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Differentiating What Is Humorous From What Is Not

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After 2.5 millennia of philosophical deliberation and psychological experimentation, most scholars have concluded that humor arises from incongruity. We highlight 2 limitations of incongruity theories of humor. First, incongruity is not consistently defined. The literature describes incongruity in at least 4 ways: surprise, juxtaposition, atypicality, and a violation. Second, regardless of definition, incongruity alone does not adequately differentiate humorous from nonhumorous experiences. We suggest revising incongruity theory by proposing that humor arises from a benign violation: something that threatens a person's well-being, identity, or normative belief structure but that simultaneously seems okay. Six studies, which use entertainment, consumer products, and social interaction as stimuli, reveal that the benign violation hypothesis better differentiates humorous from nonhumorous experiences than common conceptualizations of incongruity. A benign violation conceptualization of humor improves accuracy by reducing the likelihood that joyous, amazing, and tragic situations are inaccurately predicted to be humorous.

Keywords: humor, emotion, laughter, positive psychology, incongruity

What distinguishes amusing from annoying social encounters, funny from thrilling films, and laughable from useful consumer goods? A vast literature points to a parsimonious answer to the question of what makes things humorous: incongruity (Gervais & Wilson, 2005; Morreall, 2009; Nerhardt, 1976). We suggest, however, that the widely accepted explanation that humor results from perceiving an incongruity is limited in two ways. First, there is disagreement about what *incongruity* means. The literature discusses four different definitions: (a) something that is unexpected (i.e., surprise), (b) some contrast of concepts or ideas that do not normally go together (i.e., juxtaposition), (c) something that is different than what typically occurs (i.e., atypical), and (d) something that departs from beliefs about how things should be (i.e., a violation). A second limitation is that incongruity alone (regardless of how it is defined) is often unable to differentiate what is humorous from what is not humorous. In particular, incongruity theories often predict that joyous, tragic, and awe-inspiring experiences will be humorous even when they are not.

We propose that an updated conceptualization—simultaneously appraising something as both a violation and benign (e.g., wrong

yet okay, threatening yet safe; McGraw & Warren, 2010; Warren & McGraw, 2015)—offers a narrower definition of incongruity that better differentiates humorous from nonhumorous stimuli. Six studies reveal that the perception of a violation that simultaneously seems benign better accounts for differences between humorous and nonhumorous entertainment, consumer products, and social interactions than other common conceptualizations of incongruity. A benign violation conceptualization improves accuracy by reducing the likelihood that joyous, tragic, and amazing situations are incorrectly predicted to be humorous.

What Makes Things Humorous?

There is no universally accepted definition of humor (Gulas & Weinberger, 2006). Consistent with much of the literature (Gervais & Wilson, 2005; Martin, 2007; McGraw & Warren, 2010), we define humor as a psychological response characterized by the positive emotion of amusement, the appraisal that something is funny, and the tendency to laugh. Thus, humor is indicated by at least one of three responses: behavioral (laughing), cognitive (appraising something as “funny”), or emotional (experiencing the positive emotion of amusement). We refer to a stimulus as humorous to the extent that it elicits greater perceptions of humor (on average).

Understanding humor's antecedents across a broad range of domains is important because of the wide array of benefits humor brings. Humor helps increase enjoyment, boost creativity, facilitate coping, and mitigate the perceived intensity of negative life events (Galloway & Cropley, 1999; Isen, Daubman, & Nowicki, 1987; Keltner & Bonanno, 1997; Martin, 2002; Samson & Gross, 2012). Humor can also improve social interaction, learning, and development by increasing tolerance for social differences and by facilitating approach toward novel, mildly stressful stimulation (Fredrickson, 1998; Gervais & Wilson, 2005; Martin, 2007). Con-

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versely, a failed humor attempt can be costly, prompting disapproval—even social isolation (Smeltzer & Leap, 1988).

Although scholars have made substantial advances in understanding verbal humor attempts, including scripts (Attardo & Raskin, 1991), irony (Giora, 1995), puns (Kao, Levy, & Goodman, 2013), and repetitive jokes (i.e., AAB pattern; Rozin, Rozin, Appel, & Wachtel, 2006), there is less agreement about how to explain the broad range of experiences that evoke humor in domains such as entertainment and everyday social interaction.

For thousands of years, scholars, entertainers, and the general population have debated the conditions that trigger humor (Carrell, 2008; Keith-Spiegel, 1972). The discussion has yielded numerous theories suggesting many possible antecedents, including relief (Freud, 1928; Spencer, 1860), aggression (Gruner, 1999), disparagement (Zillman, 1983), play (Eastman, 1921), ambivalence (Plato, as cited by Keith-Spiegel, 1972), juxtaposition (Eysenck, 1942; Koestler, 1964), unexpectedness (Nerhardt, 1976; Suls, 1972), abnormality (Baillie, 1921; Woltman Elpers, Mukherjee, & Hoyer, 2004), and impropriety (McDougall, 1903; Morreall, 1983). The most widely accepted theories, however, contend that humor results from incongruity.

Incongruity Theory

Incongruity theory is the most intuitively appealing and popular theory of humor in psychology, complementary social sciences, humanities, and business. According to Gervais and Wilson (2005, p. 398), “what emerges from the literature is something of a consensus that incongruity and unexpectedness underlie almost all instances of formal laughter-evoking humor.” Others note that “humor and incongruity appear to be constant bedfellows” (Veale, 2004, p. 419) and that incongruity theories “dominate contemporary psychological research into humor” (Carrell, 2008, p. 311). *The Internet Encyclopedia of Philosophy's* (Smuts, 2009) entry for humor states, “Incongruity theory is the reigning theory of humor since it seems to account for the most cases of perceived funniness.” A number of specialized disciplines accept incongruity theory as the starting point for their investigations. Neuroimaging studies on humor have attempted to identify regions of the brain associated with incongruity detection (Bartolo, Benuzzi, Nocetti, Baraldi, & Nichelli, 2006; Goel & Dolan, 2001), and marketing research explains the process by which incongruities perceived in advertisements produce humor (Alden, Mukherjee, & Hoyer, 2000; Woltman Elpers et al., 2004).

Incongruity theory is popular because of its intuitive appeal, simplicity, and ability to explain the humor perceived in the domain of scripted jokes (e.g., Shultz, 1976; Suls, 1972). Although incongruity theory is widely endorsed, a substantial challenge is that incongruity is not precisely or consistently defined (Martin, 2007). Forabosco (1992, p. 50) writes, “the term incongruity, with a few notable exceptions, has mostly been used in connection with humor without an explicit definition, its meaning owing more to everyday usage than to scientific language.” Further complicating the issue, scholars who have explicitly defined incongruity have done so in at least four conceptually distinct ways (see Figure 1). Next, we present each definition of incongruity in turn.

Surprise

A simple yet common definition of incongruity is something that is unexpected or surprising. For example, researchers have described incongruity as “the divergence between an expected and an actual state of affairs” (Deckers & Kizer, 1975, p. 213), “a conflict between what is expected and what actually occurs” (Shultz, 1976, p. 12), “the cognitive conflict that arises when something *unexpected* happens or is being said” (De Mey, 2005, p. 70, italics in original), and a “deviation from expectations” (Alden, Hoyer, & Lee, 1993, p. 66). The suggestion that humor arises when something is unexpected dates at least as far back as Pascal, who wrote, “Nothing produces laughter more than a surprising disproportion between that which one expects and that which one sees” (cited by Morreall, 1982, p. 245). More recently, psychologists (Nerhardt, 1976; Shultz, 1972), philosophers (Morreall, 1982), and marketing researchers (Alden et al., 1993; Beard, 2008) have similarly argued that incongruity, defined as a deviation from expectations, is the key ingredient in humor.

Juxtaposition

Another common definition of incongruity is *juxtaposition*, or a contrast between two perceptions, concepts, or elements that do not normally go together. This conceptualization of incongruity dates back to at least Beattie (1776, as cited by Keith-Spiegel, 1972, p. 8), who argued, “Laughter arises from the view of two or more inconsistent, unsuitable, or incongruous parts or circumstances, considered as united in one complex object or assemblage.” More recently, researchers have similarly defined *incongruity* as “two or more real objects [that] are thought through one concept” (Schopenhauer, 2012, p. 93), the “association of two generally accepted incompatibles” (Eysenck, 1942, p. 297), “the mingling of two ideas which are thought to be utterly disparate” (Monro, 1988, p. 352), “two or more elements in a stimulus field [that] cannot be assimilated using a single processing schema” (Speck, 1991, p. 7), and “the simultaneous activation of two incompatible scripts” (Martin, 2007, p. 87).

Atypical

A third definition of incongruity, which is similar to the aforementioned conceptualization of incongruity as surprise, is something that departs from *typical* expectations. Morreall (2009) writes,

The core meaning of “incongruity” in standard incongruity theories is that some thing or event we perceive or think about is inconsistent with our typical mental patterns and normal expectations. Once we have experienced something incongruous, of course, we no longer expect *it* to fit our typical mental patterns. Nonetheless, it still is inconsistent with our normal mental patterns and our normal expectations. (p. 11, italics in original)

Other scholars have similarly defined incongruity as something atypical. For example, Baillie (1921, as cited in Keith-Spiegel, 1972) describes incongruity as “any departure from social standards”; McGhee (1979, pp. 6–7) states “when the arrangement of the constituent elements of an event is incompatible with normal or expected pattern, the event is perceived as incongruous”; and Woltman Elpers and colleagues (2004, p. 592) contend that “in-

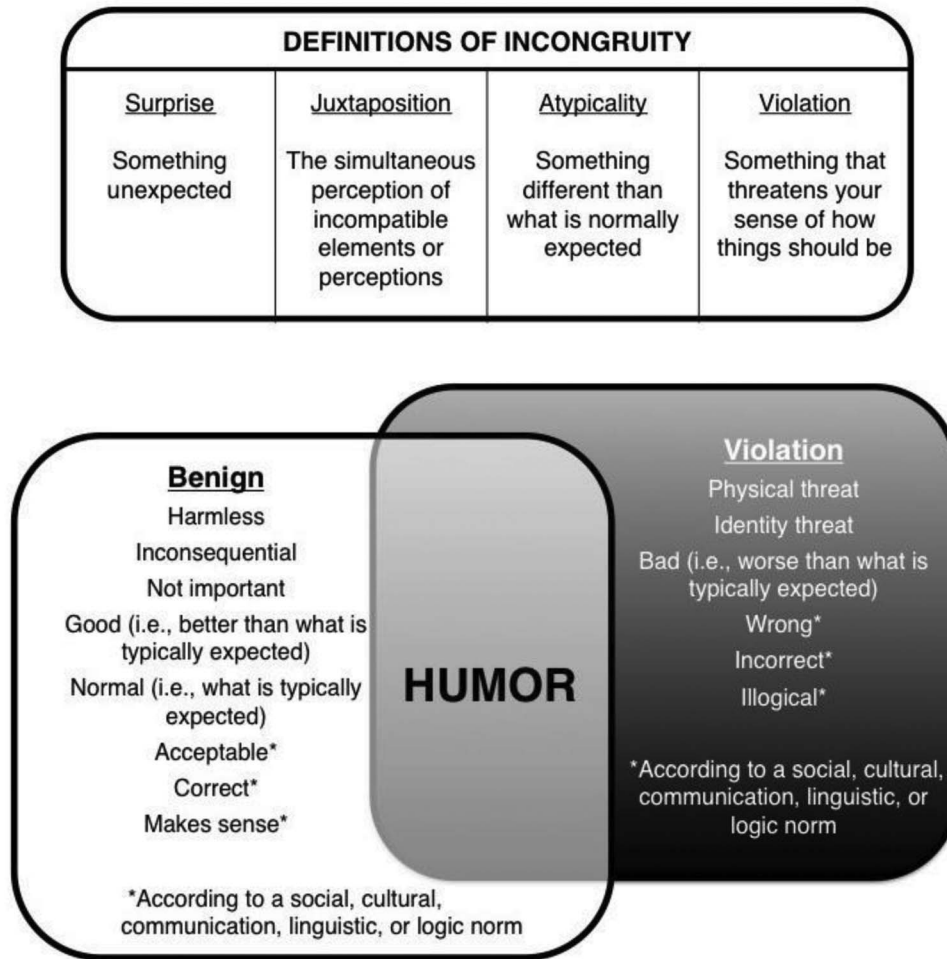


Figure 1. The literature has defined incongruity in four ways: surprise, atypicality, juxtaposition, and a violation. The top part of the figure illustrates each definition of incongruity. The benign violation hypothesis predicts that people experience humor when they simultaneously appraise a violation as being benign. The bottom part of the figure notes different ways that something can be a violation and the different reasons that it can be benign.

congruity refers to the extent to which ad content differs from generally expected beliefs, attitudes and/or behaviors.” As this quote suggests, things that are atypical are not always surprising. Readers of *Peanuts* expect Charlie Brown to have atypically bad luck, just as viewers of the TV program *Fear Factor* expect to see bizarre behavior.

