University of Nevada, Reno

Systematic Examination of the Additive Effects of Humorous Verbal Stimuli on Cooperative Responding During an Analogue Data Entry Work Task

A dissertation submitted in partial fulfillment of the

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by

Chelsea J. Wilhite

Dr. Ramona A. Houmanfar/Dissertation Advisor

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Chelsea J. Wilhite

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Ramona A. Houmanfar, Ph.D., Advisor

W. Larry Williams, Ph.D., Committee Member

Mark P. Alavosius, Ph.D., Committee Member

Laura Crosswell, Ph.D., Committee Member

Sushil Louis, Ph.D., Graduate School Representative

David W. Zeh, Ph.D., Dean, Graduate School

August, 2022

Abstract

Experiencing humor has numerous beneficial effects for humans. Producing humor (e.g., telling jokes, using satire) and engaging in the humor response (e.g., smiling, laughing) are associated with physical (Kelley et al., 1984) and mental health benefits (Martin & Lefcourt, 1984), positive social connections (Demjen, 2016), and facilitating social change (Chenoweth & Stephan, 2011). Humorous stimuli are common components of human communication, and much of human communication involves rules or contingency-specifying stimuli. Motivative augmentals are statements that temporarily alter the value of the reinforcer specified in the statement and any associated behaviors (Barnes-Holmes, et al., 2001). By drawing upon literature on humor, behavior, and a scientific account of motivation, humorous stimuli (jokes) were used as antecedent stimuli and analyzed in terms of their potential motivative augmental effect on cooperative behaviors in an analogue medical data entry task. Study 1 examined which joke delivery modality, text only, audio only, or text-plus-audio, was experienced as funnier and more likely to prompt cooperation. Pilot Studies A-E and Study 2 investigated the potential effects humorous stimuli had on the cooperation during the data entry task. Results demonstrated the augmental function of some humorous stimuli in relation to cooperative responding. The implication and limitations of using humorous stimuli as motivative augmentals for cooperation are discussed.

Correspondence regarding this dissertation should be addressed to Chelsea J. Wilhite, chelsea.wilhite@gmail.com.

Dedication

I dedicate this dissertation to my father, Brian Wilhite, and to my stepfather, Harrison Madden, both of whom I miss terribly. I wish they were here to celebrate with me.

Acknowledgements

Table of Contents

List of Tables

List of Figures

Introduction

"Humor is the universal solvent against the abrasive elements of life," proclaimed former Sen. Alan Simpson at the memorial for former Pres. George H. W. Bush (in Hubbard & Maloney, 2018, para. 24).

Humor and the Human Experience

Human communication is, on the spectrum of complexity, the most intricate in which any species engages. The meanings of individual words are so multifaceted that one simple change in context, tone, or delivery can make a word mean something completely different, from an unrelated topic to the original word's opposite. One result of this intricate influence on word and passage meaning is the ability to produce and recognize humor. From simple puns to punchline jokes to funny stories, language-based humor can have a multitude of components and varying effects. The use of humor is integrated into our everyday lives in such a way that we rarely go a day without being exposed to multiple humorous stimuli.

We all know what humor is and when we contact a stimulus we experience as "funny," yet an objective definition of humor remains—at least partially—elusive. Various fields of scientific interest have referred to humor using terms such as "trait humor" and "humor appreciation," and measured humor with criteria for "generation of humor" and "laughter." Raskin (1985) described humor, at its simplest, as a situation in which "[s]omebody hears or sees something and laughs" (p. 1). In this regard, humor is defined by the reaction behavior of the person or people contacting the situation. Darwin (1872), when addressing the potential causes of laughter in adults, wrote, "Something incongruous or unaccountable, exciting surprise and some sense of superiority in the

laughter, who must be in a happy frame of mind, seems to be the commonest cause" (p. 196). Martin and Lefcourt (1984) define a "sense of humor" as the ability or tendency to produce and enjoy humorous stimuli. Martin and Kuiper (1999) define jokes, specifically, as formulaic short stories which are aimed at amusing others and usually rehearsed. This definition, however, is lacking in that part of the definition is the "intent" of the joke-teller, which is difficult to measure objectively, and in that it does not include any component describing the effect a joke has on the listener. Missing from these definitions is the precision many behavior scientists require.

Though lacking a clear definition of "humor" or "humorous stimulus," Skinner attempted to describe both the role the listener plays in humorous situations and the components necessary to produce humor. He proposed the emotional reactions of the listener maintain behaviors of the speaker. Specifically, as it relates to humor, Skinner stated, "The listener who laughs is disposed to act in ways which are positively reinforcing—for example, he may pay the speaker in the role of entertainer or do him a favor." (Skinner, 1957, p. 154). He further stated, "The effect of wit as a form of verbal play… involves the listener's verbal behavior" (p. 285-286), though he did not offer supplementary description of those verbal behaviors. Skinner identified some of the necessary components of verbal humor as including multiple controlling variables and weak stimulus control over a specific response (see discussion below).

Others have attempted more comprehensive definitions of humor. Wyer and Collins (1992) outlined a three-prong approach to the designation of humor:

1. The stimulus for the humorous reaction can be something that a person says, a nonverbal behavior that the person performs, or a combination of both. The stimulus event might also include

nonbehavioral aspects of a situation. Indeed, a humorous response may often be stimulated by a number of verbal, nonverbal, and contextual features that are responded to as a configuration, none of which in isolation would be sufficient to elicit this response.

2. The stimulus events that elicit humor can be either intentional or unintentional.

3. A humor-eliciting response is defined in terms of a person's subjective cognitive reaction to a stimulus configuration or, more accurately, the person's perception of this reaction (specifically, "amusement") rather than in terms of an observed response to the stimulus. Although smiling, laughter, and physiological responses are often correlated with such subjective reactions, they can occur for other reasons as well. Most obviously, they can convey joy or happiness that is experienced for reasons that have nothing to do with the perception that something is funny. Laughter can also result from embarrassment or from the release of tension produced by anger. In other cases, it can reflect ingratiation, politeness, or conformity to others' apparent opinions that something is funny. In still other cases, smiles and laughter can convey delight (as when one unexpectedly arrives at the solution to a problem). According to our definition, however, these reactions would not necessarily indicate that humor was experienced. (p. 664)

While many scientists would object to the use of a "person's subjective cognitive reaction" (Wyer & Collins, 1992, p. 664) to a stimulus in the objective definition of humor, this is exactly what we mean when we utter common sayings such as, "We all know what we, personally, find funny," and "I know funny when I see it." Regardless, the research shows that humor and engaging in the humor response are beneficial to individual humans and to mankind in general.

Humor and Health

Experiencing humor and engaging in the humor response are good for health. Many studies indicate engaging in humor-related activities can contribute to good physical, mental, and emotional health. Evidence suggests engaging in the humor response can reduce the experience of pain (e.g., Cousins, 1979). And the link between a

stronger sense of humor and a reduction in the negative impact stress has on health is long established (e.g., Berk et al., 1989; Martin & Lefcourt, 1984; Lefcourt & Martin, 1986; Martin & Dobbin, 1989). During a mysterious, painful illness, Norman Cousins observed laughter had an anesthetic effect, directly resulting in a period of absence of pain (Cousins, 1979, p. 43-44). Kelley et al. (1984) found children receiving treatment and physical therapy for burns engaged in substantially less pain behavior in experimental conditions involving cartoon viewing (Bugs Bunny and Popeye) than in control conditions.

Engaging in laughter results in high oxytocin levels and lower levels of negative stress hormones; this has been understood for several decades (Woodbury-Farina & Antongiorgi, 2014). Martin and Dobbin (1989) found people with high scores on humor ratings also had a lower negative correlation between self-reported hassles and secretory immunoglobulin A (S-IgA) levels, suggesting a sense of humor might have a moderating influence on the negative impact stress has on the immune system. Bennett and colleagues concluded healthy women who watched a humorous video had more self-reported decreases in stress levels and more increases in immune functions than women in the control group (Bennett et al., 2003). And evidence suggests humor can be an effective coping tool for people such as firefighters who face workplace-related traumatic stress (Sliter et al., 2013).

A sense of humor has been connected to kinder-to-self appraisals of poor actions or difficult situations, including performance on academic tasks and coping with cancer. Kuiper et al. (1993) found "individuals with a greater sense of humour appeared to be better able to reappraise the exam in a self-protective manner when their performance

was poorer than they had expected" (p. 81). Demjen (2016) analyzed thousands of comments posted in an online cancer support group, concluding humor may allow patients to talk about aspects of cancer and its treatment that are frightening, embarrassing, or otherwise difficult. Using humor may boost the ability to reappraise or reframe those threatening aspect of cancer treatment. Further, Demjen suggested humor contributed to the feeling of support and cohesion for which cancer patients seek support groups. This body of research shows the ability to engage in humor or find humor in difficult circumstances is important to the human experience; it not only provides a buffer for negative stress but can also enhance enjoyable experiences (Martin et al., 1993).

Humor and Learning

Educators have suggested using humor to hold the attention of students who would otherwise be disinterested in the topic being taught (Bergin 1999; Powell & Andresen, 1985). Some have found humor can influence the relationship between instructor and student (Machlev & Karlin, 2016). Self-reports indicate students enjoy humor and are more motivated to complete learning tasks if humorous stimuli are involved (Dienstbier, 1995; Torok et al., 2004).

Still, little experimental research has been conducted to support or refute these hypotheses. Matarazzo et al. (2010) demonstrated that humorous stimuli increased the self-reported interest in mathematics tasks for participants who identified with the statement "Math just doesn't appeal to me," but decreased interest in the math tasks for people who identified with the statement, "I consider math to be one of my best subjects." Machlev and Karlin (2016) demonstrated a correlation between relevant and appropriate humor used by instructors and self-reported perceptions of learning though

not actual learning as measured by test scores.

Humor and Productivity

Productivity is an important consideration in group settings. For any situation in which an outcome—service, product, or result—is important, productivity of individuals is crucial (Meyer, 1997). In group settings, humor has been reported to facilitate camaraderie (Romero & Pearson, 2004; Romero & Pescosolido, 2008) and improve vertical hierarchy relationships (Clouse & Spurgeon, 1995). Several types of humor have been observed in manager-employee relationships (Schnurr, 2009), and competent leaders are said to use appropriate humor effectively (Robert & Wilbanks, 2012). Research suggests humor facilitates productivity in these group settings (Clouse & Spurgeon, 1995).

Romero and Arendt (2011) surveyed 349 workers, measuring self-reported work-oriented ratings (job-related stress, satisfaction with co-workers, team cooperation, and organizational commitment) and looked at their relationships to types of self-reported humor participants used in the workplace. The four types of humor measured included two which focused on others (affiliative and aggressive) and two that focused on the joke-teller (self-enhancing and self-defeating). Of the two main categories of humor, only the other-focused types were more often statistically significantly related to other variables than were the self-focused types. They found affiliative humor negatively related to and aggressive humor positively related to workplace stress. Not surprisingly, affiliative humor was positively related to satisfaction with co-workers and aggressive humor was negatively related. Only weak relationships were found for the types of humor and organizational commitment. The findings for team cooperation, however, were

interesting. The authors predicted they would find a negative relationship between team cooperation and both self-defeating humor and aggressive humor, and they did. Furthermore, statistically significant, positive correlations between team cooperation and affiliative humor, and between team cooperation and self-enhancing humor were found. "In an era where teams are an increasingly important element of organizational functioning," the authors noted, "identifying the factors that encourage or discourage team cooperation is essential to their effectiveness" (Romero & Arendt, 2011, p. 657).

Humor is Social and Cultural

> "Rhetoric does not get you anywhere, because Hitler and
> Mussolini are just as good at rhetoric. But if you can bring these
> people down with comedy, they stand no chance." – attributed to
> Mel Brooks

Classical Greek philosopher Plato wrote extensively on humor and its potential role in social change. His focus on humor was rooted more in "its power to disrupt the state than from delight with its practice" (Provine, 2000, p. 12). Though Plato did not provide specific examples, recent investigations demonstrated humor's power to influence social change. Sorensen (2008) argues humor significantly contributed to the fall of Serbia's Slobodan Milosevic in 2000, adding that humor has power in situations of resistance to political oppression because of "its ability to turn things upside down and present them in a new frame" (p. 185).

Humor can also be effective in enacting change because it often makes aggression directed toward the powerful more acceptable. Skinner (1957), for example, used the story of an Englishwoman who used wit to avenge a slight she suffered at the hands of

Louis Napoleon. Harney (1888) speculated the woman was the Countess of Blessington, although others referred to her as Mrs. Grote. After helping Napoleon while he was exiled in Britain, the Englishwoman later found herself exiled to France when Napoleon held the politically tenuous position of President of the French Republic. Despite nearly sure reports of her presence in France, Napoleon ignored his former friend, not so much as inviting her to tea at the palace. One day, while each was out for independent drives in the park, they met on the road in such a fashion that Napoleon could not avoid addressing her. Still, he was unwelcoming, asking, "Restez-vous longtemps à Paris? [Are you staying long in Paris?]" The Englishwoman responded quickly, "Non! Et vous? [No! And you?]" (Harney, 1888, p. 264). Because it is humorous, Skinner (1957) argues this as an example of acceptable aggression toward a power figure (p. 288).

Despite few direct connections in the literature, this notion is something social change activists of various forms have known and used for centuries. Chenoweth and Stephan (2011), for example, point out the importance of humor and satire in non-violent civil resistance movements. For this reason, many oppressive regimes, Mao Zedong, the Junta, and apartheid South Africa, for example, severely limited humor and satire outlets and persecuted people who produced those works (Freedman, 2012).

A more recent example of oppressive governments restricting satire involves Bassem Youssef, the so-called Jon Stewart of Egypt. Youssef, a surgeon by training and profession, was inspired to host short, satirical YouTube videos after treating wounded protestors in Tahrir Square during the 2011 uprising. He was angered by the conflicting government-sponsored news coverage which blamed outsiders for the protests. Those initial videos were watched millions of times. Hosni Mubarak resigned his decades-long

presidency of Egypt within days. As the Arab Spring swept through the region, Youssef's popularity rose and he began hosting a Daily Show knock-off program on television. But the newly found freedom to criticize the government (which was not allowed under the Mubarak regime) combined with Youssef's popularity (he regularly was seen by 30 million viewers) made him a target of both subsequent Egyptian governments. In 2014, Youssef was forced to leave the country ahead of travel bans imposed by the militaristic government topped by General al-Sisi (Paget, 2018).

Still, some leaders of oppressive administrations have attempted to use humor to further their own ends. German Reich Minister of Propaganda, Joseph Goebbels, targeted humor at domestic Jews and foreign adversaries via the government-sponsored publication *Simplicissimus* during the Nazi era (Freedman, 2012). And some have argued then-candidate Donald J. Trump's physical mocking of a news reporter whose muscular disorder results in contracture of joints, specifically his elbows and wrists, facilitated the acceptance (by many) of Trump's further attacks on both people with disabilities and on the free press (Hall et al., 2016).

Theories of Humor

Humor and the humor response have been present in the broader human behavioral repertoire as far back as written records are available. Some calculate they likely date back 35,000 years at the youngest (Polimeni & Reiss, 2006) but are likely much older. Early theories on humor were proposed by Classical Greek philosophers, including Democritus, Plato, and Aristotle (Bremmer, 1997). Some argue producing and reacting to humor is one of the more complicated behavior sets in which humans engage. Polimeni and Reiss (2006) state, "Given that even a simple joke can utilize language

skills, theory-of-mind, symbolism, abstract thinking, and social perception, humor may

arguably be humankind's most complex cognitive attribute" (p. 348). As with any

behavior of such intricacy, humor and the humor response have many theories regarding

their existence and function in the behavioral repertoire.

Modern Theories of Humor

Of the various general approaches to explaining humor, at least

two—arousal/arousal-reduction and superiority/disparagement theories—consider

motivation to be a primary factor. In the arousal/arousal-reduction line, for example,

Freud (1928) postulated laughing was motivated by the need to release tension related to

aggression or sexual situations. As people repress or oppress their feelings, tension

increases, according to Freud, and the greater emotional tension, the greater the need for

release. Laughter then—being a more socially acceptable behavior than aggressive or

sexual acts, in most cases—allowed for release or easing of the emotional tension. While

not all humor theorists focusing on motivation narrow their discussions to aggression and

sex, this identification of an arousal pattern has often been described as an inverted U-

shape (e.g., Berlyne, 1969; Wyer & Collins, 1992) with the increase in arousal initially

pleasurable. As arousal grows, it exceeds pleasure and becomes aversive. This is

followed by a reduction in arousal and a return to pre-arousal conditions. In the case of

humor, as the joke set-up pushes arousal beyond the comfort level, the punchline triggers

laughter and the rapid drop in arousal levels (e.g., Berlyne, 1969; Godkewitsch, 1972;

Wyer & Collins, 1992). This theory is most applicable in situations involving some sort

of social tension and in the cases of planned short- (set-up/punchline) or long-form

(stories) jokes (Epstein & Joker, 2007).

The second common motivation-based humor theory centers around the amused person's sense of superiority over or disparagement of another person or his former self (Bergson, 1911; Wyer & Collins, 1992; Zillman & Cantor, 1976). When people laugh at another's failures, deformities, incompetence and so on, this is explained as the sudden recognition of being better than the other person. In other words, it involves downward social comparison. While this kind of humor—when the target of humor is another person—is currently considered bullying behavior and discouraged, the theory is particularly adept at addressing ethnic humor, out-group jokes, and many topics considered "blue" (vulgar or crass) comedy.

A third general theory involves incongruity: a situation in which something is complete and makes sense but is incongruous, bizarre, or absurd (e.g, Hayes, Fox et al., 2001; Wyer & Collins, 1992). In its simplest form, examples of humor illustrating the components of this theory involve word-play puns and short-form jokes. Take, for example, the old joke "Time flies like an arrow. And fruit flies like a banana." There are two crucial words in each sentence, each with two different meanings. In this case the first sentence prepares the listener for one meaning of the words. "Flies," in the first sentence, is a verb meaning moves through the air, and "like" means "akin to" or "as if it were." In the second sentence, those same words "flies" and "like" are initially experienced the same as in the first sentence, however, the word "banana" instantly changes the meanings. "Flies" is now a noun that, when following the word "fruit" refers to a tiny, winged insect that eats fruit (e.g., bananas); and "like" becomes the verb meaning "have an affinity for." Appreciation of the joke requires understanding of both meanings of the words "flies" and "like," a familiarity with similes or allegories, and

knowledge that fruit flies are insects that eat fruit, including bananas.

In short, three general theories explaining humor address most of the situations in which humans laugh or identify a stimulus as "funny." There are more specific explanations of humor, however, which follow specific approaches to investigating the human condition. Still, we can see connections to these three main theories on humor when we examine those different philosophical approaches.

A Developmental Psychology Approach to Humor

Prominent humor researcher Paul E. McGhee (1979) theorizes the development of humor appreciation, including producing humorous stimuli and engaging in the humor response, progresses through several stages as a child ages and interacts with his environment. These stages can be compared to Piaget's developmental stages in that they are described according to what behaviors the child is engaging in, assigned general age ranges during which those behaviors occur, and are thought to progress rather reliably from one stage to the next with durations of overlap and few instances of skipping stages (McGhee, 1979; McGhee, 2002). While these have undergone several iterations, they can be summarized as beginning with laughter without humor or Stage 1: *laughter at the attachment figure* (approximate ages six to 15 months) through Stage 2: *treating an object as a different object* (approximately 15 months to four years), and Stage 3: *misnaming objects or actions* (two to four years) (McGhee, 2002). Stage 4 (three to five years) is subdivided into *playing with sounds*, *non-sense real word combinations*, *distortion of features of objects, people, or animals*, and *gender reversal*; and Stage 5 is called *jokes and riddles* (six to 11 years) (McGhee, 2002). McGhee suggests Stage 5 corresponds to Piaget's *concrete* and *formal operations* stages and that children begin

engaging in interpretation of word meanings, including comparisons and relations (McGhee, 2002).

Recent behavior analytic research suggests the onset of these stages is flexible and children can learn to identify and (anecdotally) produce the verbal behavior humor of novel jokes and riddles at younger than six years old with specific, multiple exemplar training (Jackson et al., 2021). Furthermore, with perhaps the exception of McGhee's first stage, it would appear many adults continue to engage in the types of humor associated with the intermediate stages. In either case, connections can be drawn from McGhee's description of the developmental stages of humor to the general incongruity theory of humor, specifically when a child treats one object as another object, mislabels objects, plays with word sounds, and engages in word-play humor.

A Cognitive Psychology Approach to Humor

Raskin's 1985 publication of *Semantic Mechanisms of Humor* launched an intense interest in the cognitive approach to analyzing humor. Although not the first to use a semantic analysis, Raskin's comprehensive and humorous approach is appealing (Dolitsky, 1985). Following in Chomsky's footsteps, Raskin (1985) set high goals for his theory, attempting to "account for the meaning of every sentence in every context it occurs" (p. 67) while noting this goal is impossible to achieve. He took a solidly cognitive approach, mentioning his principal research strategy was "the application of…semantic theory, script-based semantics, to verbal jokes" with the purpose of providing "a (partial) answer to the main problem in the field of humor research, 'What is humor?' or 'What is funny?' in terms of semantic concepts, features and categories" (p. 53).

The pertinent components of Raskin's theory are similar to other approaches to humor, involving two opposing meanings or understandings coming together in one word or phrase. While Raskin (1985) may be the first to describe this double meaning as two overlapping scripts which are "perceived as opposite in a certain sense, and it is this oppositeness which creates the joke" (p. 100), the notion of opposing or conflicting meanings being present in the same stimulus is quite common in the history of humor analysis (Dolitsky, 1985). Around the beginning of the last century, both Bergson (1899/1972) and Freud (1905/1976) noted similar conflict associated with humor, and later Skinner (1957) laid out a comparable analysis of humorous puns from the behavior analytic approach (see discussion below). These approaches clearly connect to the incongruity theory of humor.

An Evolutionary Account of Humor

Because humor appreciation and the humor response are so prevalent throughout the human species, many posit humor has an evolutionary function and can be compared to similar behavior in humans' closest relatives (Polimeni & Reiss, 2006). Observations of other apes suggest cross-species similarities in smile-like and laugh-like behaviors (Darwin, 1872; Gardner et al., 1989). Of the apes, humans' closest relatives—chimpanzees, gorillas, and orangutans—*all* emit laugh-like sounds when tickled (Caron, 2002). But the connection may originate even further back in evolution. Researchers have suggested certain sounds emitted by young rats when engaged in play behavior (Panksepp & Burgdorf, 2003) and by dogs while engaging in a play-bow (Simonet et al., 2001; Simonet et al., 2005), are akin to human laughter. Many conclude these humor response-like behaviors are evolutionarily related to human laughter. These examples fit

best with the arousal/arousal-reduction explanation of humor.

On some occasions, humor response behaviors were observed in situations in which humans, too, would laugh or smile. For example, Washoe the chimpanzee, while riding on Roger Fouts' shoulders, urinated on him then repeatedly signed "funny" while also snorting through her nose (McGhee, 1979, p. 118). De Waal (1996) observed younger chimpanzees hitting their elders with sticks and dirt or jumping on their elders as a form of what may be described as teasing. Many times, the older chimpanzees would then engage the younger animals with behaviors such as tickling or play-like chasing. It is unknown how much of these two examples is influenced by contact with humans. Goodall (1986), for example, reported less potentially humor-related play in the wild. Whether or not we see this teasing behavior more often with chimpanzees that have human contact, such behavior is definitely in the species' repertoire, and depending on the situation, may correspond with either the arousal/arousal-reduction theory or the theory involving downward social comparison.

Another consideration is whether this can be defined as humor or simply play. McGhee (1979) argues that, regardless of what the other apes "think," the situations in which they have been observed signing "funny" are situations similar those preschool-aged human children indicate are funny. Butovskaya and Kozintsev (1996) describe other primates' teasing behavior as quasi-aggression, falling somewhere on the spectrum between aggression and passivity. Whether these behaviors are mere play or more peaceful variations of aggression, they are likely related to human humor behaviors.

When early musings on humor are examined, human teasing resulting in laughter can also be viewed as on the spectrum between aggression and peacefulness. For

example, Plato concluded laughing *at* someone involved malicious intent (in Provine, 2000). Aristotle's perspective was similar. In Provine's analysis, Aristotle maintained, "…the gentle art of wit was a form of educated insolence… [and] the laughable is a subdivision of the ugly that does not cause injury or pain. The comic mask, for example, is distorted and ugly but is not pain-inducing (*Poetics*)" (Provine, 2000, p. 13-14). During the birth of modern philosophy, Thomas Hobbes wrote, "…the passion of laughter is nothing else but a sudden glory arising from sudden conception of some eminency in ourselves, by comparison with the infirmities of others, or with our own formerly" (Hobbes, 1650/2008, p. 54-55). More recently, Rapp (1947) advocated a similar approach to laughter, saying, "the laughter of ridicule is the transference to a less active plane of the overt physical action involved in a thrashing" (p. 209). These clearly reflect downward social comparison.

