to extract ironic meaning when they are used in CMC, and does that affect how funny they may find the joke ahead of it? This dissertation aims to examine how GIFs contribute to overhearers' judgments of humor in CMC. To begin, this dissertation reviews pre-existing literature to answer: 1) What cues do people use in face-to-face communication to help them evaluate and make judgements of humor? 2) What are the constraints and affordances, the possibilities for action that an agent directly perceives in an object or an environment (Gibson, 1979), of CMC, and GIFs in particular, to express nonverbal cues? 3) And how do these components work together to help overhearers interpret a humorous response in CMC?

Research indicates that GIFs may act similarly to face-to-face *backchannels*, short verbal or nonverbal responses to speaker's talk such as "mhm" or smiling (Goodwin, 1986; Bruner, 1979), that listeners use to help ground and steer the course of conversation (Clark & Wilkes-Gibbs, 1986; Tolins & Fox Tree, 2014). However, it is unknown whether "overhears" create second-order interpretations of these backchannels, and how their interpretation affects their comprehension of the

previous turn. The use of GIF has become increasingly common in the age of CMC to communicate emotional responses across a variety of mediums like tumblr (Bourlai & Herring, 2014), reddit (Massanari, 2015), Facebook, and multimedia messaging (MMS, otherwise known as text messaging) between phones (Tolins & Samermit, 2016). However, the way recipients interpret these reaction GIFs remains underexplored. Recipients' understanding of different emotional responses and backchannels may differentially predict overhearers' behavioral responses, including their experience of humor. In turn, how ironic overhearers find a reaction GIF may be influenced by different factors such as its valence, its animation, and especially the medium that it is presented in. One prediction is that a text response such as "lol" may afford less ironic interactions than an animated GIF depicting a person's genuine laughter.

This set of experiments further examines whether exposure to positive and negative reaction GIFs, as stand-ins for non-verbal backchannels like laughing or cringing, affect how funny overhearers find the previous turn, and how GIFs compare to textisms such as "lol". One aspect of this includes how passive or active overhearers are in this communicative process. The passive overhearer hypothesis predicts that the most important part of these cues and backchannels is that the valence, or emotional stance, is *conveyed* to the overhearer for them to align with: Seeing a person laughing in response might motivate the overhearer to laugh along by simply picking up on the shared valence. However, that assumption may be over simplistic in that it does not consider the overhearer's *understanding and*

interpretation of the emotional cue, such as when one receives a laughing GIF as above and reads it as sarcastic or hyperbolic. As such, this set of experiments also seeks to answer whether the different valence and medium a response is presented in changes how ironic (e.g., sarcastic, hyperbolic, critical, and playful) participants understand the reactions to be, and whether their ironic reading of each type of reaction also predicts how funny they find the text messaged jokes. GIFs present a novel form of communicating one's emotional stance and future actions that may rely as much on an overhearer's metarepresentational interpretation of them as they do the intended emotional signal to create meaning.

To summarize, there are at least two ways in which an overhearer might use a GIF to interpret an interaction as humorous. The first is that they may simply *passively observe and adopt* the valence the GIF is conveying, where a positive GIF would cause them to interpret a positive response similar to laughter contagion (Provine, 1992), and a negative GIF may cause them to interpret a negative response such as cringing. The second is that they may be *actively negotiating* the conveyed emotion by conducting metarepresentational reasoning about the GIF's use itself, helping them recognize and integrate simultaneous layers of second-order meaning such as irony into their judgments of humor. The process of *passively observing and adopting* or *actively negotiating* a conveyed emotion may differentially affect one's humor response in both face-to-face interactions as well as online.

CHAPTER II

Emotional Expressions, Laughter, and Social Affiliation in Face-to-Face Communication

What cues do people use in face-to-face communication to help them evaluate and make judgements of humor? To understand how people interpret humor in social interactions, we need to first understand the largely non-verbal cues associated with humor. As overhearers witnessing someone else's emotional responses such as cringing away or smiling and laughing, we may use these multimodal cues to motivate our decision to affiliate with someone by understanding their comment as humorous or to disaffiliate with someone by understanding their comment as inappropriate or offensive. When we experience humor, we can sometimes feel as though we are being carried away by different bodily sensations. Laughter and its emotional correspondent mirth (Arroyo et al., 1993) often accompany humorous material, and are described as making people feel light. However, some "humorous" material can make people physically cringe away (i.e. cringe comedy- see Middleton, 2013), as though it metaphorically moves people away from its topic as a force we create a stance against. The physical expression of our emotion – a laugh, smile, or cringe – can be seen in how we physically respond to someone during a humorous interaction, further marking our personal and social affiliation with them.

Humor, like emotions, evokes a sense of bodily movement (Samermit & Gibbs, 2016) in order to help us navigate our personal position towards something or someone (Kovescs, 2000). The felt sense of movement we experience with humor

may be toward an object which we judge as favorable to us (e.g., a joke that marks us as members of an “in-group”) or away from an object’s judged unsuitability (e.g., a personally offensive joke, pushing us into an “out-group”). In this way, humor can be understood as a personal *action tendency* that helps us move towards things we affiliate with and away from things we disaffiliate with (Samermit & Gibbs, 2016). The felt bodily response towards or away from something helps us respond cognitively and emotionally appropriately, especially in ambiguous social situations. Additionally, laughter is not purely a marker of humor, but may also mark that a message is “encrypted” and one needs a “key” to interpret it (Flamson, Bryant, & Barrett, 2011), further being used as a way to mark when a message must be interpreted beyond its valence and as a tool of social affiliation.

As overhearers in a conversation where we are not directly addressed, witnessing these multimodal cues can give us clues as to how to affiliate with others. If overhearers are simply passive observers of these multimodal cues, then witnessing someone laughing at another person may indicate they, too, should simply laugh along and share in the positive valence and find the person funny. They may experience a first-order response, where they pick up on the valence and share in that form of understanding without needing to do or integrate metarepresentational reasoning into this decision. However, if overhearers are active negotiators of the conversational information at hand, they may simultaneously recognize the recipient’s laughter as conveying more than just a positive valence, reading into some sort of second-order meaning attached to the response itself. As active negotiators in

the conversation, overhearers may contextually interpret a laughter reaction as ironic, understand the person who produced the previous turn may not be someone to affiliate with, and find them and their comment less funny. Humor, then, may not only be contextualized by the presence of laughter, but possibly also by how participants and overhearers alike interactively interpret the responses. Laughter is a complicated affiliative cue that marks social affiliation, irony, and affects the humor response in complex ways.

Social Effects of Laughter on Humor Responses

Are the benefits of laughter purely from the transmission of positive emotion, or could laughter also help us recognize that there is underlying meaning to be read into? Laughter has been a particularly interesting topic of research since it is often talked about as being socially “contagious,” has the power to communicate implicit beliefs, and its social context can change how funny people find things. It has long been known that an audience’s laughter tends to generate laughter from those around them (Perl, 1933) in what can be understood as *laughter contagion* (Provine, 1992). Laughter can indicate norms in behavior, which are related to its social use and propagation. For example, a sitcom narrative that expresses reckless driving behavior was understood as acceptable when there was a laugh track accompanying that discussion as compared to less acceptable for the control condition (Rhodes & Ellithorpe, 2016). This indicates that the presence of laughter may allow for some social mediation of normative beliefs, which makes laughter a powerful social tool.

This contagion indicates that laughter itself may be enough to evoke more laughter, even without the presence of a humorous stimulus (Provine, 1992).

Laughter commonly punctuates ordinary conversations, not just humorous ones, and it is an almost exclusively social behavior that occurs 30 times more frequently in social than solitary situations (Provine & Fischer, 1989). In fact, Fridlund (1991) tested the role of *implicit sociality* in the production of smiles and feelings of happiness. Participants watched a humorous video either alone, alone with the belief that a friend nearby was doing something different from them, alone but with the belief that a friend nearby was watching the same video in another room, or when a friend was physically present with them watching the video together. Results showed that participants produced the same amount of smiles and laughter when they thought that a friend was watching the same thing with them as when a friend was actually watching them, with both of these being higher than if they watched alone. Their happiness ratings were also higher when they were physically with a friend and when they imagined a friend watching with them than when they watched alone. The belief that a friend is experiencing something with the participant, even if they are not physically there, can cause them to produce more laughter and feel happier. It may be that the infectious transmission of social norms and shared positive valence is truly the source of laughter's potential communicative strengths.

The presence of laughter or someone else laughing has been shown to affect how funny people interpret what is being said. Chapman and Chapman (1974) found that children's humorous laughter, smiling, and judgements of funniness were

facilitated by the presence of a confederate that produced humorous smiles and laughter. In this study, participants were asked to listen to the material using headphones next to a confederate, who also had headphones on and were trained to laugh and smile either frequently, intermediately, or not at all while not looking at the participant. Children who were in the frequent and intermediate laughter and smile conditions found the material to be significantly funnier than in the control conditions, and also produced more smiles and laughter themselves. This indicates that the contagion of smiles and laughter can cause people to interpret material as funnier than when there's no smiles or laughter around. The presence or lack of laughter can also change what people think about a speaker. Gruner (1993) had participants listen to two speeches where the speakers attempted to be humorous. In one of these speeches the speaker received laughter from a "live audience" and in the other, the speaker tried to be humorous and was met with no laughter. Participants who acted as overhearers watched and listened to these interactions and made ratings on their perceptions of the speaker. They found that the presence of laughter in a serious interaction can cause people to find the speaker to be more interesting and funny than if the speaker did not receive any laughter. The presence of laughter and smiles in face-to-face interactions have the power to change peoples' beliefs about normative behaviors, their impressions about speakers, as well as how funny they find material.

These findings together make the assumption that laughter is a powerful vector for a listener and observer's positive valence and high humor responses.

However, these studies work under the assumption that the laughter is passively received by a listener or overhearer who understands the laugh as conveying a simple, positive meaning. Yet, it may not always be the case that laughter begets laughter, especially when the context around the laughter may be conveying something disagreeable. Take this counter-example to laughter contagion from *Natural Born Killers*³, where the scene, “I Love Mallory” spoofs classic 1950s sitcoms that used live studio audiences such as *I Love Lucy*. In this scene, Mallory comes downstairs to the sound of applause and laughter, to her family dinner. She proceeds to be degraded by her brother, father, and mother, with many of their verbal attacks being paired with a laugh track. She is visibly uncomfortable as this occurs. The scene escalates to her father calling her a “stupid bitch,” groping her, and threatening sexual assault with a laugh track punctuating each of his actions and threats. Laughter contagion has been shown to elicit more laughter, but that has commonly been shown in positive situations. Watching this particular scene induces a disturbing feeling, leaving the viewer with a sense of disgust instead of mirth. While this is anecdotal, it may point towards laughter being interpreted within the context of larger interactions. When a viewer is being presented with an acceptable norm and a laugh track is paired with it, they readily accept the laughter in contagion. However, when the context portrays a generally unacceptable norm, such as child abuse and sexual abuse, that is paired with

³The dinner scene from *Natural Born Killers* that demonstrates how a disagreeable context is enough to disrupt the effect of laughter contagion, for the first 1:30: <https://www.youtube.com/watch?v=XXq2rsaOxWQ>

a laugh track, the viewer may experience disgust and be forced to make a judgment call on their own use of laughter, or lack thereof. The use of this 1950's theme and laugh track for this scene acts as a form of ironic commentary on this family's relationships and values. In this way, laughter contagion may not be limited to the pure conveyance of a valence. The listener may also be negotiating what laughter itself is trying to convey within a larger context.

Theories of laughter contagion and implicit sociality may indicate presence of laughter itself is transmitted simply to a **passive observer** who then reciprocates the attitude of the laughter around them – positivity and the experience of humor. This assumes that humor is a simple message to be conveyed by the communication of positive affect alone. However, theories such as the encryption theory point towards laughter also acting as a “key” to an “encrypted” message that triggers further metarepresentational reasoning that causes people to process complex simultaneous meanings of the utterance, and even of the laughter itself (Flamson & Barrett, 2008). In this way, laughter may not simply be signaling positivity to overhearers, but that they should **actively negotiate** further contextualized meaning, such as irony, from the reaction itself as well as the larger interaction.

Laughter for Social Affiliation

Laughter is commonly understood as the primary marker of humor, but it has broader social functions than that. In fact, laughter acts as a marker of social affiliation and play, and indicates there may be second-order meaning to be reasoned about. An overhearer witnessing someone laugh, for example, may potentially take it

as a communicative signal that indicates two speakers have shared knowledge and affiliation with one another, such that the overhearer passively accepts that it is socially acceptable to find the interaction funny as well. The *encryption theory of humor* states that humorous acts are “encrypted” in that they have surface level content, but people must use the “key” in order to understand what is funny (Flamson & Barrett, 2008). The listener unlocks an encryption by using a “key,” or access to shared underlying knowledge, attitudes, and preferences (Clark & Brennan, 1991) in order to fully understand and appreciate the extent of the humorous content. In this way, the experience of humor and production of laughter acts as a social signal of *internal similarity*, where a sense of funniness or mirth indexes shared underlying knowledge, and produces a sense of affinity that helps us identify “cognitively similar” individuals for social coordination (McElreath et al., 2003).

In order for us to communicate that we possess the key to another person’s encryption and that we affiliate with them, we laugh (Flamson & Bryant, 2013). For example, if Annie and I were speaking in public about needing to make the bars of our graphs touch in order to get our Ph.D. (an inside joke among a group of researcher friends of ours), an overhearer might recognize this as a literal statement. But overhearers who possess insider knowledge (e.g., attendees of CogMAP where Ben Storm’s battle cry for data visualizations is “MAKE THE BARS TOUCH!”) would laugh along with us to indicate they share the “key” to our “encrypted” knowledge. Laughter then is not purely a communicative signal for humor, but a vocal signaling system that denotes *affiliative interactions* (Flamson & Bryant, 2013)

and can decrease tension and elicit positive affect (Bachorowski, Smoski, & Owren, 2001). Indeed, researchers have found that people across 24 societies can reliably judge affiliation by distinguishing friends from strangers when listening to co-laughter, even outside of the realm of conscious awareness (Bryant et al., 2016). This may be because laughter in humans, as well as similar vocalizations for other primates, are closely associated with play, or non-serious interactions (Vettin & Todt, 2005). Laughter, then, may be used to initiate moments of interactive alignment, where speakers work together to share knowledge and representations through play across speakers (Bryant, 2011). Laughter is a strong cue to listeners – passive and active – that signals affiliation and cooperative relationships.

Affective responses, whether positive or negative, can act as backchannels that socially signal how participants and observers alike should interpret the potentially humorous interaction. For example, if you are with your friends and a stranger tells you a subtly sexist joke, if you do not laugh and your friends perceive your lack of laughter, they may also stop laughing and comprehend this as a socially unacceptable topic. In a similar vein, you may spontaneously produce an inauthentic laugh, or even an ironic one (e.g., “*HA. HA. HA – very funny.*”), to indicate your position as counter to their authentic laughs. By making an affective stance against the joke, you socially signal “this joke is not okay,” which then mediates others’ interpretation of that joke in this interaction. The humorous meaning is constructed partially from the different social decisions that a producer and listener make – whether that’s laughing or cringing away – and is constrained by how recipients

interpret it in an act of participatory sense making (De Jaegher & Di Paolo, 2007). In this way, laughter is an important social signal of shared knowledge or emotional state not only for those actively involved in the conversation, but also for those observing it. The presence or lack of laughter can be a tool for social dynamics. Bryant (2012) found that folks produce different types of laughs depending on how well they know each other and whether they like each other or not. As such, shared laughter provides cues that index familiarity and affiliation between speakers. This speaks towards laughter as a communicative marker of shared underlying assumptions about the world, which we can recognize in others through the socially shared expression of laughter. Laughter can be understood as a communicative response that creates social action across groups and helps to maintain beliefs within specific communities. If one person is laughing but others are not, it can show that individual and others around them that their beliefs are not okay and to adjust them accordingly.

Laughter, then, can be understood as an affiliative and affective signal that we share underlying assumptions about the world with others. An overhearer witnessing a listener laugh at a speaker's joke may infer that the listener shares some beliefs with the speaker and affiliates with them. This would make it socially acceptable for the overhearer to share those beliefs as well and lets it be known that they think the joke is funny, too. The overhearer may, too, find themselves affiliating with the speaker and find them and their comments funny. This is assuming, however, that the only source of information that matters in the decision to affiliate is how well someone

else affiliates with the speaker. This assumes a non-participatory observer whose own interpretations play a smaller role than the presence of laughter. However, just because an overhearer perceives and understands that laughter as affiliative, that does not preclude them from simultaneously understanding it as conveying a simultaneously different meaning for themselves, such as finding the reaction ironic. The act of interpreting a response to humorous material may be more agential than passively accepting the emotions at hand. The overhearer's own metarepresentational reasoning of the emotional response – understanding it as simultaneously positive, affiliative, *and* ironic – may color how they choose to affiliate and how funny they may find the interaction.

Laughter, Irony, and Metarepresentational Reasoning

Psycholinguistic research tends to focus on linguistic properties of humorous content, but often ignores how people come to understand humor. It is often assumed that humorous content is conveyed to an individual who either understands the joke or does not in a simple process of successful or failed information transmission. A listener may hear a joke, understand it, and receive a simple form of meaning, such as the speaker's intended effect on valence. However, humorous utterances, and even folks' reactions to them, convey more complicated cognitive, social, and affective meaning that is interpreted *beyond* what is literally said. People utilize different forms of ironic speech for multiple goals that are understood as pragmatically complex (Colston, 2005) like evoking the emotional reactions of listeners (Legitt & Gibbs, 2000), who further attribute different intentions to the various forms of irony that are

used (Bryant & Gibbs, 2015). Irony can be understood as an umbrella term for a variety of figurative language and actions such as sarcasm, jocularity (or something akin to playfulness), rhetorical questions (which can be critical), hyperbole, and understatement (Gibbs, 2000).

Irony can take the form of verbal utterances as well as non-verbal actions, with some psychological perspectives emphasizing that speakers/actors pretend to be certain people or possess certain views as a “staged communicative act” that listeners must simultaneously recognize as both sincere and pretend to comprehend the doubleness in meaning (Clark, 1996; Gibbs, 2000). Like with humor, listeners must be able to recognize speakers’ second-order beliefs if they are to correctly infer the intended meaning of a potentially ironic utterance (Bryant, 2012; Sperber & Wilson, 1995). One assumption may be that these ironic acts are deliberate and conscious (O’Conner, 1986), where it is performed strategically for some specific rhetorical use by speakers that listeners understand it as such (Colebrook, 2004). The crux of irony in this view is on the speaker’s intended use of it that is conveyed and picked up by listeners. However, other parties posit that ironic acts are *not* deliberate, but rather that irony emerges from interactions across multiple constraints such as complex adaptive, unconscious processes that implicitly convey meaning to listeners (Gibbs, 2012). In this view, the speaker may not necessarily be intending to be deliberately ironic, but listeners implicitly use context to interpret the speech or reaction as ironic. In this way, ironic meaning occurs through dynamic and implicit metarepresentational reasoning, where a listener simultaneously takes up the

speaker's intended message and contextually constructs further meaning on top of it, such as identifying something as ironic.

A study examining spontaneous conversations between friends found that nearly half of all ironic utterances were closely associated with laughter, which points towards laughter helping listeners identify ironic intention (Bryant, 2010) in the same way that it acts as a “key” that marks understanding encrypted humorous material (Flamson, Bryant, & Barrett, 2011; Gibbs & Samermit, 2017). Laughter, then, may be a way by which metarepresentational reasoning, such as reading something as ironic, occurs in the online processing of utterances. In this way, laughter's potential is not limited to the simple transmission of positive valence or social norms, but also cues listeners to perform further metarepresentational reasoning. The presence of a listener's laughter may cue an overhearer to how people are perhaps being playful (Bryant, 2010), with more to the utterance to be understood and processed. This ultimately lends itself to an ironic reading of the laughter or reaction itself and to a changed understanding of the humorous content. This second-order reasoning involved in understanding a reaction or utterance as ironic may give the overhearer implicit agency in how they interpret the overall interaction.