Violation

In some of his writing, Morreall (1999) defines incongruity as a “disparity between the way things are and the way they should be” (p. 105). Importantly, Morreall (1983, p. 15) notes that the appraisal must have a negative valence by arguing that incongruity comes from “the recognition that something is irrational or improper” (1983). Lynch (2002, p. 428) similarly conceptualizes incongruity as something “irrational, paradoxical, illogical, incoherent, fallacious, or inappropriate.” Following Veatch (1998), we use the term *violation* to describe any stimulus that seems threat-

ening, wrong, or negative. A violation is a narrower conceptualization of incongruity than atypicality because not all atypical experiences are violations. Running a 4-min mile and winning the lottery, for example, are atypical, but they are not necessarily violations. Violations depart from a person’s perception of how things *should be*, whereas atypical experiences depart from a person’s perception of how things *typically are*.

What Makes Things Not Funny?

Another challenge associated with incongruity theories, regardless of definition, is that incongruity alone has difficulty distinguishing things that are humorous from things that are not humorous. Causal theories—of humor or otherwise—are useful to the extent that their conditions are present when the target phenomenon is observed *and* absent when it is not observed (Mill, 1843; Veatch, 1998). The conditions predicting humor must be general enough to explain when humor occurs (i.e., maximize hits), yet

specific enough to predict when humor will not occur (i.e., minimize false positives). We contend that the definitions of incongruity in Figure 1 lead to false positives because incongruity (in all of its forms) is present in many nonhumorous experiences.

Surprise lacks specificity. Many pleasant surprises, such as winning the lottery, and many unpleasant surprises, such as being mugged in broad daylight, are not funny (Martin, 2007). Surprise also lacks generality (Veatch, 1998). A movie scene or YouTube video may continue to be funny even after repeated viewings when the viewer knows what to expect. Moreover, jokes tend to be more humorous when their punch lines are *easier* to predict (Kenny, 1955; Pollio & Mers, 1974).

Other conceptualizations of incongruity (i.e., atypicality, juxtaposition, or violation) may be general enough to identify conditions that elicit humor, but they lack the specificity to differentiate humorous from nonhumorous experiences. Atypically positive occurrences, such as a big promotion, produce joy—but not humor. Atypically negative occurrences, such as losing a limb in a chainsaw accident, produce heartache—but not humor (Veatch, 1998). Many acts of creation and artistic expression juxtapose normally disparate concepts but produce awe—not humor (Koestler, 1964). In sum, incongruity, irrespective of how it is defined, appears to lack the specificity to adequately distinguish humorous from nonhumorous experiences.

Supplementary Conditions

Recognizing that incongruity alone is too broad to explain humor, a number of scholars argue that incongruity must be supplemented by one or more additional conditions (Martin, 2007). Hereafter, we refer to such explanations as “incongruity-plus” theories. The literature proposes a few conditions that potentially supplement incongruity, including psychological distance (Morreall, 2009), safety (Rothbart, 1973), and play cues (Beard, 2008; Willmann, 1940). The most frequently discussed supplementary condition is resolution, which refers to the process of making sense of something that initially seems unexpected or illogical (Suls, 1972; Woltman Elpers et al., 2004). For example, consider the joke: *Why do gorillas have big nostrils? Because they have big fingers!* The nonsensical link between finger and nostril size can be resolved by recognizing that gorillas are notorious nose pickers (Warren & McGraw, 2014). Supplementing incongruity with resolution helps explain humor triggered by scripted jokes (Shultz, 1972; Suls, 1972) and advertisements (Alden et al., 2000; Woltman Elpers et al., 2004), but has more difficulty explaining the humor perceived in satire, practical jokes, and many other unscripted social situations (e.g., Nerhardt, 1970; Provine, 2001).

Recent research, which builds on work documenting a general phenomenon of hedonic reversals (Apter, 1982; Hemenover & Schimmack, 2007; Rozin, Guillot, Fincher, Rozin, & Tsukayama, 2013), suggests an alternative refinement of incongruity theory: Humor arises when a violation is also appraised as benign (McGraw & Warren, 2010; McGraw, Warren, & Kan, 2015; Veatch, 1998; Warren & McGraw, 2015).

Benign Violation Hypothesis

The benign violation hypothesis integrates ideas from a variety of humor theories (including incongruity theory) to propose three

conditions that precede humor: (a) something must be appraised as a violation, (b) something must be appraised as benign, and (c) the appraisals must be simultaneously juxtaposed (McGraw & Warren, 2010; McGraw, Warren, Williams, & Leonard, 2012; Veatch, 1998). The hypothesis incorporates two definitions of incongruity as necessary for humor: violation and juxtaposition (implied in the simultaneity condition). The hypothesis, however, suggests a narrower conceptualization than alternative conceptualizations of incongruity by proposing that humor requires the specific juxtaposition of a violation appraisal and a benign appraisal.

The violation condition is consistent with theories that suggest that humor requires something potentially negative, such as disparagement (Ferguson & Ford, 2008; Zillman, 1983), maladjustment (McDougall, 1922), the release of repressed, antisocial drives (Freud, 1928), something demeaning (Gruner, 1999), an impression reinterpreted to be less valued (i.e., diminishment; Wyer & Collins, 1992), a perceived threat (Ramachandran, 1998), or something irrational or improper (Morreall, 1983). A violation refers to anything that threatens a person’s sense of how things should be (Veatch, 1998). The most primitive and universal violation is the threat of physical harm. Harmless physical threats, such as tickle attacks and rough-and-tumble play, trigger laughter across cultures and even species (Gervais & Wilson, 2005; Provine, 2001).

Violations, however, are not limited to physical threats (see Figure 1). Humans interact in a complex social network (i.e., culture) characterized by different social roles, behavioral patterns, communication norms, and systems of logic. People internalize these cultural patterns into beliefs about who to be (i.e., identity), how to behave (i.e., social norms), how to communicate (i.e., grammar, language rules, communication norms), and how to think (i.e., logic). These beliefs shape what people perceive to be normal, atypical, good, bad, correct, incorrect, sensible, and illogical. Violations include not only threats to physical well-being but also identity threats and things that seem wrong or bad according to a social, linguistic, communication, or logic norm. Teasing, ethnic jokes, and insult humor typically create violations by threatening the image or identity of a person or group of people (Ferguson & Ford, 2008). Sitcoms, such as *The Simpsons* and *Seinfeld*, regularly attempt to create humor by portraying norm violations, such as installing a food disposal in the shower or a snack that mixes gum and nuts (“together at last!”). Sarcastic comments (e.g., “Joe should start his own fashion company”) violate a communication norm by saying one thing (Joe is fashionable) but implying another (Joe is far from fashionable; Grice, 1975). Puns can evoke humor in part by breaking grammar or spelling rules (e.g., “I’ve relished the fact that you’ve mustard the strength to ketchup with me”; Warren & McGraw, 2015). Although violations threaten a person’s sense of how things should be, the threat can be relatively mild, such as misspelling a word to create a pun or even an awkward pause in a conversation (McGraw et al., 2012; Veatch, 1998). Nonetheless, threat makes a violation appraisal conceptually distinct from something unexpected or atypical. As previously noted, pleasant surprises are unexpected and atypical but are not violations.

Of course, violations are not typically humorous. They often cause anger, fear, disgust, confusion, or other negative emotions (e.g., Rozin, Lowery, Imada, & Haidt, 1999). The benign violation hypothesis proposes that humor occurs only when the violation is simultaneously appraised as being benign (McGraw & Warren,

2010). A benign appraisal occurs when a person feels that there is nothing to worry about. In other words, everything seems okay. The reason why people might simultaneously appraise a violation as benign depends on how the violation threatens them (see Figure 1). Physical and identity threats can seem benign because they are harmless (McGraw & Warren, 2010; Rothbart, 1973). Ergo, a feather makes a more effective tickling instrument than a fork. Violations can also seem benign because the threat seems inconsequential or unimportant (McGraw et al., 2012). Jokes disparaging women are funnier to misogynists because they do not care about hurting women (Thomas & Esses, 2004), just as disgusting movies and immoral scenarios are more amusing when they are psychologically distant (Hemenover & Schimmack, 2007; McGraw & Warren, 2010). Norm violations, including improper etiquette, illogical behavior, and language errors, seem benign when an alternative norm suggests that the behavior is acceptable, sensible, or correct (McGraw & Warren, 2010; Veatch, 1998). For example, the misspellings in the aforementioned pun (i.e., mustered, catch up) can be appraised as benign because they all correctly spell homonym condiments (mustard, ketchup; Warren & McGraw, 2015). Analogously, installing a disposal in the shower makes sense in that it could be a practical way for people to save time by multitasking.

Although the violation appraisal condition is narrower than other definitions of incongruity, the benign appraisal condition incorporates a broader range of supplementary conditions than alternative incongruity-plus theories. The benign condition is consistent with theories that have alternatively suggested that resolution (Suls, 1972), play cues (Alden et al., 2000), a nonserious context (Gervais & Wilson, 2005), safety (Rothbart, 1973), or psychological distance (Morreall, 2009) facilitates humor. Each of these supplementary conditions should make it easier for people to consider a stimulus or experience benign. The idea that humor requires a benign appraisal is also consistent with a broad literature from positive psychology, which suggests that positive emotions, including amusement, occur in the absence of serious danger (Fredrickson, 1998). Similar to other positive emotions, humor occurs when things seem benign; however, unlike other positive emotions, the benign violation hypothesis suggests that humor additionally requires a simultaneous violation appraisal (see Figure 1).

Objectives and Overview

By narrowing the range of stimuli predicted to trigger humor, the benign violation hypothesis may help address one of the key challenges facing incongruity theories: differentiating what is funny from what is not. We thus compare predictions of the benign violation hypothesis with predictions of prior conceptualizations of incongruity theory—including surprise, juxtaposition, atypicality, and incongruity-resolution. Six studies reveal that prior conceptualizations of incongruity struggle to differentiate humorous from nonhumorous stimuli because incongruity (regardless of how it is defined) is often present even when humor is absent. The studies find that the joint presence of both a violation appraisal and a benign appraisal better differentiates humorous from nonhumorous stimuli. In short, a benign violation account is less susceptible to false positives.

One challenge with testing various definitions of incongruity is that the presence of one often implies the presence of another. Violations and juxtaposition are atypical—and atypical experiences (including violations and juxtaposition) are usually surprising. For example, an assault with a wet noodle would be surprising, atypical, a violation, and juxtapose the perception of the noodle as both a food product and a weapon. However, there are important differences between the definitions of incongruity as well. People can learn to expect atypical events (including violations and juxtaposition; e.g., children wearing scary costumes while trick or treating on Halloween), just as people who expect something abnormal may be surprised by something normal (e.g., a trick or treater wearing street clothes). Moreover, many atypical experiences involve neither juxtaposition nor a violation (e.g., winning the lottery). Finally, many examples of juxtaposition do not involve a violation (e.g., the contrast of high and low culture in pop art), and many violations do not involve juxtaposition (e.g., getting cancer). Therefore, our studies attempt to isolate situations and stimuli in which the different conceptualizations of incongruity diverge.

A second challenge with testing the various definitions of incongruity is that testing them simultaneously would require complex studies. Therefore, we sequentially investigate the relative advantage of the benign violation hypothesis over each of the four most common conceptualizations of incongruity: surprise, juxtaposition, atypicality, and incongruity-resolution. A fifth study compares the explanatory ability of the benign violation hypothesis with each of the four prior conceptualizations of incongruity. A sixth study attempts to predict perceived humor by directly manipulating the presence of a violation and the ease of appraising it as benign.

A third challenge with testing the various definitions of incongruity is that humor exists in many different forms and occurs across a wide range of domains. In contrast to prior studies that have examined the humor evoked by canned jokes or other decontextualized verbal scripts (e.g., Attardo & Raskin, 1991; Kao et al., 2013; Shultz, 1976; Suls, 1972), we focus on humor in a wider variety of domains, including entertainment, consumer products, and social interactions. Established explanations of humor in jokes and other verbal scripts may overlook important components of humor that help explain when a broader array of stimuli trigger amusement and when they trigger alternative responses, such as joy, awe, or fear.

Study 1: Incongruity as Surprise

Surprise, or a discrepancy between what a person expects and observes, is one of the most common definitions of incongruity (e.g., Deckers & Kizer, 1975; Morreall, 1982; Shultz, 1976). As previously noted, a number of incongruity theorists have argued that surprise is the key factor driving perceptions of humor (Nerhardt, 1976; Schopenhauer, 2012; Woltman Elpers et al., 2004). Even many advocates of alternative humor theories consider surprise a necessary condition for humor (Gruner, 1999). For example, a number of websites quote Aristotle as claiming, “The secret to humor is surprise” (e.g., “Aristotle Quotes,” 2013).