For many humans, however, something more than mere teasing or quasi-aggression is needed to elicit laughter and other humor responses. As Polimeni and Reiss (2006) note, "Whether something is funny or not is often dependent on nuanced verbal phrasing in combination with a full appreciation of prevailing social dynamics" (p. 348). Here is where human behavior, as far as science has thus concluded, stands alone among the primates. Thus, it is beneficial for a comprehensive analysis of humor to consider how emotive communication, including humor, evolved at the group level.

When analyzing the individual, we focus on the function of humor and the humor response for a single person. The above scenarios connecting to the superiority/disparagement theories of humor are good examples of this individual approach. Humans, however, evolved in groups. Wilson (2018) argues focusing on the

person alone tends toward reductionism and that because the dominant level of selection for humans was *groups of humans* not *solitary humans*, we should approach explaining human communication at the group level. Groups of humans found ways to minimize troublesome or overly competitive behaviors while simultaneously encouraging cooperation among members. Survival of the group relied on physical, social, and emotional coordination of group members. Further, the ability to adopt the perspective of another person, emotionally and logically—known as perspective taking—allows humans to behave in more synchronized or coordinated ways with other individuals (e.g., Atkins, 2018; Mead, 1934/1967; Piaget & Inhelder, 1969).

The complexity of our language and intricacies of social context make a comprehensive analysis of human humor behaviors extremely difficult. Wilson (2018) argues employing the multilevel selection theory (MLS) allows for a more comprehensive understanding of human communication and cooperation. We can see how this approach is beneficial to the analysis of humor and cooperation when we bring together the behavioral tradition while keeping in mind the evolutionary and social components of communication.

A Behavioral Account of Humor

Humans live in a largely constructed environment. Unlike other animals, human beings operate in an environment in which there are vast numbers of stimuli that have been experienced under conditions of association with other stimuli in such ways as to allow people to respond with respect to stimuli that are not immediately present in their physical surroundings (Hayes & Fryling, 2015). Verbal behavior accounts for a vast portion of this complexity. For example, humans can respond to the stimulus of a door

both in the presence of and in the absence of the physical door. Opening a door is

responding to the physical stimulus of a door in its presence while saying "door" can be

responding to the door in its physical absence. As surmised in Hayes and Fryling (2015),

this means:

> …the environment of a human being includes not only that which is
> physically present as well as that which had been present in an individual's
> experience but also that which has never been present in an individual's
> experience because it happened prior to the onset of their life experience, or
> because it has yet to happen in anyone's life experience, or because it has
> always been present in a distant location, or because it has never been
> present in any location by virtue of its nonexistence. The human
> environment, then, is exceedingly substitutional. (p. 160)

This created, substitutional environment in which human beings operate is

what, in part, allows us to engage in many types of humor, particularly those which

involve multiple meanings of stimuli. Certainly, the general theory of humor

focusing on incongruity requires these multiple meanings, but many examples of

both arousal/arousal-reduction theory and superiority/disparagement theory

involve stimuli with multiple meanings. A more complete understanding of how

the behavioral account relates to humor requires stepping through the lineage of

the behavioral approach.

Skinner's Verbal Behavior and Humor. "If you want to make an audience

laugh, you dress a man up like an old lady and push her down the stairs. If you want to

make comedy writers laugh, you push an actual old lady down the stairs." This quote

from acclaimed comedy writer and actor Tina Fey (in Heffernan, 2003) exemplifies the

need for the person producing comedy (i.e., a writer, actor, improviser, and/or stand-up

comedian) to know the audience. As Skinner (1957) said when discussing speaker-

listener relationships:

> The control which a given individual exerts over the speaker is a product of a possibly long history in which his *audience character* has been established. This does not mean that every new acquaintance becomes an audience only through a long process, for the audience as a discriminative stimulus shows the principle of stimulus induction. (p. 176, emphasis original).

This need for at least *some* shared history is a crucial requirement for verbal stimuli to be produced and experienced as humor, because without the shared history of the multiple causes of humor, the listener has not experienced the requisite causes of a particular verbal stimulus.

When discussing multiple causation of verbal behavior, Skinner (1957) stated, "The difference between good and bad puns seems to be just the difference in the relevance of the variables" (p. 240). And here we see early attempts in the behavior analytic literature to define the necessary components of a humorous stimulus. "The supplementary evocation of any *feeble* response," Skinner wrote, "is usually funny" (p. 286, emphasis original). He provided examples in the form of the old story of the dentist who was changing sparkplugs in his car by taking a firm grip on the sparkplug with pliers and saying, "Now this is going to hurt a little" (p. 286). And the conversation between a soldier and his sergeant:

> SOLDIER: I've caught a tartar [sic].
> SERGEANT: Bring him along.
> SOLDIER: I can't.
> SERGEANT: Then come along yourself.
> SOLDIER: He won't let me.

Skinner maintains this is funny not because it is nonsensical (it makes sense) but because the sentence "I've caught a tartar [sic]," being followed by "He won't let me," are

incongruous and we describe the second sentence as being "unexpected" by the listener (p. 286). "The importance of the strength of the listener's response is shown by the possibility of 'spoiling' a joke or witty remark by emitting a key response too early in the telling" (p. 287).

Skinner's description of conflicting meanings in sentences or differing frames of reference clearly connects to the general theory on humor which focuses on incongruity. Additionally, the important recognition of the ability to "spoil" a joke by emitting the punchline too soon speaks to the arousal/arousal-reduction approach.

Verbal Behavior and Stimulus Equivalence. A large body of research supports Skinner's (1957) analysis of verbal behavior. Sidman (1994) gathered numerous empirical studies further describing and explaining the phenomena. In its simplest description, a person learns that two (or more) things are equivalent. For example, if there are two items, each identical, and a person learns to respond to the first item with the second item, because they are identical, this behavior can be noted as A=A. In the stimulus equivalence world, this is called *reflexivity*. If there are two items, and a person is trained to respond to the presence of A with B, and as a result, responds with A in the presence of B, this is *symmetry*. If there are three items, and in the presence of A, one is trained to respond with B, and also in the presence of A, trained to respond with C, and then are able to in the presence of B respond with C and in the presence of C respond with B, this is called *transitivity* (Sidman, 1994).

For example, if a toddler was shown a picture of a hen (A) and in its presence pointed to an identical copy of the picture (A), this is reflexivity. If the toddler was shown the picture (A) and trained to say, "Hen," (B) then upon saying, "Hen," (B) pointed to the

picture (A), this is symmetry. And if shown the picture (A) and trained to say, "Hen," (B) also, if shown the picture (A), trained to point to the written h-e-n (C), and then independently in the presence of, "Hen," (B) points to the word (C) and in the presence of the word (C) says, "Hen," (B), this is transitivity (see Figure 1).

This analysis is important because it begins to lay out the requisite multiple meanings of words and various other stimuli needed for certain types of humor and the humor response to occur. Further, it provides a link and supporting data between the early analyses Skinner (1957) provided and the current progression of the analysis of verbal behavior that is seen in Relational Frame Theory.

Relational Frame Theory on Humor. Relational Frame Theory (RFT) is a natural science accounting of human language and the subsequent, altered interaction with the environment (Hayes, Barnes-Holmes, et al., 2001). RFT builds on Skinner's (1957) description of verbal behavior and the body of stimulus equivalence research summarized by Sidman (1994) and adds numerous empirical studies to the literature. The main tenants of RFT involve the idea that humans engage in derived relational responding (DRR), which means they respond to one stimulus as if it were another, encompass three features: *mutual entailment*, *combinatorial entailment*, and *transformation of stimulus function* (Hayes, Barnes-Holmes, et al., 2001).

Mutual entailment pertains to the bidirectionality of relational frames. Like symmetry in stimulus equivalence, mutual entailment involves a trained "if A=B" and a derived "then B=A" relationship, but it goes beyond simple equivalence to include relative relations such as, "If A is larger than B, then B is smaller than A" (Hayes, Fox, et al., 2001, p.29). Combinatorial entailment is akin to transitivity in that the simple

example involves three stimuli and their mutual relationships. Like mutual entailment, it is broader than its stimulus equivalence example, making transitivity just one type of combinatorial entailment. To put it plainly, if A is related to B and B is related to C, then A is related to C in the given context. This relation need not be linear (e.g., A>B and B>C therefore A>C), though it can be. Since combinatorial entailment is not limited to linear relations, in absence of a specific example, we cannot say how A and C are related. So, if A is opposite B and B is opposite C, for example, the relationship between A and C is not a more extreme version of opposite. It is, in this case, "same" not opposite (Hayes, Fox, et al., 2001).

Transformation of stimulus function refers to the phenomenon in which the psychological features of a stimulus in a particular relational frame alter the psychological features of other stimuli in the frame (Hayes, Fox, et al., 2001). How features of the other stimuli are altered depends on their relation to the originally referenced stimulus. This inclusion of transformation of stimulus function in relational frames makes RFT particularly pertinent in the examination of humor.

The RFT literature describes humor, especially verbal humor, as relating relational networks to other relational networks in a way that is incongruous. If a joke is told, then, and someone does not "get" it, it can be assumed the listener is lacking some pertinent component in one or more of the relevant relational networks. Stewart et al., (2001) provide a thorough definition:

> Most jokes create relational networks that are complete, meaningful, and coherent but incongruous. The incongruity can be of several types. In a common form the story appears to be congruous until the punch line. Salient cues are provided that would lead the listener to predict that the network is being completed in a particular fashion. It is about a particular topic, approached in a particular way -

or so it seems until the punch line. Suddenly and unexpectedly (thus the metaphor of a "punch"), the network collapses into incoherence, only to reform an instant later in an unusual and often ridiculous and incongruent way. A moment later it is

obvious that the listener "should have seen it coming" - that is, that the dominant cues should not have been relied upon so thoroughly. (p. 83)

From this definition, connections to the three general theories of humor can be made. Certainly, the incongruity theory is strong in that the RFT definition of humor makes direct use of the word. Additionally, connection to the arousal/arousal-reduction theory can be made when transformation of stimulus function is considered. Furthermore, because the incongruity can be of several types, not only verbal frames, the superiority/disparagement theory fits as well.

In conclusion, there exist several approaches to humor that have commonalities across psychological areas of interest, including the release of tension or arousal-reduction, superiority or disparagement, and incongruity resolution. How a humorous stimulus is composed and whether it elicits or evokes the overt humor response, the broader function of the humorous situation is of primary interest. What, other than the specific responses of smiling and laughing, does a humorous stimulus evoke? Can it influence cooperation behaviors?

Humor and cooperation

Humor and cooperation are integral parts of the human experience. Cooperative behavior used in everyday language might be defined as working with another person toward a common goal or end. Hake and Vukelich (1972) defined cooperative behavior in two parts. In the first, "the reinforcers of both individuals are at least in part dependent upon the responses of the other individual," and in the second part "the procedure allows

such responses, designated as cooperative responses, to result in an equitable division of responses and reinforcers" (p. 333).

As noted above, humor brings people together, helps heal wounds (both physical and emotional), eases tension, and allows for criticism of dogma and power figures. Likewise, cooperation is key to smooth the operation of social groups and running of large societies. Indeed, engaging in cooperation is key for any social animal, especially human beings who rely on aggregate products of groups of individuals to survive (Hamann et al., 2011; Tomasello, 2014). In most societies, cooperative behaviors are heavily reinforced. Even in relatively individualistic cultures such as the United States, people are explicitly taught to work in teams, help one another, and provide back-up for friends, classmates, and co-workers (e.g., Fan, 2000; Smith, 2002; Tomasello, 2014).

As Wilson (2018) noted, "Teamwork—succeeding as a group rather than at the expense of other within one's group—became the signature adaptation of our species" (p. 249). We specifically teach our young children how to cooperate and that helping and working with others is a good thing to do (e.g., Fan, 2000; Smith, 2002; Tomasello, 2014). When playing on school or club sports teams, acting with theater troupes, or playing and singing in musical bands, orchestras, and choirs, we teach cooperation. And when employers search for new hires, one quality they look for in potential employees is the ability to work well with others (Fu et al., 2018). Given this emphasis, it is important to understand the factors which contribute to behaviors classified as cooperation behaviors and how to evoke them when needed. Indeed, one way to measure cooperative behavior is in real or analogue work settings.

Studying cooperation behaviors works well in analogue workplace settings.

Specifically looking at how the presentation of rules changes the decision to work alone entering data or to correct a partner's data-entry mistakes fits with this approach (see discussion below). While consequence-based interventions easily convert from workplace to laboratory and back, there are problems with relying solely on consequences to influence certain behaviors. Rafacz et al. (2018) note, "Cooperation and other more obscure and difficult-to-measure behaviors are challenging to compensate financially, and it is important to consider other interventions to increase their probability" (p. 50). This is where communication networks and rules, specifically antecedent stimuli called motivative augmentals, can be utilized.

Investigating Cooperative Responding, Rules, and Humor

Rafacz, et al. (2018) and Candido (2013) demonstrated antecedent stimuli, including rules, can influence cooperative responding and the more tailored the stimulus is to the participant, the greater the effect. Including humor in the antecedent stimuli would increase the complexity of the rule. Much humor, for example, involves double-meanings, metaphors, or other generalizations. These elements would require the participant to abstract relationships between components of the joke and apply the meaning to their current situation (Houmanfar et al., 2009). Whether or not the presence of a humor stimulus or the participant engaging in the humor response facilitates this abstraction remains to be seen, and if it does, are participants more likely to follow the rule? To answer that, we must step through the process of investigating cooperation.

Consequence Interventions for Cooperative Behaviors

The variables maintaining any given behavior or pattern of behaviors are complex and varied, and cooperative versus independent work behaviors are no different. Both

antecedent stimuli (before the behavior of interest) and consequence stimuli (after the

behavior of interest) are important when attempting to explain the factors contributing to

one behavior over another. When studying occupation-related cooperative behaviors,

using a pay schedule as the consequence is contextually appropriate and easy to

manipulate in analogue settings. Similarly, verbal statements, or motivative augmentals

(see discussion below), can be used as the antecedent independent variable in these

analogue procedures.

Traditional pay schedules are designed around different work-pay criteria. The

business literature, inside and outside the field of behavior analysis, details numerous

variations on common compensation and incentive structures. Three categories relevant

to the current study include pay schemes based on time worked, products completed, and

overall success/product of the organization. For example, an hourly wage is based solely

on time worked with no productivity-related contingency (Bucklin & Dickinson, 2001).

This could be described as a pay-for-time pay schedule. The two pay-for-performance

schedules relevant to the current study include a piece-rate schedule and a profit-share

schedule. A piece-rate pay schedule connects the amount of money an employee receives

directly to amount of work completed (e.g., gadgets produced) by that individual; this

schedule most closely links an employee's pay to their individual productivity (Bucklin

& Dickinson, 2001). The other pay-for-performance system, profit-share, is also based on

productivity but in this case the contingency involves the cumulative success of the

company, meaning the more everyone succeeds in completing their work tasks, the more

everyone is paid (Bucklin & Dickinson, 2001). Work behaviors are not influenced by pay

alone, however; antecedent conditions should also be considered.

Antecedent Interventions for Cooperative Behaviors

One antecedent condition with which corporate managers are concerned is the level or amount of "motivation" their employees have for completing work tasks. Business leaders, educators, parents, and scientists have been interested in what we now call "motivational" factors involved in behavior for millennia. Some of the earliest preserved writings from what has become the Western tradition dedicate considerable effort to contemplating why people engage in specific behaviors, particularly behaviors with noticeable effects such as war behaviors (e.g., Martin, 2013).

A behavioral account of factors contributing to what lay-people refer to as motivation began relatively recently. Today, behavior scientists use the umbrella term motivating operations (MOs) to refer to what influences a person's "motivation" or lack thereof with respect to a particular behavior at any given time (Michael, 1982). This broad area is broken down into two subcategories: establishing operations (EOs) and abolishing operations (AOs). Establishing operations function to momentarily establish a particular reinforcer as powerful and increase the likelihood of behaviors which have, in the past, resulted in that reinforcer (e.g., Laraway et al., 2003; Michael, 1983). Conversely, AOs function to temporarily abolish a particular stimulus change as a reinforcer and reduce any behaviors which have resulted in that stimulus change in the past (e.g., Laraway, et al., 2003; Michael, 1983). Part of a manager's job is to build a workplace environment which supports—or creates an EO for—workplace behaviors. They do this in several ways, many of which involve structured delivery of information via verbal behavior.

All places of employment have organizational structures designed to impart

information, identify relevant stimuli, and communicate desired beliefs and behaviors among members of the organization. These "communication networks" (Houmanfar et al., 2009, p. 258) often include complete or incomplete rules. The technical definition of a "rule" is a verbal statement which defines a contingency, including specifying a behavior and the consequence for said behavior (Skinner, 1969; Catania et al., 1989; Schlinger & Blakely, 1987; Houmanfar et al., 2009). An incomplete rule may lack specificity regarding one or more components of the contingency, for example, specifying the behavior but not the consequence. Rule-governed behavior is behavior for which the stated rule is a primary antecedent stimulus prompting performance of or absence of a particular behavior (e.g., Skinner, 1966; Skinner, 1969).

In a work environment, verbal communication often indicates which rules (complete or incomplete) are important to—and should be followed within—the organization. These verbal stimuli are part of the organizational milieu (Baker et al., 2015; Wilhite & Houmanfar, 2015) or internal, organizational culture and are designed to increase the MO for workplace behaviors. Familiar examples include break-room posters listing "Corporate Values," all-staff meetings in which a manager congratulates teams for reaching goals then sets new goals, and mass emails outlining how a company compares to its competitors.

Workplace rules within the organizational milieu can be classified in three ways: tracks, plys, and augmentals (Houmanfar et al., 2009; Stewart et al., 2006; Stewart et al., 2001). Tracks are rules that simply describe a contingency in which the consequence is not mediated by the rule-giver; plys are rules in which the rule-giver also controls the reinforcer; and augmentals temporarily alter the value of a reinforcer and likelihood of

associated behaviors. *Motivative* augmentals are defined as verbal statements which temporarily increase the reinforcing value of the consequence stimulus identified in the rule and temporarily increase the likelihood a person will engage in behavior which has resulted in that reinforcer in the past (Barnes-Holmes, et al., 2001). In other words, it augments an existing MO. Rules which fall into the motivative augmental category are designed by those presenting them to increase "motivation" to engage in certain work-place behaviors. A manager, for example, may encourage workers to continue or increase productivity and continue or improve adherence to protocols (e.g., safety regulations). Empirical research investigating whether these attempted motivative augmentals function to increase reinforcer value and make certain operant behaviors more likely is in its infancy. Several studies indicating motivative augmentals *can* function as intended have been conducted at the University of Nevada, Reno (UNR). This line of research has investigated simulated cooperative and independent work productivity behaviors and their relations to both antecedent and consequence stimuli. Maglieri (2007) examined consequence stimulus effects on analogue data-entry tasks and found participants were more productive when they received pay in piece rate and profit share pay conditions than in a time-based pay condition—but cooperative behaviors were lower in piece rate when participants lost the opportunity to earn more while cooperating.

Rafacz et al. (2018) examined ways antecedent stimuli (motivative augmentals) affected cooperative behavior under varying pay conditions in an analogue data-entry task. Results further supported Maglieri's conclusion that consequence stimuli in the form of pay conditions influenced independent versus cooperative data-entry behaviors. Rafacz also found antecedent motivative augmentals influenced responding, though the

effect was not as robust as the consequence pay condition.

Candido (2013) further investigated the relationship between motivative augmentals and participants' individual versus cooperative behavior, concluding that the higher degree of customization to the participant, the more likely the participant was to follow the rule indicated in the motivative augmental. For some participants, Candido included a confederate acting as the participant's "partner" to see if there would be an additive effect of meeting a real person as the "partner" in the analogue task. Not only did the introduction of the confederate peer not influence responding, in the exit survey, participants reported they did not believe their "partner" in the data-entry task was real.

The motivative augmentals included in the Rafacz and Candido studies were straight-forward statements such as "Remember that self-reliance is highly valued" and "Remember that being independent is highly valued" for the motivative augmentals targeting individual data-entry behavior, and "Remember that being in a partnership is highly valued" and "Remember that a cohesive effort is highly valued" for the motivative augmentals targeting cooperative behavior. Ghezzi et al. (2020) and Ghezzi (2021) examined cooperative and conformity responding in relation to antecedent stimuli. Ghezzi et al. (2020) found individually customized antecedent stimuli effective in temporarily altering responding in a cooperative way during financially competing contingencies (pay that promoted individual responding). Ghezzi (2021) investigated the relationship between coherent and incoherent trials on cooperative responding and the relationship between derived rules and persistence in rule following, finding participants who score higher on the conformity IRAP also "displayed a greater general sensitivity to consequences provided by others (perceived or real) and insensitivity to the direct

outcome or consequences of behavior" (pp. 45). This body of research shows that while antecedent and consequential stimuli affect behavior in complex ways, the coherence of verbal networks (history of reinforcement) associated with listener's verbal repertoire is an important variable in effective communication (Houmanfar & Johnson, 2004; Houmanfar et al., 2009). It is not the only way to create workplace MOs, however. One aspect of verbal communication yet to be explored in the behavior analytic research is humor.

Humor as an antecedent intervention

Humor is an integral part of the human experience. Examples of humor are found in advertising, literature, newspaper comics, and television, film, and theater. Laughter, part of the humor response, has been demonstrated to regulate negative emotional reactions, particularly with the use of positive humor. Many have suggested it is important that humor be incorporated into the workplace (Morreall, 1991; Plester, 2009; Samaratunge et al., 2016; Matthew & Vijayalakshmi, 2017). That employing humorous stimuli might be an effective means for establishing an MO is not a new concept in the course of human history, but using a natural science approach to empirically demonstrating it's affect is. This study investigates a potential relationship between humor and cooperation while also considering participants' histories of responding.

Implicit Relational Assessment Procedure (IRAP)

As stated earlier, when a person behaves in any given situation, a behavioral scientific approach to determining why they behaved as they did involves consideration of that person's history of responding, including their history with verbal behavior and verbal stimuli. The Implicit Relational Assessment Procedure (IRAP) was developed to

measure a person's derived relations between specific verbal stimuli, including single words or short phrases (e.g., Barnes-Holmes et al., 2006, Barnes-Holmes et al., 2017). The IRAP measures the not just the strength of association between two verbal stimuli but also the directionality of that association. For example, a person may respond to the words "tall" and "short" as if they are strongly associated with one another. They may also respond to "small" and "tiny" as if they are strongly associated with one another. However, the association between "tall" and "short" is one of contrast and that between "small" and "tiny" is one of similarity. While these simple examples may seem obvious, verbal stimuli with more complex meanings or stimuli associated with varying cultural or social values are more likely to change from person to person. The IRAP is designed to measure which type of association the person taking the IRAP is responding to and how strong that association is.

When engaging in an IRAP task, participants see verbal stimuli and are instructed to answer as accurately and quickly as they can in a way that is either consistent or inconsistent with their established verbal relations. For example, if the participants saw the words "blue" and "sky" and the condition was a one in which participants were instructed to answer in a consistent manner, they would quickly indicate the stimuli were similar. If the stimuli were "blue" and "apple," however, the participant would indicate the stimuli were dissimilar. The primary objective when interpreting the IRAP is that response latencies across consistent trials will be measurably shorter than those across inconsistent trials.

Purpose

As discussed, humor is an integral part of the human experience, and cooperation

and engaging in cooperative behaviors are valued by society. Analog studies have provided the experimental context for systematic analysis of conditions in which antecedent stimuli in the form of motivative augmentals may influence cooperative behaviors (e.g., Rafacz et al. 2018; Ghezzi et al. 2020). As such, Study 1 of this project set out to determine which stimuli of a given type were both humorous and likely to evoke cooperative behaviors. Pilot studies sought to inform methodology feasible for investigating the relationship between humorous antecedent stimuli and cooperative behaviors as measured by an analogue medical data entry task. The purpose of Study 2 was to assess the varying, within-participant effects of those humorous stimuli on cooperative behavior in the analogue medical data-entry task, with the secondary purpose to identify participatory factors that may covary with task performance, including Cooperation IRAP scores, Study 1 stimuli scores, and gamer identity.