On one hand, laughter (or its converse of cringing), may simply convey positivity and affiliation (or negativity and disaffiliation), as has previously been assumed in theories of laughter contagion. This view posits the listener and overhearer as passive recipients of a sincerely conveyed emotional response. On the other hand, laughter and cringing may act as backchannels, “keys”, that further cue a

listener and overhearer to examine the reaction and content as simultaneously conveying second-order, “encrypted” meaning. In this second view, a listener is implicitly, but actively, negotiating the context at hand and may find the reaction itself to be ironic. In both the passive observer and active negotiator view of laughter, the valence associated with laughter and cringing as backchannels may affect how funny overhearers find a speaker’s joke. However, the active negotiator view also predicts that there may be some interaction between the valence of the reaction and how ironic it is understood that changes their humor comprehension.

CHAPTER III

Emotional Expressions in Computer-Mediated Communication

What are the constraints and affordances of computer-mediated communication (CMC), and GIFs in particular, to express nonverbal cues? In face-to-face interactions, facial expressions and multimodal cues, such as laughter and cringing, act as social markers to help speakers identify the valence of a message as well as express their stances towards it. For example, sighs can indicate negative affect or stance towards something (Clift, 2014) while smiles and nods are perceived as affiliative and allow for a shared understanding and stance towards the conversational topic (Peräkylä & Ruusuvori, 2006; Stivers, 2008). However, the expression of these nuanced emotional stances is more difficult in primarily text-based mediums like online comments sections or text messaging. Instead, these forms of CMC afford new communicative practices that match evolving technologies (Knobel & Lankshear, 2006). Oftentimes these novel communicative practices, called *textisms* (Plester, Wood, & Joshi, 2009), stem from a need to translate verbal and visual nonverbal behaviors into text-based mediums.

Many textisms have been developed to communicate complicated socioemotional responses that would normally be displayed through visual nonverbal cues. Abbreviations such as *lol* (laughing out loud) and *smh* (shaking my head) are textual ways to demonstrate affiliative or disaffiliative actions and stances (Rosen et al., 2010; Tagliamonte & Denis, 2008). Research on *emoticons*, combinations of punctuation marks to emulate emotional facial expressions (e.g., :), :P, :(- Rojas,

Kirschenmann & Wolpers, 2012), and other textisms like the use of asterisks to denote dramatized actions similar to stage directions (e.g., *face palm* or *bangs head against wall*) have been commonly used across various online chat communities (Werry, 1996) to better approximate the physical expression of emotion that CMC lacks. Additionally, *graphicons*, or graphical communication tools that include emoticons as well as emojis, stickers, GIFs, images, and videos, are also heavily used for a variety of functions including expressing emotional reactions, to modify the tone of a text-based message, and even to riff (Herring & Danais, 2017). Researchers have begun identifying the different ways in which a user might use a graphicon to communicate nonverbal meaning.

However, it is still unclear whether people who receive these graphicons, or even passively witness them online, understand the nonverbal meaning in the same way that the original poster intended, or even as falling within researchers' taxonomies. It may be that these graphicons are interpreted differently by their recipients than is intended by the original poster. In fact, Miller et al. (2016) found that both the sentiment and semantic meaning of emojis have high variance between participants' interpretations of them. For example, while one person may interpret the 😞 as unamused, others may understand it as "disappointment", "depressing", "unimpressed", or "suspicious" (Miller et al., 2016, p. 264). The general valence can be conveyed through a graphicon, but the interpretation of it by a recipient may be contextual and more nuanced than simply communicating simple valence or semantic meaning (Herring & Danais, 2018). That is to say that a person's use of graphicons

such as emojis or GIFs to communicate emotions or backchannels to a recipient or overhearer in CMC with may be subject to further interpretation by the recipient or overhearer. Graphicons have have been used as modifiers to online turns in a similar way that facial expressions are used in face-to-face communication (Herring & Danais, 2018), with GIFs affording even more communicative value to users.

GIF Use in Computer-Mediated Communication

Graphical Interchange Formats (*GIFs*) re-present looped animations of embodied actions that are often derived from movies, television, and other forms of multimedia such as YouTube. Because of the intertextual nature of the images and their embodied actions, GIFs partially derive meaning from cultural use and referencing (Gordon, 2015). GIFs have been used widely across different online communities like blogs and forums (Eppnik, 2014) where they are commonly used as reactions to everyday occurrences (i.e., *reaction GIFs*; Herring, 2015).

GIFs are often used as embodied reenactments or demonstrations (Clark & Gerrig, 1990) of the actions in animated images, which are meant to be taken as the contributor's own *current* embodied actions within text-mediated conversations (Tolins & Samermit, 2016). Figure 1, above (page 3), is an example of how people use GIFs as embodied enactments to display their affective stances to prior text as well as depict a potential action that emphasizes that stance (Tolins & Samermit, 2016). In this way, GIF use in computer-mediated communication (CMC) may act similarly to verbal (“mhm”, “really”, “oh”) as well as non-verbal backchannels (e.g., smiling, nodding, shaking head, looking confused) that normally occur in face-to-face

conversation between speakers and listeners (Bavelas, Coates, & Johnson, 2000; Bruner, 1979). Backchannels help ground (Clark & Wilkes-Gibbs, 1986) or steer conversation by two means: reactively, by indicating uptake of prior talk, and proactively, by steering the dialogue in a particular direction based on the response provided (Tolins & Fox Tree, 2014).

Additionally, backchannels that are used by addressees (e.g., people responding to a speaker) are also used by overhearers to integrate information in the conversation across turns (Tolins & Fox Tree, 2016). In this way, even though overhearers are less active participants in the conversation, the dialogue is collaborative in that the overhearers themselves may be gleaning some form of meaning from the addressees as well. Overhearers, then, construct meaning from a predictive relationship between the speaker's message and the addressee's backchannel. However, it is unclear if the overhearer's passive observation of the backchannel is enough to help in their comprehension, or if the overhearer's active interpretation of it as perhaps sincere or ironic may affect their understanding of the conversation at hand. Regardless, it is difficult to naturally express nonverbal backchannels in text-based mediums. But given current innovations in technology, GIFs partially fill that communicative gap in CMC.

Many forms of social media have recently increased support of visual content as responses, which is now understood as a critical part of online communication (Highfield & Leaver, 2016). GIFs are now widely supported across most social media sites such as reddit, tumblr, and Facebook as can be seen in the example above. They

have become so prolific that dedicated GIF “keyboards” for phones, which allow a user to quickly browse a database of thousands of GIFs, have become extremely popular, with an estimated 10,000,000 to 50,000,000 downloads of “GIF Keyboard by Tenor” on the Google Play Store. GIF keyboards work similarly to emoji keyboards on cell phones, where users simply need to press a button to look for a GIF. Most GIF keyboards include a search bar, where users put in keywords such as “laughing” or “happy birthday” and browse through different examples of that category. Search terms often include actions or emotion terms, but the GIFs that come up may not always fully capture the intended sentiment and may require them to try different key terms to find one that fits. Terms for emotions are sometimes too vague and require searching for more concrete actions to refine the selection, as can be seen in Figure 3. To use them in conversation, users simply need to select the GIF that best matches the sentiment they are trying to convey for it to be added to a chat box to be sent in private messages or posted online.

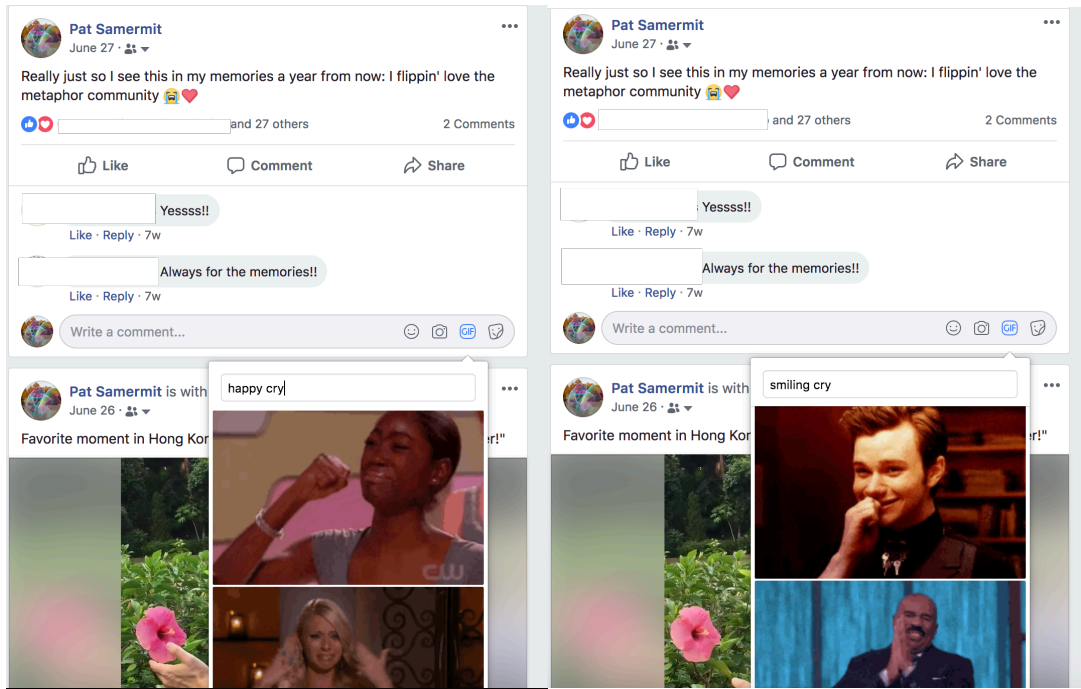


Figure 2. An example of how to use a GIF keyboard from a Facebook comment’s section on a desktop computer. The results for this particular search, “happy cry”, do not seem to capture the correct response to the comments above. Instead, another search for “smiling cry” pulls up something more akin to the sentiment trying to be conveyed. GIF keyboards are also commonly integrated on mobile phone keyboards.

Recent research has investigated why GIFs seem to be the premiere form of engaging media. Bakhshi et al. (2016) conducted social and multimedia data analyses of tumblr posts containing GIFs, text, and video to compare and identify what characteristics make GIFs engaging. As compared to text and video, GIFs are more engaging on tumblr due to their animation, lack of sound, immediacy of consumption, low bandwidth required to view them, minimal time demands, and their storytelling capabilities and utility expressing emotions. Additionally, GIFs that contained faces and higher motion energy were perceived as more engaging than others. Bakhshi et al. (2016) make the claim that GIFs themselves are so simple and interesting that they

are preferred more across social media use than text and videos, with some of their features lending themselves very well to expressing emotional stance. In fact, other research on GIFs in CMC may point towards GIFs as an effective way to express emotion across text-based mediums.

Tolins and Samermit (2016) conducted a corpus analysis on the use of GIFs in text messaging. We argued that GIFs can be understood as a form of embodied enactments of affective responses to a prior speaker's talk. The actions and emotional expressions depicted in the GIF can demonstrate the respondent's emotional stance towards the previous comment without verbal commentary, much like non-verbal backchannels (e.g., smiling or frowning). GIFs in text messaging may also act as co-speech demonstrations that depict one's affective state (not just their emotional stance towards something) and depict described future actions. These functions of GIFs in text messaging are not mutually exclusive. For example, Nick's GIF reaction on Facebook (Figure 1), demonstrates his emotional stance towards my previous text and depicts his *own* affective state visually. On top of conveying his emotional stance, recipients of the GIF – both active participants in the conversation such as myself, and overhearers – may understand the GIF as sarcastically and hyperbolically depicting Nick as Homer Simpson shrinking away in reaction to his shame. In this way, GIFs' visual depictions of actions may be communicating an emotional stance to create common ground, as a backchannel would.

However, beyond the intended emotional meaning, it may be further perceived by both active and passive participants as initiating metarepresentational

reasoning: It is understood as additionally expressing the individual's faux shame *hyperbolically and sarcastically* in a reaction to the previous turn. GIFs, then, are regularly used by senders in text messaging to present embodied actions and emotions that otherwise would be difficult to express in a text-based medium. A consideration that we failed to examine in Tolins and Samermit (2016) was how recipients further interpret the GIF itself and use that as a clue to comprehend the interaction overall. The interpretation of the GIF as a sincere display of emotion versus being somehow ironic may further influence the recipient and overhearers' understanding of the conversation as a whole. Similar to graphicons, the sentiment and semantic interpretation of a GIF may be more contextual and nuanced than conveying a simple emotion.

Because of the way GIFs can express emotions and actions, they are often used for communicative, and even humorous, purposes in online forums and text messaging, including in group chats where any individual in that chat may act as an overhearer. However, how does the presence of GIFs that display an emotional stance modulate how funny overhearers find the previous turn, and especially if that turn is a joke? It may be that overhearers are truly **passive observers**, who simply receive the conveyed emotional response in GIFs that are presented to them. However, they may also be **active negotiators** who further contextualize the GIF beyond its valence through forms of metarepresentational reasoning such as irony. Perhaps GIFs afford more ironic interactions and interpretations than other mediums, such as text, to communicate emotions. GIFs are already understood as more interesting and efficient

at conveying emotional meaning than text and video in CMC (Bakshi et al., 2016), which may lend them to more nuanced interpretations that go beyond the effect of valence alone.

CHAPTER IV

The Present Studies: The Role of GIFs in Modulating Judgments of Humor and Irony in Text Messaging

Listeners' and overhearers' use of laughter and cringing as backchannels is made more difficult within the constraints of CMC. Until recently, CMC has not afforded the same style of laughter contagion or shared humor responses. It has been limited to textisms to express emotional messages and has recently expanded to include graphicons such as videos, emojis, and GIFs. While emotional communication online and offline has been hypothesized to be similar in many respects, a meta-analysis and review of published papers on emotional expression in face-to-face communication and in CMC indicated that more frequent and explicit displays of emotion are communicated in CMC as compared to face-to-face to make up for the inability to immediately display facial expressions (Derks, Fischer, & Bos, 2008). GIFs afford more immediate displays of emotional stances, including facial expressions that denote laughter, smiles, or cringing that may bridge the gap between CMC and face-to-face communication. This would imply that GIFs should be better communicators of emotional valence when compared to textisms. If the presence of smiles and laughter positively influences humor responses in face-to-face communication, does the routine use of positive reaction GIFs as responses to text messaged jokes produce higher humor ratings as compared to textisms? Additionally,

does receiving negatively valenced reaction GIFs, such as cringing, attenuate humor ratings, more so than negative textisms?

Humor exploits multimodal communication cues such as emotional facial expressions, laughter, and cringing that act as social cognitive tools for future social coordination of group relationships. When overhearers perceive participants of a conversation laughing, then they may come to interpret the interaction as affiliative and benign. However, when overhearers perceive one person expressing affiliation by telling a joke, but another person actively cringes or chooses *not* to laugh, then they may recognize the joke as socially unacceptable and perceive it themselves as not funny. This is the case in face-to-face communication, so perhaps the functions of laughter would extend to online mediums like text messaging where non-verbal responses can be depicted through GIFs. GIFs act as hyperbolized embodied depictions of emotional responses and actions. Online mediums often cannot afford true face-to-face interactions, so GIFs are used to react to potentially humorous content as our expressive stand-ins and mark how much we affiliate or socially approve of a conversational turn and, in this case, a joke. GIFs that express positive valence indicate approval, with negatively valenced GIFs expressing disapproval. In this view, laughter in face-to-face communication, and by proxy, through GIFs, is important for shared social action. The positive, affiliative stance conveyed through laughter is picked up by listeners and overhearers, who act as **passive observers** that receive and share this stance. On the other hand, they may pick up a negative, disaffiliative stance by viewing cringing and discomfort.

Additionally, it is unclear if these emotional backchannels, such as laughter and cringing, are understood as passively conveying an intended valence or if they can be understood as conveying figurative, or second-order meaning. Is it that a listener merely picks up on the valence associated with these signals, or can emotional backchannels also be metarepresentationally interpreted as containing more meaning, such as irony? Specifically, do overhearers interpret positive and negative GIF and Text responses as differentially ironic (such as sarcasm, hyperbole, criticalness, and playfulness - Gibbs, 2000; Gibbs & Samermit, 2017)? And is their humor response, then, predicted by the different ways that they may understand the reaction itself, or just by valence? If overhearers are **passive observers**, then that would predict that they do not conduct metarepresentational reasoning on responses, and there would be no differences in how ironic they find responses of different valences or response mediums (GIF vs. Text). It would also predict that each response medium's valence is the only predictor of humor responses. However, if overhearers are **active negotiators**, then that would imply that they are participating in metarepresentational reasoning of the responses and predict a difference in how ironic they find responses of different valences and response mediums. Additionally, it would indicate that on top of valence, interactions between irony and valence should also act as predictors for how funny people find jokes when they receive either GIF or Text responses. For example, a positive-valence GIF that is also understood as sarcastic may end up attenuating rather than enhancing a humor interpretation.

Conversely, a negative-valence GIF that is also understood as hyperbolic may end up enhancing rather than attenuating a humor interpretation.

Experiment 1 examines the role that positive and negative GIF and Text responses to text messaged jokes have on overhearers' humor ratings. In this experiment, participants are "overhearers" in a group chat where they are observing people send jokes and responses to each other. Three groups of participants were assigned to read text message conversations in which text-messaged jokes are responded to with (1) GIF responses (positive, negative, no-response control), (2) Text (positive, negative, no-response control), or (3) no responses at all (True Baseline condition). After viewing each trial consisting of a joke followed by a positive, negative, or no reaction, participants were asked to rate how funny they found the joke, as well as how sarcastic, hyperbolic, critical, and playful they found the reaction to the joke. Assuming no significant difference between the True Baseline condition and each within-subjects control condition, both the passive observer and active negotiator hypotheses would predict that jokes followed by positive GIF responses should be perceived as significantly funnier than jokes followed by positive Text responses. Additionally, both hypotheses would predict positive responses cause the jokes to be perceived as significantly funnier than negative ones and control. Negative reactions such as cringing should act as a signal that marks disaffiliation and that "this isn't funny", and as such should have a lower humor rating than both the control and positive responses.

These two hypotheses pose an important question regarding how overhearers interpret responses. When observers read responses, do they understand them as primarily conveying valence, or are they integrating second-order meaning, such as recognizing irony, into their understanding of the response itself? The passive observer hypothesis would predict that overhearers only participate in first-order reasoning, where they adopt a response's valence, but generally do not integrate second-order reasoning. Because the task is asking specifically for irony ratings, this task demand allows them to be able to recognize and provide ratings on how sarcastic, hyperbolic, critical, and playful they find the reactions that are affected by the valence of the response. But because the passive observer hypothesis proposes participants do not *integrate* information beyond valence, then it also predicts that there will be no interaction between valence and response medium on the different irony measures. Additionally, the passive observer hypothesis suggests that a model to identify what characteristics of GIFs or Text responses would predict humor ratings would only indicate valence as the significant predictor since that is the only level of meaning that observers use.