Although most violations are surprising, some violations are expected, just as some surprising occurrences are not violations. We conducted two experiments to tease apart surprise from the

presence of a violation in order to investigate whether one or both are necessary for the perception of humor.

Study 1a measured the humor perceived in a YouTube video while crossing the presence of a violation (e.g., an athlete who either fails or succeeds in a pole vault attempt) with whether respondents expected the athlete to fail or succeed. When participants do not expect to observe a violation, both surprise-based incongruity theories and the benign violation hypothesis make the same prediction: Observing an unexpected violation should be more humorous than observing an expected success. The critical test is the humor perceived when participants expect to observe a violation. If surprise drives perceptions of humor, then an unexpected success should elicit more humor than an expected violation. If, on the other hand, the presence of a benign violation drives perceptions of humor, then an unexpected success should elicit less humor than an expected violation (provided the violation also seems benign).

Study 1a: Method

We recruited participants from an undergraduate subject pool at a U.S. university to participate. The sample, the size of which was determined by subject availability, included 47 (45% female) participants. The small sample size afforded less power than would have been ideal—there was approximately a 60% chance of detecting a main effect or interaction with a “moderate” true effect size (i.e., $\eta_p^2 = .10$; Judd, McClelland, & Ryan, 2009)—an issue we attempted to remedy in Study 1b.

Participants were randomly assigned to one treatment in a 2 (violation, no-violation) \times 2 (unexpected, expected) between-subjects design. Participants completed the study on personal computers in a laboratory setting. Specifically, they watched a YouTube video showing an amateur athlete attempting a pole vault. We manipulated surprise by telling participants what to expect in the video. Specific instructions were as follows:

Expected violation: “The video clip on the next page shows a male athlete attempting to pole-vault. The pole breaks and the athlete crashes on to the mat below.”

Expected nonviolation: “The video clip on the next page shows a male athlete attempting to pole-vault. The athlete successfully completes the jump, clearing the bar and then landing on the mat below.”

After participants read the expectation manipulation, we asked them to answer, “What do you expect to see in the video clip?” Subsequently, participants viewed one of two randomly assigned YouTube videos. Participants in the violation condition watched a clip in which an amateur athlete unsuccessfully attempts a pole vault. The pole breaks and the athlete crashes on to the mat below (akshaychopra, 2007). Participants in the no-violation condition watched a similar clip; however, the amateur athlete successfully clears the pole and lands the jump (Sebastian, 2008). By crossing the actual outcome with the expected outcome, we created two conditions that should be surprising (expecting a violation but observing a nonviolation, and expecting a nonviolation but observing a violation) and two conditions that should not be surprising (expecting and observing a violation, and expecting and observing a nonviolation).

After watching the clip, participants completed several measures, all of which used 5-point scales with end points labeled “disagree” and “agree.” We measured perceptions of humor using three items: “The pole vault attempt was humorous,” “The pole vault attempt was funny,” and “I was amused by the pole vault attempt” ($\alpha = .92$). We measured surprise using two items: “The outcome of the pole vault attempt was surprising” and “The outcome of the pole vault attempt was unexpected” ($r = .74$). We measured the violation appraisal using two items: “The outcome of the pole vault was not ideal” and “The outcome of the pole vault was bad for the athlete” ($r = .81$).

Study 1a: Results and Discussion

Both the violation and surprise manipulations worked as intended. A 2 (violation, no-violation) \times 2 (expected, unexpected) ANOVA model with the violation appraisal as the dependent variable revealed a significant main effect, such that the video containing a violation was seen as more of a violation than the video not containing a violation ($M = 3.89$ vs. 2.19), $F(1, 43) = 27.84$, $p < .001$, $\eta_p^2 = .39$. Neither the main effect of the expectation manipulation, $F(1, 43) = .27$, $p > .6$, nor the interaction, $F(1, 43) = 1.05$, $p > .3$, was significant (see Table 1 for descriptive statistics). The same ANOVA model with surprise as the dependent variable revealed only a significant main effect of the expectation manipulation ($M = 2.91$ vs. 1.89), $F(1, 43) = 10.80$, $p < .01$, $\eta_p^2 = .20$. Neither the violation manipulation, $F(1, 43) =$

Table 1
Mean Ratings (and Standard Deviations) of Perceived Humor, Surprise, and Violation Appraisal in Studies 1a and 1b

Measure	No violation		Violation		Harmful violation		Beta
	Unexpected	Expected	Unexpected	Expected	Unexpected	Expected	
Study 1a							
Humor	2.26 ^A (1.02)	2.33 ^A (1.12)	3.04 ^{A,B} (1.17)	3.96 ^B (.72)			—
Surprise	2.84 ^B (1.11)	1.77 ^A (.88)	2.97 ^B (.74)	2.06 ^A (1.37)			-.05
Violation	2.42 ^{A,B} (1.13)	1.91 ^A (1.26)	3.83 ^{B,C} (.96)	4.00 ^C (1.10)			.59*
Study 1b							
Humor	1.57 ^A (.76)	1.40 ^A (.69)	2.72 ^C (1.39)	2.81 ^C (1.39)	2.25 ^{B,C} (1.31)	1.80 ^{A,B} (1.02)	—
Surprise	4.26 ^D (.91)	1.39 ^A (.65)	3.56 ^C (1.35)	2.03 ^B (1.22)	3.62 ^C (1.24)	2.40 ^B (1.38)	.09
Violation	1.50 ^B (.65)	1.08 ^A (.26)	4.61 ^C (.54)	4.61 ^C (.63)	4.72 ^C (.41)	4.67 ^C (.59)	.49*
Concern	2.60 ^B (1.32)	1.79 ^A (1.07)	3.34 ^C (1.24)	3.50 ^C (1.37)	3.84 ^D (1.40)	4.00 ^D (1.13)	-.26*

Note. Study 1b also measured concern, a higher score on which indicates an absence of a benign appraisal. Means with different superscripts are significantly different than other means in the same row ($p < .05$). The rightmost column reports the standardized regression coefficient of the measure on perceptions of humor (significance at $p < .05$ indicated by an asterisk).

.46, $p > .4$, nor the interaction, $F(1, 43) = .08$, $p > .8$, significantly influenced surprise.

Next, we assessed the effects of the violation and expectation manipulations on perceived humor. Consistent with the benign violation hypothesis but not with surprise-based incongruity theories, the data showed only a main effect of the violation manipulation, such that the violation elicited more humor than the nonviolation ($M = 3.36$ vs. 2.29), $F(1, 43) = 14.55$, $p < .001$, $\eta_p^2 = .25$. Neither the main effect of the expectation manipulation, $F(1, 43) = 2.45$, $p > .1$, nor the interaction, $F(1, 43) = 1.75$, $p > .1$, was significant. When participants expected the jump to succeed, the data were directionally consistent with both surprise-based incongruity theories and the benign violation hypothesis: Participants perceived more humor when they observed a failed jump than when they observed a successful jump, although the difference was not statistically significant ($M = 3.04$ vs. 2.33), $F(1, 43) = 2.88$, $p = .097$. Critically, and consistent with the benign violation hypothesis but not with surprise-based incongruity theories, a failed jump elicited significantly more humor than a successful jump even when participants expected the jump to fail ($M = 3.96$ vs. 2.26), $F(1, 43) = 12.88$, $p < .001$.

We found further support for the claim that a violation appraisal drove perceptions of humor rather than surprise by regressing perceived humor on the violation appraisal and surprise measures. Inconsistent with incongruity theories based on surprise but consistent with the benign violation hypothesis, the regression analysis revealed a significant effect of violation appraisal, $b = .51$, $t = 4.74$, $p < .001$, but no effect of surprise, $b = -.05$, $t = -.37$, $p > .7$; violation appraisal and surprise were not significantly correlated, $r = .22$, $p > .1$.

The presence of a violation increased humor perception, but surprise did not. Moreover, when participants expected to observe a violation, a clip that confirmed their expectations seemed funnier than a video that surprised them, which is the opposite of what is predicted by surprised-based incongruity theories. The data were more consistent with the benign violation hypothesis. Study 1a suggests that the presence of a violation can drive humor perceptions, but the study did not directly investigate whether or not the violation needs to seem benign. Study 1b attempted to replicate the finding that the presence of a violation, and not surprise, drives humor, while also showing that perceptions of humor are highest when the violation seems benign.

Study 1b: Method

We attempted to replicate Study 1a while additionally examining whether humor requires that a violation seem benign. We recruited participants ($N = 182$; 61% female) from an undergraduate student subject pool at a university in the United States to participate. The sample size was large enough to afford at least a 90% chance of detecting any effect hypothesized by either surprise-based incongruity theories or the benign violation hypothesis, assuming at least a “moderate” true effect size of $\eta_p^2 = .10$ (Judd et al., 2009).

The study randomly assigned participants to one treatment in a 3 (no violation, harmful violation, harmless violation) \times 2 (unexpected, expected) between-subjects design. In order to manipulate the ease of appraising the physical violation as benign, the study included two conditions in which the athlete falls. In the benign

violation condition the fall is harmless, whereas in the nonbenign violation condition, the fall is harmful.

After participants read the expectation manipulation described in Study 1a, they again indicated what they expected to see in the video. Participants next viewed one of the two pole-vault clips described in the prior study. We created an additional condition by adding a written message on a black screen at the conclusion of the pole-vault video in which the athlete crashes. In the harmful violation condition, participants observed the athlete crash and then read, “The athlete was severely hurt by the fall. He was rushed to the hospital with a potentially crippling back injury.” In the harmless violation condition, participants viewed the same clip and then read, “The athlete was unharmed by the fall and attempted the jump again using a different pole.” To keep the conditions parallel, we also added a message at the conclusion of the no-violation clip in which the athlete successfully completes the jump: “The athlete successfully completed the jump over the pole.”

Participants completed measures of humor, surprise, violation appraisal, and benign appraisal. The measures of humor and surprise were the same as the previous study. We measured violation appraisal using two items: “The outcome of the pole vault was not ideal” and “The pole vault attempt failed” ($r = .80$). People have a harder time appraising a violation as benign if they care about the person or norm threatened by the violation (McGraw & Warren, 2010; Veatch, 1998). Thus, we measured benign appraisal by assessing whether participants were concerned about the athlete using two items: “I was worried about the athlete in the video” and “I was concerned for the athlete’s well-being” ($r = .93$). The higher the participant’s concern, the less the violation should seem benign.

Study 1b: Results and Discussion

The manipulations worked as intended, as demonstrated by mean ratings of violation appraisal, concern, and surprise listed in Table 1. Importantly, as in Study 1a, only the violation manipulation had a significant effect on perceived humor, $F(2, 176) = 20.66$, $p < .001$, $\eta_p^2 = .19$. Consistent with the benign violation hypothesis, the clip depicting a harmless failure ($M = 2.76$) elicited more humor than both the clip depicting a harmful failure ($M = 2.02$), $F(1, 176) = 13.70$, $p < .001$, and the clip depicting a success ($M = 1.48$), $F(1, 176) = 40.90$, $p < .001$. Inconsistent with theories conceptualizing incongruity as surprise, the expectation manipulation had no discernable effect on perceived humor (main effect, $F[1, 176] = 1.25$, $p > .2$; interaction, $F[2, 176] = .93$, $p > .3$). In fact, participants who experienced an expected harmless failure perceived more humor than participants who experienced a more surprising, unexpected success ($M = 2.81$ vs. 1.57), $F(1, 176) = 7.59$, $p < .01$, which is the opposite of what surprise-based incongruity theories predict.

Next, we used multiple regression analysis to test the effects of surprise, violation appraisal, and concern on perceived humor. Both the appraisal of a violation, $b = .35$, $t = 6.41$, $p < .001$, and concern, $b = -.21$, $t = -3.31$, $p < .001$, significantly predicted perceived humor. Consistent with the benign violation hypothesis, controlling for surprise and concern, a stronger violation appraisal was associated with more humor. Also consistent with the benign violation hypothesis, participants reporting a higher level of con-

cern, which indicates a lower likelihood of a benign appraisal, reported less humor (controlling for surprise and violation appraisal). Inconsistent with surprised-based incongruity theories, surprise was not significantly associated with humor, $b = .07$, $t = 1.23$, $p > .2$. As in Study 1a, surprise and violation appraisal were not significantly correlated, $r = .08$, $p > .3$. Concern, however, was significantly correlated with both surprise, $r = .21$, $p < .01$, and violation appraisal, $r = .47$, $p < .001$.

Study 1b replicated our finding that the presence or absence of a violation predicts humor but the presence of absence of surprise does not. Moreover, the study suggests that not all violations elicit humor; a harmful failure was less humorous than a harmless failure, which is consistent with the hypothesis that violations are more humorous when they seem benign. The absence of a relationship between surprise and perceived humor suggests that surprise is not necessary for humor perception and that surprise-based incongruity theories cannot adequately distinguish humorous from nonhumorous stimuli.