Study 1 Method

Participants & Setting Study 1

Participants were 74 University of Nevada, Reno (UNR) students earning credit for participating in SONA studies. SONA is an online system use by universities to schedule and organized research participation and credit. If a participant failed to rate any stimulus on either question, their data were excluded from analysis, leaving data from 53 participants. Participants were randomly assigned to one of three groups, with each experiencing only one modality of the stimuli (see *Materials* below). All study sessions were conducted in a University of Nevada laboratory room in the Mack Social Science building.

Materials Study 1

Materials were created specifically for this study. To examine humorous stimuli, those stimuli had to be created in such a way as to fit with the analogue nature of this line of research and be compatible with the computer software used. The humorous stimuli followed the "Be a Like Bob" and "Don't be a Dick" series of text jokes commonly seen as images shared via social media (see Figure 2). We chose this format based on its formulaic nature, the brevity with which the words could be read and/or heard, and its ability to be referenced with a single sentence. A team of Reno-based comedians who ranged in professional level from new open-mic comic to current working comic to retired road comic created the stimuli. The investigator's husband, a former Reno-based stand-up comic, organized and led the writing session, which included joke criteria (see Appendix A) and copies of a template allowing comics to provide their jokes in written form (see Appendix B). Writers were compensated for attending the writing session with free pizza and were paid $1 for each completed joke which fit the criteria, an additional $10 for each joke that was included in Study 1 of the research, and a further $20 for each joke that was ranked by Study 1 participants as one of the funniest four jokes. Of the jokes produced during the writing session, the research team chose which ones would work best for Study 1 and made small alterations eliminating or reducing repetition of names and phrases. Twenty-nine jokes were included in Study 1 (see Appendix C). Each was presented in three different modalities, text-only (stick-figure picture and text of the joke), audio-only (stick-figure picture and voice-over reading the same words but with no visual text), and text-plus-audio (stick-figure picture and text plus a voice-over reading the text).

Participants contacted the stimuli on a computer using Qualtrics. They viewed or viewed and heard each stimulus then had three seconds to rate the stimulus as "Not Funny," "Slightly Funny," "Funny," or "Very Funny." A four-point Likert-type scale was chosen to force a non-neutral response. If they did not respond within the first five seconds, the program advanced to the next question. After they rated the humor level of the stimulus, participants rated the stimulus on how likely it was to get them to cooperate with a partner: "Not likely," "Somewhat Likely," "Likely," or "Very Likely." There was no time limit for the response regarding cooperation. After completion of the Qualtrics survey, participants were thanked, debriefed, and awarded their SONA point. Each participant was randomly assigned to experience just one of the joke modalities, audio-only, text-only, or text-plus-audio, composing three, randomly assigned groups.

Study 1 Results

Funny and cooperation ratings for stimuli within each modality were averaged across participants (see Tables 1-3), creating two mean scores (funny and cooperation) for each joke in each modality. Those mean scores were summed, resulting in a single score for each joke in each modality. Those joke scores were then combined within each modality to create a total score for each modality as a whole. For the audio-only group, that score was 48.118; for text-only, it was 56.071; and for text-plus-audio, it was 56.500 (see Table 4).

The stimulus modality with the highest combined mean scores, text-plus-audio, was included in the subsequent Pilot Studies and in Study 2. Jokes within that modality were ranked according to the combined mean scores for level of humor and likelihood to result in cooperation (see Table 5). The highest-scoring stimulus was "John" followed by

"Bill" and "Santa." The two lowest-scoring stimuli were "Doc Holliday" and "Belletrix."

<h2 style="text-align:center">Pilot Studies</h2>

As with many new areas of exploration which require an inductive approach, pilot studies informed methodology for investigating the relationships of interest in Study 2, specifically, the influence humorous antecedent stimuli had on cooperative behaviors as measured by an analogue medical data entry task. Participants in all pilot studies were UNR students who did not participate in Study 1 or any other studies in this line of research. They all earned SONA credit for participating.

Pilot Study A

All Pilot Study A sessions were conducted in a laboratory room in the Department of Psychology at UNR building. Participants were randomly assigned to one of four groups.

The experiment included three phases: inclusion survey & instructions, analogue data-entry, post-experiment questionnaire. Participants were instructed to fill out the inclusion survey (see Appendix D) and, if not excluded, directed to sit down at a computer installed with Visual Basic software while a researcher read the medical data-entry instructions script (see Appendix E) to them. The participants then engaged in a two-minute data-entry practice session. Upon completion of the practice session, the participant began the second, experimental phase. During the second phase, participants completed eleven three-minute conditions of the medical data-entry task (see Appendix F). The third phase consisted of an exit survey (see Appendix G). Upon completion of the exit survey, participants were thanked, debriefed, and awarded SONA points.

Independent variables included the humorous stimuli selected based on analysis

from Study 1. The modality with the highest "funny" scoring was selected (text-plus-audio) and of that modality, the top two ("John" and "Bill" — "Bill" was used and not "Santa," even though their scores were identical, to avoid seasonal influences) and bottom two ("Doc Holliday" and "Belletrix") combined scoring jokes were used in Pilot Study A. Similarly structured, neutral stimuli served in control conditions (see Appendix H). The pay conditions were also be manipulated. Pay conditions included piece-rate (PR, pay for working alone only) and pay-for-time (PT, pay independent of alone/cooperate choice).

Participants chose to work alone or fix the data-entry errors of a fictitious partner. The primary dependent variable in Pilot Study A was the allocation of working alone (WA) and fixing partner's errors (FPE). The analogue condition was designed to mimic many workplace settings in which employees can either work alone or cooperatively with co-workers.

All groups were exposed to a within-subject, alternating treatments design (see Figure 3) beginning with three conditions during which participants experienced to each pay contingency with no antecedent statement present. The fourth, sixth, eighth, and tenth conditions for each group involved the pay condition assigned to that group combined with a neutral statement. The fifth, seventh, ninth, and eleventh conditions for each group involved the pay condition assigned to that group combined with the motivating statement and order assigned to that group.

The conditions assigned to Group 1 consisted of an $ABACD_1CD_2\ D_3CD_4$ sequence of conditions (see Figure 4) in which A was a piece-rate (PR) pay schedule with no antecedent statement condition, B was a pay-for-time (PT) with no antecedent

statement condition, C was PR with a neutral statement condition, D_1 and D_2 were PR with the high-scoring antecedent joke statements ("John" and "Bill," respectively), and D_3 and D_4 were PR with the low-scoring antecedent joke statements ("Belletrix" and "Doc Holliday," respectively).

Group 2 was exposed to an $ABAEF_1EF_2EF_3EF_4$ sequence of conditions (see Figure 4) in which A was a PR with no statement condition, B was a PT with no statement condition, E was PT with a neutral statement condition, F_1 and F_2 were PT with the high-scoring joke statements, and F_3 and F_4 were PT with the low-scoring joke statements.

Group 3 was exposed to an $ABACD_4CD_3CD_2CD_1$ sequence of conditions (see Figure 4) in which A was a PR with no statement condition, B was a PT with no statement condition, C was PR with a neutral statement condition, D_4 and D_3 were PR with the low-scoring joke statements, and D_2 and D_1 were PR with the high-scoring joke statements.

Group 4 was exposed to an $ABAEF_4EF_3EF_2EF_1$ sequence of conditions (see Figure 4) in which A was a PR with no statement condition, B was a PT with no statement condition, E was PT with a neutral statement condition, F_4 and F_3 were PT with the low-scoring joke statements, and F_2 and F_1 were PT with the high-scoring joke statements.

Pilot Study A Results

Two participants were in Group 1, the piece-rate, high-to-low group; three participants were in Group 2, the PT, high-to-low group; two participants were in Group 3, the PR, low-to-high group; and one participant was in Group 4, the PT, low-to-high

group. No consistent patterns of responding were seen across participants or groups (see Figure 5).

Pilot Study B

All Pilot Study B sessions were conducted in a laboratory room in the Department of Psychology at UNR. Participants were randomly assigned to one of two. We added the inclusion criterion of English-first-language speakers to ensure language was not a barrier to understanding the humor. We added a post-experiment question asking whether participants identified as "gamers" or not to determine if the cooperative behaviors needed in many video games correlated with this kind of workplace cooperation. Finally, the reminders, which were present during each three-minute condition, may have been too vague. To highlight the important components of the joke, we added a sentence to the statement which was present throughout each trial. For example, the complete "John" joke says, "This is John. John replaces the toilet paper every time the roll is empty. What a team player. He always has your backside. Be like John," and the former reminder said only, "Be like John." We added a sentence so the reminder in Pilot Study B said, "John's a team player. Be like John."

Pilot Study B included the same three phases seen in Pilot Study A, inclusion survey & instructions, analogue data-entry, post-experiment questionnaire. The post-experiment questionnaire contained the additional, "gamer" question.

In an effort to identify if the jokes could have an influence with this preparation, the independent variables included only the highest-rated humorous stimuli selected based on analysis from Study 1, "John" and "Santa." "Santa" was included because data collection began during the fall semester. The dependent variable was the same at Pilot

Study A. Because each participant only contacted two joke conditions, the total number of experimental conditions was reduced to three baseline conditions and four intervention conditions, and the only pay condition included was PT. The two groups were counterbalanced for joke order (see Figure 6).

Pilot Study B Results

Five participants were in Group 1; four participants were in Group 2. No consistent patterns of responding were demonstrated across participants or groups (see Figure 7).

Pilot Study C

All Pilot Study C sessions were conducted online using online software. Participants were instructed to ensure solid internet connections and be in a quiet, distraction-free space. Participants answered the same inclusion questions from Pilot Study B. Once included, participants took the Qualtrics text-plus-audio joke assessment from Study 1 and the Cooperation IRAP before completing the task, answering the post-experiment questionnaire, being debriefed, and credited SONA points. The participant's top two scoring jokes were used in the task.

For Pilot Study C, we employed a single-subject design. The task included three baseline conditions and four experimental conditions. Participants were randomly assigned to one of two groups, one contacting a joke first, the second contacting the neutral condition first after baseline (see Figure 8). The jokes used in the joke conditions were specific to each participant; if at least two jokes scored a minimum of "Somewhat Funny" and "Somewhat Likely," they were eligible to be included in the task. If multiple jokes qualified, the top two scoring jokes were used. Ties were determined using a

random number generator, and the order jokes were contacted in the task was also determined using the random number generator.

Pilot Study C Results

Eight participants completed all conditions of the task in Pilot Study C. Two participants' FPE responding appeared to be influenced by the antecedents upon visual inspection (see Figure 9) but no other participants' responding did (see Figure 10).

Pilot Study D

All Pilot Study D sessions were conducted online. The assessments and post-experiment procedures in Pilot Study D were the same as in Pilot Study C. Which jokes were included in the task, and the order in which they occurred were determined in the same manner they were in Pilot Study C.

Due to the inconsistent patterns of responding across participants in previous pilots, a "Cooperation" condition was included in Pilot Study D. The "Cooperation" condition included an audio-video stimulus at the beginning of the session that matched the style of both joke and neutral audio-video stimuli. Like the joke stimuli, the content of the "Cooperation" stimulus was a partial rule, however, no humor was included, instead it was a straightforward, "Cooperation is highly valued." This addition resulted in seven experimental conditions (see Figure 11).

Pilot Study D Results

Twenty-seven participants completed all components of Pilot Study D. Of those, eight responded cooperatively (i.e., FPE) in the presence of jokes and during the cooperation condition but not in the neutral conditions (e.g., Participant B01, Figure 12, top left panel). Five responded as we would expect in all but one condition (e.g.,

Participant B03, Figure 12, top right panel). Ten participants engaged in steady

responding (e.g., zero FPE) across all conditions regardless of antecedent (e.g.,

Participant B12, Figure 12, bottom left panel). Four participants' responding did not

conform to any recognizable pattern across conditions (e.g., Participant B37, Figure 12,

bottom right panel).

Pilot Study E

Pilot Study E was exactly like Pilot Study D with three exceptions: pass criteria

were placed on each pre-experiment assessment and the baseline performance, baseline

was changed from three to four conditions, and the first neutral condition was dropped

from the experimental conditions (see Figure 13). If participants scored at least two jokes

at "Very Funny" and "Very Likely," they advanced to the next assessment. Those who

continued next took the IRAP. If their IRAP D-score for "Cooperation is good" was .05

or higher, they advanced to the baseline. If their performances demonstrated sensitivity to

baseline pay conditions (more FPE in the pay-for-time conditions), they advanced to the

experimental conditions of the task. If participants did not meet pass criteria at any point,

they were thanked, debriefed, and awarded SONA credits. If they scored only two jokes

at "Very Funny" and "Very Likely," those two were used. Like Pilot Study D, joke score

ties and joke task order were determined by a random number generator.

Pilot Study E Results

Of 41 participants included, none advanced to the task in Pilot Study E. Most

participants did not advance beyond the joke assessment, the remaining did not advance

past the IRAP.

Study 2

Several modifications were made in Study 2 resulting from information gathered in the pilot studies. Our pilot studies further substantiated the necessity for adoption of single-subject methodology to capture the personalized nature of humor, and its potential influence on cooperative behaviors. Moreover, given that no participants advanced to the task in Pilot Study E, criteria for advancing past the joke assessment was adjusted to scores of Funny or Very Funny and Likely or Very Likely to prompt cooperation, and neither the IRAP nor baseline performances were not used as assessment tools. The post-experiment questionnaire was utilized to identify participants' perspectives pertaining to the experimental procedures and associated task performance (see Appendix I).

Study 2 Participants and Setting

All participants were undergraduate students enrolled in courses offered by the Department of Psychology at the University of Nevada, Reno. They were compensated with three SONA credits plus the dollar amount earned during the task. All activities were conducted online using online software. Participants were instructed to use a device with a keyboard and a strong internet connection and be in a quiet, distraction-free space.

Study 2 Materials

Inclusion criteria, the audio-video joke assessment from Study 1, and the post-experimental questionnaire were administered via computer-based Qualtrics software. The IRAP was administered through Azure Websites, a secure third-party hosting platform. The IRAP was included to help answer the secondary question. The medical data entry task was also administered through a secure, third-party hosting platform,

Digital Ocean.

Study 2 Experimental Design

Study 2 involved a single-subject design. The non-humorous, "Cooperation" condition was included to answer the primary experimental question. Pass criteria for the joke assessment was reduced to scores of "Funny" and "Likely" or higher. The Cooperation IRAP and several other measures were used to address the secondary experimental question. In the task, participants contacted four baseline conditions with no antecedent audio/video statement and alternating consequence pay contingencies, then five experimental conditions, all of which had the pay-for-time consequence and different antecedent audio/video statements: Joke 1, Neutral, Cooperation, Neutral, Joke 2 (see Figure 14).

Study 2 Procedure

Potential participants scheduled a time to participate through the UNR SONA system. At the start of each scheduled time window, the researcher emailed—through the SONA system—the participant a link to the inclusion questionnaire and the joke assessment with instructions to stop if they did not meet inclusion criteria and to continue to the joke assessment if they did (see Appendix J). Inclusion criteria required participants to be 18 years old or older, speak English as a first language, and that they have not participated in other studies in the same line of research (see Appendix K). Those not included received a dismissal message (see Appendix L). Once included, participants completed Qualtrics-administered text-plus-audio joke assessment from Study 1. Upon completion, the researcher immediately analyzed the data to determine if the participant could advance to the IRAP. Participants who did not advance were

thanked, debriefed, and awarded SONA credits (see Appendix M). To participants who advanced, the researcher emailed a personalized link to the Cooperation IRAP (see Appendix N). When participants finished the IRAP, the researcher emailed personalized links to task baseline conditions and the task experimental conditions (see Appendixes O and P). The final step of task included a link to the Qualtrics post-experiment questionnaire. When the participants finished the post-experiment questionnaire, they were thanked, debriefed, awarded SONA credits, and paid. The participant's top two scoring jokes were used in the task. Ties and joke order were determined by a random number generator.

Study 2 Results

One-hundred-eleven participants were included in the final study. Of those, 49 participants completed all the required components, including 30 female, 16 male, and three non-binary participants. Ages ranged from 18 to 24 years. Seventeen reported being gamers. Five reported having vision problems severe enough to interfere with reading the screen but all of them reported wearing corrective devices. No participants reported hearing problems. Two participants had not yet declared a major, seven reported they were working toward or considering double majors; a total of 19 different majors were reported (see Table 6).

Results for the joke assessment are listed in Table 7. The number of qualifying jokes (rated as "Funny" or higher and "Likely" to prompt cooperation or higher) per participant ranged from the two (minimum requirement for participants to advance) to 25, with the mode being three and median six.

Participants' list-level IRAP Cohen's D scores are listed in Table 8. The D scores for Cooperation=Good ranged from -0.57791 to 1.26942. Scores for Independence=Good ranged from -0.40503 to 1.52026. Cooperation=Bad scores ranged from -0.72732 to 0.96449, and Independence=Bad from -1.37882 to 0.68507. The stimulus-level Cohen's D scores were examined (see Table 9). Collaboration=Good scores ranged from -0.76086 to 1.55225; Cooperation=Good scores ranged from -1.03629 to 1.53224, Group Effort=Good scores ranged from -0.85689 to 1.19259; Team Player=Good scores ranged from -0.87489 to 1.42945; Independence=Good range from -0.68379 to 1.80382; On My Own=Good scores ranged from -0.95137 to 2.4414; Flying Solo=Good scores ranged from -1.10576 to 1.73554; Self-Sufficient=Good scores ranged from -0.95214 to 1.92004.

Table 10 reports information about each participant's first contact with the FPE and WA choices, including the resulting accuracy of that first trial (correct or incorrect) and the condition in which participants first contacted each choice. All participants but one contacted both FPE and WA before the end of the third baseline condition (the second Piece-Rate condition). Forty-six participants chose WA for the first time in the practice condition, and three in the first Piece-Rate condition. Thirty-six participants chose FPE for the first time in the practice condition, seven in the first Piece-Rate condition, four in the first Pay-for-Time condition, one in the second Piece-Rate conditions, and participant E24 never chose FPE.

To answer the primary experimental question, we analyzed patterns of responding in the analogue medical data entry task within and across participants in several ways, including overall percentage of FPE and percentage of FPE in each condition compared

to other conditions. First, we calculated the percentage of FPE across all nine conditions

(Table 11). The purpose of this measure was to give us an idea of how cooperative each

participant was in general. These ranged from 0% to 86.77%.

We also calculated FPE percentages in each condition then compared them to one

another using visual inspection and several calculations. Based on visual inspection, we

defined and labeled two umbrella category response patterns and seven sub-group

response patterns. While visual inspection was sufficient to determine in which pattern-

group some participants belonged, independent measures were also used to add

objectivity, resulting in the final performance pattern groupings. Based on these,

participants fell into two main groups: those who engaged in orderly responding with

regards to the antecedent stimuli (n=29) and those who did not (n=20). Of the 20 whose

performances were not affected by the antecedents, eight (E11, E24, E36, F24, F45, F51,

F71, and F74) engaged in little to no FPE—zero to one instance—in each of the five

conditions with antecedent stimuli (see Figures 15 and 16). We called this the "Little

FPE" Group. The remaining twelve (E09, E23, E39, F08, F09, F22, F34, F35, F49, F50,

F57, and F59), called the "No Pattern" Group, engaged in FPE but had no discernable

pattern across conditions (see Figures 17 and 18).

The 29 participants whose responding was orderly were arranged into groups

based on their similar patterns of responding. The first of those groups included response

patterns that we would expect should the joke and "Cooperation" stimuli function as

motivative augmentals in relation to the neutral stimuli (F04, F14, F18, F29, F32, F65,

and F73). If both joke conditions and the "cooperation" condition were three or more

FPE percentage points higher than the highest neutral conditions, we determined there

was differentiation. Based on the visual depiction when graphed, we labeled this group the "W Group" (see Figures 19 and 20).

A second group had the same pattern of responding across conditions except it was on a trend, either decreasing (F28) or increasing (F42, F54, and F60). To be placed in this pattern group, joke conditions had to be within one percentage point (higher or lower) of the neighboring neutral condition even if it was much lower than the more distant neutral condition. This group was labeled the "W-On-Trend Group" (see Figures 21 and 22).

The third sub-group demonstrated cooperative responding as a function of exposure to the joke and "Cooperation" condition in two of those three conditions. To be categorized with this group, two of the three potential motivative augmental conditions had to be three FPE percentage points or more above the highest neutral condition. The third potential motivative augmental condition could be two FPE percentage points higher than, equal to, or less than its neighboring neutral condition. Four participants did not engage in FPE during the first joke condition but demonstrated cooperative responding during the "Cooperation" and the second joke conditions (E31, F10, F19, and F58). Three participants did not participate in FPE during the second joke condition but engaged in FPE during the "Cooperation" and the first joke conditions (F13, F33, and F66). Five participants did not engage in FPE during the "Cooperation" condition but demonstrated FPE in joke conditions (E15, E48, F02, F36, and F52). This pattern-group was labeled the "Partial W Group" (see Figures 23 and 24).

The fourth sub-group consisted of participants who demonstrated FPE during the "Cooperation" condition but did not engage in FPE in neither of the joke conditions (F21

and F26). To be in this pattern-group, the "Cooperation" condition had to be three or more FPE percentage points above the highest neutral condition and both joke conditions had to be less than three FPE percentage points above the highest neutral condition. This pattern-group was labeled the "Co-op Only Group" (see Figure 25 and 26).

The fifth subgroup engaged in patterns of responding that we would expect should the joke and "Cooperation" conditions functioned opposite of expected in terms of motivative augmentals (E45, F03, F61, and F75). To be in this group, the joke and "Cooperation" conditions had to be either three FPE percentage points lower than the lowest neutral condition or within one FPE percentage point of the nearest neutral condition on trend, in other words, the opposite of the "W" and "W-On-Trend" groups combined. We combined these two sets of criteria because there were only four total participants who met these criteria. This pattern-group was labeled the "M Group" (see Figures 27 and 28).

To further examine the differences between participants' performances among the experimental conditions, we conducted a non-parametric, block ANOVA, the Friedman test, F_r. Using percentage of trials per condition during which FPE was selected as the dependent variable, we conducted the Friedman test for all participants (n=49), for all participants except the "Little FPE Group" (n=41), and for participants in the "W-related" groups ("W," "W-on-Trend," and "Partial W") combined (n=23). For all group combinations, the null hypothesis was stated as "the treatments (joke, neutral, cooperation conditions) did not differ in their influence of FPE behaviors in this procedure," the alternative hypothesis being "the treatments differed in their influence of FPE behaviors in this procedure." Results for all three tests rejected the null hypothesis

(k=5, n=49, Q=9.487, p=.423; k=5, n=41, Q=9.487, p=.013; and k=5, n=23, Q=9.487, p=2.65388E-07, respectively).

As Friedman tests only indicate whether responding in the conditions differ to a statistically significant degree, we used the Wilcoxon Signed Rank Test to determine which of the conditions were statistically different from one another. Again, we conducted this test for each of the previous groupings of participants. When all participants were considered, there was a significant difference between the "Cooperation" condition and the second neutral condition (T=512.5, z=2.489, p=.015) (see Table 12). When all participants but those in the "Little FPE Group" were considered, there was a significant difference between the first joke condition and the second neutral condition (T=619, z=3.603, p=.0003) and between the "Cooperation" condition and the second neutral condition (T=497, z=2.577, p=.00998) (see Table 12). When only the "W-related" groups combined were considered, the first joke condition was significantly different from both the first and second neutral conditions (T=233.5, z=3.4738, p=.00051 and T=264.5, z=5.1789, p=2.2E-07 respectively), and the "Cooperation" condition was significantly different from the second neutral condition (T=221.5, z=3.684, p=.00023) (see Table 12).

To point the way toward further investigations which might answer questions about for whom jokes functioned as motivative augmentals and for whom they do not, we turned to our secondary questions. As described, the secondary questions in this study pertained to any potential factors which, when further investigated, may guide future research investigating influences over or factors in the motivative augmental-cooperative

behavior relationship. To explore these questions, we converted participants'

performances into objective numbers and ran a series of statistical tests.

First, we determined the percentages of FPE within each condition and within all

like conditions (e.g., percentage of FPE across both joke conditions). We subtracted the

total percentage of FPE in the neutral conditions from the total percentage of FPE in the

joke conditions for each participant. If the jokes functioned as motivative augmentals

relative to the neutral conditions, the resulting number would be positive (e.g., E48 and

F04). If they did not, the number would be zero or negative (e.g., E09 and E45). We

compared the resulting numbers to various other measures using Spearman's correlation,

the non-parametric *r*. There were no statistically significant correlations between the

dependent measure and any of the IRAP measures (see Table 13) or gamer status (see

Table 14). The moderate, positive correlation between the dependent measure and the

number of qualifying jokes was statistically significant (r(47)=.29, p=.042; Table 14).