On the other hand, the active negotiator hypothesis assumes metarepresentational reasoning occurs implicitly, and that overhearers would have differential ratings across the sarcasm, hyperbole, criticalness, and playfulness scales by condition. In particular, this hypothesis predicts that valence as well as the interactions between valence and response medium will have an effect on how sarcastic, hyperbolic, critical, and playful participants find responses since in this

hypothesis, encrypted meaning comes from multiple layers of information at once. For sarcasm ratings, this hypothesis predicts that negatively valenced reactions will be significantly more sarcastic than positive ones since people may have the folk notion that conveying indirect criticism, such as negative cues, as being sarcastic. This also predicts GIF reactions will have larger effect sizes than Text since they better express nuances of emotion. For hyperbole ratings, this hypothesis predicts that positive reactions will be perceived as more hyperbolic than negative reactions since they may have more metaphorical emotional movement to them. It also predicts that the GIF condition will have higher hyperbole ratings than the Text condition, as GIFs afford more nuanced emotional expression. Criticalness ratings are predicted to be higher for negative responses than positive ones across GIF and Text responses, but again, should have a larger effect size for the GIF condition. Playfulness ratings are predicted to be higher for the positive reactions than negative ones across both response mediums, with GIF responses being perceived as significantly more playful than Text ones.

Finally, this hypothesis, similar to the passive observer one, assumes that valence is a significant predictor of humor ratings. However, unlike the passive observer hypothesis, the active negotiator hypothesis also stipulates that how ironic observers find the responses, and interactions between the valence and how ironic they perceive them, also significantly predict how funny they find the original text messaged jokes. This is because metarepresentational reasoning provides

simultaneous layers of meaning, such as different ways that people may interpret a response as ironic, that may also contribute to their understanding of humor.

Evidence towards the active negotiator hypothesis would support the Encryption Theory of Laughter (Flamson & Barrett, 2008), which indicates that laughter does not only convey a positive valence and affiliation, but also acts as a “key” that indicates “encrypted” messages that are to be decoded by listeners to understand humorous messages (Flamson, Bryant, & Barrett, 2011) as well as ironic implicatures (Bryant, 2012; Bryant & Gibbs, 2015; Gibbs & Samermit, 2017). Should the results come out in support of the active negotiator hypothesis, they would indicate that observers are not simply passively understanding valence and affiliation, but are actively using laughter and cringing as backchannels that help them interpret the conversation through their use of metarepresentational reasoning.

CHAPTER V

Experiment 1: Valence and Response Medium on Judgements of Irony and Humor

Participants

One-hundred and forty-four participants (95 women, 44 men, 4 preferred not to say; $M_{age} = 19.9$ years old) were recruited from the University of California, Santa Cruz psychology research pool for this experiment. All participants consented to participate in the study as is consistent with IRB protocol. The participants were all native English speakers or early English-learning bilingual speakers. Participants were then assigned to one of three between-subjects conditions: GIF, where they saw GIF reactions, Text, where they saw text reactions, or the True Baseline Control, where they saw no reactions. In the GIF and Text conditions, participants were presented with 3 reaction valences: Positive, negative, and control (no-reaction baseline). The True Baseline Control group is to validate that the within-subjects humor ratings for the control trials in the GIF and Text conditions were not mediated by viewing positive or negative trials. All participants were granted partial course credit for their participation in the study.

Materials

Positive and negative reaction GIFs. The GIFs for this study were chosen from MIT's GIFGIF corpus (Jou, Bhattacharya, & Chang, 2014), which is an online project that focuses on the computational prediction and recognition of emotions perceived by viewers of GIFs. The GIFGIF corpus consists of 17 emotion categories

such as “Amusement”, “Happiness”, “Surprise”, and “Disgust” with rankings for which GIFs in the corpus best represent that emotion. To acquire these rankings, MIT GIFGIF created a public website where people can respond to a forced choice question such as “Which better expresses pleasure?” by clicking on the GIF they believe corresponds to that emotion. In this way, the GIFs in this database have been normed and categorized into which emotion people perceive from the image itself, and are ranked based off of their predictive regression with over 3 million votes across their database. Since emotions are more complex than simply expressing “Happiness”, GIFGIF also allows you to see which GIFs express more complex emotions by multi-selecting two or more emotions. For example, an emotional response for the sense of completion may be found by multi-selecting “Pride” and “Relief”, which provides the GIF in Figure 3.



Figure 3. Some stills from a GIF of Spongebob Squarepants patting his hands off and producing a cloud, found as the number one GIF that expresses both Pride and Relief from MIT GIFGIF.

For the *positive valence GIFs* in this study, I selected GIFs from the emotional categories of “Amusement” or the multi-selected categories of “Amusement-Pleasure” or “Amusement-Surprise”. These categories were chosen because they most closely approximate mirth, the emotion that is generally associated with a positive humor response (Arroyo et al., 1993) and commonly accompanies laughter,

such as Figure 4. The GIFs that were used in this study were restricted to having humans expressing these emotions so as to better approximate positive face-to-face responses to humorous experiences.



Figure 4. Some stills from the number 6th ranked GIF in the “Amusement” category on MIT’s GIFGIF that exemplifies the style of GIF that will be used as positive reaction GIFs in Experiment 1. This image displays a woman laughing and covering her face as she laughs.

For the *negative valence GIFs* in this study, I selected GIFs from MIT’s GIFGIF corpus in the emotional categories of “Embarrassment” or the multi-selected categories of “Embarrassment-Disgust” or “Embarrassment-Contempt”. These categories were chosen because they most closely approximate the emotional experience of discomfort or cringey-ness, which is an emotion and experience that is associated with the disapproval of potentially humorous content such as feeling discomfort or cringing away from an especially racist joke (Bicknell, 2007; Wright, 2011). An example of such a reaction can be seen in Figure 5. In total, there were 16 GIFs – 8 positive reactions and 8 negative reactions.



Figure 5. Some stills from the number 6th ranked GIF in the multi-select “Embarrassment-Contempt” category on MIT’s GIFGIF that exemplifies the style of GIF that will be used as negative reaction GIFs in Experiment 1. This image displays a woman glaring, giving side-eye, and turning away to leave.

Prior to choosing the 16 GIFs, a larger GIF set was piloted for how funny participants find them, with the most average GIFs selected as the ones for the study. This is to control for GIFs that are funny in and of themselves, which may skew the results of the study. In the pilot study, participants were also asked “Would you text/message this GIF to a friend?” for each GIF as a way to gauge how ecologically valid it would be to use that particular GIF in a text exchange. The GIFs that had “Yes” as the mode for “Would you text/message this GIF to a friend?” were prioritized. The final GIF set for the positive and negative reaction GIFs consisted of 16 GIFs with average funniness ratings and that participants would text to a friend.

Positive and negative text reactions. The text reactions to the text messaged jokes in this study consisted of textisms and common responses, which generally act as creative communicative techniques to display non-verbal reactions over text-based mediums (Rosen et al., 2010; Tagliamonte & Denis, 2008). Eight positive valence text reactions were chosen, including common textisms such as “lol” and “rofl”

which stand for “laughing out loud” and “rolling on the floor laughing”, respectively. Similarly, general negative textisms, such as “meh.” or “smh” for “shaking my head” were used as negative text reactions. There were a total of 8 positive text reactions and 8 negative text reactions.

Jokes. The jokes used in this study were one-liners that were piloted for funniness in a previous study. The 24 one-liner jokes that were selected were chosen for being the most average jokes of the piloted set. These jokes were counterbalanced across 3 within-subjects conditions: Positive valence reactions, negative valence reactions, and no-reaction baseline. All 24 of the jokes were presented as one of the first turns in a text message conversation to be responded to with either a positive reaction, a negative reaction, or no reaction in the GIF and Text conditions. The True Baseline Control condition presented the jokes without any reactions to the jokes.

Text message conversation trials. The text message in this experiment were created using iMessage. These conversations were screen recordings of an iPhone’s group chat with two people and the participant viewing the conversation as though they were receiving it on their phone. Each trial consisted of a video where one person in the group chat sent a joke and another person responded with either a positive GIF, a positive text message, or nothing at all. The videos were recorded as separate instances of group chats where a new person was sending the joke and a new person was sending a response so as to prevent any learned assumptions about the joke teller or respondent.

For each of the between-subjects conditions, the 24 text message conversations were presented in a randomized order. There were 24 text message conversations in total – 8 with a positive reaction, 8 with a negative reaction, and 8 without a response – for the GIF and Text conditions. The same 24 text message conversations were presented without a reaction in the True Baseline Control condition.

For both the True Baseline Control between-subjects condition and the *no response baseline* within-subjects condition, participants saw a video of person A telling a joke, followed by no response from person B. The video of the text messaged conversation ended automatically after a pause to indicate the joke was received. Participants were then presented with the appropriate rating scales. There was a 4-second pause after the joke was presented before the clip of the text message conversation changed to the appropriate rating scales.

Person A: “Hey check out this joke I just found!”

Person A: [JOKE]

Person B: [no response, 4 second pause]

Clip ends – moves on to humor and irony scales

The GIF and Text between subjects conditions present 8 *no response baseline* clips just as above, as well as 8 *positive reaction* and 8 *negative reaction* clips. In the *positive reaction conditions*, participants saw a text messaged conversation where

person A tells a joke, then person B responds with either a positive reaction GIF or positive text reaction, depending on their between-subjects condition, such as this:

Person A: “Hey check out this joke I just found!” [or some iteration of this]

Person A: [JOKE]

Person B (depending on between-subjects condition):

Positive reaction GIF condition: [positive reaction GIF, no text on image, no co-speech]

Positive Text reaction condition: “lol” or “that’s funny” [one of 8]

Clip ends – moves on to humor and irony scales

For the *negative reaction conditions*, participants saw a text conversation where person A tells a joke, then person B responds with either a negative GIF or negative Text reaction such as this:

Person A: “Hey check out this joke I just found!” [or some iteration of this]

Person A: [JOKE]

Person B (depending on between-subjects condition):

Negative reaction GIF condition: [negative reaction GIF, no text on image, no co-speech]

Negative Text reaction condition: “...” or “that’s not funny” [one of 8]

Clip ends – moves on to humor and irony scales

Measures

Humor and irony ratings. After each text message conversation, participants were asked to answer, “How funny did you find this joke?” on a scale from 1 (not funny at all) to 7 (very funny). After answering the humor scale, participants were asked to make judgments about how ironic they found the reaction to the joke. They were asked to rate the reaction on four irony scales, sarcasm, hyperbole, criticalness, and playfulness (Gibbs & Samermit, 2017; Gibbs, 2000) from 1 (not sarcastic/exaggerated/critical/playful at all) to 7 (very sarcastic/exaggerated/critical/playful).

Humor styles questionnaire. After completing the main study, participants were asked to complete the Humor Styles Questionnaire 32 (Martin et al., 2003) at the end of the study to address whether there are any between-group differences in senses of humor or preferred humor styles that could potentially influence humor responses. The Humor Styles Questionnaire is a validated scale that assesses individual differences in humor styles, which is understood as a combination of the ability to create, understand, appreciate, enjoy, and habitually use humor (Martin et al., 2003) and split into four categories. These categories of humor styles are: 1) *self-enhancing humor*, or the tendency to maintain a humorous outlook on life even when not with others or using humor to cope with stress; 2) *affiliative humor*, the tendency to share humor with others, to tell jokes or funny stories, amuse others or enjoy laughing with others; 3) *aggressive humor*, the tendency to use humor to disparage or put others down, to ridicule or enjoy offensive humor, or express humor when inappropriate; and 4) *self-defeating humor*, or the tendency to amuse others at one’s

own expense or laugh along with others when one is being put down, or using humor to hide one's feelings from others. Participants were asked to rate their agreement on 32 statements with a 7-point Likert scale where 1 is Totally Disagree and 7 is Totally Agree on statements such as "Letting others laugh at me is my way of keeping my friends and family in good spirits" for self-defeating humor or "My humorous outlook on life keeps me from getting overly upset or depressed about things?" for self-enhancing humor. Participants received a total score for each category of humor, where a high score in each category indicates that they prefer to both use and appreciate that style of humor. The score for each of these humor categories was compared between participants in the GIF and Text conditions to see if there were any between-group differences in humor styles.

GIF familiarity questionnaire. Following the humor styles questionnaire, participants completed a GIF familiarity questionnaire to account for previously encountering the GIF regardless of if they were in the GIF condition or not. In this questionnaire, participants were first presented with each GIF that was used in the study. Participants were asked about to respond to "How frequently have you seen this GIF online or in text messages?" on a scale of 1 (not frequently at all) to 7 (very frequently) with the 8 GIFs presented in the study. For each individual GIF, they also answered a forced choice question asking if they are familiar with the source of each GIF (Yes, No, I'm not sure). If they respond "Yes" or "I'm not sure", they were prompted to indicate what the source of the GIF is in an open-ended response. Finally, for each GIF, participants were asked what they think each GIF is expressing

in an open-ended response. The questionnaire was used to identify GIFs that were commonly recognized and may have been considered outliers.

Participants finally answered questions on their demographics as well as their general use of GIFs in online contexts.

Procedure

Participants signed a consent form as is set by IRB protocol, and then were seated at an Mac Mini to begin the experiment. The experiment was run on PsychoPy (Peirce, 2007), a free Python-based software.

Participants went through 24 text conversation trials according to their between-subjects condition. When participants see a trial, they viewed a text message conversation that consists of a joke, either a positive reaction, a negative reaction, or no response. In the *GIF response condition*, participants saw GIFs as responses to jokes, with the *Text response condition* having text responses. The pre-emptive text (“Hey, wanna hear a joke I just found?”) was kept on the screen for 3 seconds prior to sending the joke. The joke was on the screen for 6 seconds before the response appeared and stayed on screen an additional 7 seconds. Participants in *True Baseline Control* condition viewed all 24 text conversations with no response, with the joke staying on screen for 13 seconds. Immediately after the video for each trial ended, participants were then asked to rate the joke on the humor scale. Once they made a rating, it immediately moved on to have them rate the response (or lack thereof) on the irony scales as listed above. After completing all of the trials, participants

completed the Humor Styles Questionnaire, then the GIF Familiarity Questionnaire and a demographics survey. They were then debriefed about the study and released into the world.

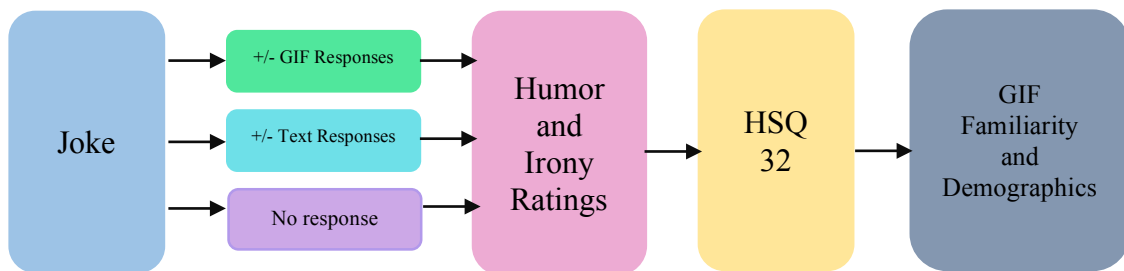


Figure 6. The flow of Experiment 1. For each trial, a participant will see a Joke, a Response (between-subjects condition of GIF vs. Text vs. True Baseline Control), then a Rating scale. In the 24 trials, the response will either be a positive GIF or text response, a negative GIF or text response, or No response for the GIF and Text between-subjects conditions. Participants in the True Baseline condition will see all 24 trials with no response. Each trial was followed by humor and irony ratings. After completing all 24 trials, participants completed the Humor Styles Questionnaire, the GIF familiarity questionnaire, and provided their demographics information.

Results

Humor ratings. Participants' True Baseline condition's average humor ratings ($M = 3.56$, $SD = .991$) of all 24 text message conversation trials was not statistically significantly different from ratings provided by participants in the no-reaction trials of the GIF condition ($M = 3.45$, $SD = 1.12$; $t(94) = -.443$, $p = .659$) or the the no-reaction trials of the Text condition ($M = 3.64$, $SD = 1.21$; $t(94) = .396$, $p = .693$). This result validates that the within-subjects control ratings for the humor scale were not mediated by the positive or negative responses that participants saw in the

GIF or Text reaction trial. Additionally, there was no statistically significant difference in humor styles across participants the GIF and Text conditions (see Table 1). Thus, differences across our experimental groups are not likely to arise from group differences in their humor styles.

<u>Humor Style</u>	<u>GIF</u>		<u>Text</u>		<u>Df</u>	<u>t</u>	<u>p</u>
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>			
Affiliative	39.21	7.12	40.84	5.51	142	-1.51	.133
Self-enhancing	37.31	8.23	35.88	8.15	142	.994	.322
Aggressive	29.56	7.39	28.49	7.91	142	.782	.434
Self-defeating	29.33	10.48	28.10	9.29	142	.717	.475

Table 1. The Humor Styles Questionnaire scores and statistics from Experiment 1, split into the two between-subjects conditions, GIF and Text. There were no statistically significant differences between participants in the GIF and Text conditions for any of the humor styles, suggesting that any between-group differences should not be attributable to differences in sense of humor.

The mean was taken for the GIF condition's positive ($M = 3.48$, $SD = 1.05$), negative ($M = 3.42$, $SD = 1.14$), and control ($M = 3.45$, $SD = 1.12$) humor ratings and compared to those of the text condition (positive: $M = 3.64$, $SD = 1.13$; negative: $M = 3.36$, $SD = 1.22$; control: $M = 3.36$, $SD = 1.21$) using a 2 (reaction) x 3 (valence) mixed ANOVA. There was a marginal main effect of valence ($F(2, 188) = 2.68$, $p = .071$), but no statistically significant main effect of response medium ($F(1, 94) = .193$, $p = .661$) or interaction between reaction type and valence ($F(2, 188) = 1.37$, $p = .258$). These results suggest that neither the type of response nor the positive or negative valence of the response caused participants to perceive text messaged jokes

as any more or less funny than jokes they saw with no response at all. Additionally, there were four GIFs that people rated as being highly familiar on the GIF familiarity questionnaire. Repeating the analyses excluding trials with these familiar GIFs produced the same pattern of results.

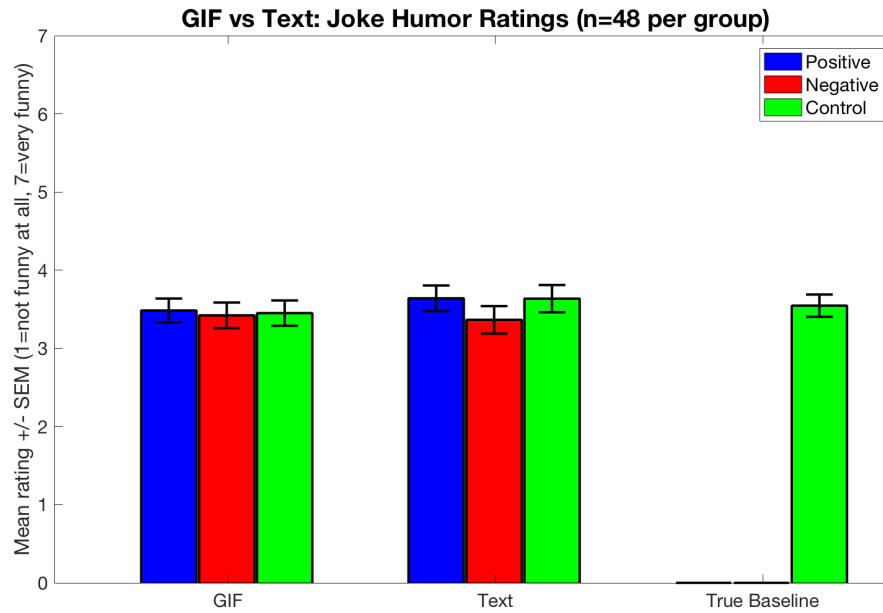


Figure 7. Humor ratings from Experiment 1 comparing the between-subjects conditions of GIF, Text, and True baseline and the within-subjects conditions of valence (positive, negative, control). There was no statistically significant difference between the True Baseline and the control sets in the GIF and Text conditions. Additionally, there was no effect of valence or reaction type on how funny participants found the jokes.