Study 2: Incongruity as Juxtaposition

Another common definition of incongruity is a juxtaposition of two perceptions, ideas, or features that do not normally fit together (Eysenck, 1942; Monro, 1988). Several versions of incongruity theory argue that juxtaposition alone drives perceptions of humor (e.g., Beatty, 1776, as cited by Keith-Spiegel, 1972; Schopenhauer, 2012). The benign violation hypothesis agrees that juxtaposition is a necessary condition for humor, but it suggests that not all juxtapositions are humorous, as juxtaposition can produce art and scientific discovery rather than humor (Koestler, 1964). For example, the first smartphone combined product attributes (i.e., a phone and an Internet browser) that did not previously go together, but most consumers considered the juxtaposition innovative and useful rather than humorous. Unlike incongruity theories suggesting that juxtaposition alone elicits humor, the benign violation hypothesis proposes that humor requires the appraisal of a violation in addition to the juxtaposition of a benign appraisal.

We designed Studies 2a and 2b to demonstrate that juxtaposition, another way that incongruity is frequently conceptualized, cannot fully distinguish consumer products that people think are funny from nonhumorous products. Specifically, we asked marketing students to describe a product that combines attributes that do not normally go together in a useful or appropriate way, a product that combines attributes that do not normally go together in a way that seems useless or inappropriate, or a product that combines attributes that typically do go together. Most consumers believe that products should be useful, so a product with useless or inappropriate attribute combinations include both juxtaposition and a violation, whereas products that combine attributes in a useful or appropriate way include juxtaposition but not a violation. The benign violation hypothesis predicts that products that include both juxtaposition and a violation should be more likely to elicit humor than either products that lack juxtaposition or products that lack a violation, whereas juxtaposition-based incongruity theories predict that any juxtaposition should elicit humor. We did not directly investigate the benign condition in the study because we assumed that participants would be unlikely to describe products that they did not consider benign regardless of condition.

Study 2a: Method

Master's students ($N = 86$; 81% female) enrolled in a marketing course (conducted in English) at a university in Italy completed the study, titled "Product Attributes and Benefits Study," as an optional homework assignment. We randomly assigned participants to one of three between-subjects conditions: juxtaposition without a violation, juxtaposition with a violation, or no juxtaposition. The sample size, which was limited by the number of volunteering students in the class, afforded approximately a 70% chance of detecting a difference between any two of the conditions (assuming a "moderate" effect size of $\eta_p^2 = .10$; Judd et al., 2009).

All participants read,

Products often have several attributes. An attribute is any element of a product including the parts the product is made of as well as the things the product can do. Generally, products combine attributes that fit with one another in ways that seem valuable and appropriate, but this is not always the case.

The subsequent instructions varied by condition:

Juxtaposition without a violation: "In this study we would like you to identify a product that combines attributes or features that do not typically go together, yet the combination of attributes seems useful and appropriate."

Juxtaposition with a violation: "In this study we would like you to identify a product that combines attributes or features that do not typically go together, and the combination of attributes or features seems useless or inappropriate."

No juxtaposition: "In this study we would like you to identify a product that combines attributes or features that typically go together, and the combination of attributes or features seems useful and appropriate."

Next, all participants provided a detailed description of the product and rated their perception of the product on 7-point agree-disagree scales. We measured humor with the statement, "This product makes me laugh." We also measured whether the product seemed surprising ("is surprising") and atypical ("is unusual").

Study 2a: Results and Discussion

An omnibus test revealed that perceptions of humor differed across the three conditions, $F(2, 83) = 4.71$, $p = .01$, $\eta^2 = .10$. Juxtaposition alone, however, was not enough to explain which products were perceived to be humorous. Inconsistent with theories conceptualizing incongruity as juxtaposition alone, products that featured juxtaposition but lacked a violation were no more likely to elicit humor than products that lacked juxtaposition ($M = 2.43$ vs. 2.50), $F(1, 83) = .02$, $p > .8$. Supplementing juxtaposition with a violation, however, did increase humor, as products that involved both juxtaposition and a violation were more likely to make participants laugh ($M = 3.71$) than products that involved juxtaposition but no violation, $F(1, 83) = 7.58$, $p < .01$, and products that did not involve juxtaposition, $F(1, 83) = 6.59$, $p = .01$. Thus, juxtaposition alone did not elicit humor; humorous products also featured some sort of violation.

We next tested whether either surprise or atypicality—the other common definitions of incongruity—could explain why products featuring both juxtaposition and a violation elicited more humor

than the other products. The more humorous products involving both juxtaposition and a violation were neither more surprising ($M = 4.00$ vs. 4.46), $F(1, 82) = .90, p > .3$, nor more atypical ($M = 4.93$ vs. 5.13), $F(1, 82) = .19, p > .6$, than the less humorous products that involved juxtaposition without a violation. Thus, neither surprise nor atypicality can explain why products that feature juxtaposition and a violation are more humorous than products that feature juxtaposition without a violation.

Study 2b: Method, Results, and Discussion

We conducted a follow-up study to attempt to replicate the results using a larger sample from a different country (United States instead of Italy) and multiple-item scales to measure the constructs. Undergraduate students ($N = 286$; 58% female) at a university in the United States participated in the study for class credit. We collected a large enough sample to afford at least a 99% chance of detecting a difference between any two conditions (assuming at least a “moderate” true effect size of $\eta_p^2 = .10$; Judd et al., 2009).

The method was the same as Study 2a with two exceptions: (a) participants completed the survey in the lab on a personal computer, and (b) participants evaluated the product using multi-item measures. Specifically, participants assessed perceived humor (“is humorous,” “is funny,” and “makes me laugh”; $\alpha = .97$), surprise (“is surprising,” “is unexpected”; $r = .69$), atypicality (“is atypical,” “is unusual”; $r = .70$), juxtaposition (“juxtaposes different features,” “combines attributes that don’t normally go together”; $r = .73$), and violation appraisal (“is different from what I think products should be like,” “seems like a bad idea,” “shouldn’t exist”; $\alpha = .90$).

The manipulations worked as intended. The products containing juxtaposition and a violation were perceived as portraying larger violations than both the products containing juxtaposition alone ($M = 4.76$ vs. 2.21), $F(1, 283) = 163.00, p < .001$, and the products lacking juxtaposition ($M = 4.76$ vs. 1.57), $F(1, 283) = 248.72, p < .001$; omnibus test, $F(2, 283) = 139.82, p < .001$,

$\eta^2 = .50$. In contrast, perceptions of juxtaposition were similar in both the products containing juxtaposition and a violation and the products containing juxtaposition without a violation ($M = 4.92$ vs. 4.85), $F(1, 283) = .11, p > .7$. Participants perceived less juxtaposition in the products in the no juxtaposition condition ($M = 2.14$); omnibus test, $F(2, 283) = 89.44, p < .001, \eta^2 = .39$.

Importantly, replicating the prior study, participants perceived the products containing both juxtaposition and a violation as being more humorous than either the products containing juxtaposition alone ($M = 4.04$ vs. 2.79), $F(1, 283) = 21.70, p < .001$, or the products lacking juxtaposition ($M = 4.04$ vs. 1.70), $F(1, 283) = 75.12, p < .001$; omnibus test: $F(2, 283) = 37.61, p < .001, \eta^2 = .21$. Again, juxtaposition was most likely to increase perceptions of humor when combined with the presence of a violation.

As in Study 2a, neither of the other conceptualizations of incongruity (i.e., surprise and atypicality) could explain why the products were more humorous when they supplemented juxtaposition with a violation. The more humorous products containing both juxtaposition and a violation were neither more surprising ($M = 3.91$ vs. 4.39), $F(1, 283) = 3.16, p = .08$, nor more atypical ($M = 4.61$ vs. 4.24), $F(1, 283) = 2.08, p > .15$, than the less humorous products containing juxtaposition alone (see Table 2).

Studies 2a and 2b illustrated that theories conceptualizing incongruity, as juxtaposition alone cannot fully explain why some products are funny and others are not. Many products that combine attributes or features that do not typically go together do not seem humorous. The data, however, were consistent with the possibility that humor requires not one, but two, different conditions previously defined as incongruity, as both juxtaposition and the presence of a violation were present in humorous products.

Study 3: Incongruity as Atypical

Thus far, we have addressed how one definition of incongruity, *surprise*, is neither a necessary nor sufficient explanation for humor, and a second definition of incongruity, *juxtaposition*, is not alone a sufficient explanation. In Study 3, we offer further evi-

Table 2
Examples of Nominated Products as Well as Mean Ratings (and Standard Deviations) in Study 2

Measure	No juxtaposition	Juxtaposition, no violation	Juxtaposition plus violation
	(e.g., Danon Activa yogurt, a pen)	(e.g., protein-rich apple, luggage with an extractable seat)	(e.g., Heineken beer lipstick, rollerblade sneakers)
Study 2a			
Humor	2.50 ^A (1.80)	2.43 ^A (1.59)	3.71 ^B (1.92)
Surprising	3.07 ^A (1.98)	4.47 ^B (1.72)	4.00 ^B (1.94)
Atypical	2.71 ^A (1.88)	5.13 ^B (1.59)	4.93 ^B (1.84)
Study 2b			
Humor	1.70 ^A (1.42)	2.79 ^B (2.03)	4.04 ^C (2.01)
Violation	1.57 ^A (.92)	2.21 ^B (1.30)	4.76 ^C (1.80)
Juxtaposition	2.14 ^A (1.53)	4.85 ^B (1.62)	4.93 ^B (1.74)
Surprising	3.21 ^A (1.93)	4.39 ^B (1.88)	3.91 ^B (1.83)
Atypical	2.73 ^A (1.67)	4.24 ^B (1.93)	4.61 ^B (1.66)

Note. The second row lists examples of products that participants suggested contained attributes that typically go together (no juxtaposition), attributes that do not typically go together but whose combination is useful (juxtaposition, no violation), or attributes that do not typically go together whose combination is useless (juxtaposition plus violation). The rows below list the mean ratings (and standard deviations) of the extent to which the products seemed humorous, creative, surprising, and unusual. Means with different superscripts are significantly different than other means in the same row ($p < .05$).

dence that two alternative conceptualizations of incongruity, the perception that something is atypical and a violation appraisal, are likewise not specific enough to differentiate humorous from non-humorous experiences. Atypicality may be necessary for humor, but it is too broad a criterion. For example, perceiving something that is atypically vast in size, number, scope, complexity, ability, or social bearing tends to elicit awe rather than humor (see Rudd, Vohs, & Aaker, 2012). Conversely, tragedies, which are atypically bad, tend to elicit negative feelings rather than humor. Unlike humor theories that conceptualize incongruity as atypicality, the benign violation hypothesis suggests that awe-inspiring experiences are not humorous because there is no violation, and that most tragedies are not humorous because they do not seem benign.

To show that theories conceptualizing incongruity as atypicality alone are not specific enough to differentiate humorous from nonhumorous experiences, we asked participants to recall a sports play that was routine, tragic, amazing, or humorous, and measured whether the participant perceived the play to be atypical, a violation, and benign. We expected the nonhumorous tragic and amazing plays to seem atypical, which would illustrate the inability of atypicality to explain when sports plays are humorous and when they are not. If atypicality accurately explains humor, then humorous plays should be perceived as atypical, but routine, amazing, and tragic plays should not. If, on the other hand, the benign violation hypothesis is correct, then humorous plays should be seen as both a violation and benign, but routine, tragic, and amazing plays should not.

Method

We recruited participants from an undergraduate student subject pool at a university in the United States to participate. The number of participants available in the subject pool determined the study's sample size ($N = 101$; 45% female), which was large enough to detect a true 30% difference between conditions at least 65% of the time (Chow, Shao, & Wang, 2008). The study assembled a sample of humorous and nonhumorous stimuli by asking participants to recall one of four types of sports plays: routine, amazing, tragic, or humorous. Instructions for each condition were as follows:

Routine: "Think of a specific play that you observed in an athletic game or competition that you personally thought was routine. The play can be from any sport (e.g., football, basketball, skiing, track, skateboarding, etc.), as long as you thought the play was typical and routine."

Amazing: "Think of a specific play that you observed in an athletic game or competition that you personally thought was amazing. The play can be from any sport (e.g., football, basketball, skiing, track, skateboarding, etc.), as long as you thought the play was awesome, spectacular, and amazing."

Tragic: "Think of a specific play that you observed in an athletic game or competition that you personally thought was tragic. The play can be from any sport (e.g., football, basketball, skiing, track, skateboarding, etc.), as long as you thought the play was disappointing, tragic, and heartbreaking."

Humorous: "Think of a specific play that you observed in an athletic game or competition that you personally thought was humorous. The play can be from any sport (e.g., football, basketball, skiing, track,

skateboarding, etc.), as long as you thought the play was funny and the play amused you and made you laugh."