Post-Experiment Questionnaire

The post-experiment questionnaire results most relevant to humor and the

analogue medical data entry task are presented in Table 15 through 18. Thirty-three

participants reported they primarily worked alone during the task with 16 reporting they

primarily fixed their partner's errors; 41 correctly identified their responding in relation

to the experimental contingency and eight did not (see Table 15). Twenty-eight

participants reported they believed their partner was another UNR student, 12 reported

they thought the partner was a computer, three speculated it was either a computer or the

researcher, two reported they believed it was the researcher, and four did not know. Eight

participants reported they found WA more difficult while 27 reported FPE was more difficult; 14 reported WA and FPE were the same level of difficulty. Forty-one participants noticed the background colors, indicating they were able to discriminate that the conditions were different from one another. Forty-four participants reported they noticed the statements related to cooperation. Twenty-five participants indicated the statements relating to participation increased their cooperation, three said it decreased their cooperation, 18 said it did not affect their cooperation, and three did not answer. Eight participants reported they were not at all motivated by earning money, 12 said they were a little motivated by earning money, eleven said somewhat, fourteen reported being very motivated by money, and four did not notice. Only two participants had heard of the study prior to participating (see Table 16).

Of the thirty-five participants who reported they thought videos were funny, most answered with information detailed enough to identify a specific joke (see Table 17). The video most frequently mentioned was Jaden followed by John (see Table 18). Four of the seven participants in the "W Group" reported the videos influenced their FPE and/or WA behaviors, all four in "W-on-trend," seven of 12 in the "Partial W," one of two in the "Co-op Only," one of three in the "M," zero of eight in the "Little FPE," and three of 12 in the "No Pattern" groups reported the videos influenced their task behaviors (see Table 18).

Discussion

This study examined the potential motivative augmental effects of humorous stimuli on cooperative behaviors as measured by an analogue medical data entry task. Since no previous studies in this line of research attempted to include humor, an

inductive research approach was necessary. The long and successful history of inductive questioning combined with single-subject design within the behavioral tradition supports this approach. Additionally, this research attempted to establish any correlation between task performance and Cooperation IRAP scores, and between task performance and various other measures.

Previous studies have demonstrated antecedent stimuli such as rules can influence cooperative responding and that the more personalized the stimuli, the greater the effect (Rafacz, et al., 2018; Candido, 2013). The puns, metaphors, and generalizations often included in humor increase ambiguity, requiring participants to abstract relationships between joke components then apply their meanings to current behavior. Since clarity has been shown to increase motivative effects, and the antecedent joke statements in this study added ambiguity, it was expected that participant behavior would not be as robust as previous studies' results. That there was no statistical difference between the joke conditions and the "Cooperation" condition in any of the groupings analyzed, however, suggests the increased ambiguity caused by including humor in the partial-rule antecedents did not harm the effectiveness of the rules. Another possibility is that the ambiguity of the jokes may influence accuracy of responding. However, for participants in the "W" and "W-on-Trend" groups, trial accuracy across experimental conditions was comparable (see Table 20).

With a combined eleven participants responding to the joke and "Cooperation" stimuli as if they were motivative augmentals ("W Group" and "W-on-Trend Group"), the answer to our primary question of whether humorous stimuli can function as motivative augmentals is a clear yes based on visual and statistical inspection. The 12

participants in the "Partial W Group" show, however, that this phenomenon is complex, and the further six participants in the "Co-op Only" and "M" groups show that these types of jokes may not function as motivative augmentals for cooperative behavior for some people.

The moderate, positive correlation between the total number of jokes participants rated at "Funny" and "Likely" to prompt cooperation and the dependent measure (percentage FPE in joke conditions minus percentage FPE in neutral conditions) may speak to how prepared participants were at that moment to be influenced by humor. For example, if establishing operations were in effect for humor as a reinforcer, contacting the humorous stimuli and experiencing reinforcement may have generalized the reinforcing function to other experimental stimuli, resulting in more cooperative behavior. Or perhaps the individual histories of those who were more likely to score the jokes as funny included correlations between humor or the humor response and prosocial behaviors. Future research could investigate these potential relationships.

Limitations

It is important to note a number of limitations when considering conclusions drawn from our findings and future studies. Some components of the task may have influenced participants' initial responding. For 46 of 49 participants, the first contact with the WA choice was in the practice condition with the latest first-contact for WA coming in the first baseline condition. First contact with FPE was in the practice condition for only 36 of the 49 participants, and the latest first-contact was in the third baseline condition. Working alone may be easier to complete accurately than FPE in general. Across all participants, accuracy for all WA trials was 95.69% correct while FPE was just

89.67%. Additionally, there were 27 reports in the post-experiment questionnaire that WA was easier than FPE for the participant compared to compared to only eight reports that FPE was easier. Future studies might account for the difference in response effort needed to result in accurate submissions in WA versus FPE as measure of the magnitude of motivative augmentals.

In addition, while all jokes promoted cooperation, some jokes instructed participants to be like a cooperative subject in the joke and others instructed participants not to be like an uncooperative subject (see Table 19). However, there was no correlation between what kind of instruction the joke gave and the percentage of FPE the participant engaged in during that condition (r(98)=.01, p=.936). Future studies could further examine the instructional influence of humorous verbal stimuli in educational and work settings.

This study is the first in this line of research to employ audio/video stimuli with text, voice, and picture components. Previous research used only textual verbal stimuli in the antecedent interventions. Future research could directly compare the traditional, text only presentation to a comparable video stimulus.

As described earlier, all components of Study 2 were conducted online. This presented unique challenges related to the potential for participants to come under the influence of unaccounted for stimuli in their physical environment at the expense of experimental stimuli. While future research may limit this possibility by bringing participants into a laboratory setting, the presence of researchers or research assistance may increase cooperative behaviors beyond the influence of the antecedent task stimuli alone. Furthermore, the medical data entry task is designed to mimic real-world work

tasks which are increasingly moving to remote, online environments which better match the conditions under which this study was conducted. Future research could compare responding across these two settings.

That participants were instructed to complete the steps in a quiet, distraction-free space likely resulted in participants being alone—at least verbally if not physically. Humorous stimuli and humor responses have historically been shared in real time with a physically present verbal community. Lack of a shared social setting may influence cooperative behaviors in a different or lesser manner than were participants to contact them in group settings. The social variables in groups settings are important factors to be explored in further research.

Implications

The results of this study suggest humor can be used as a motivative augmental for cooperative behaviors in an analogue medical data entry task. Moreover, they extend previous research examining the effects of antecedent interventions in simulated work settings. While the findings confirm the potential for verbal behavior to function as motivative augmentals, the inclusion of humor complicates the stimuli to such a degree that more personalization of the stimuli may be needed for the same effect.

This study contributes to the literature in two primary ways. It is the first to use audio-video recording as antecedent stimuli in this analogue medical data entry task procedure, opening the door for more realistic stimuli. Particularly as more employees are working remotely, audio-visual stimuli in the form of live tele-meetings, tele-conferencing, and video messages are becoming increasingly common. This study serves as a proof-of-concept that similar audio-video stimuli can be used in this preparation.

Secondly, this is the first study of its kind to include humorous stimuli. While necessarily exploratory, a first step into investigating humor as a motivative augmental may open doors to studying other more nuanced forms of human communication. Voice inflection, facial expression, and tone can all be conveyed in statements delivered via audio-video recordings in ways that static text cannot. These components of verbal behavior can change the meaning of statements in dramatic, even opposite ways. That we now have the tools to begin studying them in this line of research may allow us to gain a better understanding of the motivative effects of nuanced verbal behavior.

As mentioned earlier, humor is connected to increased wellbeing (Martin & Lefcourt, 1984; Lefcourt & Martin, 1986; Martin & Dobbin, 1989, Woodbury-Farina, & Antongiorgi, 2014; Bennet et al., 2003) and improved productivity (Romero & Pearson, 2004; Romero & Pescosolido, 2008; Clouse & Spurgeon, 1995) in various situations, including workplace settings. Discussions of wellbeing in the workplace have suggested behaviors and contingencies—including statements of rules—that support prosocial organizational practices (Houmanfar & Szarko, 2021; Houmanfar et al., 2015). Moreover, since humor is associated with improved health, reduced stress, and strengthened co-worker relationships, analyzing its use in rules to support prosocial organizational environments is a valuable investigation. The preparation employed in Study 2 has been used to investigate factors related to cooperative behaviors in analogue settings that mimic real-world organizations (e.g., Candido & Houmanfar, 2013; Rafacz et al., 2018), hence is uniquely appropriate for this area of research in behavior science.

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Table 1

Audio only mean ratings across audio-only participants

Audio Only Joke	Mean Funny Rating	Mean Cooperation Rating	Combined Mean Scores
Belletrix	0.294	0.412	0.706
Beth	1.176	0.471	1.647
Bob and Tim	0.765	0.941	1.706
Caligula	0.294	0.412	0.706
Chuck the Pizza Guy	1.412	1.000	2.412
Cotton-Eyed Joe	0.529	0.353	0.882
Dana	0.529	0.941	1.471
Bill	1.118	0.941	2.059
Dave	0.588	0.765	1.353
Doc Holliday	0.235	0.647	0.882
Ed	0.471	0.294	0.765
Garth	0.706	1.529	2.235
Gary	0.529	1.118	1.647
Genghis	0.765	0.706	1.471
Jaden	1.118	0.941	2.059
John	1.235	1.647	2.882
Karl	0.471	0.412	0.882
Lance	1.059	0.941	2.000
Neil	0.882	0.529	1.412
Noel	0.706	0.824	1.529
Paul	1.412	1.235	2.647
Rob	0.647	1.412	2.059
Santa	1.294	0.706	2.000
Sam	1.235	0.941	2.176
Self-Indulgent Sally	0.882	0.765	1.647
Sir Reginald	0.647	0.765	1.412
Sparta	0.647	1.176	1.824
Tanner	1.000	1.059	2.059
Wayne	0.647	0.941	1.588
Totals	23.294	24.824	48.118

Table 2

Text-only mean ratings across text-only participants

Text Only Joke	Mean Funny Rating	Mean Cooperation Rating	Combined Mean Scores
Belletrix	0.571	0.429	1.000
Beth	1.071	0.643	1.714
Bob and Tim	1.357	1.214	2.571
Caligula	0.714	0.714	1.429
Chuck the Pizza Guy	1.500	0.857	2.357
Cotton-Eyed Joe	0.786	0.929	1.714
Dana	0.500	1.286	1.786
Bill	1.643	1.143	2.786
Dave	0.571	0.786	1.357
Doc Holliday	0.357	0.500	0.857
Ed	0.714	1.071	1.786
Garth	0.786	1.286	2.071
Gary	1.143	1.357	2.500
Genghis	1.143	1.357	2.500
Jaden	1.214	1.357	2.571
John	1.714	1.714	3.429
Karl	0.857	0.571	1.429
Lance	0.571	0.714	1.286
Neil	1.000	0.643	1.643
Noel	0.429	1.071	1.500
Paul	1.286	0.857	2.143
Rob	0.714	1.357	2.071
Santa	1.714	1.000	2.714
Sam	1.143	0.500	1.643
Self-Indulgent Sally	0.714	0.714	1.429
Sir Reginald	0.786	0.571	1.357
Sparta	1.000	1.429	2.429
Tanner	1.357	1.214	2.571
Wayne	0.429	1.000	1.429
Totals	27.786	28.286	56.071

Table 3

Text-and-Audio Mean Ratings Across Text-and-Audio Participants

Text-and-Audio Joke	Mean Funny Rating	Mean Cooperation Rating	Combined Mean Scores
Belletrix	0.455	0.727	1.182
Beth	1.227	0.727	1.955
Bob and Tim	0.955	0.864	1.818
Caligula	0.636	0.727	1.364
Chuck the Pizza Guy	1.045	0.864	1.909
Cotton-Eyed Joe	0.864	0.682	1.545
Dana	0.727	1.364	2.091
Bill	1.591	1.091	2.682
Dave	0.818	0.909	1.727
Doc Holliday	0.364	0.455	0.818
Ed	0.818	1.000	1.818
Garth	0.818	1.273	2.091
Gary	0.773	1.136	1.909
Genghis	1.045	0.864	1.909
Jaden	1.227	1.273	2.500
John	1.545	1.545	3.091
Karl	0.682	0.591	1.273
Lance	0.727	0.727	1.455
Neil	1.364	1.136	2.500
Noel	0.773	1.091	1.864
Paul	1.000	0.682	1.682
Rob	0.864	1.409	2.273
Santa	1.545	1.136	2.682
Sam	1.227	1.045	2.273
Self-Indulgent Sally	1.364	1.045	2.409
Sir Reginald	1.045	0.636	1.682
Sparta	0.636	0.909	1.545
Tanner	1.409	0.955	2.364
Wayne	0.864	1.227	2.091
Totals	28.409	28.091	56.500

Table 4

Sums of mean ratings for each modality

Modality	Sum of Mean Funny	Sum of Mean Cooperation	Sum of Combined Mean Ratings
Audio-Only	23.294	24.824	48.118
Text-Only	27.786	28.286	56.071
Text-plus-Audio	28.409	28.091	56.500

Table 5

Text-and-audio jokes ranked highest to lowest by combined mean scores

Joke Name	Combined Mean Scores	Combined Mean Rank
John	3.091	1
Bill	2.682	2
Santa	2.682	2
Jaden	2.500	4
Neil	2.500	4
Self-Indulgent Sally	2.409	6
Tanner	2.364	7
Rob	2.273	8
Sam	2.273	8
Dana	2.091	10
Garth	2.091	10
Wayne	2.091	10
Beth	1.955	13
Chuck the Pizza Guy	1.909	14
Gary	1.909	14
Genghis	1.909	14
Noel	1.864	17
Bob and Tim	1.818	18
Ed	1.818	18
Dave	1.727	20
Paul	1.682	21
Sir Reginald	1.682	21
Cotton-Eyed Joe	1.545	23
Sparta	1.545	23
Lance	1.455	25
Caligula	1.364	26
Karl	1.273	27
Belletrix	1.182	28
Doc Holliday	0.818	29

Table 6

Demographics for completed participants

Part.ID	Age	Gender	Gamer	Vision Problems	Wearing Lenses	Hearing Problems	Major (Current or Anticipated)
E09	22	F	No	No	n/a	No	Neuroscience
E11	18	M	Yes	Yes	Yes	No	Biochemistry and Molecular Biology
E15	18	NB	Yes	No	n/a	No	Pre-nursing, Pre-pharmacy
E23	18	F	Yes	No	n/a	No	Nursing
E24	21	M	No	No	n/a	No	Neuroscience
E31	19	F	No	No	n/a	No	Social Work
E36	18	F	No	No	n/a	No	Psychology
E39	18	M	Yes	No	n/a	No	Kinesiology
E45	18	F	No	No	n/a	No	Biology
E48	18	F	No	No	n/a	No	Pre-nursing
F02	18	F	Yes	No	n/a	No	Pre-nursing
F03	18	M	Yes	No	n/a	No	Kinesiology
F04	18	F	No	No	n/a	No	Pre-nursing
F08	18	F	No	No	n/a	No	Pre-nursing
F09	24	M	Yes	No	n/a	No	Psychology
F10	18	M	No	No	n/a	No	Undeclared
F13	19	M	No	No	n/a	No	Finance
F14	20	NB	Yes	No	n/a	No	Psychology
F18	18	NB	Yes	No	n/a	No	Finance
F19	20	M	No	No	n/a	No	Business Marketing
F21	18	F	No	No	n/a	No	Biology
F22	18	F	No	Yes	Yes	No	Criminal Justice
F24	18	F	No	No	n/a	No	Psychology
F26	18	F	No	No	n/a	No	Business
F28	21	M	Yes	No	Yes	No	Information Systems, Psychology
F29	19	M	Yes	No	n/a	No	Finance, Economics
F32	18	M	Yes	No	n/a	No	Business
F33	21	M	Yes	No	n/a	No	Neuroscience
F34	19	F	No	No	n/a	No	Psychology
F35	18	F	Yes	No	n/a	No	Biochemistry, Anthropology
F36	19	F	No	No	n/a	No	Community Health Science
F42	18	M	No	No	n/a	No	Economics, Finance
F45	19	M	Yes	Yes	Yes	No	Neuroscience
F49	19	F	No	No	n/a	No	Biology
F50	18	F	No	No	n/a	No	Biology
F51	18	F	No	No	n/a	No	Pre-nursing

F52	21	F	No	No	n/a	No	Psychology
F54	21	F	No	Yes	Yes	No	Psychology
F57	18	F	No	No	Yes	No	Wildlife Ecology and Conservation
F58	18	F	No	No	n/a	No	Neuroscience
F59	21	F	No	No	n/a	No	Journalism
F60	18	F	No	No	n/a	No	Neuroscience
F61	21	M	Yes	No	n/a	No	Journalism
F65	20	F	No	Yes	Yes	No	Human Development and Family Studies
F66	19	F	No	No	n/a	No	Pre-nursing
F71	21	F	No	No	n/a	No	Psychology, English
F73	18	F	No	Yes	Yes	No	Microbiology and Immunology
F74	21	F	No	No	n/a	No	Neuroscience
F75	18	M	Yes	No	n/a	No	Psychology, Art

Table 7

Joke ratings by participant

Part. ID	No. Qualifying Jokes	Joke 1		Joke 2	
		Funny Rating (0 not funny – 3 very funny)	Prompt Coop. Rating (0 not likely – 3 very likely)	Funny Rating (0 not funny – 3 very funny)	Prompt Coop. Rating (0 not likely – 3 very likely)
E09	2	2	2	2	2
E11	6	3	3	3	3
E15	3	2	2	3	2
E23	4	2	2	3	2
E24	10	2	3	3	2
E31	15	3	3	3	3
E36	3	2	2	2	2
E39	8	3	3	3	3
E45	5	3	2	3	2
E48	6	2	2	2	2
F02	7	3	2	3	2
F03	2	2	3	2	2
F04	11	3	3	3	3
F08	9	2	2	2	2
F09	7	3	2	3	2
F10	6	2	3	3	3
F13	7	3	3	2	3
F14	4	2	2	3	2
F18	8	2	2	2	2
F19	13	3	3	3	3
F21	3	2	2	2	2
F22	21	3	3	3	3
F24	2	2	2	2	2
F26	6	2	3	2	3
F28	3	2	2	2	2
F29	13	3	3	3	3
F32	9	2	2	3	3
F33	3	3	3	3	2
F34	3	2	3	3	3
F35	3	2	2	2	3
F36	7	3	3	2	3
F42	8	3	2	3	3
F45	6	3	3	3	3
F49	6	2	3	3	3
F50	13	3	2	3	2
F51	3	3	2	2	2

F52	5	3	2	3	2
F54	4	2	3	3	3
F57	3	2	2	3	2
F58	5	2	2	3	2
F59	10	3	3	3	2
F60	5	3	3	3	2
F61	6	3	2	3	2
F65	5	2	2	2	3
F66	3	3	2	3	2
F71	2	2	2	2	2
F73	25	3	3	3	3
F74	3	2	2	2	2
F75	3	3	3	3	3

Table 8

IRAP list-level Cohen's D scores

	Cohen's D Scores at the List Level			
Part. ID	Coop.=Good	Ind.=Good	Coop.=Bad	Ind.=Bad
E09	0.28426	-0.20482	-0.61956	0.06400
E11	0.83291	-0.07797	-0.34387	0.47622
E15	0.35792	0.83055	0.00509	0.03015
E23	-0.38542	1.03415	0.58382	-0.48997
E24	0.98898	1.15575	-0.25967	-0.65300
E31	0.08987	1.01846	0.22756	0.37618
E36	-0.57791	-0.14264	0.22779	-1.00497
E39	0.85543	0.21115	-0.27950	-0.03179
E45	0.79930	1.12250	-0.05246	0.12809
E48	0.29598	0.23073	0.52148	0.11583
F02	0.53794	0.99950	-0.11336	-0.01133
F03	1.14594	0.24195	0.01105	0.27093
F04	0.90551	0.55974	-0.13927	-0.17892
F08	0.60356	0.60092	-0.39142	0.65690
F09	0.42638	0.86648	-0.52328	0.40205
F10	0.54588	0.87475	-0.28568	-1.37882
F13	0.74132	-0.40503	-0.49788	-0.54378
F14	0.42342	0.03627	0.10655	0.01696
F18	0.65784	0.26488	-0.27891	0.42468
F19	0.93522	0.99844	0.31171	-0.45778
F21	0.75599	-0.11464	0.15682	0.18364
F22	-0.25978	0.33378	0.43556	-0.37328
F24	0.30942	0.42667	-0.49739	0.03681
F26	0.29426	0.74545	0.54036	-0.97886
F28	0.89075	0.30786	-0.43848	-0.47322
F29	0.85678	0.71538	0.51870	0.35734
F32	0.23296	0.75809	-0.10684	-0.77806
F33	0.54949	0.04012	0.85104	-0.33721
F34	0.78928	0.00736	0.96449	0.16302
F35	0.75587	1.10309	-0.32951	0.14266
F36	0.84958	1.52026	0.78955	-0.18233
F42	0.98273	1.09316	-0.05721	-0.38914
F45	-0.14298	0.15900	-0.70979	-0.57049
F49	0.52788	0.41230	0.43934	0.02867
F50	0.13799	0.14396	-0.03352	0.68507
F51	-0.12342	0.87657	-0.29483	-0.93072
F52	1.21569	0.66151	0.12563	-0.46785
F54	0.86186	0.63408	0.28455	-1.13061

F57	0.45394	0.98906	-0.29029	-0.37321
F58	0.38950	0.97062	0.57482	-0.21133
F59	1.10242	0.89038	-0.11872	-0.08320
F60	0.66975	0.74807	-0.01811	0.20299
F61	1.26942	0.35601	0.17109	0.23754
F65	0.70688	1.02554	-0.72732	-0.00521
F66	0.62067	0.43905	-0.02698	-0.80039
F71	-0.02036	0.88583	0.40847	-0.46935
F73	0.44655	0.43818	-0.59616	0.25300
F74	0.01991	0.77309	0.39711	0.61942
F75	0.30919	0.63593	-0.56282	-0.10445

Table 9
IRAP stimulus-level Cohen's D scores

| Part. ID | Cohen's D Score at the Stimulus Level | | | | | | | |
| | Stimuli Associated with Cooperation | | | | Stimuli Associated in Independent | | | |
	Collabo-ration	Coop-eration	Group Effort	Team Player	Indepen-dent	On My Own	Flying Solo	Self-Sufficient
E09	-0.01366	1.04620	0.94147	0.54969	1.01228	0.98847	0.24386	1.47463
E11	0.86865	0.70742	-0.28503	0.07668	0.76968	-0.46966	0.51916	0.00688
E15	0.24103	-0.55633	-0.80584	-0.09809	-0.62538	0.00124	0.77928	-0.18302
E23	-0.19231	-0.46464	-0.36202	-0.51759	0.20299	0.01574	0.21807	1.21439
E24	0.67600	0.86485	0.21916	0.97373	-0.15497	0.80566	1.03824	1.05012
E31	1.55225	0.39664	-0.21099	-0.25463	-0.21192	-0.19149	-0.20402	-0.23673
E36	0.55586	-0.05291	0.76889	0.67531	-0.01441	0.73162	0.11353	-0.27777
E39	-0.51214	-0.01988	0.73238	-0.12042	1.05108	1.73317	0.56834	0.42669
E45	-0.48645	-0.32192	-0.56703	0.05784	1.10368	0.02576	0.75065	0.50931
E48	0.33517	0.79977	1.03249	0.11467	-0.07414	-0.06845	-0.73650	-0.84635
F02	-0.35780	-0.66315	1.08858	-0.59723	-0.39558	1.20248	1.22670	0.89208
F03	0.36598	0.08585	-0.75120	-0.47717	0.74056	1.35123	0.85370	0.29668
F04	-0.14370	1.53224	-0.36015	-0.01803	0.82997	0.76761	1.10317	0.31194
F08	1.06828	0.55820	0.10012	0.63439	0.35580	-0.12796	-0.64769	0.59084
F09	-0.03599	-0.66786	0.58745	0.87982	0.38225	0.60684	1.12134	0.88283
F10	-0.33812	1.13645	0.79277	0.05421	0.67828	0.48787	-0.70959	-0.26476
F13	0.34840	-0.28003	0.21948	0.79667	-0.68379	2.44140	1.62229	-0.00537
F14	0.60856	0.48147	0.56097	0.24876	-0.14626	0.33292	0.05186	-0.12608
F18	0.54735	-0.29169	1.08892	0.38244	-0.07177	-0.23144	0.29720	0.43867
F19	0.11283	-0.43835	-0.19770	0.13408	-0.06972	0.24046	0.21936	0.32407
F21	0.01110	-0.20195	0.43304	-0.40084	0.07102	-0.39190	-1.10576	0.34927
F22	-0.16151	0.71372	0.41792	-0.37217	1.07698	0.76381	1.59347	0.53886
F24	0.59566	1.09778	0.17789	0.02634	0.02288	-0.95137	-0.05639	0.31300
F26	-0.23907	-0.06293	0.69996	-0.09998	0.07162	0.37837	0.00808	0.37549
F28	0.54057	1.47546	0.20800	0.42200	0.11043	0.86393	0.93015	-0.23795
F29	0.27544	0.43248	0.24310	0.60452	-0.27824	0.09313	0.15125	-0.95214
F32	0.37247	0.63080	0.24208	1.01390	-0.42306	0.45020	0.41389	0.11716
F33	0.16060	0.60562	0.31864	0.85811	0.78394	0.60794	0.75193	0.73695
F34	0.16909	-0.36732	-0.85689	-0.04254	-0.13582	0.07160	1.73554	0.24865
F35	-0.56751	0.11778	0.01504	0.12146	0.37663	-0.10305	0.30242	0.19511
F36	0.84655	0.99772	0.19563	1.15007	0.05456	0.18371	1.16028	0.21385
F42	-0.21639	1.49928	0.32430	0.55935	-0.29846	0.71447	0.04866	1.13946
F45	0.25428	-0.08414	-0.00338	0.00045	0.45366	0.58436	1.18739	-0.71920
F49	-0.36490	-0.14994	0.84114	0.59265	-0.42591	0.78111	0.95783	0.50006
F50	-0.76086	0.47934	-0.01609	-0.02769	0.05800	0.88502	-1.07563	-0.56744
F51	1.32599	-1.03629	0.01325	0.34012	0.50301	-0.50182	0.35126	0.99029