Sarcasm ratings. A 2 (reaction) x 2 (valence) mixed model ANOVA was used to compare how sarcastic participants found the responses to the text messaged jokes across the GIF and Text conditions. Control conditions did not include a response to the jokes and were excluded in this analysis and the following analyses on other irony scales (hyperbole, criticalness, and playfulness).

There was a main effect of valence ($F(1, 94) = 7.65, p < .01$) and a statistically significant interaction between reaction type and valence ($F(1, 94) = 25.45, p < .001$). Participants in the GIF condition perceived negative responses to be more sarcastic ($M = 4.41, SD = 1.13$) than positive responses ($M = 3.13, SD = 1.40$; $t(47) = 4.78, p < .0001$) but participants in the Text condition perceived negative responses ($M = 2.94, SD = 1.08$) as marginally less sarcastic than positive responses ($M = 3.32, SD = 1.20$; $t(47) = -1.91, p = .062$). This finding suggests that the valence of the reaction does not have a uniform effect on how sarcastic people find all response mediums. Rather, the perceived sarcasm of the reaction depends on both the valence and the reaction type, with negative GIFs being perceived as more sarcastic than positive GIFs and significantly more sarcastic than negative text responses ($t(93) = 6.38, p < .0001$). Negative text reactions are perceived as marginally less sarcastic than positive text reactions. This surprising finding indicates that the valence of a response may not be all that conveys ironic meaning, at least for sarcastic meaning, despite the belief that sarcasm only conveys negativity. The medium in which the negative message is conveyed can greatly affect how ironic people find the response.

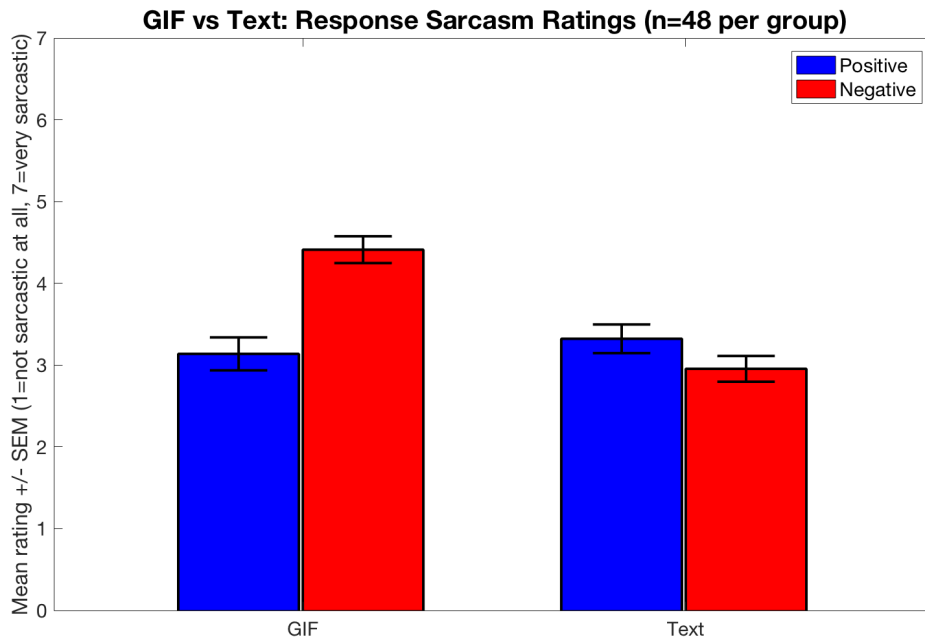


Figure 8. Chart comparing how sarcastic participants found positive and negative GIF and Text reactions in Experiment 1. There was a significant main effect of valence and a significant interaction between reaction type and valence.

Hyperbole ratings. A 2x2 mixed model ANOVA was used to compare how hyperbolic (exaggerated) participants found positive GIFs ($M = 5.12$, $SD = 1.01$), negative GIFs ($M = 4.14$, $SD = 1.05$), positive Text ($M = 3.78$, $SD = 1.17$), and negative Text responses ($M = 2.84$, $SD = .996$). There was a main effect of valence ($F(1, 94) = 63.271$, $p < .0001$), with Bonferroni corrected pairwise comparisons indicating that positive reactions were statistically significantly more hyperbolic than negative reactions ($p < .0001$) and that GIFs were significantly more hyperbolic than the Text reactions ($p < .0001$). These results indicate that positive reactions across both the GIF and Text conditions are perceived as more hyperbolic than negative reactions, and GIF reactions overall are considered more hyperbolic than text

reactions. However, there was not a statistically significant interaction between reaction type and valence ($F(1, 94) = .010, p = .920$). Unlike sarcasm, valence and response medium separately affect how hyperbolic participants found the responses. That is, these results indicate that both valence and response medium have effects on how hyperbolic a response is perceived, but that the effect of valence is independent from the effects of the medium, GIF or Text, in which the response is presented.

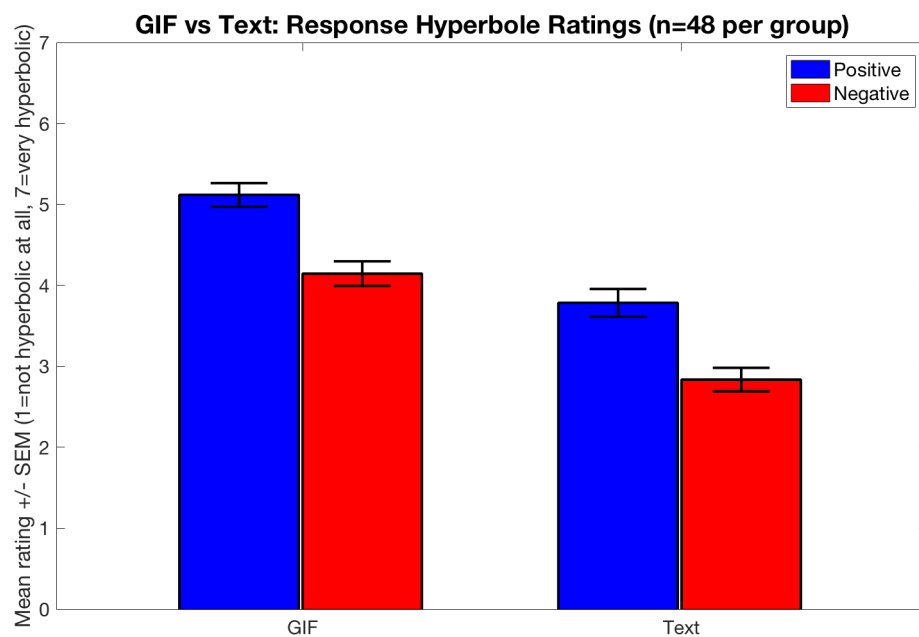


Figure 9. Chart comparing how hyperbolic participants found positive and negative GIF and Text reactions in Experiment 1. There was a statistically significant main effect of valence, with Bonferroni corrected pairwise comparisons indicating positive reactions were perceived as significantly more hyperbolic than negative ones.

Criticalness ratings. To compare how critical participants perceived the positive GIF ($M = 2.84, SD = 1.25$), negative GIF ($M = 4.61, SD = 1.13$), positive Text ($M = 2.98, SD = .999$), and negative Text responses ($M = 4.23, SD = 1.33$), a 2

(response medium) x 2 (valence) mixed model ANOVA was used. There was a main effect of valence ($F(1, 94) = 109.77, p < .0001$), with Bonferroni corrected pairwise comparisons indicating that the negative responses were perceived as significantly more critical than positive responses across both GIF and Text responses ($p < .0001$). There was not a significant interaction between response medium and valence ($F(1, 94) = 2.10, p = .150$). These findings together suggest that the perceived criticalness of the responses varies reliably with the valence such that negative responses are perceived as more critical, but that the medium in which a response is presented has no effect.

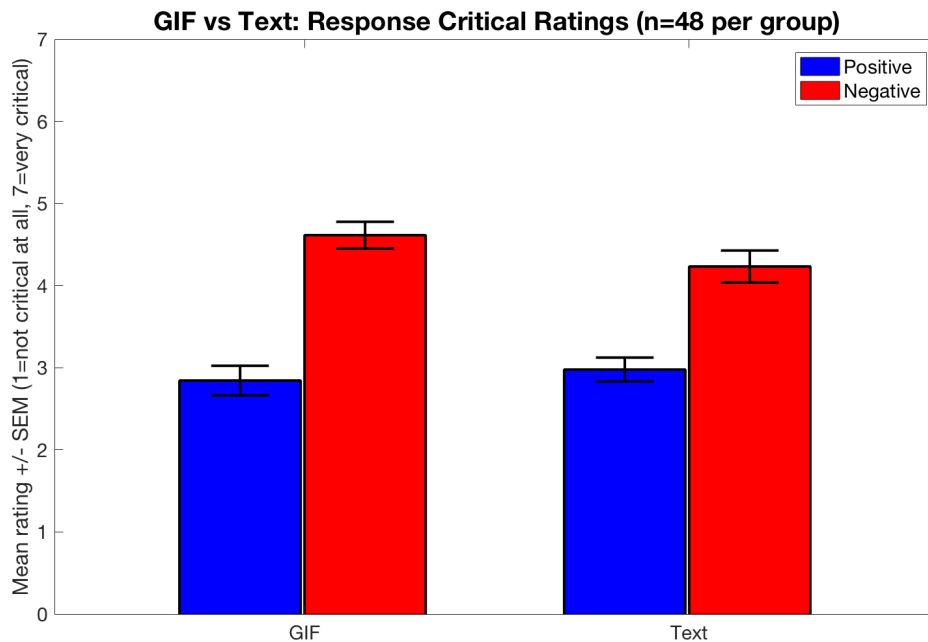


Figure 10. Chart comparing how critical participants found positive and negative GIF and Text reactions in Experiment 1. There was a statistically significant main effect of valence, with Bonferroni corrected pairwise comparisons indicating negative reactions were perceived as significantly more critical than positive ones.

Playfulness ratings. A 2 (response medium) x 2 (valence) mixed ANOVA was used to compare how playful people perceived when they were presented as responses to jokes in text messages. There was a main effect of valence ($F(1, 94) = 94.00, p < .0001$). Bonferroni corrected pairwise comparisons indicated that positive responses across both GIF ($M = 5.50, SD = .960$) and Text ($M = 4.53, SD = 1.08$) conditions were perceived as significantly more playful than negative GIF ($M = 3.94, SD = 1.31$) and Text responses ($M = 2.86, SD = 1.19; p < .0001$). Additionally, GIF responses were perceived as significantly more playful than Text responses ($p < .0001$), although there was not a statistically significant interaction between response medium and valence ($F(1, 94) = .186, p = .667$). These results suggest that positive reactions are perceived as reliably more playful than negative reactions when used as responses to jokes in text messages, and that GIFs are understood as more playful than Text responses.

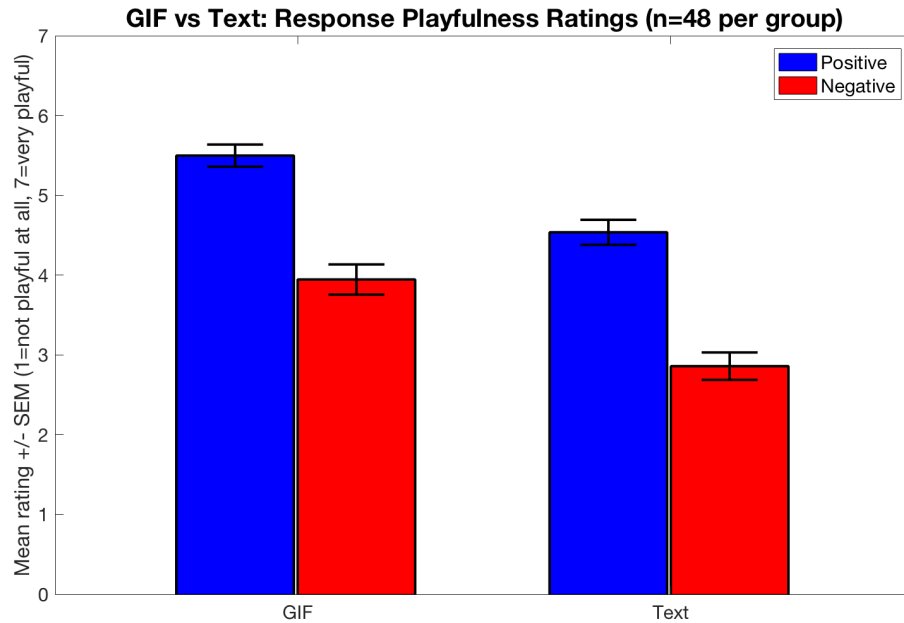


Figure 11. Chart comparing how playful participants found positive and negative GIF and Text reactions in Experiment 1. There was a statistically significant main effect of valence, with Bonferroni corrected pairwise comparisons indicating positive reactions were perceived as significantly more playful than negative ones.

Predicting humor from valence and irony. Stepwise regressions were used to model the relationship between GIF and Text responses' valence, sarcasm, hyperbole, criticalness, and playfulness to predict participants' humor ratings for jokes. Separate regressions were conducted to identify the different characteristics of the two types of responses that best predict humor ratings. These regressions were based on aggregate trial-by-trial responses across all participants, and used a forward procedure, with the assumption that valence was a forced variable.

The stepwise regression for GIF responses indicated that valence, playfulness ratings, and the interactions between valence and hyperbole and valence and criticalness significantly predicted 9.4% of the variance for humor ratings. The results

of this regression indicate that more positive and playful GIF responses predict higher humor ratings. Additionally, the interactions between valence and hyperbole as well as valence and criticalness negatively predict humor. That is, if a negative GIF is more hyperbolic (or conversely a positive GIF is less hyperbolic) and if a negative GIF is more critical (or a positive GIF is less critical), then the joke will be understood as funnier. All of these factors taken together identify characteristics of GIF responses that best predict high humor responses to text messaged jokes.

Predictor Variables	<i>b</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	<i>F</i>	<i>R</i> ²
Overall Model					.000***	19.026	.094
Valence	.849	1.83	.849	3.69	.000***		
Playfulness	.284	1.77	.504	7.06	.000***		
Valence x Hyperbole	-.171	1.75	-.824	-4.41	.000***		
Valence x Criticalness	-.076	1.74	-.314	-2.02	.04*		

Table 2. Stepwise regression model determining which characteristics of GIF responses predict humor ratings for jokes in Experiment 1. This model indicates that valence and playfulness positively predict humor ratings, with the interactions between Valence x Hyperbole and Valence x Criticalness negatively predicting humor ratings.

The stepwise regression for Text responses to text messaged jokes indicated that valence, playfulness ratings, and an interaction between valence and playfulness significantly predicted 13.5% of the variance. However, unlike the GIF model, this model indicates negative text responses positively predict humor ratings. That is, the more negative the text response, the funnier people found the joke. Additionally, a highly playful text response significantly predicts a higher humor rating. Finally, the interaction indicates that if the text response is highly playful and positive, then the

humor rating will be higher. All of these factors taken together identify characteristics of text responses that best predict high humor responses to text messaged jokes.

Predictor Variables	<i>b</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	<i>F</i>	<i>R</i> ²
Overall Model					.000***	37.721	.135
Valence	-.727	1.89	-.727	-4.46	.000***		
Playfulness	.396	1.78	.757	10.249	.000***		
Valence x Playfulness	.141	1.77	.572	3.65	.000***		

Table 3. Stepwise regression model determining which characteristics of Text responses predict humor ratings for jokes in Experiment 1. This model indicates that Playfulness and an interaction between Valence x Playfulness positively predict humor ratings. Surprisingly, a Text response’s valence negatively predicts humor ratings, which is an opposite finding from how a GIF response’s valence predicts humor ratings.

Discussion

Experiment 1 examined whether GIF responses would be used by “overhearers” of text-messaged jokes as better markers of how funny the joke was compared to Text responses. Additionally, it set out to answer whether the valence of the response – positive acting similarly to laughter and smiles that indicate affiliation, and negative acting as a stand-in for cringing away in disaffiliation – would make people perceive the joke in those directions. The findings in Experiment 1 initially seem to indicate that emotional depictions afforded by GIFs do not affect how humorous participants find the text-messaged jokes as compared to Text reactions. Upon first glance, it also appears as though there is no difference in how funny people found jokes regardless of if they saw positive or negative reactions as compared to control. But, when we look at the regressions for GIF and Text reactions to see what

predicts high humor ratings, we see that there is a significant effect of valence, and that it interacts with participants' differential perceptions of how ironic they find the responses. The regressions show that there is an effect of valence, but because it interacts so strongly with how ironic people perceive the GIF or Text reaction to be, its effects cannot be detected on the aggregate data. The effect of valence on humor was obscured by its interaction with different forms of irony.

These results indicate that participants are indeed able to conduct metarepresentational reasoning to detect irony by reading past the simple valence of the response and finding it simultaneously sarcastic, hyperbolic, critical, and playful. However, this effect may be due to demand characteristics where participants are explicitly asked to provide irony ratings and thus cannot specifically speak towards either hypothesis. However, the models for GIF and Text response characteristics that predict humor ratings indicate that participants are further integrating the reaction's perceived ironic meaning and valence in a way that affects their judgements of humor.

This finding supports the active negotiator hypothesis, which indicates that participants conduct metarepresentational reasoning, and specifically, that an integration of multiple sources of implicit information predicts how funny they find the joke. These findings together support the idea that positive and negative reactions successfully act as backchannels that move overhearers to understand jokes as more or less funny. It is particularly interesting that the valence of GIF responses predicts an opposite pattern of humor ratings as compared to the valence of Text responses.

That is, for GIF responses, a positive reaction strongly positively predicts humor while for Text responses, a negative reaction positively predicts humor with an equivalent strength. This may point to how the valence interacts differently for different mediums in which a response is being sent, suggesting that the response medium itself carries metarepresentational meaning that is further integrated into people's judgements of humor.

A secondary question was whether participants, as "overhearers", were passively observing the reactions and simply receive the conveyed emotional response that are presented to them, or if they were active negotiators, who performed metarepresentational reasoning and understood the responses themselves to convey more meaning than the valence or affiliation alone. The findings showed that although there was no effect of response medium and valence on humor ratings, they did have differential effects on sarcasm, hyperbole, criticalness, and playfulness ratings. This finding supports the idea that participants are performing metarepresentational reasoning about the response itself when they understand them to contain various forms of irony, supporting the active negotiator hypothesis. The perceived sarcasm of a response changed as a function of the interaction across the response medium and the valence, with negative GIFs being perceived as the most sarcastic of all. Interestingly, negative Text reactions were marginally less sarcastic than positive Text reactions, indicating that they may not actually convey as much disdain as their GIF counterparts.

Participants also read the responses as having different hyperbolic profiles, with GIFs overall being perceived as more hyperbolic than Text reactions, and positive reactions being perceived as more hyperbolic than negative ones. This may be because GIFs contain more movement than Text reactions, and perhaps also convey through that motion some form of metaphorical emotionality. Indeed, it may be something about the motion itself, as well as the presence of facial expressions, that affords more nuanced emotional expression. This exaggerated emotionality may be perceived as hyperbole. In fact, the positive reactions were perceived as much more hyperbolic than the emotional reactions across the response medium. Perhaps the expression of positive emotion is associated with visually larger, more exaggerated movements, such as “lol” being “laughing out loud”, “rofl” being simulated as someone rolling on the floor laughing, or actually witnessing a GIF of someone throwing their head back in laughter. It may also be that the expressions of positive emotions have more movement in them altogether (e.g., someone laughing versus holding their head in shame).