Participants spent 5 min describing the play in detail, including the sport, the action or behavior, the outcome, and the people involved.

After describing the play, participants answered three questions. The first question assessed the perception of atypicality and a violation by asking, "Compared to what you would normally expect in this context, how would you describe the performance/execution of the play?" The response options were (a) "better than normal/above average," (b) "normal/about average," and (c) "worse than normal/below average." We coded participants who indicated that the play was either better than normal or worse than normal as perceiving the play as atypical. We coded participants who indicated that the play was worse than normal as perceiving the play as a violation. Thus, all violations were perceived to be atypical, but plays perceived to be better than normal were atypical but not violations. In order to assess whether participants appraised the play as being benign, we next asked two questions: "Did the play have a large effect on the outcome of the game?" and "Did you like or dislike the effect that the play had on the outcome of the game?" Because an event is benign if it seems either inconsequential or good (see Figure 1), we coded a benign appraisal when participants indicated the play had either no effect or a positive effect on the outcome of the game. Conversely, we coded participants who indicated that the play had an undesirable effect as not appraising it as benign. We coded participants who saw the play as both violation and benign as perceiving a benign violation. Finally, participants completed manipulation checks assessing the extent to which they considered the play humorous, amazing, tragic, and normal on 7-point scales anchored by not *humorous/humorous*, not *amazing/amazing*, not *tragic/tragic*, and *unusual/normal*, respectively.

Results and Discussion

As illustrated in Table 3, the manipulations worked as intended. Given the humorous plays were indeed perceived to be more humorous than the amazing, tragic, and routine plays, an accurate theory of humor should provide conditions that adequately discriminate between the humorous plays and the three types of nonhumorous plays.

First, we tested whether perceived atypicality, a common definition of incongruity, could distinguish the humorous sports plays from the nonhumorous, amazing, tragic, and routine sports plays (omnibus test, $\chi^2[3, N = 101] = 30.18, p < .001$). Atypicality discriminated humorous plays from routine plays, as a higher percentage of humorous plays were perceived to be atypical (87% vs. 31%), $\chi^2(1, N = 49) = 15.73, p < .001$. However, it did not discriminate between humorous plays and amazing plays, $\chi^2(1, N = 53) = .62, p > .3$, nor did it discriminate between humorous and tragic plays, $\chi^2(1, N = 45) = 2.29, p > .1$, because most amazing plays (93%) and most tragic plays (68%) also seemed atypical.

Some incongruity theories suggest that incongruity is only humorous when something unusual or atypical also seems benign (Morreall, 1982; Rothbart, 1973). Therefore, we also tested whether benign incongruity, that is, plays that seemed both atypical and benign, discriminated humorous from nonhumorous plays

Table 3
Mean Ratings (Standard Deviations) of the Extent to Which the Routine, Amazing, Tragic, and Humorous Plays Were Perceived to Be Normal, Amazing, Tragic, and Humorous in the Third Study (Scale From 1 to 7)

Measure	Routine play	Amazing play	Tragic play	Humorous play
Normal (perceived)	5.38 ^B (2.02)	2.37 ^A (1.59)	2.41 ^A (1.84)	2.09 ^A (1.70)
Amazing (perceived)	3.77 ^B (2.23)	6.60 ^D (1.22)	2.27 ^A (1.88)	4.87 ^C (2.24)
Tragic (perceived)	2.00 ^{A,B} (1.47)	1.83 ^A (1.70)	6.45 ^C (.96)	2.78 ^B (2.44)
Humorous (perceived)	2.54 ^B (2.02)	2.23 ^{A,B} (1.91)	1.36 ^A (1.29)	6.39 ^C (1.20)

Note. Different subscripts within a row indicate that the means were significantly different at $p < .05$ across the columns within the row. The means suggest that the manipulations worked as intended.

(omnibus test, $\chi^2[3, N = 101] = 37.41, p < .001$). Although benign incongruity distinguished humorous plays from routine plays (87% vs. 31%), $\chi^2(1, N = 49) = 15.73, p < .001$, and tragic plays (87% vs. 27%), $\chi^2(1, N = 45) = 16.42, p < .001$, it did not distinguish humorous plays from amazing plays, $\chi^2(1, N = 53) = .12, p > .7$, because most amazing plays (90%) seemed both atypical and benign.

Next we tested whether the presence of a violation alone could discriminate the humorous plays from the nonhumorous plays (omnibus test, $\chi^2[3, N = 101] = 26.62, p < .001$). Although the presence of a violation alone distinguished humorous plays from routine plays (43% vs. 4%), $\chi^2(1, N = 49) = 11.01, p < .001$, and amazing plays (43% vs. 3%), $\chi^2(1, N = 53) = 12.76, p < .001$, it did not distinguish humorous plays from tragic plays, $\chi^2(1, N = 45) = .19, p > .6$, because tragic plays often contained violations (50%).

Similar to the previous criteria, the appraisal of the play as both a violation and benign discriminated between the different types of plays overall (omnibus test, $\chi^2[3, N = 101] = 25.81, p < .001$). In contrast to the previous criteria, the appraisal of a benign violation adequately discriminated humorous plays from routine plays, $\chi^2(1, N = 49) = 11.01, p < .001$, amazing plays, $\chi^2(1, N = 53) = 16.08, p < .001$, and tragic plays, $\chi^2(1, N = 45) = 6.80, p < .001$. Although many participants perceived a benign violation in the humorous plays (43%), very few perceived a benign violation in the routine (4%), amazing (0%), or tragic (9%) plays (see Figure 2).

We conducted a second test of whether atypicality or benign violations better explained humor by regressing the measure of perceived humor on the dichotomous perception of atypicality and the dichotomous perception of a benign violation (both coded using dummy variables). The results were more consistent with the benign violation hypothesis than atypicality-based incongruity theories; the perception of a benign violation significantly predicted perceived humor, $b = 2.60, t = 3.64, p < .001$, but the perception of atypicality did not, $b = .43, t = .82, p > .4$. Substituting the continuous measure of perceived typicality into the regression equation instead of the dichotomous measure showed similar results. Again, the perception of a benign violation predicted perceived humor, $b = 2.64, t = 3.80, p < .001$, but the perception that the play was normal did not, $b = -.13, t = -1.26, p > .2$.

Study 3 demonstrated that neither atypicality nor a violation can alone explain differences between humorous and nonhumorous sports plays. Although most humorous plays seem atypical, many nonhumorous plays also seem atypical, including most amazing

and tragic plays. Similarly, although many humorous plays were appraised as violations, many tragic plays were appraised as violations as well. In contrast, only humorous sports plays were appraised as benign violations; tragic sports plays typically did not seem benign, whereas amazing and routine sports plays typically did not seem like violations.

Across our initial studies, the joint presence of both a violation appraisal and a benign appraisal provided a better means of differentiating humorous from nonhumorous stimuli than prior theories conceptualizing incongruity as surprise (Studies 1a & 1b), juxtaposition alone (Studies 2a & 2b), atypicality (Study 3), or a violation alone (Studies 1b & 3). That said, participants did not appraise many of the humorous events in Study 3 as benign violations, which suggests that the benign violation hypothesis is too narrow, that the measures are too narrow, or both. In the current study, we suspect that by assessing whether the execution of the play seemed worse than what is normally expected, the

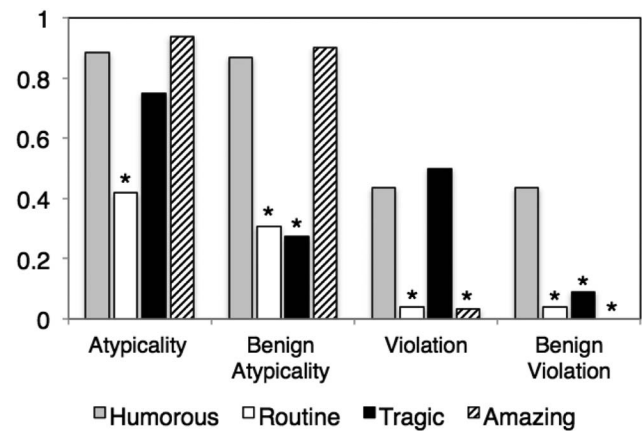


Figure 2. The proportion of routine, tragic, amazing, and humorous sports plays perceived to be atypical (incongruity), both atypical and benign (benign incongruity), a violation, and both a violation and benign (benign violation) in Study 3. A correct humor theory must identify conditions that are general enough to be present in humorous events (gray bars) but specific enough to not be present in nonhumorous events (the white, black, and striped bars). Note that only the joint presence of both the violation and benign conditions was more likely to be present for humorous events than all three types of nonhumorous events. Significant differences ($p < .05$) between the humorous events and the nonhumorous events are indicated by an asterisk over the bar representing the nonhumorous event.

violation measure may have been overly narrow excluding violations unrelated to the performance of the play. For example, one of the humorous plays described a dog interfering with a football game. Although this event certainly involves a violation (dogs are not supposed to interfere during a football game), the execution of the play by actual football players did not seem worse than expected, and, consequently, the measure in the study did not identify the play as a violation. Despite the potential measurement concerns, the joint presence of a violation appraisal and benign appraisal better differentiated humorous from nonhumorous sporting events than alternative conceptualizations of incongruity, including atypicality, benign atypicality, and a violation.

Study 4: Incongruity-Resolution

Both our theorizing and data suggest that a specific juxtaposition that something is both a violation and benign (McGraw & Warren, 2010; Warren & McGraw, 2015) may provide a better explanation of humor than surprise, juxtaposition, atypicality, or a violation appraisal. However, we have not yet explicitly compared the benign violation hypothesis with popular theories that supplement incongruity with additional conditions (i.e., *incongruity-plus* theories). Comparing the benign violation hypothesis with other incongruity-plus theories is challenging both because the benign violation hypothesis incorporates two conceptualizations of incongruity (a violation appraisal and juxtaposition) and because the benign appraisal condition attempts to integrate a number of supplemental conditions included in other incongruity-plus theories. However, if the benign violation hypothesis offers an improved explanation of humor, as we contend, then it should more accurately distinguish humorous experiences from nonhumorous experiences than popular incongruity-plus theories.

Incongruity-resolution theory, which argues that humor results from making sense of something that initially seems unexpected or unusual, has become the most popular variant of incongruity-plus theories (Alden et al., 2000; Suls, 1972; Woltman Elpers et al., 2004). Suls (1972, p. 82), for example, described humor perception as a form of “problem solving to find a cognitive rule which makes the punch line follow from the main part of the joke and reconciles the incongruous parts.” Other researchers have similarly argued that incongruity-resolution explains the humor perceived by children (McGhee, 1979; Shultz, 1976), in jokes (Shultz, 1976; Suls, 1972), and in advertisements (Alden et al., 2000; Woltman Elpers et al., 2004).

Although incongruity-resolution provides a reasonable explanation of humor in jokes and advertisements, it is less clear whether incongruity-resolution is general enough to explain humor across a wider range of experiences (Martin, 2007; Nerhardt, 1970, 1976). For example, little seems resolved in the humor elicited by practical jokes or slapstick comedies like *The Three Stooges* or *Jackass*. Given that laughter and humor result from a wide range of experiences beyond jokes and advertisements (Martin, 2007; Provine, 2001), it is also important to assess what explains humor in other domains.

Our fourth study compared the benign violation hypothesis with incongruity-resolution theory, the most popular variant of incongruity-plus theories, to examine which better explains differences between humorous and nonhumorous videos. Specifically, we asked participants to find a humorous video clip, an inspiring

video clip, and a frightening video clip, and then assess the presence of either a benign violation or a resolved incongruity. We expected the presence or absence of a benign violation to better discriminate the humorous from the nonhumorous video clips than the presence or absence of a resolved incongruity.

Method

Students in an undergraduate subject pool at a university in the United States participated in the study for class credit. The number of participants available in the subject pool determined the study’s sample size ($N = 131$; 29% female). Six participants did not complete the study, resulting in a final sample size of 125, which was large enough to detect a true 30% difference between conditions at least 85% of the time (Chow et al., 2008).

The study, which was administered using online survey software, first asked participants to find three brief videos on YouTube: one humorous video, one inspiring video, and one tragic video. Participants read, “The videos can be scenes from a movie, scenes from a television show, advertisements, short films, or home videos, just as long as each video is less than 3 minutes in duration.” Participants read that they would have 15 min to search for the video clips and that they would have an opportunity to watch them again later in the study, so if they came across a clip they already knew well, they did not need to watch it during the search part of the study. The instructions for finding the humorous video read, “Open a new web browser, and then please find a brief video that you personally consider humorous. The video should be humorous, but it should not be inspiring or frightening.” The instructions for finding the inspiring and frightening videos were the same, except “humorous” was replaced with “inspiring” or “frightening,” respectively. Participants entered the name and link for each of the three videos. The order of the three videos was counterbalanced.