F52	0.61530	0.77791	1.19259	-0.32610	1.11567	0.56469	1.39568	1.53831
F54	-0.68997	1.07441	0.08107	-0.63184	-0.15838	0.03841	0.76781	0.07678
F57	0.75219	0.50170	0.73820	0.60062	0.80607	0.85575	0.44786	-0.36937
F58	0.76701	0.32602	0.27454	-0.31111	0.92796	1.36726	0.40426	-0.17463
F59	-0.12676	-0.08071	-0.43319	0.29572	1.21212	0.34351	0.36279	1.92004
F60	0.52068	0.66284	0.30080	0.12704	0.22708	0.11433	0.83328	0.13525
F61	0.23279	0.58031	-0.07289	0.02796	0.00939	-0.33620	0.29213	-0.00998
F65	0.12615	0.17860	-0.11701	0.96083	1.08700	-0.12369	0.38921	-0.46279
F66	0.06050	1.19136	0.38140	-0.02593	1.80382	0.11614	-0.00738	0.87022
F71	-0.30487	0.56713	0.81675	1.42945	0.26719	0.57046	-0.53527	0.57648
F73	-0.31093	0.24325	0.19464	-0.87489	0.07459	0.21368	0.30358	0.38861
F74	0.47790	0.48114	0.42721	0.86070	0.62157	0.16259	0.29108	0.76483
F75	0.51464	0.59577	0.08575	1.20353	0.16667	-0.58831	-0.22497	0.07571

Table 10

First contacts with WA and FPE and total percentage correct

	1st Contact w/FPE		1st Contact w/WA		% Correct Across 9 Conditions	
Part. ID	Accuracy	Condition	Accuracy	Condition	FPE	WA
E09	Correct	Practice	Correct	Practice	0.94068	0.88889
E11	Correct	Practice	Correct	Practice	0.90000	1.00000
E15	Correct	Practice	Correct	Practice	0.00000	0.97479
E23	Correct	Practice	Correct	Practice	0.80952	0.94203
E24	n/a	n/a	Incorrect	Practice	n/a	0.92347
E31	Correct	Practice	Correct	Practice	0.85938	0.95455
E36	Correct	Practice	Incorrect	Practice	1.00000	0.98400
E39	Incorrect	PR1	Incorrect	Practice	0.93750	0.91589
E45	Correct	Practice	Incorrect	Practice	0.95238	0.98361
E48	Incorrect	Practice	Incorrect	Practice	0.26241	0.90625
F02	Correct	PR1	Correct	Practice	0.97260	0.95062
F03	Correct	Practice	Correct	Practice	0.92308	0.98718
F04	Incorrect	Practice	Incorrect	Practice	0.87500	0.92500
F08	Correct	Practice	Incorrect	Practice	0.92500	0.96703
F09	Correct	Practice	Correct	Practice	0.96610	0.90323
F10	Correct	Practice	Correct	Practice	0.95652	0.98000
F13	Correct	Practice	Correct	PR1	0.96078	0.95946
F14	Incorrect	Practice	Correct	Practice	0.98551	0.95238
F18	Correct	Practice	Correct	Practice	0.94118	0.93548
F19	Correct	PT1	Incorrect	Practice	0.96970	1.00000
F21	Correct	PR1	Incorrect	Practice	0.83333	0.97260
F22	Correct	Practice	Correct	PR1	0.97727	0.93443
F24	Correct	PT1	Incorrect	Practice	0.66667	0.92958
F26	Correct	Practice	Correct	Practice	1.00000	1.00000
F28	Correct	Practice	Correct	Practice	0.96825	0.98077
F29	Correct	PR2	Incorrect	Practice	0.93478	0.96040
F32	Correct	PR1	Correct	Practice	0.92000	0.97872
F33	Correct	Practice	Correct	Practice	0.98734	0.98485
F34	Incorrect	Practice	Correct	Practice	0.96552	0.92188
F35	Correct	Practice	Correct	Practice	0.99074	0.97500
F36	Correct	Practice	Correct	Practice	0.96939	1.00000
F42	Correct	Practice	Correct	Practice	0.90385	0.98630
F45	Correct	Practice	Correct	Practice	n/a	0.99020
F49	Incorrect	Practice	Correct	Practice	0.86207	0.87179
F50	Correct	Practice	Correct	Practice	0.95000	0.98058
F51	Correct	PT1	Correct	Practice	1.00000	0.96875
F52	Incorrect	Practice	Incorrect	Practice	0.00000	0.95420

F54	Correct	Practice	Correct	Practice	0.91892	1.00000
F57	Correct	Practice	Correct	PR1	0.98551	1.00000
F58	Correct	Practice	Correct	Practice	0.83333	0.94845
F59	Correct	PR1	Incorrect	Practice	0.90000	0.97619
F60	Correct	Practice	Correct	Practice	0.92157	0.96667
F61	Correct	Practice	Correct	Practice	0.89286	0.93671
F65	Incorrect	Practice	Correct	Practice	0.89130	0.85484
F66	Incorrect	Practice	Incorrect	Practice	0.90278	0.93220
F71	Correct	PT1	Correct	Practice	1.00000	0.96154
F73	Correct	PR1	Correct	Practice	0.92000	0.91667
F74	Correct	PR1	Correct	Practice	1.00000	0.88235
F75	Correct	Practice	Correct	Practice	0.95946	0.96296

Table 11

Percentages of FPE across and within like conditions

Part.ID	%FPE Across All Conditions	%FPE in Jokes Minus %FPE in Neutrals	%FPE in Cooperation Minus %FPE in Neutrals	%FPE in Cooperation Minus %FPE in Jokes
E09	0.86765	-0.02244	-0.00270	0.01974
E11	0.10309	0.04348	0.00000	-0.04348
E15	0.46637	0.07692	0.02137	-0.05556
E23	0.47727	0.10000	0.00000	-0.10000
E24	0.00000	0.00000	0.00000	0.00000
E31	0.42105	0.11197	0.09774	-0.01422
E36	0.01575	0.00000	0.00000	0.00000
E39	0.23022	0.17647	-0.08824	-0.26471
E45	0.25610	-0.21250	-0.10000	0.11250
E48	0.68780	0.70739	-0.08571	-0.79310
F02	0.47403	0.08333	-0.08889	-0.17222
F03	0.25000	-0.18154	-0.21154	-0.03000
F04	0.44444	0.25490	0.52381	0.26891
F08	0.30534	-0.23529	0.02941	0.26471
F09	0.65556	-0.12573	0.08134	0.20707
F10	0.47917	0.19022	0.36522	0.17500
F13	0.40800	0.01667	0.75000	0.73333
F14	0.62162	0.66931	0.74074	0.07143
F18	0.35417	0.29437	0.35664	0.06227
F19	0.23077	0.36667	0.72222	0.35556
F21	0.03947	0.00000	0.23529	0.23529
F22	0.41905	0.01087	-0.23913	-0.25000
F24	0.04054	0.02429	-0.05263	-0.07692
F26	0.11111	-0.09091	0.46465	0.55556
F28	0.54783	0.12005	0.37931	0.25926
F29	0.31293	0.38235	0.50000	0.11765
F32	0.15060	0.12121	0.15455	0.03333
F33	0.54483	0.18521	0.27345	0.08824
F34	0.47541	-0.01720	0.06429	0.08148
F35	0.72973	-0.06863	-0.13333	-0.06471
F36	0.56647	0.34496	-0.25028	-0.59524
F42	0.41600	0.26429	0.58571	0.32143
F45	0.00000	0.00000	0.00000	0.00000
F49	0.27103	-0.00699	-0.54545	-0.53846
F50	0.27972	0.00000	0.04306	0.04306
F51	0.05882	-0.05091	0.00000	0.05091
F52	0.02963	0.06250	0.00000	-0.06250
F54	0.29839	0.10256	0.08333	-0.01923

F57	0.64486	-0.13077	-0.01648	0.11429
F58	0.11009	0.08296	0.96296	0.88000
F59	0.32258	-0.04497	0.13447	0.17944
F60	0.62963	0.16471	0.15000	-0.01471
F61	0.26168	-0.10490	-0.35641	-0.25152
F65	0.42593	0.29630	0.28205	-0.01425
F66	0.54962	0.47304	0.76471	0.29167
F71	0.07143	0.00000	0.00000	0.00000
F73	0.25773	0.17949	0.30070	0.12121
F74	0.01163	0.00000	0.00000	0.00000
F75	0.57813	-0.16964	-0.18750	-0.01786

Table 12

Wilcoxon signed rank scores, H0: the mean ranks of the conditions do not differ

Conditions		All Participants			All but Little GPE Group			W, WoT, PW Groups		
		T	z	*p*	T	z	*p*	T	z	*p*
Joke1	Part1	472	1.144	.256	428.5	1.162	.245	233.5	3.474	.00051
Joke1	Coop.	345	-1.332	1.817	297.5	-1.512	1.87	115.5	-.357	1.279
Joke1	Part2	473	.847	.397	619	3.603	.0003	264.5	5.179	2.2E-07
Joke1	Joke2	352	-1.244	1.787	293	-1.354	1.824	111	-.821	1.588
Part1	Coop.	180	-2.587	1.99	180	-2.587	1.99	24	-3.18	2
Part1	Part2	314	-.299	1.23	308	-.115	1.091	106	.443	.658
Part1	Joke2	259.5	-2.216	1.973	246.5	-2.384	1.982	14.5	-3.756	1.9998
Coop.	Part2	512.5	2.489	.015	497	2.577	.00998	221.5	3.684	.0023
Coop.	Joke2	417	.094	.925	373	.036	.971	109.5	-.552	1.419
Part2	Joke2	204.5	-2.218	1.973	149.5	-2.53	1.989	2.5	-3.928	1.999

Table 13

Spearman's r for FPE in joke minus neutral conditions and IRAP

Calculated with IRAP	All Participants			All but Little FPE Group			W, WoT, PW Groups		
	r	*df*	P	r	*df*	p	r	*df*	p
List-level D score Coop.=Good	.12	47	.426	-.07	29	.669	.03	25	.904
List-level D score Ind.=Good	.02	47	.915	.04	29	.824	-.01	25	.948
List-level D score Coop.=Bad	.19	47	.187	.10	29	.578	.20	25	.330
List-level D score Ind.=Bad	-.16	47	.280	-.10	29	.600	.06	25	.773
Stim.-level D score Collab.=Good	-.03	47	.860	-.15	29	.435	-.02	25	.919
Stim.-level D score Coop.=Good	-.03	47	.840	.04	29	.831	-.05	25	.798
Stim.-level D score GrpEft=Good	-.01	47	.919	-.08	29	.651	-.11	25	.596
Stim.-level D score TeamPlyr=Good	-.03	47	.857	-.03	29	.862	-.09	25	.679
Stim.-level D score Ind.=Good	.03	47	.819	.23	29	.221	.21	25	.312
Stim.-level D score OnMyOwn=Good	.03	47	.822	-.15	29	.435	-.26	25	.215
Stim.-level D score FlyingSolo=Good	.18	47	.222	-.13	29	.500	-.29	25	.166
Stim.-level D score SelfSuf.=Good	.08	47	.595	.20	29	.290	.11	25	.616

Table 14

Spearman's r for FPE in joke minus neutral conditions and other measures

Calculated with	All Participants			All but Little FPE Group			W, WoT, PW Groups		
	r	*df*	p	r	*df*	p	r	*df*	p
Gamers and Non-Gamers	.03	47	.836	-.06	39	.747	.08	21	.692
Total %FPE All Conditions	.21	47	.151	.14	39	.374	.14	21	.522
Number of Qualifying Jokes	.29	47	.042	-.08	39	.657	-.03	21	.869

Table 15

Accuracy of self-reported WA or FPE tendency

Part.ID	Total % FPE	Did you primarily WA or FPE?	Self-report Accurate?
E09	86.8	FPE	Yes
E11	10.3	WA	Yes
E15	46.6	WA	Yes
E23	47.7	WA	Yes
E24	0.0	WA	Yes
E31	42.1	FPE	No
E36	1.6	WA	Yes
E39	23.0	WA	Yes
E45	25.6	WA	Yes
E48	68.8	WA	No
F02	47.4	FPE	No
F03	25.0	WA	Yes
F04	44.4	WA	Yes
F08	30.5	WA	Yes
F09	65.6	FPE	Yes
F10	47.9	WA	Yes
F13	40.8	WA	Yes
F14	62.2	FPE	Yes
F18	35.4	WA	Yes
F19	23.1	WA	Yes
F21	3.9	WA	Yes
F22	41.9	FPE	No
F24	4.1	WA	Yes
F26	11.1	WA	Yes
F28	54.8	FPE	Yes
F29	31.3	FPE	No
F32	15.1	WA	Yes
F33	54.5	FPE	Yes
F34	47.5	FPE	No
F35	73.0	FPE	Yes
F36	56.6	WA	No
F42	41.6	WA	Yes
F45	0.0	WA	Yes
F49	27.1	WA	Yes
F50	28.0	WA	Yes
F51	5.9	WA	Yes
F52	3.0	WA	Yes
F54	29.8	WA	Yes
F57	64.5	FPE	Yes
F58	11.0	WA	Yes
F59	32.3	WA	Yes
F60	63.0	FPE	Yes
F61	26.2	WA	Yes
F65	42.6	FPE	No
F66	55.0	FPE	Yes
F71	7.1	WA	Yes
F73	25.8	WA	Yes
F74	1.2	WA	Yes
F75	57.8	FPE	Yes

Table 16

Non-demographic post-experiment questionnaire responses

	W Group	W-on-Trend Group	Partial W Group	Co-op Only Group	M Group	Little FPE Group	No Pattern Group	Total
Did you WA or FPE?								
WA	4	2	8	2	3	8	6	33
FPE	3	2	4	0	1	0	6	16
Think any videos funny?								
Yes	3	4	9	2	4	6	7	35
No	3	0	3	0	0	2	5	13
No response	1	0	0	0	0	0	0	1
Partner UNR student?								
UNR student	3	4	9	1	1	4	6	28
Computer	3	0	2	1	1	3	2	12
Computer or researcher	0	0	1	0	1	0	1	3
Researcher	0	0	0	0	0	0	2	2
Don't know	1	0	0	0	1	1	1	4
WA or FPE more difficult?								
WA	1	1	1	0	0	2	3	8
FPE	5	1	7	2	1	5	6	27
Same level	1	2	4	0	3	1	3	14
Notice Background colors?								
Yes	5	3	11	2	2	8	10	41
No	2	1	1	0	2	0	2	8
Notice coop. statements?								
Yes	6	4	11	2	4	8	9	44
No	1	0	1	0	0	0	3	5
Part. statements affect FPE?								
Increased cooperation	5	3	7	1	2	3	4	25
Decreased cooperation	1	0	1	0	0	1	0	3
Did not affect	0	1	4	1	2	4	6	18
No response	1	0	0	0	0	0	2	3
Motivated by money?								
Not at all	1	0	2	0	0	2	3	8
A little	2	1	2	1	1	3	2	12
Somewhat	2	0	4	0	1	1	3	11
Very much	2	3	3	1	1	2	2	14
Didn't notice	0	0	1	0	1	0	2	4
Had you heard of the study?								
Yes	1	0	1	0	0	0	0	2
No	6	4	11	2	4	8	12	47

Table 17

Verbatim open-ended answers to joke-specific post-experiment questions

Part. ID	Videos funny?	Which one(s)?	How did they influence your WA or FPE?
E09	No		
E11	Yes	The video about anime and the fortnite kid was the funniest.	No they haven't changed my perspectives at all
E15	Yes	The weaboo video was amusing.	Not truly, sometimes I would think about the video and it's message for a quick moment at the beginning however after I paid them no mind.
E23	Yes	I thought the Soundcloud rapper one was funny just because it's a dumb funny	They did not influence my decision to work alone or with others - I honestly forgot they were there
E24	Yes	Wine drinking, I don't remember all the videos	I honestly did not think those videos influenced picking working alone
E31	No		
E36	No		
e39	No		i primarily just chose to work alone
E45	Yes	The one with the top hat and naked man	It do not think it influenced me
E48	No		
F02	Yes	The fortnite and burning homework ones!	They were just primarily about working together. That is what influenced me to fix my partners errors more.
F03	Yes	The one with the mormon and water	I don't feel as if they did
F04	Yes	I liked the 90s hip hop one.	When it talked about participation I worked more on my own, and when it talked about collaboration I tended to work more on fixing my partners errors.
F08	No		
F09	Yes	The one with Dave	The videos gave cues on what option was better to do.
F10	No		The words made me feel a certain way about working with my partner such as not being self-indulgent or simply if my participation alone was appreciated
F13	Yes	The bellatrix one was my favorite because I'm a big Harry Potter fan	Didn't really influence me one way or another
F14	No	Maybe the gaming one	Made me want to participate
F18			Because I actually got paid for doing my own work
F19	Yes	The ones that had specific names, and prior in the experiment the fortnite one was really funny.	When the video prompted "cooperation" before the evaluations I felt like I should help fix my partner errors.
F21	Yes	Mostly the ones that had jokes in them.	They did not influence my decision to work alone.
F22	Yes	the one about cotton eyed Joe and the pornography one	they didn't
F24	Yes	The Sparta one was kind of funny	Didn't really influence me, I chose to work mainly alone

F26	Yes	The ones with puns	When it mentioned working together I felt that I was suppose to
F28	Yes	Fortnite	Work cooperatively
F29	Yes	The Sparta one was slightly funny	I did end up favoring whatever the video told me to do.
F32	No		
F33	Yes	I thought the TP joke was funny	This really made me want to work with another individual. It is funny and makes a good point.
F34	Yes	John has your backside	they did not really influence my choice, but maybe subconsciously gave me the push to help
F35	No		
F36	Yes	Santa	The funny videos I would start initially with fixing my partners and would switch between myself and fixing.
F42	Yes	the karl marx one	I thought that would give me an incentive
F45	Yes	There were ones that had references I understood like the Naruto weeb one that was pretty funny	I don't think they had any influence on my choice to work alone
F49	Yes	The one that said to stop, collaborate and listen.	They made me try to work with others.
F50	No		
f51	Yes	The "he's got your backside"	They didn't really.
f52	Yes	Pizza Costume	Made me laugh so I did better
F54	Yes	The gary one	It made me want to help when thinking about others.
F57	Yes	The ones that referenced pop culture.	They did not influence me
F58	Yes	The toilet paper one, the team player.	If I saw conditions like that, I would do more fix partner choices.
F59	Yes	The ones that involved coworkers and how they make work fun.	Sometimes I felt inclined to fix partner errors in order to move faster.
F60	Yes	The Harry Potter one and santa one	The more funny the more I thought about team work
F61	Yes	The porn one got a good chuckle out of me	I don't know if it reallt affected my choice at all
F65	No		When given the videos about collaboration I tended to fix partner errors more in order to accomplish collaboration
F66	Yes	There were a couple, I can't remember exactly but I remember laughing at things that were relatively 'dumb' or ironic	If the video resembles something along the lines of people working together and it being fun.
F71	Yes	The vodka one.	It did not.
F73	Yes	The one that made the Harry Potter reference.	I don't think influenced too too much but it just made me think that I should help my partner.
F74	No		
F75	Yes	The grading curve one, Karl, and the commune guy.	The ones shown before doing the task made me feel as though there was supposed to be an incentive to collaboration.