Criticalness ratings were higher for negative reactions than positive one, but were not different across the response mediums. Conversely, participants found an opposite pattern for another dimension of irony: negative responses are perceived as less playful than positive ones, with GIF responses being understood as overall more playful than text ones. This different pattern of results across four dimensions of irony indicate that participants can see a single response medium and interpret it to contain a variety of ironic meaning. For example, positive GIF responses are understood as

simultaneously as extremely hyperbolic and playful, but not very critical or sarcastic. This suggests that participants perform metarepresentational reasoning that goes beyond the mere transmission of emotional valence, leading them to understand different forms of ironic meaning to arise from these responses. The evidence on how differentially ironic participants find the responses also support the active negotiator hypothesis.

One final question was what factors of the GIF or Text responses predict how funny people may find these overheard text messaged jokes? The passive observer hypothesis stipulated that only valence would predict humor ratings since the responses would simply convey positive or negative valence in the form of affiliation and disaffiliation, respectively. However, the active observer hypothesis posited that valence, different forms of irony, and interactions across the two would predict humor since those forms of metarepresentational reasoning convey meaning of themselves that may influence how funny people find a joke. The results indicated that for GIFs, assuming valence would be included in the model, playfulness, and interactions across valence and hyperbole, and valence and criticalness also significantly predicted humor. Interestingly, Text responses had a different set of predictors for humor ratings with valence, playfulness, and an interaction across valence and playfulness. This finding provides evidence for the active negotiator hypothesis, where metarepresentational reasoning and participants' construction of ironic meaning across the response mediums predicted how funny they found the jokes. The different models also indicate that the way that each medium is understood to be

ironic contributes differently to how funny participants find the jokes. That is, GIFs and text afford different forms of ironic meaning making, which then differentially predicts how funny people will find a joke depending on what form of backchannel they see.

CHAPTER VI

Experiment 2: Dynamic Versus Static Emotional Reactions on Judgments of Irony and Humor

The results from Experiment 1 present a complex set of response characteristics that contribute to overhearers' perception of humor through text messaging. In particular, these findings indicate that participants perform some form of metarepresentational reasoning where they understand the responses to be somehow sarcastic, hyperbolic, critical, and/or playful depending on the response medium and valence that they saw. This opens up the question about a complex relationship between irony and humor, and more specifically what may be contributing to the metarepresentational reading of these positive and negative responses as ironic. For example, the finding with hyperbole is particularly interesting because it may indicate an intimate relationship between motion and emotion, where the animation of the GIFs may lend itself to participants reading the emotionality as more exaggerated. Perhaps there is a relationship between animation and the increased recognition of emotional dynamics that lends itself to more ironic readings of the responses, as well as differences in how funny people find jokes when responded to by positive and negative GIF and Text responses.

Dynamic Facial Expressions and Emotional Processing

Research has shown that dynamic motion of faces improves participants' accuracy of judgements for subtle emotional facial expressions (Ambadar, Schooler, & Cohn, 2005). In this study, participants were presented with single-static (one

frame of an emotional expression), multi-static (more than one frame of the same emotional expression), and dynamic forms of the six basic emotions as proposed by Ekman and Freisen (1982): anger, disgust, fear, happiness, sadness, and surprise. These faces were presented either upright or inverted to also examine whether dynamicity had an effect on holistic processing of faces. They found that motion improved facial expression recognition and confidence in their judgments. They did not find an interaction between motion and orientation, indicating that the increased performance was not due to an increase in holistic processing, but rather by some aspect of dynamic movement itself. In study 2, they replicated study 1 with the inclusion of a first-last (first and last frame of an emotional expression) condition to examine whether the effects in study 1 had to do with the temporal unfolding of specific emotions or if the benefit to performance came from increased sensitivity in facial configuration. No significant difference in the first-last condition and the dynamic condition would suggest that dynamic facial expressions aid in emotional expression recognition by increasing viewers' sensitivity to changes in facial configurations, which is what the data showed.

These findings suggest that dynamic movement aids in the recognition of emotional expressions by helping people recognize nuanced changes in facial configurations. This includes emotions such as disgust, happiness (albeit with mixed results across study 1 and 2), and surprise, which were all used as key expressions in the selection of the GIFs used in Experiment 1. These emotions are also key components to the expression of mirth and disgust, which are recognized as positive

and negative backchannels towards potentially humorous responses. If people use motion to identify nuanced changes in emotional expressions, then perhaps the increase in nuance is one reason why positive and negative emotional cues in GIFs and Text lead people to differentially read them as ironic.

Studies on the neurological underpinnings of dynamic versus static facial expressions have indicated that dynamic facial expressions elicit higher activation in areas associated with social cognition and emotional processing such as the parahippocampal gyrus, amygdala, STG, IFG, and OFC (Arsalidou, Morris, & Taylor, 2011; Trautmann, Fehr, & Herrman, 2009). Studies have shown that the amygdala is a key area for processing emotional expressions in faces (Adolphs, 2002; Gobbini & Haxby, 2007). However, beyond simply increasing the ability to process emotional expressions, dynamic movement may contribute to the way people read more into facial expressions and create judgments beyond emotionality.

Arsalidou, Morris, and Taylor (2011) conducted a set of fMRI experiments examining the different activation patterns of dynamic and static emotional facial expressions compared to dynamic and static control images (e.g., flowers) and compared their findings using an activation likelihood estimate meta-analysis to validate their findings. Their experiments and concordant evidence from the meta-analysis indicate that dynamic faces have greater activation than static faces in the medial temporal gyri (MTG), which they propose process the motions associated with nuanced facial movements in dynamic visual scenes, and the superior temporal sulcus (STS). The STS is associated with visually processing social signals such as the

“effortless perception, consolidation, and revision of information regarding the intentions, goals, and actions of agents in our environment” (Pelphrey et al., 2004, 1710). Arsalidou, Morris, and Taylor’s (2011) meta-analysis found that STS is regularly activated more for dynamic expressions than static ones, further suggesting that dynamic facial expressions not only provide increased ability to recognize nuances in facial expressions, but also to extract second-order forms of meaning from them such as interpolating the intentions, goals, and actions of agents in our environment. Motion, then, may be a critical aspect in the metarepresentational reasoning involved in making affiliative or ironic judgments about facial expressions, and thus, perhaps in predicting humor responses.

The dynamics of facial expressions may further be used to make judgments of affiliation and cooperation, which may explain why laughter and cringing may be used as markers of affiliation and shared, encrypted knowledge. Krumhuber et al. (2007) examined whether participants were sensitive to subtle dynamic changes in others’ smiles when making the decision to financially trust and cooperate with them in a simulated game relating to money. Participants were asked to make financial decisions such as whether to engage or exit a transaction with their “game partner,” who was presented as having either a fake smile (short onset and offset of the smile with long apex duration), an authentic smile (long onset and offset, short apex duration), or a neutral expression (static). Results indicated that participants were very sensitive to these changes and significantly engaged authentic smiles more than either the fake smile or control. Additionally, they found that participants rated the

authentic smiler as significantly more likeable, attractive, and trustworthy, and that they expected them to cooperate much higher than the other conditions. A regression showed that facial dynamics significantly predicted trustworthiness, with both facial dynamics and trustworthiness significantly predicting cooperative behavior. This study indicates that people are sensitive to subtle facial dynamics for smiles, specifically, when choosing whether or not to affiliate, trust, and cooperate with people. This points back to the encryption theory of laughter, which stipulates that authentic laughter and smiles are markers of shared underlying knowledge and suggested affiliation. Beyond that, the encryption theory indicates that there is a something *more* to be shared with affiliates – a second-order, “encrypted” message to be further interpreted by a listener, such as ironic meaning that can be interpreted through metarepresentational reasoning.

This evidence helps support the idea that GIFs may be especially interesting because they are necessarily animated and easily consumable (Bakshi et al., 2016). In particular, GIFs that have dynamic facial expressions, like the ones in Experiment 1, may be aiding participants in recognizing nuances in emotional expressions, interpreting the emotional expresser’s action intentions and goals, and conveying whether or not a message should be interpreted as containing second-order, encrypted knowledge as a marker of affiliation. GIFs with dynamic emotional expressions may act as better backchannels than static images since they convey more meaning for an overhearer to interpret. The present study seeks to identify whether dynamic GIFs expressing positive and negative facial expressions differentially move how sarcastic,

hyperbolic, critical, and playful people understand the responses, compared to static GIFs (i.e. single snapshots depicting the apex of the emotional reaction), and whether such a difference predicts humor responses to text-messaged jokes.

The Present Study

Experiment 2 aims to replicate and extend the findings of Experiment 1 by examining the relationship between motion, emotionality, irony, and humor in CMC.

What role does motion play in text messaged GIFs reactions that moves how sarcastic, hyperbolic, critical, and playful people find the responses? And does this change in ironic reading predicting their humor responses? It may be that humor only relies on receiving the emotional backchannel of positive or negative affiliative responses, and that more motion would increase that effect, such as the passive observer hypothesis would predict. This hypothesis would also indicate that listeners and observers do not perform metarepresentational reasoning on responses, and would not assume differences in how sarcastic, hyperbolic, critical, or playful people find them regardless of response medium, valence, or motion type. In this hypothesis, the different irony scales have no predictive power for how funny people find jokes and only valence and motion should predict how funny people find each response medium. The active negotiator hypothesis would also predict that the valence and motion affect how funny participants find the overheard text messaged jokes.

However, it also stipulates that participants are active negotiators of the responses and may perform metarepresentational reasoning about them, predicting a difference in how sarcastic, hyperbolic, critical, and playful the responses are depending on the

response medium, valence, and motion type. The active negotiator hypothesis would predict not only that valence and motion predict humor responses, but also that the different forms of irony and their interactions with valence and motion will predict how funny people find jokes that are responded to by each response medium.

It may be that the humor being conveyed is only through the emotional valence of the facial expression, with passive observers relying only on the emotion conveyed through the musculature of the face. If that is the case, is it the presence of any emotional facial expression that causes a change in humor and irony ratings? If so, then controlling for the visual portrayal of emotions through the use of static screenshots of the same GIF should have the same effects as using the original animated GIFs themselves. However, if there is something special about animated GIFs, such as motion increasing a participants' ability to recognize and metarepresentationally reason about the expressed emotions, then animated GIFs should have greater effects on humor and irony than static screenshots of the same GIFs.

However, research indicates that motion may differentially affect emotional facial expressions as compared to non-faces (Arsalidou, Morris, & Taylor, 2011). This predicts that animated Text responses may not receive any benefit towards higher humor responses as compared to static Text responses. But, since perceived agential motion activates areas of the brain related to understanding goals and intentions (Pelphrey et al., 2004), people may read into text responses with animations as conveying more meaning than just positive and negative valence. This

would predict bigger effect sizes for animated Text responses compared to static ones.

In Experiment 2, participants were presented with positive and negative GIF or Text responses to text-messaged jokes. These responses were also either static expressions of emotion (e.g., a single frame from the GIF or a regular textism like “lol”) or animated (e.g., an animated GIF, or a textism that moves). For each trial, these reactions were presented in response to a text-messaged joke in a group text chat. Participants were then asked to rate how funny they found the joke, and to provide ratings on how ironic (sarcastic, hyperbolic, critical, and playful) they found the response.

Both the **passive observer** and **active negotiator** hypotheses predict that positive responses lead to higher humor ratings than negative responses, with animated responses overall causing jokes to be perceived as funnier than static ones. Research suggests that dynamic facial expressions improve people’s accuracy in judging facial expressions (Ambadar, Schooler, & Cohn, 2005), provide increased ability to recognize nuances in emotional expressions (Arsalidou, Morris, & Taylor, 2011), and allow the extraction of second-order forms of meaning from them such as interpolating the intentions, goals, and actions of agents in our environment (Pelphrey et al., 2004). Additionally, both hypotheses would predict that GIF reactions would cause jokes to be perceived as funnier than Text ones. However, these two hypotheses have different predictions about how ironic participants may find the responses themselves. The **passive observer hypothesis** suggests that recipients only read into

the valence and do not necessarily integrate metarepresentational reasoning about the response itself (such as its medium or how ironic they may perceive it), even if they can detect these signals. Because participants are asked to conduct irony ratings, they will recognize and be able to provide varied ratings for how sarcastic, hyperbolic, critical, and playful they find the reactions depending on the valence. But again, because this hypothesis suggests participants do not integrate information beyond valence alone, then it also predicts that there will be no interaction between valence and response medium, or valence and motion type that affects how ironic they perceive the reactions. Additionally, the passive observer hypothesis suggests that a model to identify what characteristics of GIFs or Text responses would predict humor ratings would only indicate valence as the significant predictor since that is the only level of meaning that observers use. It would not suggest that any form of irony, or any interactions between valence and irony could predict humor ratings.

On the other hand, the **active negotiator** hypothesis supports the idea that laughter and its converse, cringing, convey more than just emotional valence and affiliation. It suggests that laughter or cringing indicates a second-order “encrypted” message exists to be unlocked and metarepresentationally reasoned about. This hypothesis would predict differences in how sarcastic, hyperbolic, critical, and playful participants understand the responses depending on their response medium, valence, and motion type. Even more specifically, this hypothesis suggests that there are interactions across valence and response medium, since Experiment 1 has already

shown that the medium in which a response is presented may modulate valence's effect on irony ratings.

Furthermore, the models predicting what characteristics of Text and GIF reactions affect humor responses will also have different sets of predictors since this theory suggests the medium itself already contains metarepresentational meaning that the overhearer may also reason about in their judgements of humor. Additionally, it would indicate that more than just the valence of a response predicts humor ratings. Indeed, the active negotiator hypothesis suggests that humor ratings depend on an integration of multiple levels of information that is metarepresentationally reasoned about. This suggests that multiple levels of either a GIF or Text reaction's characteristics, such as valence, motion type, the different forms of irony, and interactions between these characteristics predict how funny people find text messaged jokes.

These findings would provide support for GIFs acting as embodied depictions of emotions that serve as backchannels for overhearers in CMC where emotions are otherwise difficult to convey. The use of GIFs to fill in multimodal gaps in communicating emotional stances, like laughter for affiliation and cringing for disaffiliation, would also extend support for the encryption theory of humor beyond the limits of face-to-face interaction to CMC.

Participants

Ninety-six participants (63 women, 33 men; $M_{age} = 20.5$ years old) were recruited from the University of California, Santa Cruz psychology research pool for

this experiment. All participants consented to participate in the study as is consistent with IRB protocol. The participants were all native English speakers or early English-learning bilingual speakers. Participants were then assigned to either the GIF or Text condition. Because the True Baseline Condition in Experiment 1 had humor ratings that were not statistically significantly different from the within-subject control conditions, no true baseline was included for Experiment 2. In the GIF and Text conditions, participants were presented with text messaged conversations that had reactions with one of two valences (positive, negative), one of two motion types (animated, static), or control (no-reaction baseline). All participants were granted partial course credit for their participation in the study.

Materials

Experiment 2 used the same materials as Experiment 1 with one exception. Participants were also presented with positive and negative static GIFs and animated Text responses in addition to the animated GIF and static Text ones from Experiment 1. The static GIFs used in the *Static GIF condition* were chosen from a pilot study where participants were asked to select the frame that best expressed the GIF's emotion from a sprite sheet created from each GIF used in Experiment 1 (*Figure 12*). The mode response for each GIF was taken as the static GIF used in Experiment 2.



Figure 12. A sprite sheet used to determine which frame to use as the static GIF response. Participants in the pilot study were presented with all of the positive and negative GIFs used in Experiment 1 and selected the one they thought best represented the emotion. The mode response for each GIF (in this example, number 6) was used for the static GIF condition.

The textisms used in the *Animated Text Condition* consisted of the same phrases as in Experiment 1, but were animated into a wave and saved as a GIF (Figure 12). The participants in the GIF and Text conditions saw four positive animated, four positive static, four negative animated, four negative static, and eight control trials. To ensure participants did not see the same responses as both animated and static within the same sitting, the responses were counterbalanced for their valence, animation, and jokes they were paired with.

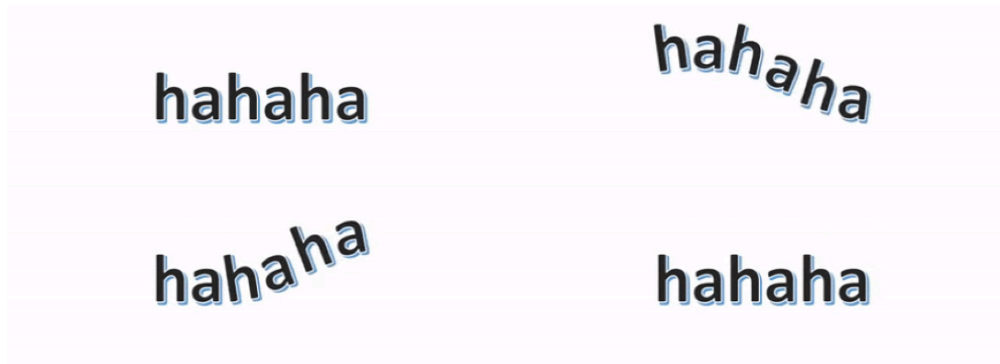


Figure 13. An example of an animated text response created using Microsoft Powerpoint animations. The text begins as a flat word, then proceeds to move in a wave formation.

Measures

The same measures were used in Experiment 2 as in Experiment 1.

Procedure

The same procedure was used in Experiment 2 as in Experiment 1, with the two between-subjects conditions being the GIF and Text mediums and the two within-subjects conditions being valence and motion type.

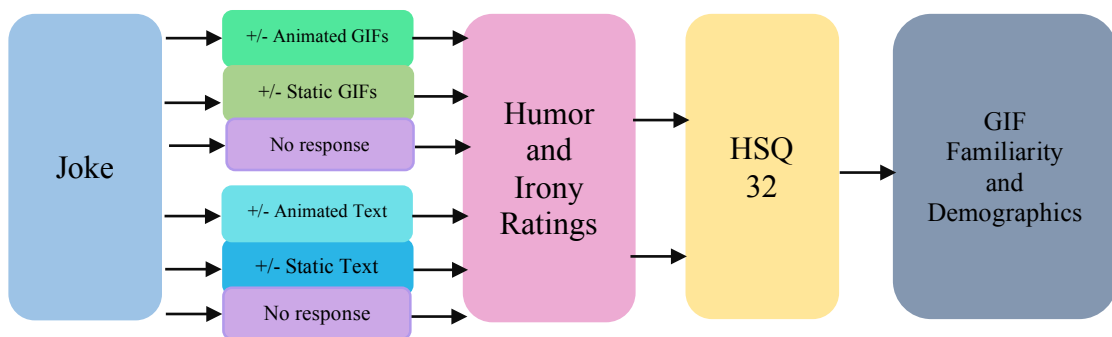


Figure 14. The flow of Experiment 2. For each trial, a participant saw a Joke texted to them in a group chat, a Response (between-subjects condition of response medium: GIF vs. Text), then a Rating scale. For each trial, the response was either be a positive static, positive animated, negative static, or negative animated response, or No response. Each trial was followed by humor ratings for the joke and irony ratings (sarcasm, hyperbole, criticalness, playfulness) for the response. After completing all 24 trials, participants completed the Humor Styles Questionnaire, the GIF familiarity questionnaire, and provided their demographics information.

Results

Humor ratings. There were no statistically significant differences in any humor styles across the GIF and Text conditions (see Table 4). Thus, any differences in humor ratings and irony ratings for Experiment 2 across the GIF and Text conditions are not likely to arise from group differences in their humor styles.