After finding the three clips, participants read that they would be reporting their impressions of the videos. Participants subsequently rated the most emotional (i.e., most humorous, inspiring, or frightening, depending on the video) part of the videos on one of three randomly assigned sets of criteria: violation + benign, surprise + resolution, or atypicality + resolution. We used separate sets of measures to operationalize incongruity as both surprise and atypicality because incongruity-resolution theories have defined incongruity as either surprise (e.g., Shultz, 1976) or atypicality (e.g., Alden et al., 2000).

Before evaluating the clips, participants read detailed definitions of the constructs (i.e., violation and benign, surprise and resolution, or atypical and resolution, depending on the participant’s condition). We adapted the definitions of *violation* and *benign* from McGraw and colleagues (McGraw & Warren, 2010; McGraw et al., 2012). We adapted the definitions of *surprise* and *atypical* largely from the dictionary (Atypical, n.d.; Surprise, n.d.) but also from various papers defining incongruity as either *surprise* or *atypicality* (e.g., Alden et al., 1993; Morreall, 1982; Shultz, 1972; Woltman Elpers et al., 2004). We adapted the definition of *resolution* from book chapters by Suls (1972) and Martin (2007). We kept the definitions of the different constructs as parallel as possible (see Appendix A for details). The definitions also included an example of how to apply the measures to a situation in which someone makes a sarcastic comment. We included the example to

help participants better understand the definitions and because sarcasm typically involves a violation, is surprising, and is atypical. To ensure that participants understood the instructions, we asked them to define the measures (violation and benign, surprise and resolve, or atypical and resolve, depending on condition) in their own words before evaluating the videos. Participants had the option of reading the descriptions a second time before providing their own definition.

Next, participants were directed to the link for the humorous, inspiring, or tragic video (order counterbalanced) and were asked to watch the video. Participants then responded to an open-ended question asking, "What happens in the most (humorous/inspiring/tragic) part of this video?" Then they evaluated the most emotional part of the video by checking one of three options. Participants assessing the presence of benign violations selected between "There is no violation," "There is a violation; it does not seem benign," and "There is a violation; it seems benign." Participants assessing the presence of surprise and resolution selected between "There is no surprise," "There is a surprise; it is not resolved," and "There is a surprise; it is resolved." Participants assessing the presence of atypicality and resolution selected between "Everything seems normal," "Something is abnormal; it is not resolved," and "Something is abnormal; it is resolved." The survey displayed the detailed definitions of the constructs below the measures in case participants needed to refer back to them while completing the measures. Finally, participants repeated the same process for the remaining two videos.

Results and Discussion

As in the previous study, we examined which condition or set of conditions best discriminated between the humorous videos and the nonhumorous videos. First, we investigated whether the presence or absence of incongruity alone (operationalized as surprise, atypicality, and violation, respectively) could distinguish humorous clips from frightening clips. Omnibus tests indicated that each operationalization of incongruity discriminated between the three

videos; surprise, $\chi^2(2, N = 40) = 19.41, p < .001$; atypical, $\chi^2(2, N = 43) = 7.61, p < .05$; and violation, $\chi^2(2, N = 42) = 22.75, p < .001$. However, incongruity alone was too broad a criterion to accurately differentiate humorous stimuli from nonhumorous stimuli. Frightening videos were as likely to contain an incongruity as humorous videos when incongruity was operationalized as either atypicality (84% vs. 77%), $\chi^2(1, N = 43) = .42, p > .4$, or a violation (79% vs. 64%), $\chi^2(1, N = 42) = 2.10, p > .1$, and even more likely to contain a surprise (88% vs. 60%), $\chi^2(1, N = 40) = 7.81, p < .01$ (see Figure 3).

Next, we assessed whether the presence or absence of a resolved incongruity accurately distinguished humorous from frightening and inspiring videos. As illustrated in Figure 3, neither a resolved surprise (omnibus test, $\chi^2[2, N = 40] = .30, p > .8$) nor a resolved atypicality (omnibus test, $\chi^2[2, N = 43] = 5.73, p = .06$) occurred more frequently in humorous videos than nonhumorous frightening or inspiring videos. Participants were no more likely to perceive a resolved surprise in a humorous video than in a frightening (33% vs. 33%), $\chi^2(1, N = 40) = 0, p > .9$, or inspiring video (33% vs. 38%), $\chi^2(1, N = 40) = .22, p > .6$. Similarly, participants were no more likely to perceive a resolved atypicality in a humorous video than in a frightening (30% vs. 26%), $\chi^2(1, N = 43) = .23, p > .6$, or inspiring video (30% vs. 49%), $\chi^2(1, N = 43) = 3.11, p = .08$. Importantly, however, participants were significantly more likely to perceive a benign violation in the humorous videos than in both the frightening (48% vs. 17%), $\chi^2(1, N = 42) = 8.73, p < .01$, and inspiring videos (48% vs. 17%), $\chi^2(2, N = 40) = 8.73, p < .01$; omnibus test, $\chi^2(2, N = 42) = 13.62, p = .001$.

As in previous studies, the presence or absence of incongruity alone, regardless of the way in which it was operationalized, could not explain differences between humorous and tragic videos. The study extended previous studies by demonstrating that supplementing incongruity with an additional condition, resolution, does not fix the problem; the presence or absence of a resolved incongruity also failed to explain differences between humorous and nonhumorous videos. The presence of a benign violation, on the

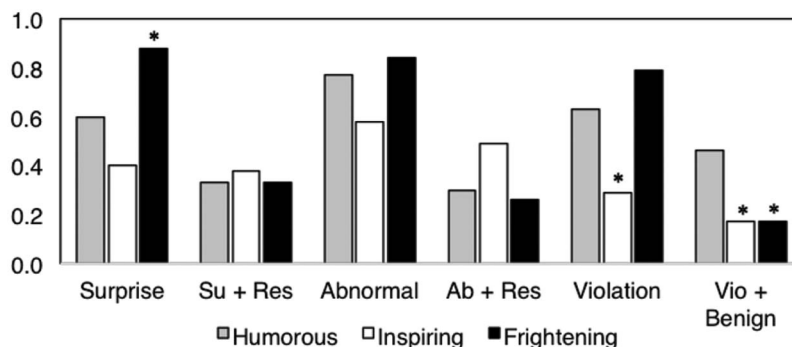


Figure 3. The proportion of humorous (gray), inspiring (white), and frightening (black) videos perceived to contain a surprise (Surprise), a resolved surprise (Su + Res), atypicality (Abnormal), resolved atypicality (Ab + Res), a violation (Violation), and a benign violation (Vio + Benign) in Study 4. A correct humor theory must identify conditions that are general enough to be present in humorous events (gray bars) but specific enough to not be present in nonhumorous events (the white and black bars). Note that only the joint presence of both the violation and benign conditions was more likely to be present for humorous videos than both types of nonhumorous videos. Significant differences ($p < .05$) between the humorous events and the nonhumorous events are indicated by an asterisk over the bar representing the nonhumorous event.

other hand, provided a more accurate, though still imperfect, explanation. Benign violations were perceived more frequently in humorous videos than nonhumorous videos. The relative advantage of the benign violation hypothesis over incongruity-resolution theory in the current study may in part be because the construct of resolution was developed in the domain of scripted jokes (Suls, 1972; Shultz, 1976), and may not be general enough to apply to the many ways in which humor is created in videos (or often occurs in everyday life).

Study 5: Benign Violations Versus Four Alternative Conceptualizations of Incongruity

The previous studies compared the explanatory ability of the benign violation hypothesis sequentially with four of the most common alternative conceptualizations of incongruity theory: surprise-based incongruity, juxtaposition-based incongruity, atypicality-based incongruity, and incongruity-resolution. We conducted a fifth study in an attempt to conceptually replicate the previous studies in a single empirical demonstration. Specifically, we examined whether the presence of incongruity alone (operationalized as surprise, atypicality, juxtaposition, and a violation), resolved incongruity (operationalized as surprise and atypicality), a benign juxtaposition, or a benign violation best accounts for differences between humorous and nonhumorous videos.

Method

Students in an undergraduate subject pool at a university in the United States participated in the study for course credit. We collected between 65 and 70 participants per condition ($N = 271$; 42% female) in order to ensure at least a 98% of detecting a significant effect, assuming a true effect size equal to the observed difference between the humorous and nonhumorous video clips in the benign violation condition in Study 4 (Chow et al., 2008).

Participants identified one humorous, one frightening, and one inspiring video on YouTube and then rated the videos on one of four sets of measures: surprise + resolution, atypical + resolution, juxtaposition + benign, violation + benign. The study used the same procedure as Study 4, except for two changes. First, in order to reduce the concern that an example could potentially bias the way participants interpret the measures, we excluded the sarcasm example from the measure instructions (see Appendix B). Second, in order to compare the explanatory ability of the benign violation hypothesis with juxtaposition-based incongruity theories, we included a fourth condition measuring the presence of juxtaposition. To keep it parallel with the other three conditions, we also had participants in this condition assess if any detected juxtapositions seemed benign (see Appendix B for details). Specifically, participants evaluated the most emotional part of the three videos (order counterbalanced) by selecting one of the following: "There is no juxtaposition," "There is juxtaposition; it does not seem benign," and "There is juxtaposition; it seems benign."

Results and Discussion

Omnibus tests indicated that each operationalization of incongruity alone discriminated between the three clips; surprise, $\chi^2(2, N = 68) = 17.09, p < .001$; atypical, $\chi^2(2, N = 68) = 27.91, p <$

.05; violation, $\chi^2(2, N = 67) = 10.32, p < .01$; and juxtaposition, $\chi^2(1, N = 67) = 6.05, p < .05$. However, replicating the previous studies, incongruity alone did not accurately predict differences between humorous and nonhumorous stimuli. Frightening clips were as likely or more likely to contain an incongruity than humorous clips, regardless of whether incongruity was operationalized as a surprise (87% vs. 66%, $\chi^2[1, N = 68] = 8.01, p < .01$, atypicality (87% vs. 74%), $\chi^2(1, N = 68) = 3.74, p = .05$, violation (58% vs. 55%), $\chi^2(1, N = 67) = .12, p > .7$, or juxtaposition (61% vs. 76%), $\chi^2(1, N = 67) = 3.47, p > .05$. Juxtaposition was the only conceptualization of incongruity that was more frequently present in humorous clips than both inspiring (76% vs. 57%; $\chi^2[1, N = 67] = 5.65, p < .05$) and frightening (76% vs. 61%; $\chi^2[1, N = 67] = 3.47, p = .06$) clips, although, as previously noted, the latter difference did not reach a conventional level of significance.

Next we assessed whether the different conceptualizations of incongruity-plus theories accurately distinguished humorous from frightening and inspiring videos. Incongruity-resolution did not distinguish humorous videos from nonhumorous inspiring videos. Participants were no more likely to perceive a resolved surprise in a humorous video than in an inspiring video (43% vs. 47%), $\chi^2(1, N = 68) = .27, p > .6$; omnibus test, $\chi^2(2, N = 68) = 11.17, p < .01$. Similarly, participants were no more likely to perceive a resolved atypicality in a humorous video than in an inspiring video (43% vs. 37%), $\chi^2(1, N = 68) = .49, p > .4$; omnibus test, $\chi^2(2, N = 68) = 10.62, p < .01$. The perception that the video contained a juxtaposition that was benign, an incongruity-plus theory (i.e., appropriate incongruity) advocated by Oring (1992), similarly failed to differentiate humorous videos from inspiring videos (43% vs. 42%), $\chi^2(1, N = 67) = .03, p > .8$; omnibus test, $\chi^2(2, N = 67) = 12.05, p < .01$. As in prior studies, only the perception of a benign violation significantly differentiated the humorous and nonhumorous videos (omnibus test: $\chi^2[2, N = 67] = 6.66, p < .05$). Participants were significantly more likely to perceive a benign violation in the humorous videos than in both the frightening (43% vs. 25%), $\chi^2(1, N = 67) = 4.77, p < .05$, and inspiring videos (43% vs. 25%), $\chi^2(1, N = 67) = 4.77, p < .05$ (see Figure 4).

As in previous studies, the presence or absence of a benign violation better differentiated humorous from nonhumorous stimuli than alternative conceptualizations of incongruity theory. Incongruity alone, whether conceptualized as surprise, atypicality, juxtaposition, or violation, is too broad a condition to explain humor, as many frightening and inspiring stimuli are perceived to be incongruous. Alternative incongruity-plus theories, including incongruity-resolution and appropriate incongruity (i.e., juxtaposition + benign; Oring, 1992), make fewer false hits, but have difficulty distinguishing humorous from inspiring stimuli.