Table 18

Frequency of jokes reported as funny and influential by performance group

	W	W-on-Trend	Partial W	Co-op Only	M	Little FPE	No Pattern	Total
Jokes funny?								
Belletrix	1	1	1	0	0	0	0	3
Beth	0	0	0	0	1	1	0	2
Bill	0	0	0	0	0	0	1	1
Caligula	0	0	0	0	0	1	0	1
Chuck	0	0	1	0	1	0	1	3
Dave	0	0	0	0	0	0	1	1
Gary	0	1	0	0	0	0	0	1
Jaden	1	1	2	0	0	1	0	5
Joe	0	0	0	0	0	0	1	1
John	0	0	2	0	0	1	1	4
Karl	0	1	0	0	1	0	0	2
Lance	0	0	0	0	1	0	0	1
Paul	0	0	1	0	0	2	0	3
Rob	1	0	0	0	0	0	1	2
Sam	0	0	1	0	1	0	0	2
Santa	0	1	1	0	0	0	0	2
Sparta	1	0	0	0	0	1	0	2
Tanner	0	0	0	0	1	0	0	1
Too vague to determine	0	0	1	2	0	0	2	5
Did jokes influence WA/FPE?								
Yes	4	4	7	1	1	0	3	20
Only temporarily	0	0	2	0	0	0	0	2
No	1	0	1	1	3	6	4	16
Maybe or unknown	1	0	0	0	0	0	1	2
Unanswered	1	0	2	0	0	2	4	9

Table 19

Participants performance by joke name and instruction type

Part.	First Joke Name	First Joke Instruction	First Joke %FPE	Second Joke Name	Second Joke Instruction	Second Joke %FPE
E09	Garth	Be like	0.83333	Gary	Be like	0.90000
E11	Jaden	Don't be like	0.00000	Sam	Don't be like	0.07692
E15	Chuck	Be like	0.51724	Paul	Don't be like	0.48276
E23	Gary	Be like	0.43750	Paul	Don't be like	0.78571
E24	Dave	Don't be like	0.00000	Santa	Don't be like	0.00000
E31	John	Be like	0.47368	Reginald	Don't be like	0.61111
E36	Sam	Don't be like	0.00000	Bill	Don't be like	0.00000
E39	SI Sally	Don't be like	0.56250	Noel	Don't be like	0.00000
E45	Bill	Don't be like	0.09091	Tanner	Be like	0.40000
E48	Wayne	Be like	0.60000	Bill	Don't be like	0.89474
F02	John	Be like	0.81250	Sam	Don't be like	0.65000
F03	Chuck	Be like	0.09091	Beth	Don't be like	0.42857
F04	Noel	Don't be like	0.50000	Rob	Be like	0.66667
F08	John	Be like	0.38462	Beth	Don't be like	0.19048
F09	Ed	Don't be like	0.25000	Dave	Don't be like	0.90000
F10	Chuck	Be like	0.37500	SI Sally	Don't be like	0.87500
F13	John	Be like	0.57143	Noel	Don't be like	0.00000
F14	Paul	Don't be like	0.85714	Bill	Don't be like	1.00000
F18	Chuck	Be like	0.55556	Rob	Be like	0.41667
F19	Paul	Don't be like	0.00000	Gary	Be like	0.84615
F21	John	Be like	0.00000	Bill	Don't be like	0.00000
F22	CE Joe	Be like	0.45455	Tanner	Be like	1.00000
F24	Sparta	Be like	0.12500	Gary	Be like	0.00000
F26	Gary	Be like	0.00000	Tanner	Be like	0.00000
F28	Jaden	Don't be like	0.84615	John	Be like	0.64286
F29	Noel	Don't be like	0.85714	Sparta	Be like	0.50000
F32	Dana	Be like	0.26667	Paul	Don't be like	0.09524
F33	Sam	Don't be like	0.73333	John	Be like	0.52632
F34	Tanner	Be like	0.53846	John	Be like	0.50000
F35	Bill	Don't be like	0.53333	Noel	Don't be like	0.94737
F36	Santa	Don't be like	0.63158	Tanner	Be like	1.00000
F42	Bill	Don't be like	0.21429	Karl	Be like	1.00000
F45	Gary	Be like	0.00000	CE Joe	Be like	0.00000
F49	Tanner	Be like	1.00000	Rob	Be like	0.00000
F50	Reginald	Don't be like	0.31250	Santa	Don't be like	0.23529
F51	John	Be like	0.08333	Garth	Be like	0.00000
F52	Chuck	Be like	0.07143	Beth	Don't be like	0.05556
F54	Dana	Be like	0.08333	Gary	Be like	0.42857
F57	Bill	Don't be like	0.50000	Paul	Don't be like	0.69231
F58	Genghis	Be like	0.00000	John	Be like	0.25000
F59	Garth	Be like	0.28571	Sam	Don't be like	0.23529
F60	Santa	Don't be like	0.63636	Bill	Don't be like	1.00000
F61	Paul	Don't be like	0.25000	Chuck	Be like	0.35714
F65	Rob	Be like	0.45455	Gary	Be like	0.75000
F66	Caligula	Be like	1.00000	Chuck	Be like	0.46154
F71	Tanner	Be like	0.00000	Sparta	Be like	0.00000
F73	SI Sally	Don't be like	0.25000	Noel	Be like	0.41667
F74	Ed	Don't be like	0.00000	Bill	Be like	0.00000
F75	Karl	Be like	0.69231	Lance	Be like	0.60000

Table 20

Responding accuracy by condition for W and W-on-Trend groups

PartID	Joke 1 % Correct	Neutral 1 % Correct	Cooperation % Correct	Neutral 2 % Correct	Joke 2 % Correct
			W Group		
F04	100.0	88.9	100.0	77.8	88.9
F14	66.7	90.0	88.9	90.0	100.0
F18	100.0	90.9	100.0	100.0	91.7
F29	92.9	100.0	94.1	100.0	95.0
F32	93.3	100.0	100.0	100.0	95.2
F65	90.9	91.7	84.6	75.0	93.8
F73	100.0	100.0	100.0	100.0	83.3
Totals	94.4	95.5	95.6	94.0	93.2
			W-on-Trend Group		
F28	92.3	100.0	100.0	100.0	92.9
F42	100.0	100.0	92.9	86.7	85.7
F54	100.0	100.0	100.0	93.3	100.0
F60	100.0	100.0	100.0	71.4	83.3
Totals	98.0	100.0	98.1	90.6	91.7
			W and W-on-Trend		
Totals	95.9	97.2	96.6	92.8	92.7

Figure 1
Diagram of trained and derived relations
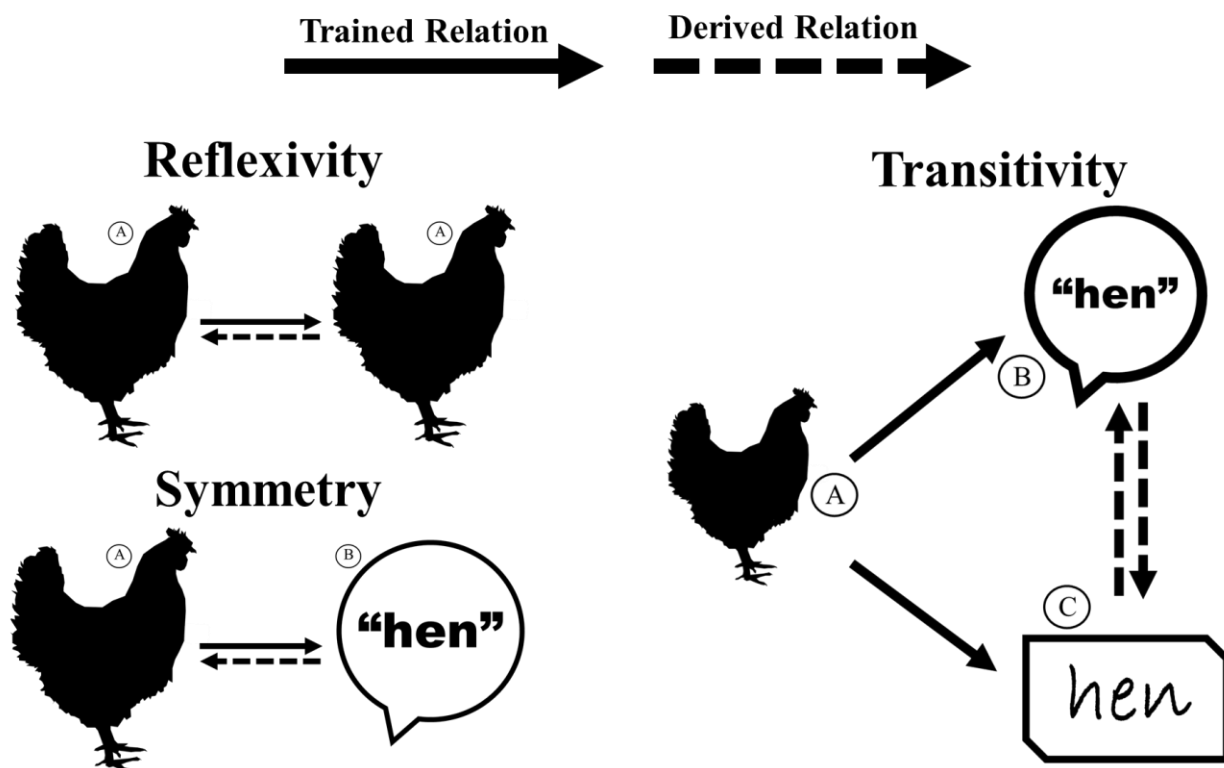
Figure 2
Examples of the "Don't be a Dick" jokes shared on social media
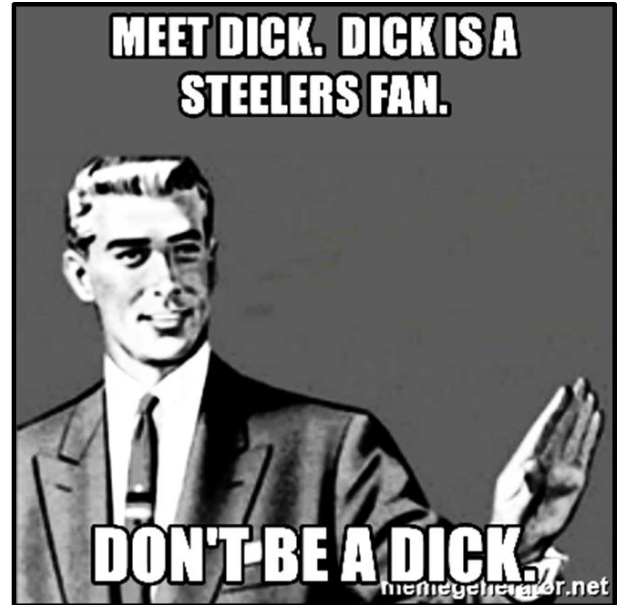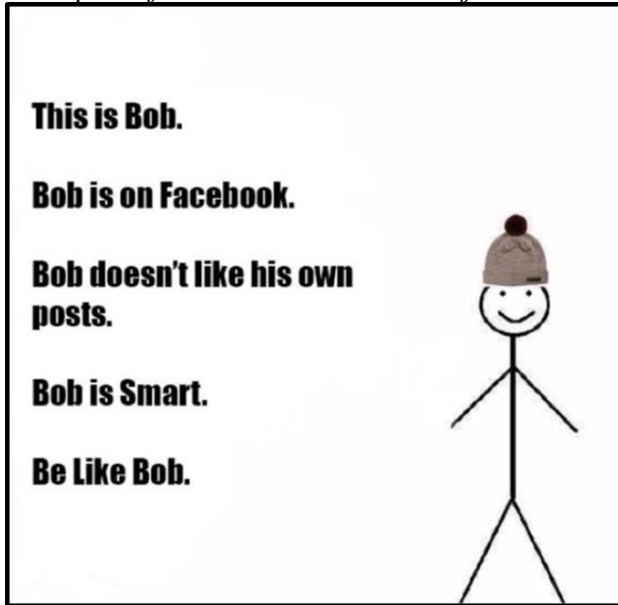
Figure 3

Pilot Study A groups

	Piece Rate (PR)	Pay for Time (PT)
Stimuli Ranking High to Low	Group 1	Group 2
Stimuli Ranking Low to High	Group 3	Group 4

Figure 4

Pilot Study A conditions by group

	A	B	A	C	D_1	C	D_2	C	D_3	C	D_4
GROUP 1	Piece-Rate (PR)	Pay for Time (PT)	PR	PR	PR	PR	PR	PR	PR	PR	PR
High to Low IV Ranking	No Statement (--)	--	--	Neutral Statement (N)	High Motivating Statement (MH)	N	MH	N	Low Motivating Statement (ML)	N	ML

	A	B	A	E	F_1	E	F_2	E	F_3	E	F_4
GROUP 2	PR	PT	PR	PT	PT	PT	PT	PT	PT	PT	PT
High to Low IV Ranking	--	--	--	N	MH	N	MH	N	ML	N	ML

	A	B	A	C	D_4	C	D_3	C	D_2	C	D_1
GROUP 3	PR	PT	PR	PR	PR	PR	PR	PR	PR	PR	PR
Low to High IV Ranking	--	--	--	N	ML	N	ML	N	MH	N	MH

	A	B	A	E	F_4	E	F_3	E	F_2	E	F_1
GROUP 4	PR	PT	PR	PT	PT	PT	PT	PT	PT	PT	PT
Low to High IV Ranking	--	--	--	N	ML	N	ML	N	MH	N	MH

Figure 5

Pilot Study A participants' percentage fix partner errors by condition
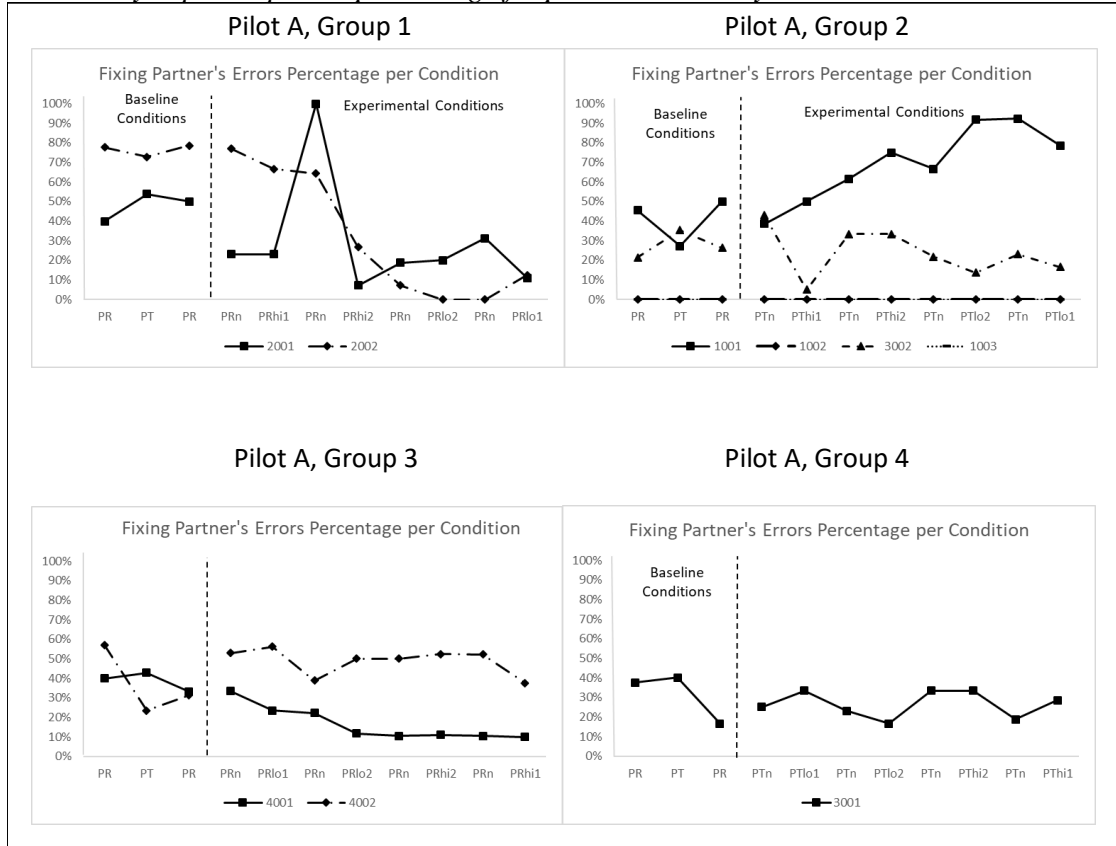
Figure 6

Pilot Study B groups and conditions

	A	B	A	C	D1	C	D2
Group 1	Piece-Rate (PR)	Pay for Time (PT)	PT	PT	PT	PT	PT
John, Santa	No Statement (--)	--	--	Neutral Statement (N)	John	N	Santa

	A	B	A	C	D2	C	D1
Group 2	Piece-Rate (PR)	Pay for Time (PT)	PT	PT	PT	PT	PT
Santa, John	No Statement (--)	--	--	Neutral Statement (N)	Santa	N	John

Figure 7

Pilot Study B participants' percentage fix partner errors by condition
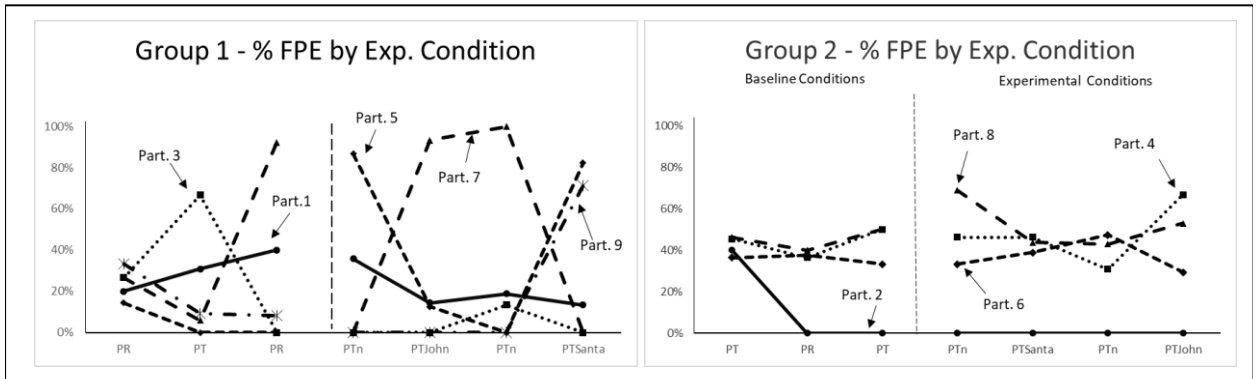
Figure 8

Pilot Study C groups and conditions

Pilot Study C – Grp A	A	B	A	C	D1	C	D2
	Piece-Rate (PR)	Pay for Time (PT)	PR	PT	PT	PT	PT
	No Statement (--)	--	--	Neutral Statement (N)	Joke 1	N	Joke 2

Pilot Study C – Grp B	A	B	A	D1	C	D2	C
	Piece-Rate (PR)	Pay for Time (PT)	PR	PT	PT	PT	PT
	No Statement (--)	--	--	Joke 1	Neutral Statement (N)	Joke 2	N

Figure 9

Pilot Study C examples of participants' percentage fix partner errors by condition
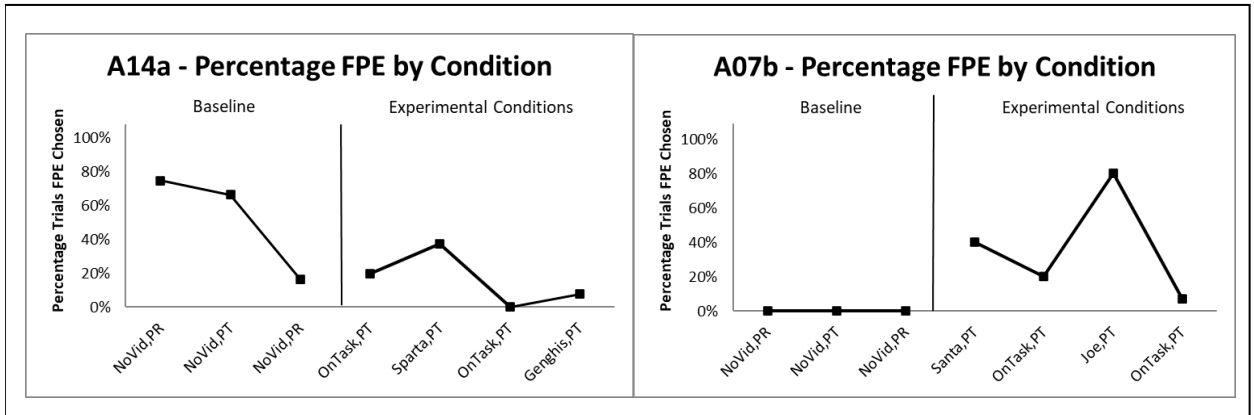
Figure 10

Pilot Study C examples of participants' percentage fix partner errors by condition
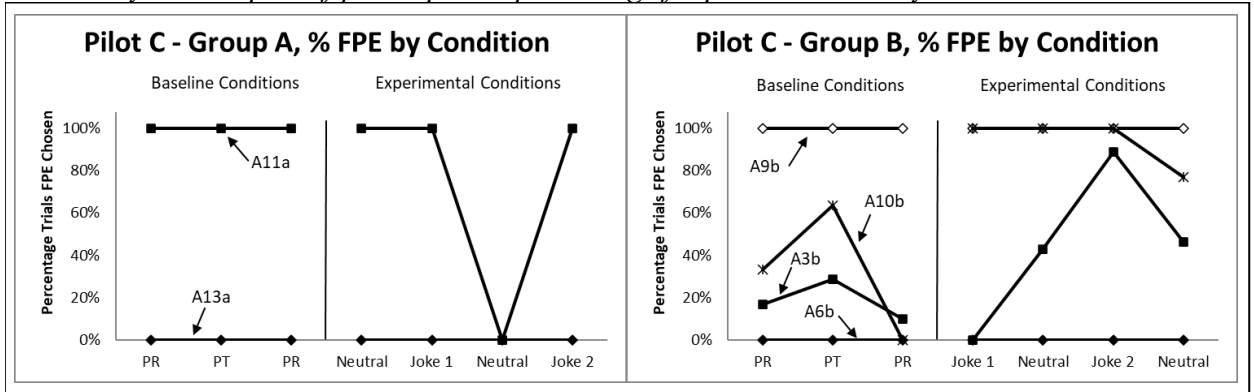
Figure 11

Pilot Study D conditions

Pilot Study D	A	B	A	C	D1	C	E	C	D2
	Piece-Rate (PR)	Pay for Time (PT)	PR	PT	PT	PT	PT	PT	PT
	No Statement (--)	--	--	Neutral Statement (N)	Joke1	N	Coopera-tion	N	J2

Figure 12

Pilot Study D examples of fix partner errors by condition
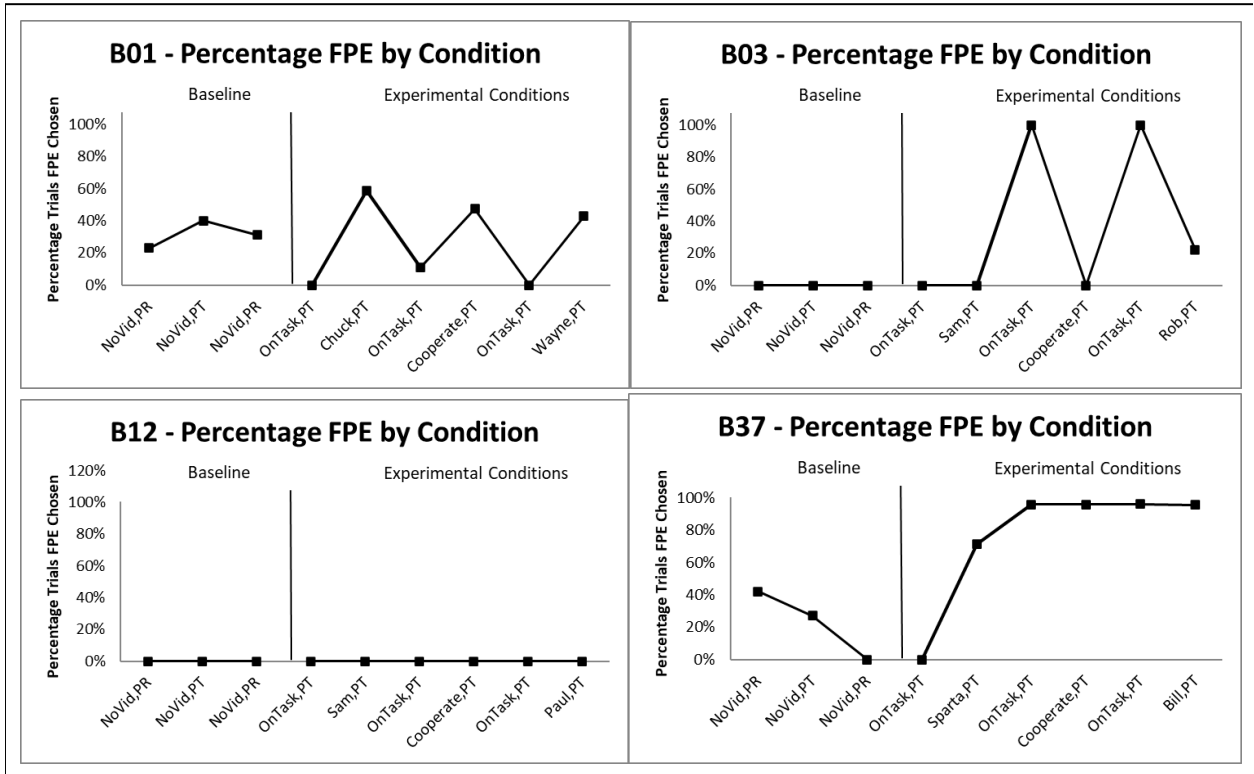
Figure 13

Pilot Study E conditions

Pilot Study E	A	B	A	B	D1	C	E	C	D2
	Piece-Rate (PR)	Pay for Time (PT)	PR	PT	PT	PT	PT	PT	PT
	No Statement (--)	--	--	--	Joke1	N	Coopera-tion	N	J2

Figure 14

Study 2 conditions

Study 2	A	B	A	B	D1	C	E	C	D2
	Piece-Rate (PR)	Pay for Time (PT)	PR	PT	PT	PT	PT	PT	PT
	No Statement (--)	--	--	--	Joke1	N	Coopera-tion	N	J2

Figure 15

Example of responding by percentage of fix partner errors in the Little FPE group
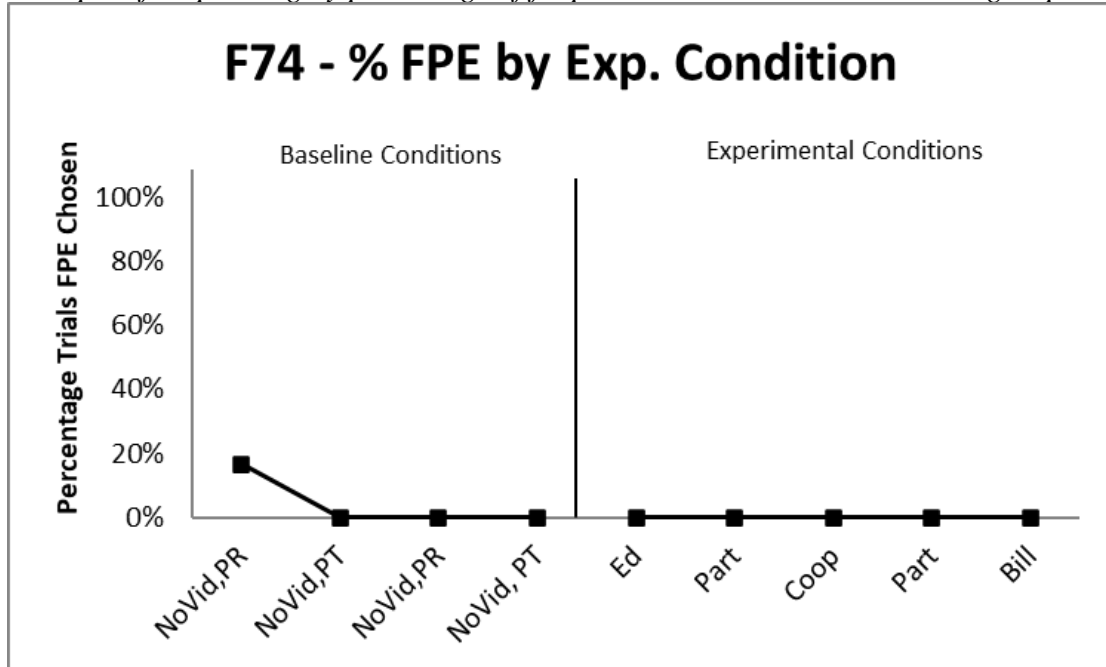
Figure 16