<u>Humor Style</u>	<u>GIF</u>		<u>Text</u>		<u>Df</u>	<u>t</u>	<u>p</u>
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>			
Affiliative	40.75	5.52	40.54	4.98	94	.194	.847
Self-enhancing	37.44	8.99	37.23	7.23	94	.125	.901
Aggressive	29.89	7.24	28.88	7.42	94	.682	.497
Self-defeating	29.35	9.78	27.81	9.22	94	.795	.429

Table 4. The Humor Styles Questionnaire scores and statistics from Experiment 2, split into the two between-subjects conditions, GIF and Text. There were no statistically significant differences between participants in the GIF and Text conditions for any of the humor styles, suggesting that any between-group differences should not be attributable to differences in sense of humor.

To calculate how funny participants found the text-messaged jokes, the mean humor rating was taken for each participants' positive animated (GIF: $M = 3.57$, $SD = 1.18$, Text: $M = 3.47$, $SD = 1.35$), positive static (GIF: $M = 3.82$, $SD = 1.21$; Text: $M = 3.58$, $SD = 1.28$), negative animated (GIF: $M = 3.25$, $SD = 1.12$; Text: $M = 3.30$, $SD = 1.20$), negative static (GIF: $M = 3.46$, $SD = 1.15$; Text: $M = 3.19$, $SD = 1.32$), and no response across the response mediums. To confirm that the group differences would be an effect of the manipulations, but not of group differences in humor, we compared the GIF ($M = 3.52$, $SD = .90$) and Text ($M = 3.36$, $SD = 1.22$) no-response control conditions and found no statistically significant difference ($t(94) = .759$, $p = .449$). Additionally, there was no statistically significant difference for any of the four humor styles across GIF and Text conditions ($p > .4$ for Affiliative, Aggressive, Self-enhancing, and Self-defeating humor styles).

A 2 (response medium) x 2 (valence) x 2 (motion type) mixed ANOVA was used to compare humor ratings across the GIF and Text conditions. There was a significant main effect of valence ($F(1, 94) = 14.0, p < .001$), but no significant main effect of response medium ($F(1, 94) = 2.46, p = .120$) or of motion type ($F(1, 94) = 2.137, p = .147$) on humor ratings. Additionally, there were no statistically significant interactions between reaction type and valence, reaction type and motion type, or between all three (all $p > .2$). This indicates that viewing positive reactions caused participants to rate jokes as funnier than if they saw a negative reaction, regardless of whether they were GIF or text responses. But animation and response medium did not seem to affect humor ratings across both GIF and Text responses.

The findings above may be due to differences in how motion type and valence affect participants' humor responses *depending* on which response medium – GIF or Text – they received as reactions to jokes. To delve deeper into how valence and motion type differentially affect humor ratings for each of the response medium, separate 2 (motion type) x 2 (valence) repeated measure ANOVAs were conducted for the GIF condition and the Text condition. For the GIF condition, there was a statistically significant main effect of valence ($F(1, 47) = 9.37, p = .003$), indicating that when participants saw positive reaction GIFs in response to a joke, they rated that joke as significantly funnier than when the joke received a negative reaction GIF. There was a marginal main effect of motion type ($F(1, 47) = 3.55, p = .066$), which indicates that jokes receiving static GIFs were rated as marginally funnier than those

receiving animated GIFs. However, there was no significant interaction across motion type and valence ($F(1, 47) = .030, p = .863$).

Similarly for the Text condition, there was a main effect of valence ($F(1, 47) = 5.13, p = .028$), where participants found jokes that received positive text reactions to be funnier than jokes that received negative text reactions. However, unlike the GIF condition, there was no main effect of motion type ($F(1, 47) = 0.00, p = 1.00$), indicating that animated text responses had no differential effect on humor ratings when compared to typical, static textisms. Additionally, there was no significant interaction across motion type and valence for text responses either ($F(1, 47) = 1.02, p = .318$).

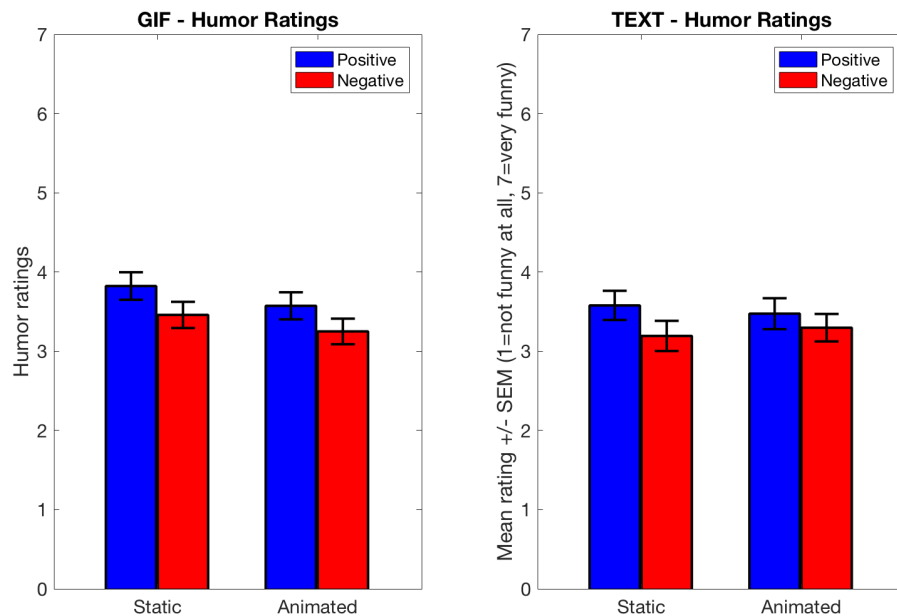


Figure 15. Humor ratings from Experiment 2 comparing the between-subjects conditions of GIF and Text and the within-subjects conditions of valence (positive, negative) and motion type (static, animated). Overall there was a significant main effect of valence, no main effect of motion type, and no interactions.

Sarcasm ratings. A 2 (response medium) x 2 (motion type) x 2 (valence) mixed model ANOVA was used to compare how sarcastic participants perceived GIF and Text reactions that were positive animated (GIF: $M = 3.09$, $SD = 1.39$, Text: $M = 3.29$, $SD = 1.38$), positive static (GIF: $M = 2.97$, $SD = 1.22$; Text: $M = 3.32$, $SD = 1.27$), negative animated (GIF: $M = 4.23$, $SD = 1.55$; Text: $M = 3.17$, $SD = 1.30$), and negative static (GIF: $M = 3.97$, $SD = 1.31$; Text: $M = 2.67$, $SD = 1.16$). There were statistically significant main effects of response medium ($F(1, 94) = 4.941$, $p = .029$), motion type ($F(1, 94) = 5.870$, $p = .017$), and valence ($F(1, 94) = 6.374$, $p = .013$) on sarcasm ratings. There was a statistically significant interaction between response medium and valence ($F(1, 94) = 28.469$, $p < .0001$) and between motion type and valence ($F(1, 94) = 4.187$, $p = .043$). These findings suggest that negative GIF reactions are perceived as generally more sarcastic than positive GIF reactions regardless of motion type. However, negative Text reactions are perceived as *less* sarcastic than positive ones if they are both static, and are not perceived as any more or less sarcastic if they are animated.

To further examine differences in how motion type and valence affect how sarcastic participants found each type of response, 2x2 repeated measures ANOVAs were conducted. When participants received only GIF responses, there was a main effect of valence with Bonferroni corrected pairwise comparisons indicating that negative GIF reactions were considered more sarcastic ($F(1, 47) = 21.709$, $p < .0001$). However, there was no significant main effect of motion type ($F(1, 47) = 2.46$, $p = .123$) or interaction between motion type and valence ($F(1, 47) = .425$, $p = .517$). This

suggests that for GIFs, the more negatively valenced the reaction, the more sarcastic it was perceived regardless of motion type. Similarly, for Text responses there was a statistically significant main effect of valence ($F(1, 47) = 6.85, p = .012$), with negative text responses being perceived as more sarcastic, as well as a marginally significant main effect of motion type ($F(1, 47) = 3.421, p = .070$) indicating animated text responses were perceived as marginally more sarcastic than static ones. Additionally, there was a statistically significant interaction between motion type and valence on how sarcastic people found text reactions ($F(1, 47) = 4.582, p = .038$), indicating that sarcasm ratings for Text responses change as a function of both motion type and valence, unlike GIF responses.

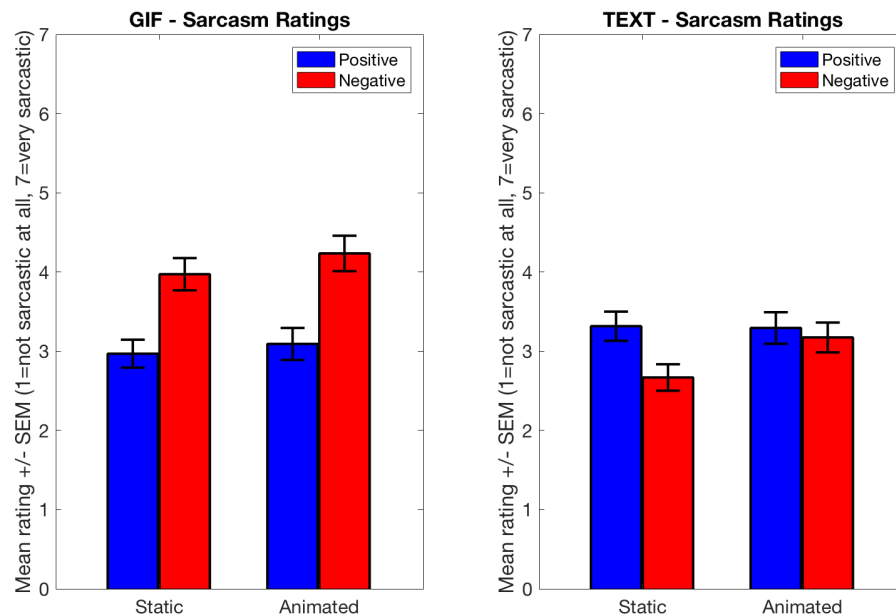


Figure 16. Chart comparing how sarcastic participants found the responses in Experiment 2 across the between-subjects conditions of GIF and Text and the within-subjects conditions of valence (positive, negative) and motion type (static, animated). Overall, there were a statistically significant main effects of response medium,

motion type, and valence, and statistically significant interactions between response medium x valence and valence x motion type.

Hyperbole ratings. A 2 (response medium) x 2 (motion type) x 2 (valence) mixed model ANOVA was used to compare how hyperbolic participants found the positive animated (GIF: $M = 5.09$, $SD = 1.14$, Text: $M = 4.06$, $SD = 1.26$), positive static (GIF: $M = 4.75$, $SD = .889$, Text: $M = 3.48$, $SD = 1.29$), negative animated (GIF: $M = 3.81$, $SD = 1.49$, Text: $M = 3.27$, $SD = 1.32$), and negative static (GIF: $M = 3.66$, $SD = 1.36$, Text: $M = 2.41$, $SD = 1.18$) responses to text messaged jokes. There was a statistically significant main effect of response medium ($F(1, 94) = 33.479$, $p < .0001$), indicating that participants found GIFs more hyperbolic than text responses. Additionally, a main effect of motion ($F(1, 94) = 18.630$, $p < .0001$) suggests that participants found animated responses to be more hyperbolic than static ones, and a main effect of valence ($F(1, 94) = 69.973$, $p < .0001$) points towards positive responses being more hyperbolic than negative ones.

A statistically significant interaction between response medium and motion type ($F(1, 94) = 4.388$, $p = .039$) suggests that hyperbole ratings are a function of both the medium that the response is sent in and its style of animation. Separate 2x2 repeated measures ANOVAs for the GIF and Text conditions were used to further examine how motion and valence differentially affect how hyperbolic participants found each type of response. For GIF responses, there was a significant main effect of motion type ($F(1, 47) = 5.733$, $p = .021$) and a significant main effect of valence ($F(1, 47) = 31.481$, $p < .0001$), but no significant interaction across the two ($F(1, 47) = .754$, $p = .390$). A similar pattern of results holds for the Text condition, where there

was a significant main effect of motion type ($F(1, 47) = 13.093, p < .001$) and of valence ($F(1, 47) = 44.717, p < .0001$) on how hyperbolic participants found Text responses, but no statistically significant interaction across motion and valence ($F(1, 47) = 2.096, p = .1543$). These findings together suggest that responses that are animated are perceived as more hyperbolic than static ones, and that positive responses are more hyperbolic than negative ones across both GIF and Text reactions. However, the interaction across response and motion type indicates that the effect of animation on hyperbole depends on the medium that the response is being presented in, with participants perceiving GIF responses as more hyperbolic than Text ones.

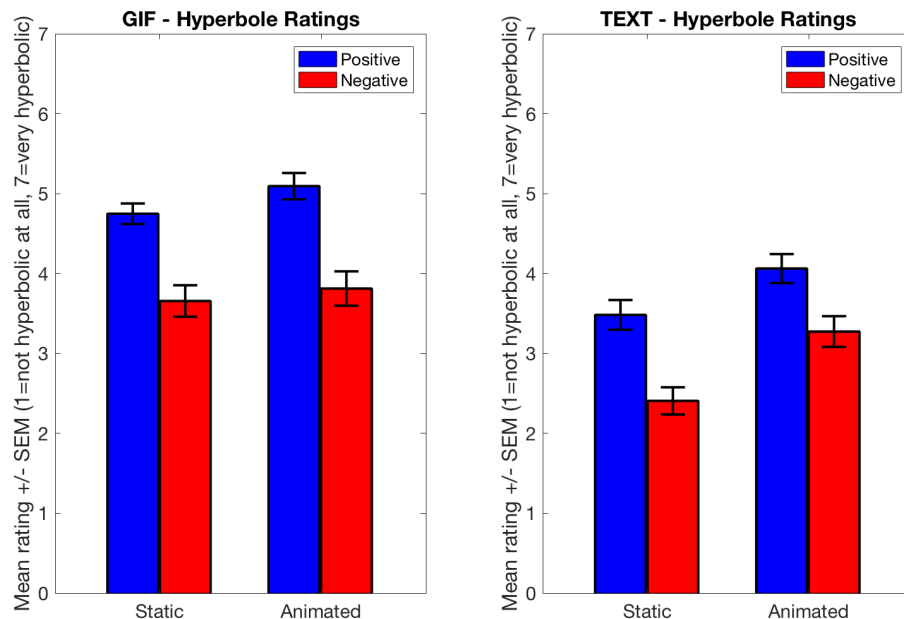


Figure 17. Chart comparing how hyperbolic participants found the responses in Experiment 2 across the between-subjects conditions of GIF and Text and the within-subjects conditions of valence (positive, negative) and motion type (static, animated). Overall, there were a statistically significant main effects of response medium, motion type, and valence, and a statistically significant interaction between response medium x motion type.

Criticalness ratings. A 2 (response medium) x 2 (motion type) x 2 (valence) mixed model ANOVA was used to compare how critical participants found the positive animated (GIF: $M = 2.48$, $SD = 1.32$, Text: $M = 2.77$, $SD = 1.33$), positive static (GIF: $M = 2.56$, $SD = 1.10$, Text: $M = 2.80$, $SD = 1.30$), negative animated (GIF: $M = 5.02$, $SD = 1.17$, Text: $M = 3.97$, $SD = 1.54$), and negative static (GIF: $M = 4.65$, $SD = 1.31$, Text: $M = 4.03$, $SD = 1.60$) responses to text messaged jokes. The analysis found that there was a significant main effect of valence ($F(1, 94) = 114.938$, $p < .0001$) and a significant interaction between response medium and valence ($F(1, 94) = 11.212$, $p = .001$), but no main effect of response medium ($F(1, 94) = 2.272$, $p = .135$) or motion type ($F(1, 94) = .328$, $p < .568$). This finding suggests that negative responses are perceived as more critical than positive ones as a function of the medium, GIF or Text, that it is sent as.

To delve deeper into this finding, separate 2x2 ANOVAs were conducted for the GIF and Text conditions. A significant main effect of valence ($F(1, 47) = 78.963$, $p < .0001$) and a significant interaction between motion type and valence ($F(1, 47) = 6.393$, $p = .015$) were found for the GIF condition. This suggests that for GIFs, negative responses are being perceived as more critical than positive ones, but that criticalness is also a function of whether the GIF is animated or not. However, for the Text responses, there was no significant interaction across motion type and valence ($F(1, 47) = .018$, $p = .893$). A main effect of valence ($F(1, 47) = 36.401$, $p < .0001$) suggests that unlike GIF responses, Text responses are perceived as more critical when they are negative, regardless of whether the text response is animated or static.

This suggests that GIF and Text responses are both found as more critical when they are negative than positive, but a GIF's criticalness rating also depends on its animation while Text responses do not.

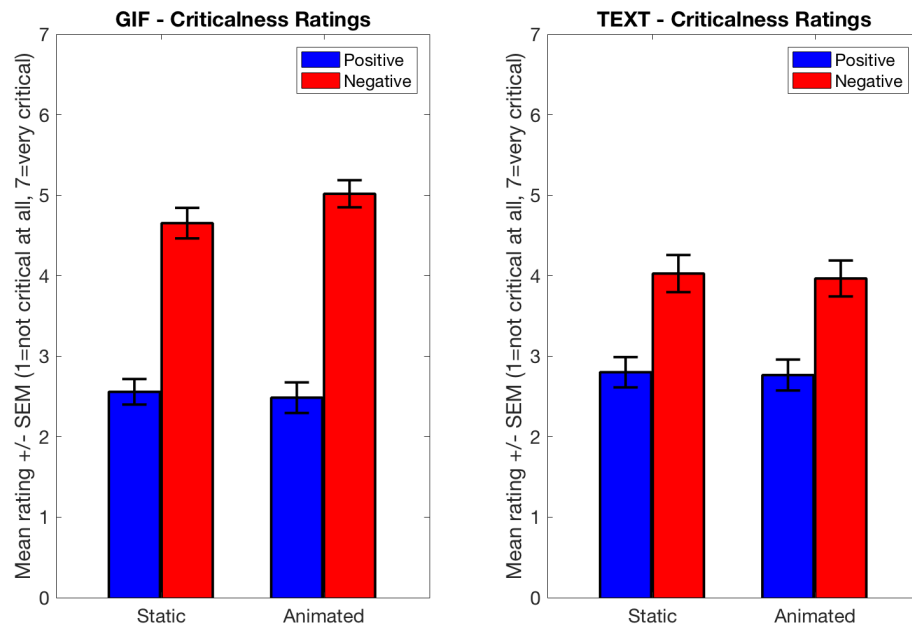


Figure 18. Chart comparing how critical participants found the responses in Experiment 2 across the between-subjects conditions of GIF and Text and the within-subjects conditions of valence (positive, negative) and motion type (static, animated). Overall, there were a statistically significant main effect valence, and a statistically significant interaction between response medium x valence.

Playfulness ratings. A 2 (response medium) x 2 (motion type) x 2 (valence) mixed model ANOVA was used to compare how playful participants found the positive animated (GIF: $M = 5.44$, $SD = 1.21$, Text: $M = 4.66$, $SD = 1.25$), positive static (GIF: $M = 5.26$, $SD = 1.18$, Text: $M = 4.15$, $SD = 1.27$), negative animated (GIF: $M = 4.04$, $SD = 1.23$, Text: $M = 3.32$, $SD = 1.45$), and negative static (GIF: $M = 3.91$, $SD = 1.21$, Text: $M = 2.30$, $SD = 1.08$) responses to text messaged jokes. A

statistically significant main effect of response medium ($F(1, 94) = 33.205, p < .0001$) suggests that GIF responses overall were perceived as more playful than text responses. A significant main effect of motion type ($F(1, 94) = 23.393, p < .0001$) indicates that animated responses overall were perceived as more playful than static ones, but an interaction between response and motion type ($F(1, 94) = 10.368, p = .002$) indicates that the effect of motion depends on whether the response is a GIF or Text.