Study 6: Manipulating Benign and Violation Appraisals

Study 6 tested whether alternative conceptualizations of incongruity can differentiate humorous from nonhumorous stimuli by manipulating the presence or absence of surprise-based incongruity, resolved incongruity, and a benign violation. Because people most frequently experience humor in social contexts (Martin, 2007; Provine, 2001), the study examined which conceptualization

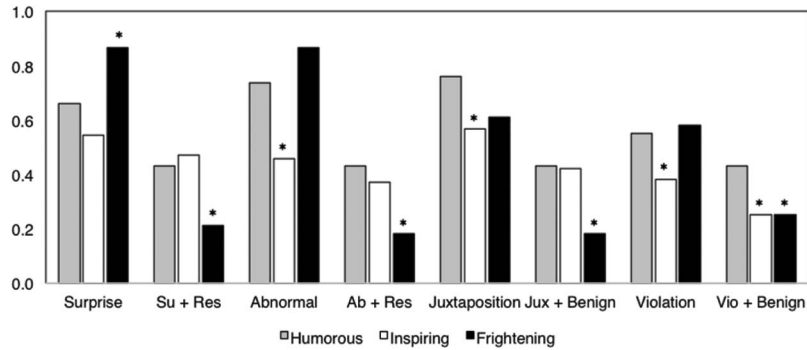


Figure 4. The proportion of humorous (gray), inspiring (white), and frightening (black) videos perceived to contain a surprise (Surprise), a resolved surprise (Su + Res), atypicality (Abnormal), resolved atypicality (Ab + Res), juxtaposition (Juxtaposition), benign juxtaposition (Jux + Benign), a violation (Violation), and a benign violation (Vio + Benign) in Study 5. Significant differences ($p < .05$) between the humorous events and the nonhumorous events are indicated by an asterisk over the bar representing the nonhumorous event.

of incongruity best predicts differences in the humor that people express during an atypical social interaction. As in prior studies, we predicted that social interactions involving a benign violation would elicit more humor than incongruous interactions that either lack a violation or contain a violation that is more difficult to appraise as benign.

Participants were subjected to a carefully scripted social interaction with a confederate who played the role of a participant in the study. To manipulate the presence or absence of a violation, the confederate's behavior was either atypically positive (offering candy to the participant) or atypically negative (throwing candy at the participant). Orthogonally, the study also manipulated whether the confederate explained his or her behavior (i.e., offering or throwing the candy) beforehand or afterward. Explaining what was about to happen beforehand should make the behavior less surprising. But the explanation should also make it easier for participants to appraise the violation as benign by helping them realize that the behavior is not a real act of aggression but merely part of the experiment.

The benign violation hypothesis, surprise-based incongruity theories, incongruity-resolution theories, and atypicality-based incongruity theories make different predictions about which condition should elicit the most humor. The benign violation hypothesis predicts that participants will express the most humor in response to a negative behavior that was explained beforehand. In contrast, surprised-based incongruity theories predict that participants will express the most humor in response to a behavior (either positive or negative) that was not explained beforehand. Incongruity-resolution theories predict that participants should exhibit the most humor in response to an explanation that follows an unexpected behavior (either positive or negative); however, incongruity-resolution theories suggest that the explanation itself, rather than the behavior, should trigger laughter and amusement. Because all four behaviors are atypical, atypicality-based incongruity theories do not make a clear prediction about which conditions should elicit the most humor.

Method

We attempted to recruit 160 participants (80 male and 80 female) from an undergraduate student subject pool in order to ensure at least an 80% chance of detecting any of the predicted

contrasts (assuming a “moderate” true effect size of $\eta_p^2 = .10$; Judd et al., 2009). However, the semester ended before we could collect enough female respondents. Additionally, we also could not use the data from five participants. One participant completed the study twice, so we retained only the data from his first participation. We also lost data from another four participants because an experimenter failed to link the video of the participant with his or her condition or survey. As a result, the final sample included 140 participants (41% female).

Before arriving at the lab, participants were randomly assigned to a condition using a 2 (behavior: positive, negative) \times 2 (explanation: before, after) between-subjects design. Upon arrival, participants learned that they would be completing a “language exercise,” followed by a “social interaction study” with another participant. The experimenter subsequently directed participants to a room in which a confederate, an actor pretending to be another study participant, was working on the language exercise. The experimenter sat the participant across a table from the confederate. The confederate had a completed consent form and a bowl of unpackaged Skittles candy next to him or her on the table. To minimize gender effects, female participants interacted with a female confederate, and male participants interacted with a male confederate (analyses confirmed that there were not any significant gender effects). The room contained a video camera, which recorded the participants' behavior throughout the study. Before the onset of the study, the confederates practiced delivering the manipulations until they were able to deliver each with a neutral expression. The confederates were students in a different degree program at the same university as the participants and were unaware of the study's hypotheses.

After being seated across from the confederate, participants completed a consent form and began working on the language exercise. The language exercise was a decoy designed to hold participants' attention while the confederate delivered the behavior and explanation manipulations. In the “positive behavior” conditions, the confederate offered the participant some candy from the bowl of Skittles. In the “negative behavior” conditions, the confederate tossed the Skittles at the participant. In the “explanation before” conditions, the confederate warned the participant before

giving or tossing the candy. Specifically, in the “positive/explanation before” condition, the confederate said, “I’m sorry for interrupting, but in a few seconds I need to offer this candy to you,” before offering the participant the candy. In the “negative/explanation before” condition, the confederate said, “I’m sorry for interrupting, but in a few seconds I need to toss this candy at you,” before tossing the candy at them. In the “positive/explanation after” conditions, the confederate first offered the candy to the participant and then subsequently stated, “I’m sorry for interrupting, but I needed to offer the candy to you.” In the “negative/explanation after” condition, the confederate first threw the candy at the participant and then subsequently stated, “I’m sorry for interrupting, but I needed to toss the candy at you.” The confederate paused for approximately three seconds after both the behavior and explanation manipulations so that we could assess participants’ reaction to the behavior and their reaction to the explanation separately.

After performing the manipulations, the confederate informed participants that he or she had been instructed to offer (throw) the candy to (at) them as part of the social interaction study. The confederate then told the participants that they did not need to complete the language exercise, asked them to instead complete a different questionnaire assessing their reaction to the prior social interaction, and left the room. The questionnaire assessed participants’ reactions to the behavior and the explanation separately. The questionnaire measured perceived humor (“I thought it was funny” and “It was humorous”; $r_{\text{behavior}} = .92$; $r_{\text{explanation}} = .92$), surprise (“It surprised me” and “It was unexpected”; $r_{\text{behavior}} = .79$; $r_{\text{explanation}} = .86$), violation appraisal (“It seemed inappropriate,” “It seemed impolite,” “It seemed rude,” and “People aren’t suppose to do/say things like that”; $\alpha_{\text{behavior}} = .91$; $\alpha_{\text{explanation}} = .86$), and benign appraisal (“It seemed harmless” and “I didn’t have a problem with it”; $r_{\text{behavior}} = .57$; $r_{\text{explanation}} = .75$) to both the behavior (giving/tossing) and the explanation in the prior interaction. The survey also included several exploratory measures that we do not report for the sake of brevity. All measures used 7-point agree–disagree scales. After participants completed the questionnaire, the experimenter returned to debrief participants and offer them an unopened bag of Skittles.

Coding Behavioral Responses

One pair of research assistants (hereafter, editors) edited the recordings of the participants before a different pair of research assistants (hereafter, coders) coded participants’ reactions. First, the editors removed the irrelevant parts of the interaction, retaining only the seconds immediately after the explanation of the behavior and the seconds immediately after the behavior itself. Retaining only the moments following the manipulations should reduce the likelihood of the coders assessing emotional reactions unrelated to the experimental manipulations. Second, the editors reordered the recording in the “explanation after” conditions such that the video always showed participants’ reaction to the explanation before showing their reaction to the behavior. The purpose of reordering the videos was to obscure the “explanation” manipulation from the coders by making the sequence of all of the videos similar. Thus, the edited videos first showed the participant’s reaction to the explanation followed by a 1-s black screen, and then the participant’s reaction to the behavior.

Two different research assistants independently viewed the edited videos and rated participants’ reactions to both the explanation and the behavior. Coders rated “expressions or signs of a humorous reaction (i.e., amusement or laughter)” on a scale from 0 (*no humor*) to 3 (*strong humor*). Coders also rated “expressions or signs of other positive emotion aside from humor (e.g., happiness, awe, excitement, gratitude, etc.)” on a scale from 0 (*no positive emotion*) to 3 (*strong positive emotion*). Finally, coders rated “expressions or signs of negative emotion (confusion, anger, frustration, embarrassment, discomfort, disgust, etc.)” on a scale from 0 (*no negative emotion*) to 3 (*strong negative emotion*). Coders showed a high level of agreement in their ratings of expressed humor ($r_{\text{explanation}} = .65$, $r_{\text{behavior}} = .70$) and negative emotion ($r_{\text{explanation}} = .30$, $r_{\text{behavior}} = .69$; all $ps < .001$). There was less agreement on ratings of the expression of positive emotion ($r_{\text{explanation}} = .05$, $r_{\text{behavior}} = .33$). Because of the poor reliability of the measure and because we did not have any hypotheses concerning the expression of positive emotion, we do not discuss this variable further (means for each condition reported in Table 4). In addition, because our hypotheses focused on participants’ reactions to the atypical behavior (rather than reactions to the explanation per se), we discuss the reactions to the behavior below while reporting reactions to the explanation in Table 4.

Results

Surprise, violation, and benign appraisals. We first examined how the confederate’s behavior (either giving or tossing the candy at the participant) influenced the reported measures of surprise, a violation appraisal, and a benign appraisal. One concern with the self-report measures is that they were administered retrospectively after the participants learned that the positive or negative behavior had been part of the study. Learning that the candy had been offered or thrown as part of the study may have changed participants’ appraisals—recall that one reason that we manipulated the order of the explanation in the first place was to make the candy assault seem more benign in the “explanation-before” condition. Thus, the appraisal measures provide a weak test of the success of the manipulations, as it is possible that the manipulations may have successfully influenced initial appraisals but the retrospective measures were not sensitive enough to detect this influence at a later time. Nonetheless, if the appraisal measures do detect significant differences between conditions, it would increase our confidence that the manipulations worked as intended.

As intended, the explanation manipulation significantly influenced surprise such that the behavior was less surprising when it was explained beforehand ($M = 5.08$ vs. 6.01), $F(1, 136) = 12.02$, $p < .001$, $\eta_p^2 = .081$. The negative behavior was also more surprising than the positive behavior ($M = 5.86$ vs. 5.28), $F(1, 136) = 4.83$, $p < .05$, $\eta_p^2 = .034$, but the interaction was not significant, $F(1, 136) = 3.82$, $p > .05$. The appraisal ratings suggest that if surprise drives humor, participants should express less humor when the behavior is explained beforehand.

Also as intended, the behavior manipulation significantly influenced the ratings of violation appraisal such that the negative behavior seemed like a larger violation than the positive behavior ($M = 3.87$ vs. 1.37), $F(1, 36) = 176.02$, $p < .001$, $\eta_p^2 = .56$. The timing of the explanation interacted with the behavior manipulation, $F(1, 136) = 11.13$, $p < .01$, $\eta_p^2 = .076$, but the negative

Table 4
Mean Ratings (Standard Deviations) of Participants' Expressed Reactions (Scale From 0 to 3) and Self-Reported Reactions (Scale From 1 to 7) in Study 6

	Positive (confederate offers candy)		Negative (confederate throws candy)	
	Explained after	Explained before	Explained after	Explained before
Response to behavior				
Humor (express)	.28 ^A (.53)	.55 ^A (.64)	.97 ^B (.77)	1.71 ^C (.79)
Negative (express)	.21 ^A (.41)	.08 ^A (.28)	1.46 ^C (.87)	.56 ^B (.52)
Positive (express)	.67 ^B (.46)	1.06 ^C (.53)	.27 ^A (.33)	.66 ^B (.48)
Humor (report)	4.45 ^A (1.67)	5.32 ^B (1.66)	5.94 ^{B,C} (1.64)	6.53 ^C (.72)
Surprise (report)	5.47 ^A (1.57)	5.05 ^A (1.97)	6.65 ^B (.67)	5.11 ^A (2.09)
Violation (report)	1.40 ^A (.71)	1.33 ^A (.45)	4.56 ^C (1.34)	3.22 ^B (1.61)
Benign (report)	6.28 (1.23)	6.36 (1.01)	5.89 (1.36)	5.96 (1.29)
Response to explanation				
Humor (express)	.85 ^B (.74)	.56 ^A (.62)	1.36 ^C (.77)	1.17 ^{B,C} (.73)
Negative (express)	.21 ^A (.25)	.23 ^A (.31)	.48 ^B (.69)	.39 ^{A,B} (.47)
Positive (express)	.59 (.36)	.48 (.48)	.65 (.38)	.56 (.38)
Humor (report)	3.34 ^A (1.83)	4.83 ^B (1.62)	5.46 ^{B,C} (1.31)	5.71 ^C (1.47)
Surprise (report)	4.54 ^A (1.98)	5.48 ^B (1.41)	4.20 ^A (2.16)	6.11 ^B (1.33)
Violation (report)	1.51 ^{A,B} (.83)	1.42 ^A (.52)	1.92 ^B (1.13)	2.51 ^C (1.35)
Benign (report)	6.59 ^B (.73)	6.65 ^B (.61)	5.91 ^A (1.51)	6.27 ^{A,B} (.85)

Note. This table shows participants' expressed and measured reactions to an atypical behavior (top rows) and to the explanation of the same atypical behavior (bottom rows) depending on whether the behavior was positive or negative and whether the explanation preceded or succeeded the behavior. Different subscripts within a row indicate that the means were significantly different at $p < .05$ across the columns within the row.

behavior was perceived to be a larger violation regardless of whether it was explained beforehand ($M = 3.22$ vs. 1.33), $F(1, 136) = 48.08$, $p < .001$, or not ($M = 4.56$ vs. 1.40), $F(1, 136) = 189.52$, $p < .001$. Thus, if a violation appraisal drives humor, then participants should express more humor in response to the negative behavior than the positive behavior.