Responding by percentage of fix partner errors of all participants in the Little FPE group
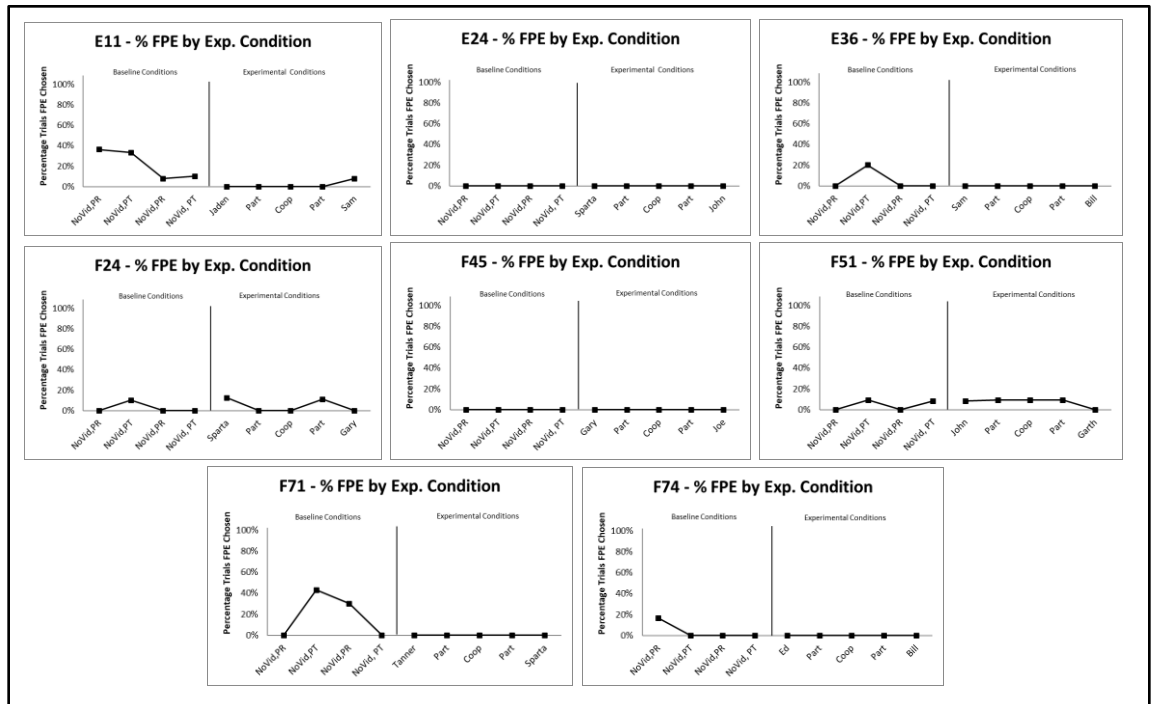
Figure 17

Example of responding by percentage of fix partner errors in the No Pattern group
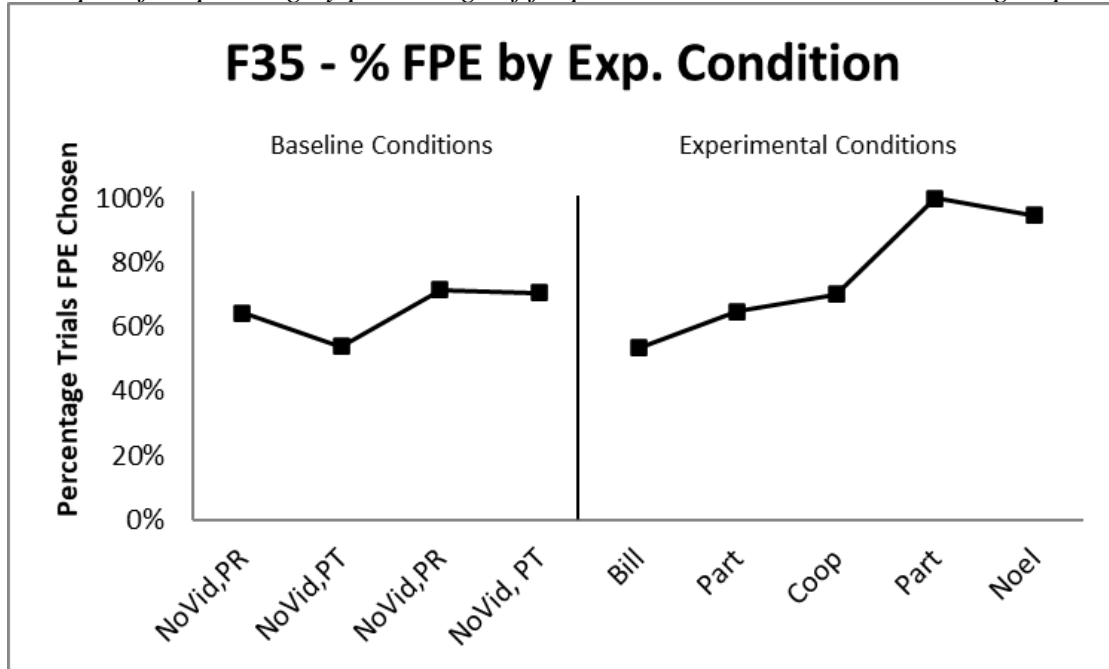
Figure 18

Responding by percentage of fix partner errors for all participants in the No Pattern group
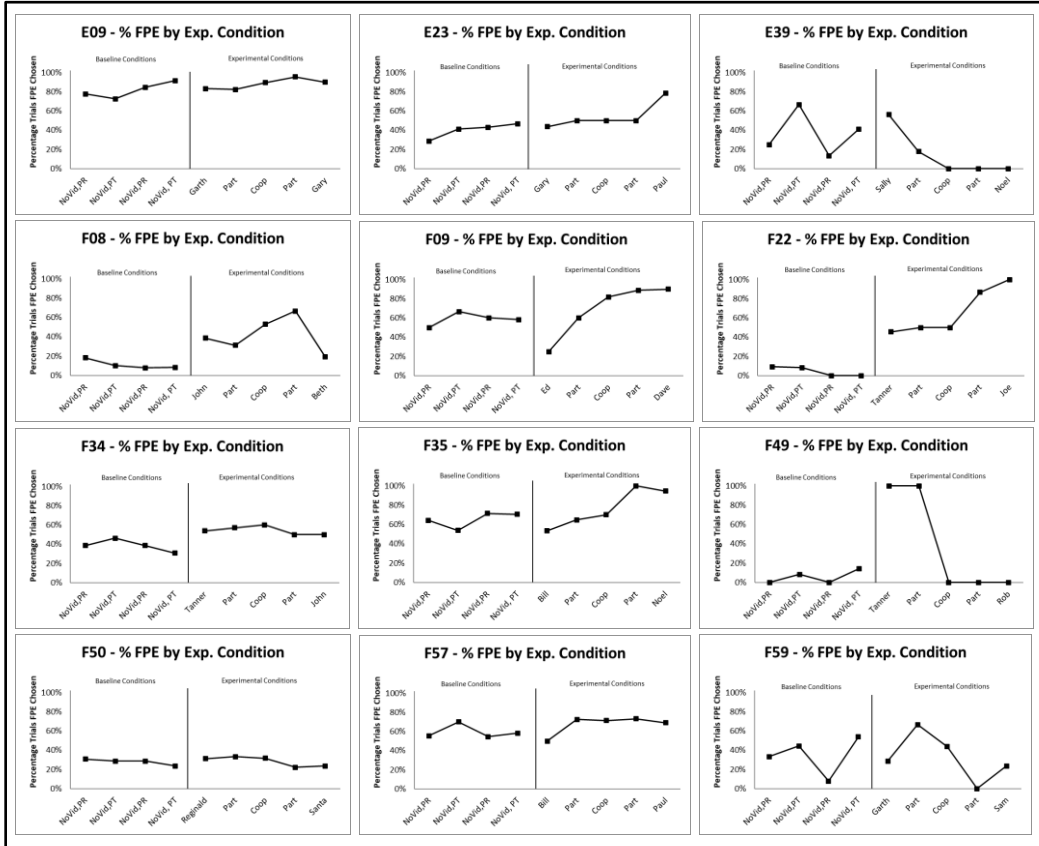
Figure 19

Example of responding by percentage of fix partner errors in the W group
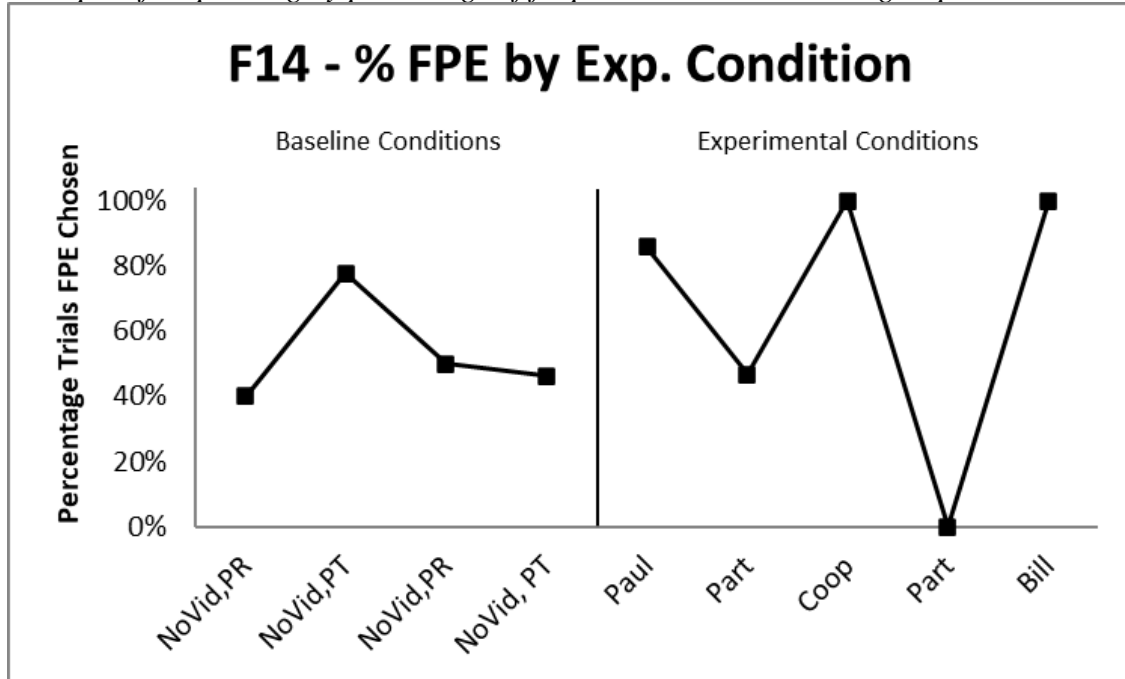
Figure 20

Responding by percentage of fix partner errors for all participants in the W group
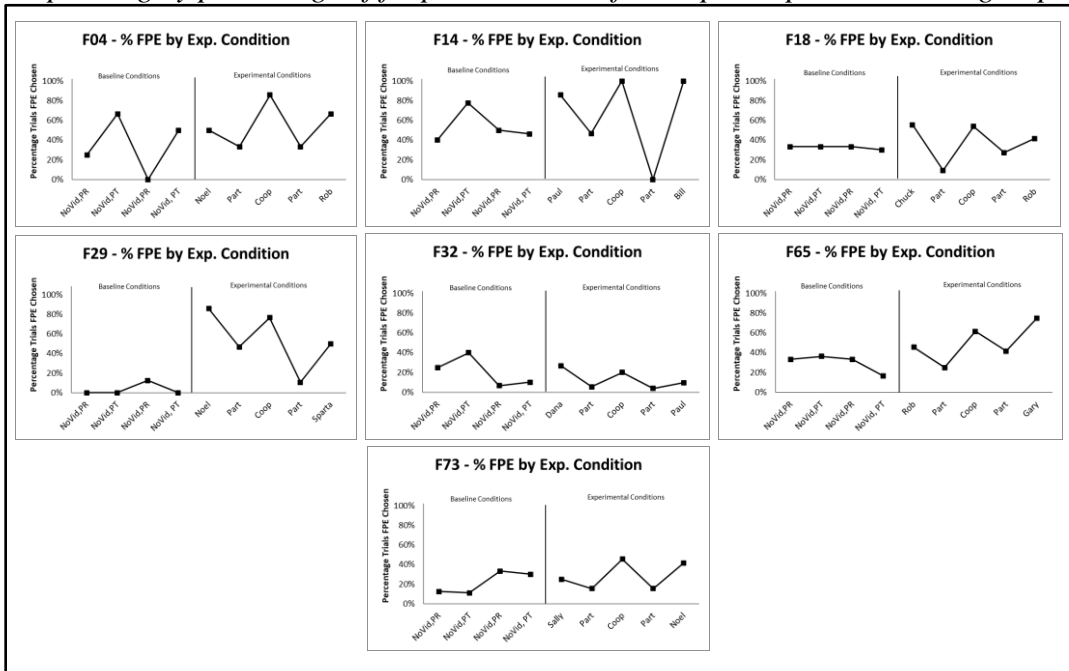
Figure 21

Example of responding by percentage of fix partner errors in the W-on-Trend group
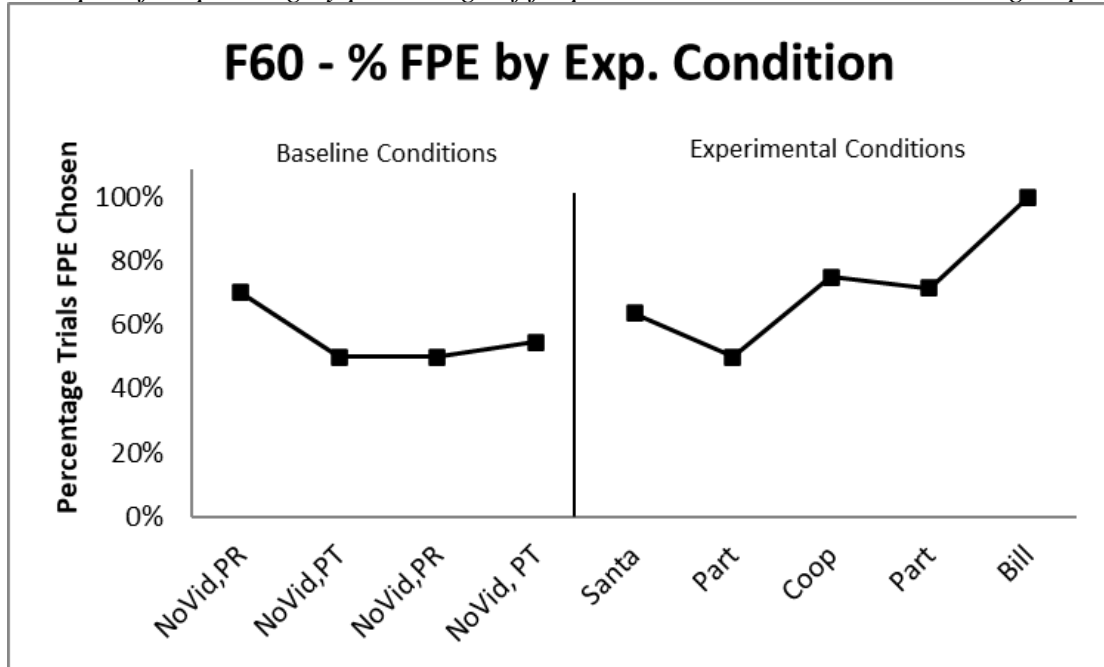
Figure 22

Responding by percentage of fix partner errors for all participants in the W-on-Trend group
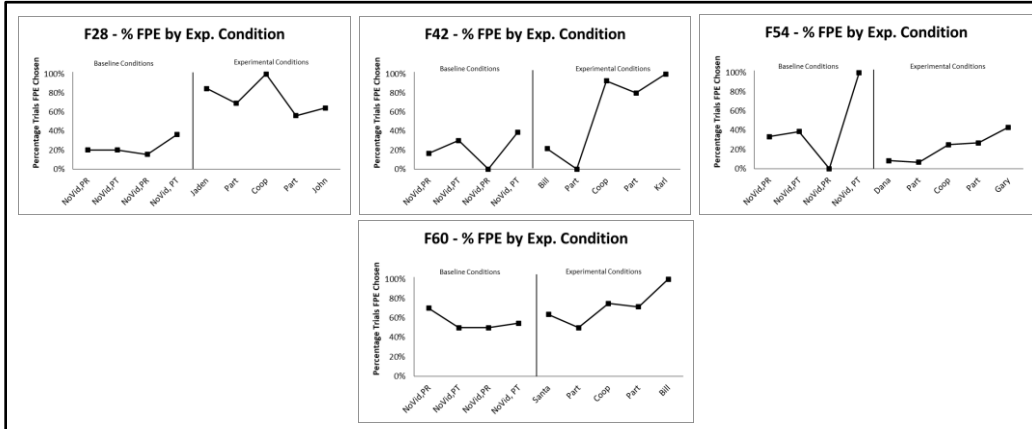
Figure 23

Example of responding by percentage of fix partner errors in the Partial W group
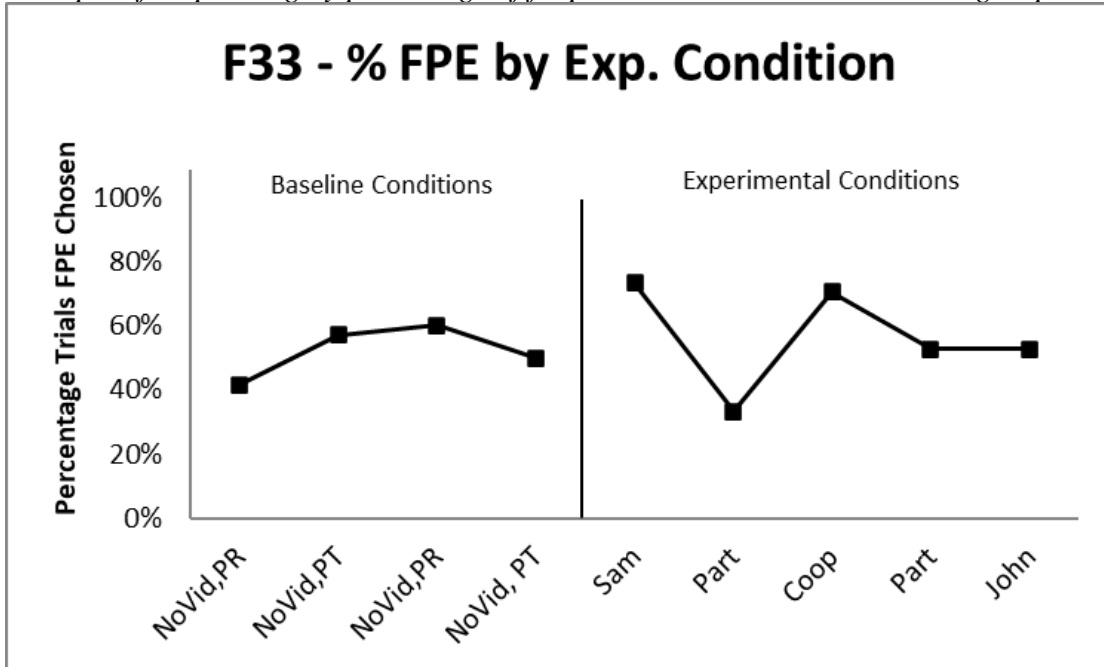
Figure 24

Responding by percentage of fix partner errors for all participants in the Partial W group
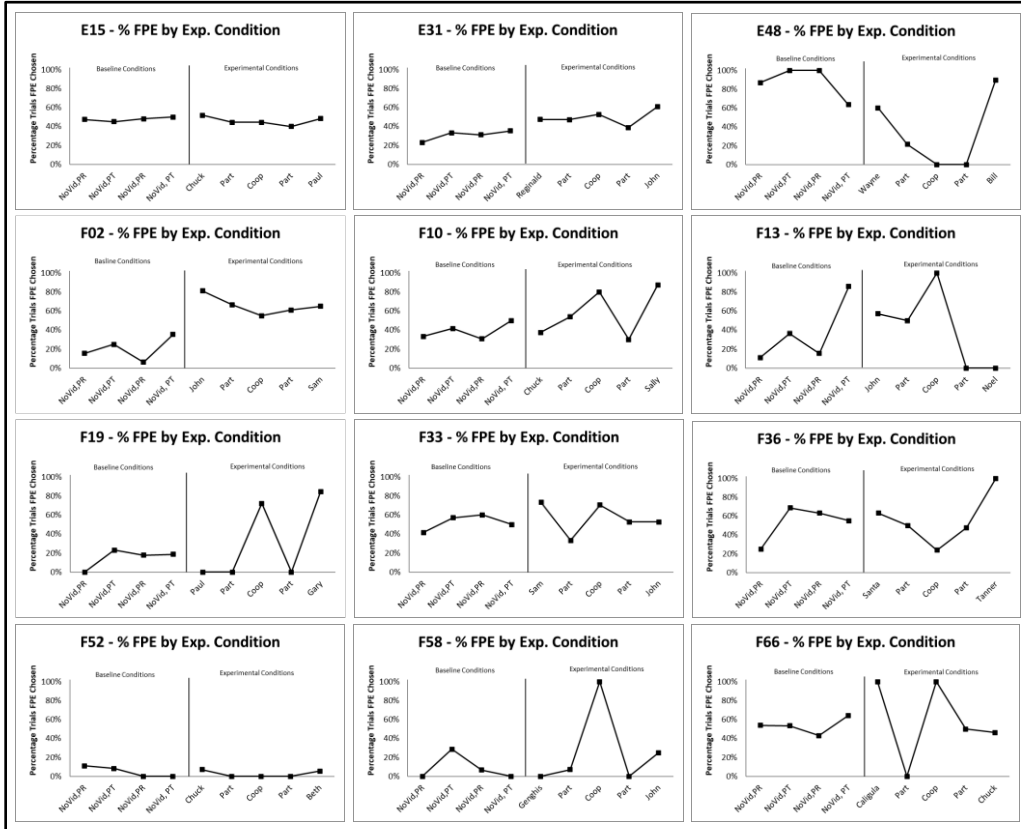
Figure 25

Example of responding by percentage of fix partner errors in the Co-op group
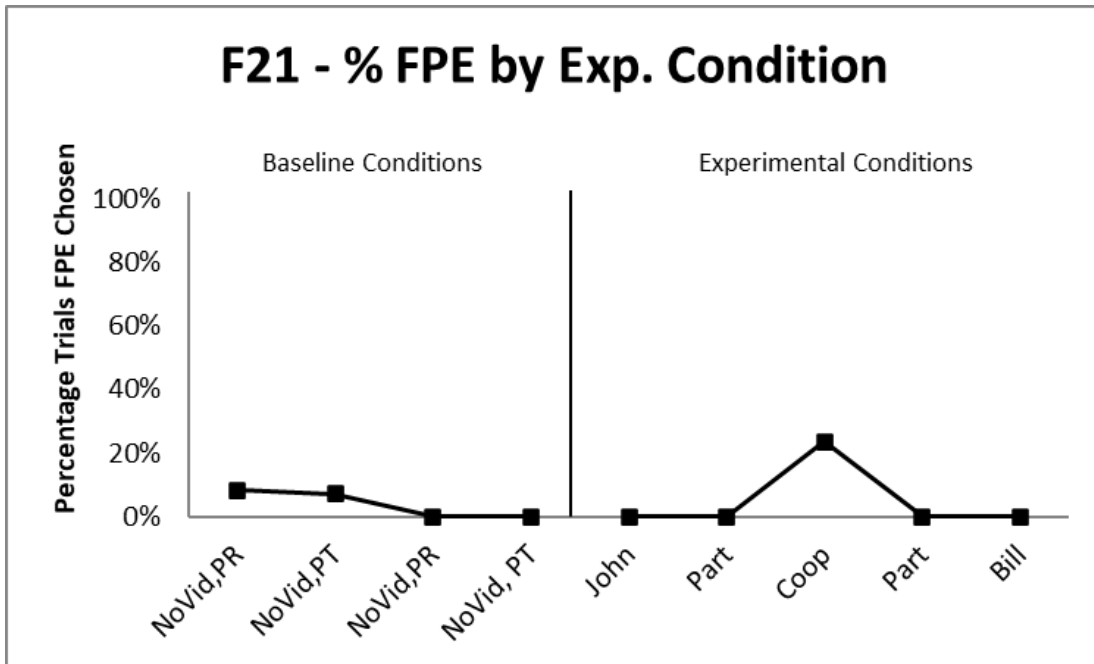
Figure 26