Separate 2 (motion type) x 2 (valence) repeated measures ANOVAs were conducted to identify the differential effects of the two variables on how playful GIF and Text responses were perceived. For GIF responses, there was a significant main effect of valence ($F(1, 47) = 59.093, p < .0001$), but no significant main effect of motion type ($F(1, 47) = 3.037, p = .088$) or interaction between the two ($F(1, 47) = .084, p = .774$). This indicates that how playful a GIF response is perceived is only affected by the valence, but not whether it is animated or not. In particular, positive GIF responses were perceived as more playful than negative ones. On the other hand, Text responses showed significant main effects of motion type ($F(1, 47) = 20.677, p < .0001$) and valence ($F(1, 47) = 90.389, p < .0001$), indicating that both the valence and the animation type played a role in how playful participants perceived the text response. Indeed, a statistically significant interaction ($F(1, 47) = 4.071, p < .05$) indicates that, unlike GIF responses, the effect of valence on how playful participants found text responses also depended on whether the text was animated. That is, positive text responses were considered more playful than negative ones in both the

static and animated conditions, but negative animated responses were considered more playful than negative static responses. The animation of the negative text lent itself to being perceived as more playful.

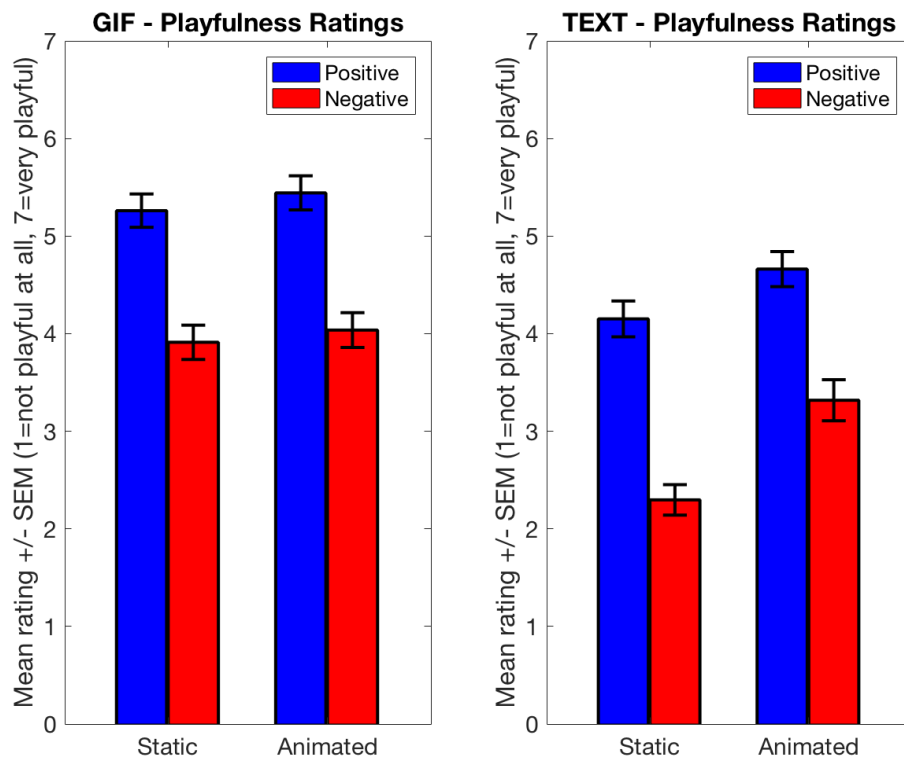


Figure 19. Chart comparing how playful participants found the responses in Experiment 2. Overall, there were a statistically significant main effects of response medium, motion type, and valence, and a statistically significant interaction between response medium x motion type.

Predicting humor from valence, motion type, and irony. Stepwise

regressions were used to model the relationship between GIF and Text responses’ valence, motion type, and their perceived sarcasm, hyperbole, criticalness, and playfulness to predict participants’ humor ratings for jokes. Separate regressions were conducted to identify the different characteristics of GIF and Text responses that best

predict humor ratings. These regressions used a forward procedure, with the assumption that valence was a forced variable.

The stepwise regression for GIF responses indicated that valence, playfulness, the interaction between valence and hyperbole, and the interaction between motion type and hyperbole significantly predicted 13.8% of the variance in humor ratings. These results suggest that valence and playfulness positively predicted humor ratings, meaning the more positive or playful the GIF response was, the more likely participants would give its accompanying joke a high humor rating. However, negative predictors of humor ratings include the interaction between valence and hyperbole as well as the interaction between animation and hyperbole. That is, if a negative GIF was more hyperbolic or if a positive GIF was less hyperbolic, then participants would find the joke funnier. Similarly, if a GIF was static but highly hyperbolic or if a GIF was animated and less hyperbolic, then it was more likely that participants would find the joke funnier. These different factors taken together identify characteristics of GIF responses that best predict humor responses to text messaged jokes.

Predictor Variables	<i>b</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	<i>F</i>	<i>R</i> ²
Overall Model					.000***	28.598	.138
Valence	.429	1.83	.429	2.51	.012***		
Playfulness	.370	1.73	.664	9.51	.000***		
Valence x Hyperbole	-.126	1.72	-.591	-3.51	.001***		
Motion Type x Hyperbole	-.042	1.71	-.199	-3.11	.002*		

Table 5. Stepwise regression model determining which characteristics of GIF responses predict humor ratings for jokes in Experiment 2. This model indicates that a GIF response's Valence and Playfulness positively predict humor ratings. It also indicates that the interactions between Valence x Hyperbole and Motion Type x Hyperbole negatively predict humor ratings.

Another stepwise regression indicated that 9 factors of text responses significantly predicted 19.6% of the variance in how funny participants found the jokes. Of these, sarcasm, hyperbole, criticalness, playfulness, and the interaction between valence and play positively predicted humor ratings. This suggests that the more sarcastic, hyperbolic, critical, and playful the text response was, then the funnier the joke was found. Additionally, if a text response was both positive and more playful, then the joke would also be found as funnier. A text reaction's valence marginally predicted humor ratings in the opposite direction of a GIF reaction's valence. Additionally, significant interactions between valence and sarcasm, valence and hyperbole, and motion type and hyperbole, negatively predicted humor ratings. This result surprisingly suggests that positive text reactions marginally predict lower humor ratings and negative text reactions predict higher ones, an opposite effect of valence when compared to GIF responses. It also suggests that positive reactions that are less sarcastic or hyperbolic, or conversely, negative reactions that are more sarcastic or more hyperbolic significantly predict higher humor responses. Finally, static text responses that were more hyperbolic or animated images that were less hyperbolic also predict that the jokes will be understood as funnier. These results

taken together portray a complex set of text reaction's features that predict how funny participants find text messaged jokes.

Predictor Variables	<i>b</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	<i>F</i>	<i>R</i> ²
Overall Model					.000***	19.36	.196
Valence	-.318	1.84	-.318	-1.84	.064		
Sarcasm	.101	1.74	.183	2.51	.012*		
Hyperbole	.109	1.72	.199	2.47	.014*		
Criticalness	.132	1.70	.244	3.47	.0006***		
Playfulness	.254	1.69	.487	5.89	.0000***		
Valence x Sarcasm	-.079	1.68	-.282	-2.02	.044*		
Valence x Hyperbole	-.088	1.67	-.330	-2.03	.04*		
Valence x Playfulness	.221	1.67	.878	5.14	.0000***		
Motion Type x Hyperbole	-.038	1.66	-.144	-2.24	.025*		

Table 6. Stepwise regression model determining which characteristics of Text responses predict humor ratings for jokes in Experiment 2. This model indicates that Sarcasm, Hyperbole, Criticalness, Playfulness, and an interaction between Valence x Playfulness significantly and positively predict humor ratings. It also suggests that significant interactions between Valence x Sarcasm, Valence X Hyperbole, and Motion Type x Hyperbole negatively predict humor ratings. The negative predictive power of Valence on humor ratings is marginally significant.

Discussion

Experiment 2 replicated and extended the findings of Experiment 1 by examining the role of response medium, valence, and animation of positive and negative GIF and Text responses on how funny overhearers find text messaged jokes as well as how ironic they found the responses themselves. Both the passive observer and active negotiator hypotheses predicted that positive responses would cause higher humor ratings, with GIF responses having a larger effect size than Text ones. They

also predicted that animated GIF responses would be more effective than static ones since they better express nuances of emotional expressions, but that the animated Text would not. Results from Experiment 2 replicated results from Experiment 1, where the responses' valence significantly affected how funny overhearers found the joke, but no overall effect of motion type or of response medium. However, when breaking down these results to look at each response medium, specifically, we see that valence and motion type may differentially affect them. For GIF responses, valence affected how funny participants found the joke, and there was a marginal effect of motion type, indicating that static GIFs, surprisingly, caused jokes to be perceived as marginally funnier than animated ones. Research suggests that the advantages of an animated face comes largely from the increased sensitivity to changes in facial expression configurations (Ambadar, Schooler, & Cohn, 2005).

These findings may have occurred because our selection of the static facial expressions may have left us with faces that were perhaps "too good" at expressing peak emotion. In fact, these faces that were caught mid emotional expression may have also been implying facial motion, which participants could use to simulate the rest of the emotional expression. Perhaps, even, it was simply that a static, peak emotion was kept on for the same amount of time that a GIF was normally looped, giving them longer exposure to the most expressive moment of emotion. For Text responses, valence affected how funny participants found the jokes, but motion type did not. These results provide support for the use of positive and negative responses, regardless of response medium, acting as backchannels. However, it does not provide

support for the theory that states that animation itself plays a role in conveying a stronger backchannel than a static response.

Experiment 2 also examined whether participants act as passive observers of responses, where they merely gleaned valence and affiliation from the responses, or if they were active negotiators who performed metarepresentational reasoning and interpreted the responses as conveying more meaning, depending on its response medium, valence, and motion type. Results across sarcasm, hyperbole, criticalness, and playfulness support the active negotiator hypothesis, where response medium, valence, and motion type differentially affected how ironic overhearers found the responses. All three of these factors, for example, individually affected how sarcastic a participant found a response, as well as having interactions across some of them. Participants found negative results to be more sarcastic than positive ones, but *only* for GIF responses. For text responses, participants did not find negative animated responses any more or less sarcastic than positive animated ones, but they did find negative static ones as more sarcastic than positive static responses. This finding suggests that the mediums at play, as well as their motion type, play a critical role in how participants metarepresentationally glean meaning from the responses themselves.

Similar to Experiment 1, the pattern of results was different across all of the different forms of irony, suggesting that people can see a single response medium and yet still interpret multiple, simultaneous layers of meaning from it. For example, the hyperbole ratings for Experiment 2 also indicated that response medium, valence, and

motion type, as well as interactions across some of these, significantly affected how hyperbolic people found the response. Like in Experiment 1, positive responses were perceived as more hyperbolic than negative ones. GIF responses were perceived as more hyperbolic than Text responses, and animated responses were perceived as more hyperbolic than static ones. These results portray a different pattern of results, just as criticalness and playfulness also have distinct patterns in how people found them to be ironic. This indicates that overhearers may understand the same responses to simultaneously contain multiple forms of ironic meaning at once. This supports the active negotiator hypothesis, where recipients act as agents of meaning making within the interaction through their metarepresentational reasoning of emotional backchannels.

Finally, what factors predict higher humor ratings? The passive observer hypothesis would predict that for each response medium, only valence and motion type would matter as these components of emotionality are what convey the most meaning. However, the active negotiator hypothesis predicted that valence and motion type would predict humor, but so would the different ways that people understand a response to be ironic and potential interactions with them. The regressions for both GIF and Text responses provided support for the active negotiator hypothesis as both models included aspects of irony as predictors for humor ratings. Specifically, if a GIF response has high valence and playfulness, and a negative interaction between valence and hyperbole and motion type and hyperbole, then it predicts a higher humor rating. The model for Text reactions is extremely

different from the model for GIFs, indicating a more complicated set of response characteristics predicts high humor ratings. The difference between these models is particularly important evidence towards the active negotiator hypothesis as it indicates that for GIFs and Text responses, the medium of the response may afford separate ironic interpretations based on its motion and valence. The different affordances of the mediums predict humor in different ways, indicating that overhearers may be interpreting irony differentially across them and ultimately changing the way they can understand humor from these responses.

The results from Experiment 2 provide evidence towards the active negotiator hypothesis and further supports the encryption theory of humor, where overhearers do use emotional backchannels in text messaging to identify what is or is not funny through performing metarepresentational reasoning on the responses themselves to interpret second-order meaning such as irony. The interactions between different forms of irony and valence, as well as interactions between hyperbole and motion type, indicate that these multiple layers of meaning must be understood simultaneously in the act of judging text-messaged jokes as humorous.

CHAPTER VII

General Discussion

This dissertation explored how GIF responses contributed to overhearers' judgements of irony and humor in text messaging as compared to Text responses. Experiment 1 and Experiment 2 support the active negotiator hypothesis, indicating that participants not only align with the valence of the response, but also perform metarepresentational reasoning on the responses to differentially understand them as sarcastic, hyperbolic, critical, and playful. In addition, both sets of experiments indicate that valence does, in fact, predict humor ratings, supporting the idea that GIF and Text responses can act as backchannels to help overhearers make judgments of humor.

However, contrary to the passive observer hypothesis, overhearers' judgments of irony, and the ways these ironic readings interact with the valence or motion type of the response, also significantly predict humor ratings. The valence of a response is not enough to predict how funny overhearers find a joke. This supports the idea that overhearers conduct metarepresentational reasoning on both GIF and Text responses, which contributes to their judgments of humor for text messaged jokes. This finding provides evidence towards the encryption theory of laughter, which indicates that laughter does not only convey a positive valence and affiliation, but also acts as a "key" that indicates "encrypted" messages that are to be decoded by listeners to understand humorous messages (Flamson, Bryant, & Barrett, 2011) as well as ironic implicatures (Bryant, 2012; Bryant & Gibbs, 2015; Gibbs & Samermit, 2017).

Further, it extends the encryption theory of laughter into the realm of CMC, where GIFs newly afforded naturalistic stand-ins for laughter and cringing. People do not merely read into the valence of GIF or even Text reactions, but perform second-order reasoning about the responses themselves. In this way, they may understand responses as simultaneously conveying multiple layers of meaning, such as sarcasm, hyperbole, affiliation, and valence all at once, as in the Facebook example this dissertation began with.

Thinking of GIFs as conveying more metarepresentational meaning than simple valence may explain why the same graphicon can be used for a wide variety of functions across different contexts (Herring & Danais, 2018) or even why people may interpret the same emoji as expressing different emotional sentiments (Miller et al., 2016). The intended valence may be understood within the context of a larger interaction as well as the medium it is sent in (e.g., GIF vs text) to be further metarepresentationally understood as conveying sarcasm, hyperbole, criticalness, or playfulness and affect how a reader interprets it overall. In this way, ironic meaning does not always need to be deliberately sent from someone, but may arise as a dynamic emergent property across a number of features of the response itself.

This poses some difficulty for machine learning algorithms that are used to classify GIFs for the different GIF keyboards and databases that people regularly use. If people are able to metarepresentationally reason about the emotions being conveyed on a GIF, such as sincere laughter, and read the same visual components (e.g., throwing one's head back in a laugh) as being potentially ironic (i.e., that

laughter is sarcastic and hyperbolic), then how do we teach such a system to recognize sincere signals as conveying irony for its users? As of August 2018, GIF search engines and GIF keyboards still rely on primarily descriptive search terms for the image or emotion in the GIF itself (see Figure 2 for example; “happy cry” brings up people crying rather than expressing joy). As computer vision may rely specifically on the cues in the scene to classify GIFs, it proves difficult to teach them nuances in emotional valence, and even more difficult to teach them figurativeness in emotional expressions, such as irony conveyed in a smile. It may be that teaching systems how to recognize emergent properties, such as irony or humor, may be beyond the current scope of technology. Future research should continue to think of the complex ways that visual signals may interact and how human observers may construe second-order meaning from them to further refine machine learning systems.

Some limitations may have determined why Experiment 1 did not show a significant difference in how response medium and valence affected humor ratings, as well as why animation did not seem to benefit GIF responses when it came to humor ratings in Experiment 2. The first limitation is that the jokes may not have been adequate or ecologically valid for a study on CMC. The jokes used in Experiment 1 and 2 were initially piloted for in-lab experimental studies that were more decontextualized than this set of studies on text messaging. The genre of jokes that were used in this study, two-liners, are commonly referred to now on the internet as “dad jokes”. This type of joke would be more commonly sent in text messages as memes than it would as a joke that someone genuinely finds funny. Future studies

examining how reaction GIFs differentially affect humor in text messaging or across CMC should attempt to find more naturalistic corpora to base stimuli off of.

Similarly, positive textisms such as “lol” or “haha” are often used as neutral discourse markers or fillers in online communication. It may be that these responses which originally expressed positive meaning are now pragmatically used as more neutral responses in chats. On the other hand, negative textisms such as “ugh.” and “smh” may be understood as actually communicating disdain rather than being used as a filler. This may partially explain why positive text responses were read as more sarcastic than negative text responses in both experiments (marginally in Experiment 1 and significantly in Experiment 2).

Additionally, Experiment 2 did not show the benefit of animated GIFs on humor ratings, as was predicted. This may be because the static frames chosen as peak examples of emotion may already convey dynamic emotional meaning to them. That is, the static frames may also imply the future motion of the facial expressions, which people may visually simulate to understand the emotion that is being conveyed. It may be that seeing the peak emotion in a static image allowed participants to imagine just as great of an expression of emotion as would have been conveyed by the animated GIF itself. To my knowledge, the role of embodied simulation on understanding emotions from static facial expressions with implied motion has yet to be studied and warrants further investigation. Additionally, the role of implied motion on second-order reasoning of facial expressions, such as perceiving irony through static faces, may also be a domain worth studying.



Figure 20. An example of a static frame pulled from a GIF at its peak emotion. The facial expression and musculature in the static frame contains implied motion for the following, dynamic expressions. Also, this GIF aptly sums up the findings of this dissertation: Irony is difficult to explain, and can ultimately be understood as just ironically funny in and of itself.

One interesting point to note is that the emotional expressions on GIFs used in these experiments may contain multimodal metaphors, where metaphorical meaning is expressed through visual cues and dynamic motion rather than through language itself (Forceville, 2008). For example, the positive GIFs for the most part show someone throwing their head in laughter. This is a visual depiction of the HUMOR IS FORCE conceptual metaphor, where humor is a force acting on one's body as they tussle with the funny material (Samermit & Gibbs, 2016). Additionally, the positive GIFs tend to have upward motion, visually depicting HAPPINESS IS UP (Yu, 1998), while the negative GIFs mostly have downward motion similarly depicting SADNESS IS DOWN (Kövecses, 2013). The motion and visual cues may act as cues to help us figuratively comprehend emotions being expressed in the GIFs beyond the facial expressions themselves. The metaphoricity, or felt metaphorical experience that exists even without language (Jensen & Cuffari, 2014) can be understood through

multimodal metaphors of expressive movements in speech, gestures, facial expressions, and structures of film or visual scenes (Kappelhoff & Müller, 2011). In this way, the combination of facial expressions and framed motion in the GIFs contribute to our understanding of the emotion, and furthermore, perhaps to our second-order reasoning of their use as ironic. Future studies should consider systematically investigating the ways in which GIFs convey metaphorical meaning.

Finally, the distinction of passive observer and active negotiator may be more nuanced in online processing. At any given time, a person may be more passive or active in their metarepresentational reasoning about content, with various factors such as affiliation, mental state, motivation, etc. playing a role in how agential they may be in that moment. It may also be the case that some people tend to be more or less active in their metarepresentational reasoning abilities or tendencies, though an examination of individual differences of that kind go beyond the scope of this dissertation. Humor and irony both are extremely complicated figurative tools that rely on simultaneously maintaining multiple representations at once such as bicoherent thought, largely understood through our embodied experiences, and accomplished through metarepresentational reasoning about the people and things around us (Gibbs & Samermit, 2017).

It may be prudent of future studies to consider how people in context may be on a spectrum of passive observers to active negotiators. People may exist in the “in-between space” where they sometimes read into the second-order meaning of things and sometimes take things at face value. Further examining the contexts, factors, and

mediums that allow for humor and irony to dynamically emerge both in face-to-face interactions and in CMC may help researchers understand the ephemeral nature of bicoherent thought, action, and communication.

Appendix A

Two-liner Joke Stimuli

1. My friend gave me his Epi-Pen as he was dying, it was very important to him that I have it.
2. What's the difference between gravity and a white man? Gravity holds everyone down equally.
3. Anyone know how to fix some broken hinges? My door's always open.
4. I threw a boomerang a few years ago. Now I live in constant fear.
5. I wondered why the baseball was getting bigger. Then it hit me.
6. You don't need a parachute to go skydiving. You need a parachute to go skydiving twice.
7. Women call me ugly until they find out how much money I make. Then they call me ugly and poor.
8. What happens if you eat too many bowls of alphabet soup? You'll have a big vowel movement.
9. My married friends keep trying to set me up. I don't know where they keep finding all these bloody gloves.
10. When I opened my new Thesaurus, all the pages were blank. I have no words to describe how angry I am.
11. I want to die peacefully in my sleep like my grandfather... Not screaming and yelling like the passengers in his car.

12. A ham sandwich walks into a bar and orders a beer. The bartender says ‘Sorry we don’t serve food here’
13. I have a fear of elevators, but I’ve started taking steps to avoid it.
14. My doctor told me to drink two glasses of wine after a hot bath. But I can’t even finish drinking the bath.
15. This week’s meeting of the Clairvoyants Society has been cancelled due to unforeseen circumstances.
16. A genie asked me, ‘What’s your first wish?’ I answered, ‘I wish I was rich.’ And the genie said, ‘Okay, what’s your second wish, Rich?’
17. I used to be addicted to soap, but I’m clean now.
18. Why don’t oysters share their pearls? They’re shellfish.
19. My wife accused me of being immature, I told her to get out of my fort.
20. Yesterday I saw a guy spill all his Scrabble letters on the road. I asked him, ‘What’s the word on the street?’
21. A Roman legionnaire walks into a bar, holds up two fingers and says, ‘Five beers please’
22. What’s green, fuzzy, and if it fell out of a tree would kill you? A pool table.
23. A friend will help you move. A best friend will help you move a body.
24. My grandfather has a heart of a lion and a lifetime ban at the zoo.

Appendix B

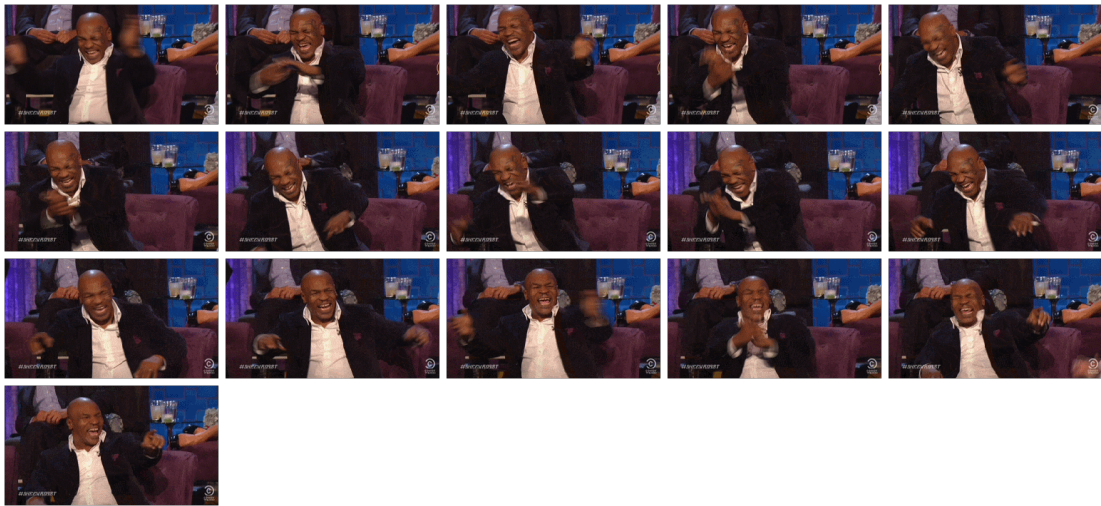
GIF Response Stimuli

Sprite Sheets

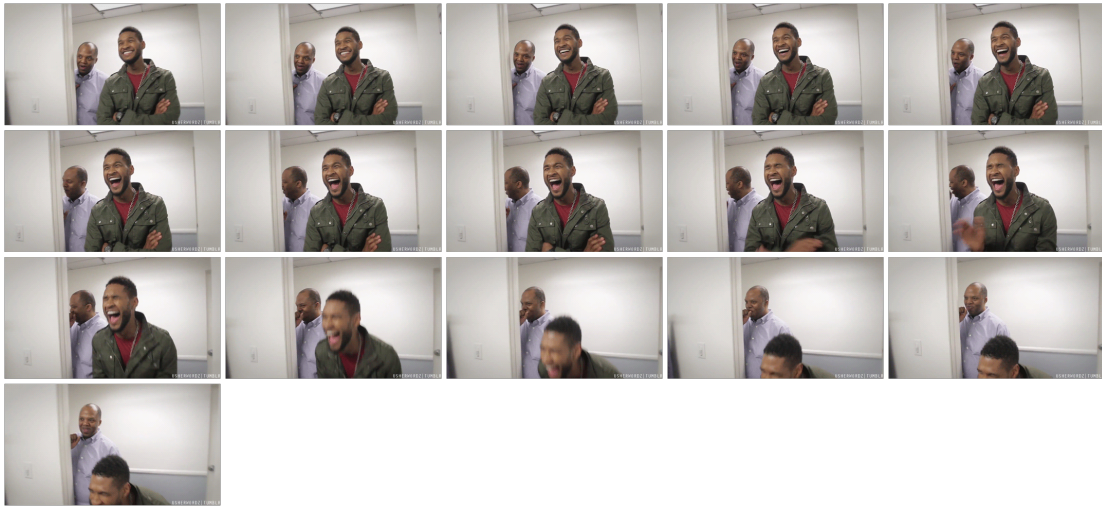
The animated GIF response stimuli used in Experiments 1 and 2 are displayed here as sprite sheets depicting their full range of animation. The actual GIFs themselves can be found in the Supplemental Materials.

Positive, Animated GIFs



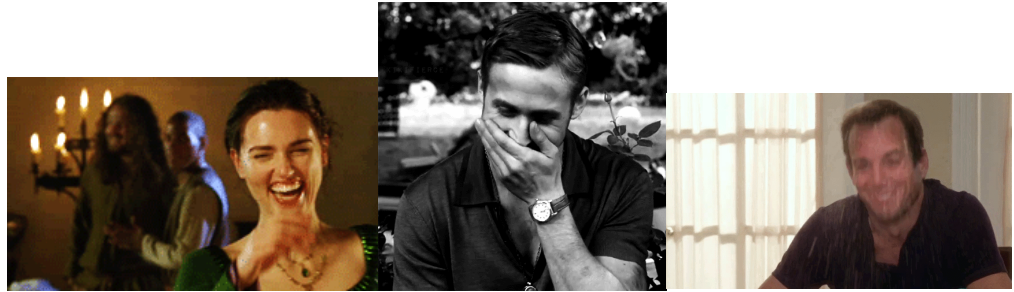




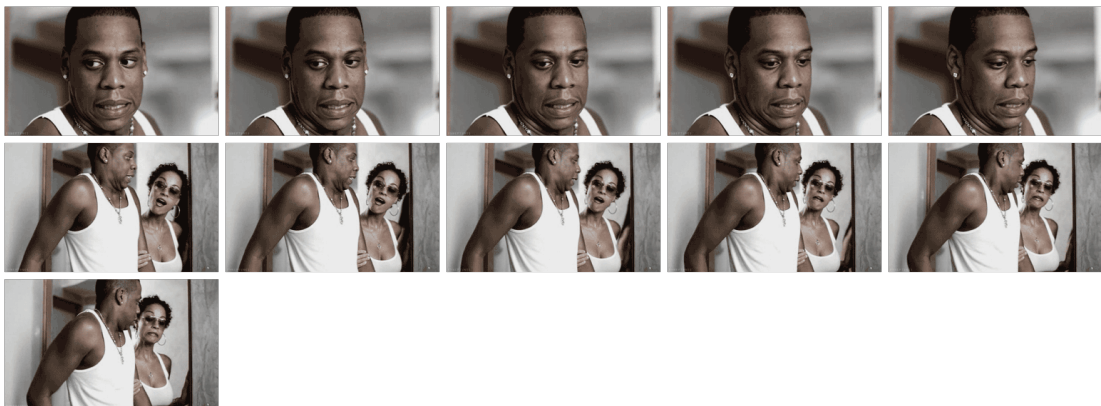


Positive, Static GIFs

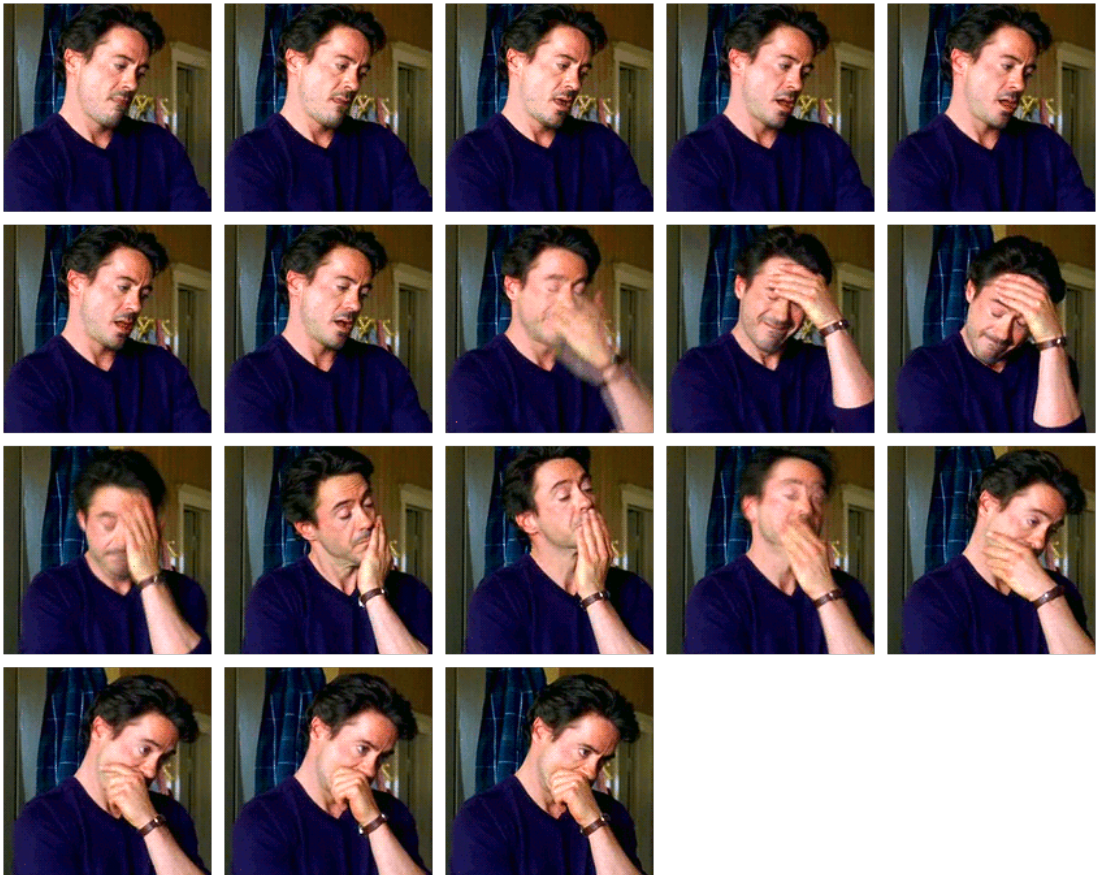
The following are the static frames used as the Static GIFs in Experiment 2. These were chosen in a pilot study where participants were shown the sprite sheets (above) and asked to select the frame that best displays the expressed emotion.



Negative, Animated GIFs



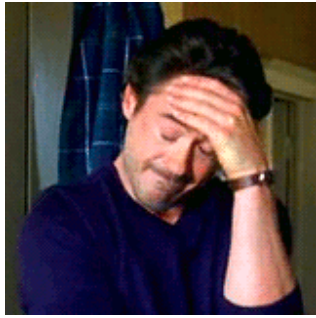






Negative, Static GIFs





Appendix C

Text Response Stimuli

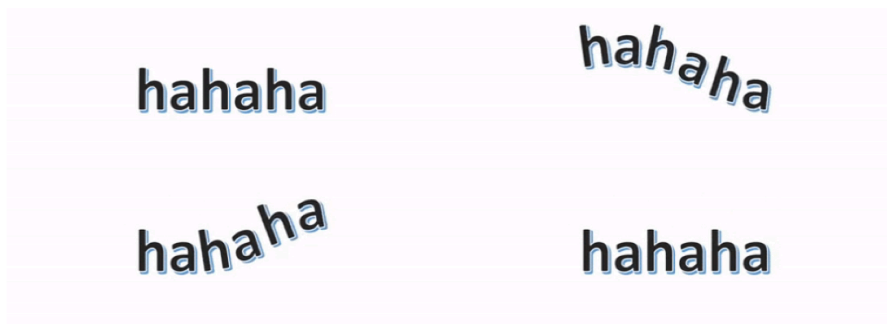
Static Text Responses

The following were used for positive and negative static text responses. They were texted into the text input for iMessage as any normal text message would be sent.

<u>Positive</u>	<u>Negative</u>
hahaha	oh.
LOL
that's funny	I don't get it
rofl	what?
lmao	smh
lol	ugh.
haha	meh.
lolol	uhhhh

Animated Text Responses

These were created using Microsoft Powerpoint word art and animations. They were animated into waves as in this figure. For the actual GIFs, see supplemental materials.



Appendix D

Humor Styles Questionnaire

People experience and express humor in many different ways. Below is a list of statements describing different ways in which humor might be experienced. Please read each statement carefully, and indicate the degree to which you agree or disagree with it. Please respond as honestly and objectively as you can. Use the following scale:

Totally Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Totally Agree	
1	2	3	4	5	6	7	
1.	I usually don't laugh or joke around much with other people. If I am feeling depressed, I can usually cheer myself up with humor.					1	2 3 4 5 6 7
2.	If someone makes a mistake, I will often tease them about it. I let people laugh at me or make fun at my expense more than I should.					1	2 3 4 5 6 7
3.	I don't have to work very hard at making other people laugh -- I seem to be a naturally humorous person. Even when I'm by myself, I'm often amused by the absurdities of life.					1	2 3 4 5 6 7
4.	People are never offended or hurt by my sense of humor.					1	2 3 4 5 6 7
5.	I will often get carried away in putting myself down if it makes my family or friends laugh. I rarely make other people laugh by telling funny stories about myself.					1	2 3 4 5 6 7
6.	If I am feeling upset or unhappy I usually try to think of something funny about the situation to make myself feel better.					1	2 3 4 5 6 7
7.	When telling jokes or saying funny things, I am usually not very concerned about how other people are taking it.					1	2 3 4 5 6 7
8.	I often try to make people like or accept me more by saying something funny about my own weaknesses, blunders, or faults.					1	2 3 4 5 6 7
9.	I laugh and joke a lot with my friends.					1	2 3 4 5 6 7
10.	My humorous outlook on life keeps me from getting overly upset or					1	2 3 4 5 6 7

- depressed about things. 1 2 3 4 5 6 7
15. I do not like it when people use humor as a way of criticizing or putting someone down. 1 2 3 4 5 6 7
16. I don't often say funny things to put myself down. 1 2 3 4 5 6 7
17. I usually don't like to tell jokes or amuse people. 1 2 3 4 5 6 7
18. If I'm by myself and I'm feeling unhappy, I make an effort to think of something funny to cheer myself up. 1 2 3 4 5 6 7
19. Sometimes I think of something that is so funny that I can't stop myself from saying it, even if it is not appropriate for the situation. 1 2 3 4 5 6 7
20. I often go overboard in putting myself down when I am making jokes or trying to be funny. 1 2 3 4 5 6 7
21. I enjoy making people laugh. 1 2 3 4 5 6 7
22. If I am feeling sad or upset, I usually lose my sense of humor. 1 2 3 4 5 6 7
23. I never participate in laughing at others even if all my friends are doing it. 1 2 3 4 5 6 7
24. When I am with friends or family, I often seem to be the one that other people make fun of or joke about. 1 2 3 4 5 6 7
25. I don't often joke around with my friends. 1 2 3 4 5 6 7
26. It is my experience that thinking about some amusing aspect of a situation is often a very effective way of coping with problems. 1 2 3 4 5 6 7
27. If I don't like someone, I often use humor or teasing to put them down. 1 2 3 4 5 6 7
28. If I am having problems or feeling unhappy, I often cover it up by joking around, so that even my closest friends don't know how I really feel. 1 2 3 4 5 6 7
29. I usually can't think of witty things to say when I'm with other people. 1 2 3 4 5 6 7
30. I don't need to be with other people to feel amused -- I can usually find things to laugh about even when I'm by myself. 1 2 3 4 5 6 7
31. Even if something is really funny to me, I will not laugh or joke about it if someone will be offended. 1 2 3 4 5 6 7

32. Letting others laugh at me is my way of keeping my friends and family
in good spirits.

1 2 3 4 5 6 7

Scoring

Affiliative Humor: 1*, 5, 9*, 13, 17*, 21, 25*, 29*

Self-Enhancing Humor: 2, 6, 10, 14, 18, 22*, 26, 30

Aggressive Humor: 3, 7*, 11, 15*, 19, 23*, 27, 31*

Self-Defeating Humor: 4, 8, 12, 16*, 20, 24, 28, 32

* Note: Items marked with * are reverse keyed; i.e., 1=7, 2=6, 3=5, 4=4, 5=3, 6=2, 7=1 After reversing these items, sum across all 8 items in each scale to obtain scale totals.

Interpretation

Affiliative Humor: tendency to share humor with others, tell jokes and funny stories, amuse others, make others laugh, enjoy laughing along with others

Self-Enhancing Humor: tendency to maintain a humorous outlook on life even when not with others, use humor in coping with stress, cheer oneself up with humor

Aggressive Humor: tendency to use humor to disparage, put down, or manipulate others; use of ridicule, offensive humor; compulsive expression of humor even when inappropriate

Self-Defeating Humor: tendency to amuse others at one's own expense, self-disparaging humor; laughing along with others when being ridiculed or put down; using humor to hide one's true feelings from self and others

Source

Martin, R. A., Puhlik-Doris, P., Larsen, G., Gray, J., & Weir, K. (2003). Individual differences in uses of humor and their relation to psychological well-being:

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