Responding by percentage of fix partner errors for all participants in the Co-op Only group
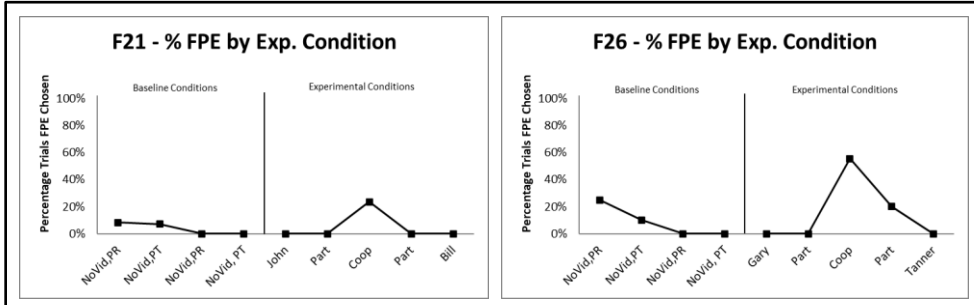
Figure 27

Example of responding by percentage of fix partner errors for the M group
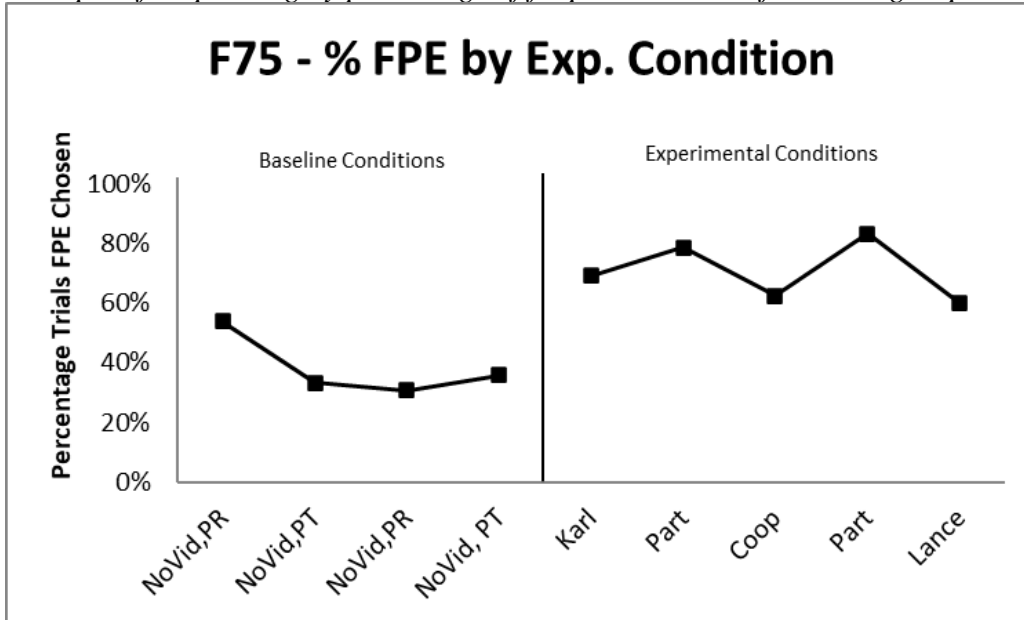
Figure 28

Responding by percentage of fix partner errors for all participants in the M group
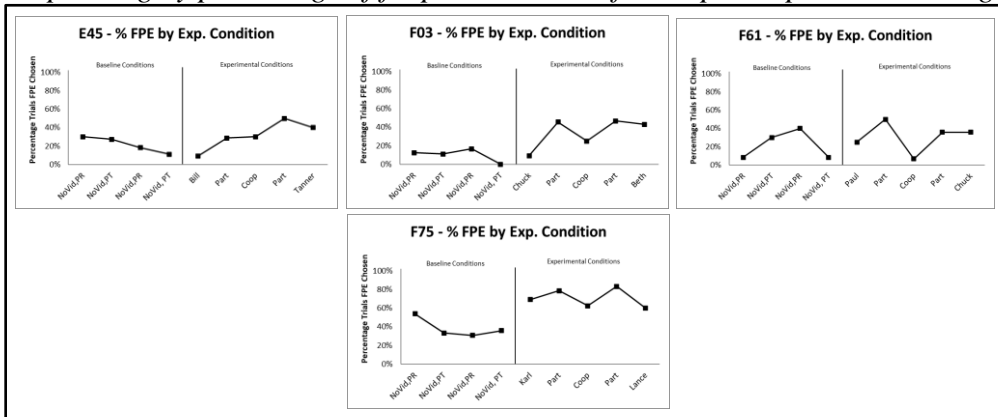
Appendix A

Hello Comics! My name is Chelsea Wilhite. (Yeah, I'm Wayne's wife. I'm lazy and never changed my name.) I am trying (desperately) to finish my PhD. My dissertation is all I have left to do. I want to see if/how humorous statements influence how likely someone is to cooperate with others. In order to do that, I need some funny shit to show them. So, here are the guidelines (yeah, they're rules but "guidelines" sounds nicer).

1. Jokes must follow the, "This is Bob. Blah blah blah. Blah blah blah. Be like Bob/Don't be like Bob," format.
   a. Feel free to change the name and "This is" and "Be like/Don't be like" wording to suit your needs as long as it means the same thing.

2. Jokes must encourage cooperation, collaboration, group effort, and/or being a team player.

3. Jokes must include the words/phrases "cooperation," "collaboration," "group effort," or "team player" or their conjugations.
   a. Synonyms of these words/phrases may be used but might not make the final cut.

4. Jokes must be between 25 and 35 words long.

5. Nothing blue. (I know. I'm no fun and suck as a human being. Sorry!)
I have the right to add/eliminate/change words as I see fit.
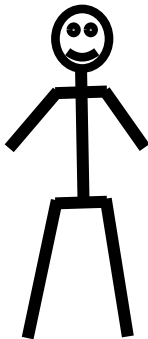
I will pay:
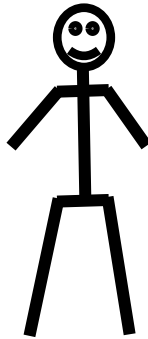
- **$1** per completed joke that fits these parameters
- An additional **$10** per joke that makes the final cut for Part 1 of my study (total of 10-15 jokes) as determined within the next two weeks.
- An additional **$20** each for the four top-ranking jokes from Part 1 (participants will rate the jokes for how "funny" they are and how likely they are to get them to "cooperate with others") as determined within the next two months.
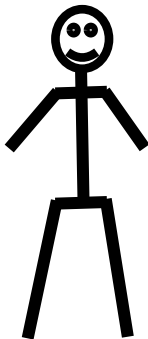
So, make sure you put your names on the papers. If you work in pairs or teams, *you* will be in charge of dividing the money—I'm not messing with that sticky situation.
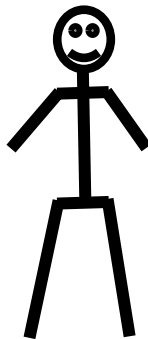
Appendix B

Author(s) Name(s):

_____

Appendix C

Stimuli Scripts

This is Belletrix. Belletrix was able to kill the very powerful Sirius Black because she was a team player. Be like Belletrix… but not crazy and evil.

This is Beth. When Mormon missionaries show up on hot days, she thinks it's funny to offer water but serves vodka instead. Beth pretends to cooperate but doesn't. Don't be mean like Beth.

This is Bill. Bill wants to be a musician but he doesn't like collaboration. Now Bill is a mumble rapper on SoundCloud. Don't be like Bill.

Bob lives 5 miles from work. Tim lives 30. They both leave at 9:15, who gets to work first? Tim, because Bob's hung over and stops for breakfast tacos. Bob fails at teamwork. Don't be Bob.

Meet Caligula. Caligula needed many people to satisfy his needs. With teamwork and a lot of wine and positive attitude, his subjects were able to make him happy. Be enthusiastic like Caligula's subjects.

This is Chuck the Pizza Guy. Chuck collaborated on a pornography set by lending his uniform to the lead actor. Chuck was helpful. Be like Chuck.

This is Cotton-Eyed Joe. No one knows where he came from or where he'll go—solid team player, though. If you have to be mysterious, be like Cotton-Eyed Joe.

This is Dana. Dana knows how to have fun, hence the silly glasses. Everyone in Dana's group works together and gives 100% because Dana makes work suck less. Party on, Dana.

This is Dave. Dave was asked to make a PowerPoint for today's group presentation. But he watched cat videos and took a nap instead. Dave hates cooperation. Don't be like Dave.

This is Doc Holliday. Doc Holliday cooperated with Wyatt Earp and others no one remembers to rid Tombstone of outlaws. He twirled a tiny cup and was played by Val Kilmer. Be like Doc Holliday.

This is Ed. Ed notices no one is enjoying the Twilight movie marathon. Ed takes a poll to see what everyone wants to watch.   But he continues Twilight anyway. Poor group effort. Don't be Ed.

This is Garth. Garth knows how to party, hence the silly hat. Everyone in Garth's group cooperates and gives their best effort because Garth makes them forget that work sucks. Party on, Garth.

This is Gary. Gary is a geologist. Gary wants to get your opinion on some mineral samples because Gary loves collaboration… and he thinks you rock! Be cool like Gary.

Meet Genghis. Genghis would spare his adversaries' lives if they had skill in battle and would join his group's efforts to conquer new lands. Be kind of like Genghis.

This is Jaden. Jaden is a 13-year-old Fortnite player. He thinks it's totally lit to Twitch stream himself wrecking his own team's fort. Jaden's not lit. Don't be Jaden.

This is John. John replaces the toilet paper every time the roll is empty. What a team player. He always has your backside. Be like John.

This is Karl. Karl had lots of ideas about labor even though he never really had a job. Teamwork is good and rarely ends in atrocities. Be like Karl.

This is Lance. Lance makes breakfast for his commune and uses the eggshells to make body jewelry. His commune members think he's odd but appreciate his collaborative efforts. Lance is cool.

This is Neil. Neil fights squirrels on the weekend. That's a little nutty, but not as nutty as his hatred of teamwork. Don't be like Neil.

This is Noel. Noel has been practicing Wonderwall on his guitar in his dorm room for the last five weeks, making it impossible to finish our group project. Don't be a Noel.

This is Paul. All Paul cares about is anime and magna, and he only cooperates with people if they watch the show Naruto. Don't be a Weeaboo like Paul.

This is Rob. Rob will stop, collaborate and listen. He will help with your brand new invention. Rob likes '90s hip-hop and teamwork. Be like Rob.

This is Sam. Sam turned in your homework for you, but he turned it into a pile of ashes. Sam believes in the grading curve more than teamwork. Don't be like Sam.

This stick figure is supposed to be Santa. Santa enslaves elves while receiving international praise. He's not a team player. It's only a matter of time before the elves rise to overthrow him. Don't be Santa.

This is Self-Indulgent Sally. Sally picks karaoke songs over seven minutes long, and doesn't care that everyone hired babysitters and just wants to sing Wagon Wheel and go home. Don't be a Self-Indulgent Sally.

This is Sir Reginald. Reginald thinks his ideas are better than everyone else's. He doesn't cooperate. He'd rather eat biscuits, drink tea, and drive on the wrong side of the road. Don't be Sir Reginald.

This is Sparta. Spartans worked really well together. Through the power of teamwork, 300 Spartans held off King Xerxes' massive army. Even if the reference is dated, be like Sparta.

This is Tanner. Tanner thinks top hats are so cool that he doesn't have to wear clothes. No one corrects him because he's incredibly nice and a team player. Be like Tanner… but with pants.

This is Wayne. Wayne knows how to be silly, hence the funny vest. Everyone at Wayne's work collaborates and tries hard because Wayne makes them forget they're at work. Party on, Wayne.

Appendix D

Inclusion Criteria Form

Please Indicate the following:	Yes	No	N/A
Are you under the age of 18?			
Have you previously participated in a study entitled "The effects of humorous stimuli on cooperative responding?"			
Have you previously participated in a study entitled "The Effects of Individually-Determined Stimuli on a Data Entry Task?"			
Have you previously participated in a study entitled "The Effects of Group-Determined Stimuli on a Data Entry Task?"			
Have you previously participated in a study entitled "The Effects of Varying Stimuli on a Data Entry Task?"			

**If you have answered "Yes" to any of the above listed questions then you are ineligible to participate in this study.
I attest that all the above marked information is accurate.

_____   _____
Participant Signature   Date

Appendix E

Medical Data-Entry Instructions

For this part of the study you will be working as an Electrocardiography (ECG) Technician for a medical records company named Medical, Incorporated. One of the main responsibilities of ECG Technicians is to review and compare patient heart rates and rhythms against normal ranges.

Being that accuracy of reporting for this job is extremely important, you will be working with a partner to correct each other's mistakes. In order to ensure correct screens, at any time, you can either choose to work on your own data-entry comparisons or select to fix your partner's errors.

(refer to screen shot examples)

To begin comparing and completing each patient's set of information, you will:
- Select the button that says "start work session", which will begin a 3-minute timer
- At that time, you can select to either "work alone" or "fix partner's errors"
    - No Matter what you choose, the data entry task remains pretty much the same.

On Each Data Entry Screen: You will be shown everything you need to know to report 1) The patient's QT interval (i.e., patient gender and QT interval) and 2) The Patients Heart Rate (i.e., patient age and heart rate).

To determine QT interval:
You will compare your patient's QT Interval value with the normal QT interval range for both genders as presented on the screen. You will then use the mouse and click the "below range", "within range" or "above range" option depending upon where your current patient's value lies.

To compare Heart Rate:
As in determining patient QT interval values, you will compare the patient's presented heart rate to a series of ranges based on the person's indicated age. After doing so, you will select if it is "below average", "average" or "above average" and then click "submit" to complete the screen.

*Once you submit the screen, a small red "X" will appear if you made an error in your data-entry.

At this point the two buttons with "work alone" and "fix partner's errors" will reappear. If you choose to "work alone" the next patient's information will appear for you to complete. If you choose to "fix partner's errors" the screen will appear with pre-completed fields on the right for you to correct any mistakes.

You will continue completing patient data screens until each 3-minute work session ends. At the conclusion of each session, you will be provided with a feedback screen, which will indicate how many screens you completed correctly and how much money you have earned for doing so.

There will also be a counter on the screen illustrating these earnings.

Lastly, you will notice that the background color changes – you'll want to pay attention to these colors since it's related to how you get paid in the work task.

Any Questions?

We will begin with a series of practice trials. When they are complete a message will appear saying that you are done and to get the experimenter. You will then come and get me and I will start you on the actual experiment. At the end of the entire work session you will be given a survey that will ask you questions about your experience during the study.

Appendix F

Appendix G

Post-Experiment Questionnaire

Q1 Please enter Participant ID:

_____

Q2 During the task, did you primarily work alone or fix partner errors?

○ Primarily worked alone

○ Primarily fix partner errors

○ I don't know

Q3 If you primarily worked alone or primarily fix partner errors, why did you choose to do so?

_____

Q4 Did you think any of the reminders were funny?

○ Yes

○ No

Q5 If so, which one(s)?

_____

Q6 If so, how did they influence your decision to work alone or fix partner errors?

_____

Appendix H

Staying on task is highly valued.

Appendix I

Post-Experiment Questionnaire

Q1 Please enter Participant ID. _____
Q2 During the task, did you primarily work alone or fix partner errors?
    ○ Primarily worked alone
    ○ Primarily fix partner errors
    ○ I don't know
Q3 If you primarily worked alone or primarily fix partner errors, why did you choose to do so?
    _____

Q4 Did you think any of the videos were funny?
    ○ Yes
    ○ No
Q5 If so, which one(s)? _____
Q6 If so, how did they influence your decision to work alone or fix partner errors?
    _____

Q7 How old are you (in years)? _____

Q8 What is your gender? _____

Q9 Are you a gamer?
    ○ Yes
    ○ No
Q10 Do you have vision problems severe enough to interfere with seeing computer screen details?
    ○ Yes
    ○ No
Q11 If so, do you use corrective devices?
    ○ Yes
    ○ No
Q12 If so, are you using them today?
    ○ Yes
    ○ No
Q13 Do you have hearing problems severe enough to interfere with hearing the audio you heard today?
    ○ Yes
    ○ No
Q14 If so, do you use corrective devices?
    ○ Yes
    ○ No
Q15 If so, are you using them today?
    ○ Yes
    ○ No
Q16 Was your partner another UNR student?
    ○ Yes
    ○ No
    ○ I don't know
Q14 If you answered "no" or "I don't know," who do you think your partner was?
    _____
Q15 How did your partner affect your level of cooperation? (cooperating = fixing partner errors)?

_____

Q16 Which one of the tasks, working alone and fixing partner errors, was more difficult?

_____

Q17 Did you notice the background color changing?
  ○ Yes
  ○ No

Q18 If you answered yes, what were the colors? _____

Q19 What do you think it meant when the background colors changed?

_____

Q20 How motivated were you by the money you were earning?
  ○ Not at all
  ○ A little
  ○ Somewhat
  ○ Very much
  ○ I didn't notice I was earning money.

Q21 There were written statements throughout the experiment RELATED TO COOPERATION. Did you notice the statements?
  ○ Yes
  ○ No

Q22 If you did notice the scrolling PARTICIPATION statements, how did they affect your level of cooperation (selecting to fix partner errors)?
  ○ Increased my level of cooperation
  ○ Decreased my level of cooperation
  ○ Did not affect my level of cooperation
  ○ None of the above

Q23 Had you heard about this study before participating?
  ○ Yes
  ○ No

Q24 My mood depends on what my friends think of me.
  ○ Never true
  ○ Very seldom true
  ○ Seldom true
  ○ Sometimes true
  ○ Frequently true
  ○ Almost always true
  ○ Always true

Q25 I care a lot about what my friends think of me.
  ○ Never true
  ○ Very seldom true
  ○ Seldom true
  ○ Sometimes true
  ○ Frequently true
  ○ Almost always true
  ○ Always true

Q26 If other people don't value my work, I feel as though it was not worth the effort.

○ Never true
○ Very seldom true
○ Seldom true
○ Sometimes true
○ Frequently true
○ Almost always true
○ Always true

Q27 It's very important for me to feel accepted by other people.
○ Never true
○ Very seldom true
○ Seldom true
○ Sometimes true
○ Frequently true
○ Almost always true
○ Always true

Q28 In order to be happy, I need people to value me.
○ Never true
○ Very seldom true
○ Seldom true
○ Sometimes true
○ Frequently true
○ Almost always true
○ Always true

Q29 My self-worth depends on what other people think and say about me.
○ Never true
○ Very seldom true
○ Seldom true
○ Sometimes true
○ Frequently true
○ Almost always true
○ Always true

Q30 My main goal in life is to be recognized and respected by those around me.
○ Never true
○ Very seldom true
○ Seldom true
○ Sometimes true
○ Frequently true
○ Almost always true
○ Always true

Q31 My decisions are very much influenced by other people's opinions.
○ Never true
○ Very seldom true
○ Seldom true
○ Sometimes true
○ Frequently true
○ Almost always true
○ Always true

Q32 I worry a lot about presenting a perfect image of myself.
○ Never true

○ Very seldom true

○ Seldom true

○ Sometimes true

○ Frequently true

○ Almost always true

○ Always true

Q33 What I do would be pointless if people couldn't see it.

○ Never true

○ Very seldom true

○ Seldom true

○ Sometimes true

○ Frequently true

○ Almost always true

○ Always true

Q34 Hard work is only worth it if people recognize it.

○ Never true

○ Very seldom true

○ Seldom true

○ Sometimes true

○ Frequently true

○ Almost always true

○ Always true

Q35 It's essential that other people have a good impression of me.

○ Never true

○ Very seldom true

○ Seldom true

○ Sometimes true

○ Frequently true

○ Almost always true

○ Always true

Q36 To feel good about myself, I need other people's approval.

○ Never true

○ Very seldom true

○ Seldom true

○ Sometimes true

○ Frequently true

○ Almost always true

○ Always true

Q37 I can't disappoint other people's expectations of me.

○ Never true

○ Very seldom true

○ Seldom true

○ Sometimes true

○ Frequently true

○ Almost always true

○ Always true

Q38 Before making a decision, I need other people to understand my reasons.

○ Never true

○ Very seldom true

○ Seldom true

○ Sometimes true

○ Frequently true

○ Almost always true

○ Always true

Q39 When making a decision, I value other people's advice more than my own opinion.

○ Never true

○ Very seldom true

○ Seldom true

○ Sometimes true

○ Frequently true

○ Almost always true

○ Always true

Q40 Before doing important things, I ask for other people's advice.

○ Never true

○ Very seldom true

○ Seldom true

○ Sometimes true

○ Frequently true

○ Almost always true

○ Always true

Q41 Fear of criticism prevents me from doing things.

○ Never true

○ Very seldom true

○ Seldom true

○ Sometimes true

○ Frequently true

○ Almost always true

○ Always true

Q42 What is your current, or anticipated, college major? _____

Q43 Do you have any other observations about this study you'd like to share?

_____

Appendix J

Thank you for participating! Please use a device with a keyboard and limit distractions. If any of the following steps do not work, please contact me immediately at (text) 661-747-5184 or (email) chelsea.wilhite@gmail.com. Thank you for your participation.

Your participant number/ID is**:**

Use this any time a form asks for a participant number or ID.

Please complete the following steps.

Step 1:
Please fill out the form at:
https://unrpsych.az1.qualtrics.com/jfe/form/SV_blug9r1ns3IWLgp
If you answer "No" to all questions, please proceed to Step 2. If you answered "yes" to any question(s), please stop and contact me.

Step 2:
Please complete this questionnaire as quickly as you can
https://unrpsych.az1.qualtrics.com/jfe/form/SV_4Zb8KtpioyQDsTX

After you complete Step 2, please wait. I will email you with further information within a few minutes.

Thank you.

Appendix K

Inclusion Criteria Form

Please Indicate the following:	Yes	No	N/A
Are you under the age of 18?			
Is English NOT your first language?			
Have you previously participated in a study entitled "The effects of humorous stimuli on cooperative responding?"			
Have you previously participated in a study entitled "The Effects of Individually-Determined Stimuli on a Data Entry Task?"			
Have you previously participated in a study entitled "The Effects of Group-Determined Stimuli on a Data Entry Task?"			
Have you previously participated in a study entitled "The Effects of Varying Stimuli on a Data Entry Task?"			
Have you previously participated in a study entitled "2-Part Study: Word Assessment and Medical Data Entry Task."			

**If you have answered "Yes" to any of the above listed questions then you are ineligible to participate in this study.
I attest that all the above marked information is accurate.

_____   _____

Participant Signature   Date

Appendix L

Thank you for signing up. You do not qualify for this study.

Appendix M

Your participation in this study is complete. Thank you for participating! I will award your SONA points. This study is looks at whether humorous stimuli influence cooperative behavior. Do you have any questions?

Appendix N
Step 3:
Please complete all components. Please go to this site and use the login information below:
https://myirap.azurewebsites.net/loginpage.html
username: xxx
password: xxx
Please message me that you're done when you complete this step and wait for the next instructions.

Appendix O

Step 4:
Please go to this site and follow the directions. Use your original Participant ID. Once you complete the task, please wait for instructions to the next step. I will email you shortly after you finish. Thank you.
https://www.performancesystemtechnologies.com/task?_id=615752e4fac0f2d2a5950ff1&study=615752b8fac0f2023a950ff0&customId=CW_bl_E09

Appendix P

Steps 5&6:
Please go to this site and follow the directions. Use your original Participant ID. After you complete Step 6, I will credit your SONA and pay your earnings. Please let me know how you would like your payment: PayPal, Venmo, or check via the USPS. Thank you.
https://www.performancesystemtechnologies.com/task?_id=61575c42fac0f2ebea950ffa&study=61575838fac0f2feab950ff3&customId=CJW_E09