Finally, neither the explanation manipulation, $F(1, 140) = .12$, $p > .7$, nor the behavior manipulation, $F(1, 136) = 3.63$, $p > .05$, significantly influenced the benign appraisal measure; interaction: $F(1, 136) = .002$, $p > .9$. Participants appraised the behavior as being relatively benign in all of the conditions (see Table 4). Given that the explanation manipulation was intended to help participants appraise the behavior as being benign, it is possible that participants may have appraised the behavior as benign across conditions because benign appraisal was measured after the explanation in all of the conditions. Unfortunately, if our interpretation is correct, the benign appraisal measure cannot directly assess whether a prior explanation successfully made the negative behavior seem more benign at the time.

Expressed negative emotion. Another way to assess whether a prior explanation made the negative behavior seem more benign is the extent to which the behavior triggered negative emotion. Behaviors that seem benign should elicit less negative emotion than behaviors that do not seem benign. As expected, negative emotional reactions depended on an interaction between the behavior and expression manipulations, $F(1, 136) = 16.45$, $p < .001$, $\eta_p^2 = .11$. Being offered candy was unlikely to elicit negative emotion regardless of whether or not the positive behavior was explained beforehand ($M = .08$ vs. $.21$), $F(1, 136) = .96$, $p > .3$. Importantly, however, being the target of thrown candy was less likely to elicit negative emotion when the negative behavior was explained beforehand ($M = .56$ vs. 1.45), $F(1, 136) = 43.78$, $p > .001$, which is consistent with the interpretation that a prior explanation made the deluge of Skittles seem more benign.

Expressed humor. The extent to which the manipulations influenced participants' expressions of humor (e.g., laughter) detected by the coders was more consistent with the benign violation hypothesis than alternative variants of incongruity theory. Consistent with the proposition that a violation is necessary for humor, participants expressed more humor in response to a negative event (candy thrown at them) than a positive event (candy offered to them; $M = 1.35$ vs. $.40$), $F(1, 136) = 63.60$, $p < .001$, $\eta_p^2 = .32$. Inconsistent with surprised-based incongruity theories, there was also a significant main effect of explanation such that participants expressed more humor in response to an event that was explained beforehand than an event that was not explained beforehand ($M = 1.15$ vs. $.60$), $F(1, 136) = 18.75$, $p < .001$, $\eta_p^2 = .12$. There was also a significant interaction, $F(1, 136) = 4.27$, $p < .05$, $\eta_p^2 = .030$. Consistent with the hypothesis that humor occurs when a violation seems benign, participants were more likely to express humor in response to a negative event when the event was explained beforehand ($M = 1.71$ vs. $.97$), $F(1, 136) = 19.95$, $p < .001$. In contrast, participants expressed little humor in response to a positive event regardless of whether or not it was explained beforehand ($M = .55$ vs. $.28$), $F(1, 136) = 2.63$, $p > .10$.

Self-reported humor. As discussed above, the self-reported measures are limited in that they were taken retrospectively after the focal social interaction and its explanation. Nonetheless, self-reports of humor were significantly correlated with expressions of humor detected by the coders, $r = .46$, $p < .001$, and showed a similar pattern of results. There was a main effect of behavior such that participants reported more humor when candy was thrown at them rather than offered to them ($M = 6.24$ vs. 4.85), $F(1, 136) = 63.54$, $p < .001$, $\eta_p^2 = .18$. There was also a main effect of explanation such that participants reported more humor when the behavior was explained beforehand ($M = 5.94$ vs. 5.13), $F(1, 136) = 8.47$, $p < .01$, $\eta_p^2 = .059$. However, self-reported humor

differed from expressed humor in that the interaction was not significant, $F(1, 136) = .31, p > .5$.

Relationship between appraisals and expressed humor. We conducted an alternative test of surprise-based incongruity theories and the benign violation hypothesis by regressing expressed humor in response to the behavior on self-reports of surprise, violation appraisal, and benign appraisal. Inconsistent with surprise-based incongruity theories, self-reported surprise did not predict expressed humor, $b = -.03, t = -.72, p > .4$. The violation and benign appraisals, on the other hand, did significantly predict expressed humor. Controlling for surprise and benign appraisal, appraising the behavior as a violation was associated with more expressed humor, $b = .16, t = 3.51, p < .001$. Moreover, controlling for surprise and a violation appraisal, appraising the behavior as benign was associated with more expressed humor, $b = .13, t = 2.13, p < .05$.

Discussion

Study 6 supplements prior studies in two ways. First, instead of relying on self-reported humor, the study recorded and coded participants' behavioral expressions of humor (laughing, smiling, etc.). Second, the study manipulated the presence or absence of surprise-based incongruity, resolved incongruity, and a benign violation to test which best predicts the humor expressed during a social interaction. Consistent with the benign violation hypothesis, people expressed the most humor in response to a behavior that violated a social norm (being targeted by thrown candy) but that seemed benign by means of being explained beforehand. The results were less consistent with other variants of incongruity theory. In contrast to the predictions of surprise-based incongruity theories, behaviors elicited more humor if they were less surprising as a result of being explained beforehand. Additionally, neither atypicality-based incongruity theories nor incongruity resolution theories can easily explain why an atypical behavior elicits more humor when it is negative yet explained beforehand rather than positive or unexplained.

General Discussion

For thousands of years, scholars have offered dozens, if not hundreds, of explanations of humor. The most popular, incongruity theory, is parsimonious, intuitively appealing, and provides a useful foundation for understanding humor elicited by scripted jokes (e.g., Shultz, 1976; Suls, 1972) and advertising (e.g., Alden et al., 2000; Woltman Elpers, et al., 2004). Incongruity, however, can mean many things, including surprise, juxtaposition, atypicality, and a violation. Moreover, none of these conceptualizations accurately differentiate humorous from nonhumorous stimuli because incongruity often inaccurately predicts that nonhumorous creative, amazing, inspiring, tragic, and frightening stimuli will be humorous.

Our studies show that the benign violation hypothesis articulates a set of conditions—the juxtaposition of a violation appraisal with a benign appraisal—that better differentiate humorous from nonhumorous entertainment, consumer products, and social interactions than other popular incongruity theories. Studies 1a and 1b showed that the presence or absence of a violation predicts the humor perceived in a YouTube video, but the presence or absence of surprise does not. Studies 2a and 2b showed that juxtaposition produces humor when the juxtaposition involves a violation, but

not when the juxtaposition seems useful or valuable. Studies 3 through 5 showed that the presence or absence of a benign violation better discriminates humorous sports plays and YouTube videos from nonhumorous sports plays and YouTube videos than the criteria advocated in popular versions of incongruity theory, including surprise, atypicality, resolved incongruity, and appropriate incongruity. Finally, Study 6 showed that social interactions that are easiest to appraise as benign violations elicit the greatest expressions of humor.

Beyond Jokes

Many humor theories were designed to explain jokes, and the merits of such theories are often tested using verbal stimuli (Raskin, 1985; Shultz, 1976; Suls, 1972). Although joking is an important domain, only a minority of humorous experiences involve scripted jokes (Martin, 2007; Provine, 2001). People often experience humor in response to films, TV, websites, books, magazines, and other media. People also regularly share laughs with friends, lovers, acquaintances, and strangers in everyday social interaction. Testing a theory only with jokes is limiting because jokes are generally funny, at least compared with things not being joked about. Consequently, the weaknesses of a theory, including most of the conceptualizations of incongruity, may only appear (as they do in our inquiry) when researchers examine humor across a wider range of both funny and not-funny stimuli. Therefore, we encourage researchers to continue to test and refine humor theories across a wider variety of psychological experiences.

Accounting for Different Types of Humorous Stimuli

Moving beyond jokes is a challenge for humor theorists due to the vast array of situations, experiences, and stimuli that trigger humor. A pun and flatulence share few surface features, yet both can make people laugh (or wince). Some scholars believe that it is not worth pursuing a general explanation of humor, arguing instead that different humor theories explain different forms of comedy (Buijzen & Valkenburg, 2004; Strohminger, 2011). Creating a menu of humor theories to explain different types of stimuli—slapstick, puns, irony, tickling, or farts—can improve predictions, but there is also value in pursuing a general explanation across different domains. Pursuing a general humor theory is important because relying on one theory to explain slapstick and another theory to explain irony lacks parsimony. Moreover, it seems odd that humor would require a menu of different explanations given that scientists typically agree on a single, general explanation for other complex psychological experiences, such as embarrassment, disgust, and pride (Han, Lerner & Keltner, 2007; Lewis, 1993; Rozin, Haidt, & McCauley, 2008).

Further Refining Humor Theory

Incongruity provides a strong starting point for developing a general theory of humor because seemingly different triggers of humor—from puns to tickle attacks—are incongruous in one way or another. However, as we highlight here, incongruity is limited as a general explanation because incongruity alone, regardless of how it is conceptualized, is not specific enough to differentiate humorous from nonhumorous stimuli.

The benign violation hypothesis decreases ambiguity in how to conceptualize incongruity and better differentiates humorous from

nonhumorous stimuli. Although an improvement over alternative conceptualizations of incongruity, the benign and violation conditions need further study. For example, a benign violation hypothesis would seem to have difficulty differentiating humorous (e.g., disgusting jokes) from nonhumorous (e.g., spicy foods) cases of benign masochism (Rozin et al., 2013). Additionally, despite outperforming alternative conceptualizations of incongruity, measures of benign violations in our studies were unable to perfectly classify humorous and nonhumorous stimuli. The data showed that the benign violation hypothesis often missed characterizing humorous stimuli as humorous, which suggests a need for refinement in theory, measurement, or both.

Improving theory and measurement will require conceptualizing the benign and violation conditions at a detailed level. Just as the benign violation hypothesis improves the explanatory power of incongruity theory by breaking incongruity into benign and violation (and simultaneity) components, new hypotheses could explain more variance in humor, at least within a specific domain, by identifying subcomponents of benign violations. For example, Raskin (1985) identifies opposing scripts, such as obscenity/no-obscenity, violence/no-violence, death/life, real/unreal, and bad/good, that are examples of benign violations in verbal texts (Veatch, 1998).

Researchers should also strive to understand not only the broad components that give humor its shape (e.g., benign violations) but also the domain-specific components that afford a complete portrait of why and when different stimuli evoke humor. Subtle components help transform a physical gesture, image, sound, sequence of actions, or string of words into something humorous. For example, a full explanation of tickling requires understanding the physiology of touch, the dynamics of the nervous system, and the social dynamics of specific tickle attack. Similarly, decoding satire requires a detailed understanding of a person's cultural background, values, and beliefs, not to mention the language, visual images, or another medium used to communicate the satire.

The Evolution of Humor

Finally, a strong explanation of humor should offer insight into the evolutionary benefits of humor (Gervais & Wilson, 2005; Miller, 2001). Although humor offers multiple adaptive benefits to contemporary humans (Flamson & Barrett, 2008; Greengross & Miller, 2011), the benign violation hypothesis complements emerging evidence from positive psychology and the ethology of laughter to suggest that humor may have initially evolved to communicate that a potential threat is not a concern.

Humor involves the positive emotion of amusement and therefore shares some adaptive benefits with other positive emotions. Positive emotions occur in a benign environment, and the absence of immediate danger stimulates creative thinking, rehearsal, and learning other skills that may be useful at a later time (Fredrickson, 1998). Thus, rather than orient a person toward a specific behavior, positive emotions promote a range of "broaden and build" activities that enhance long-term fitness (Fredrickson, 1998). For example, research on animal learning suggests that play fighting, the most common source of laughter in nonhuman primates, promotes social development later in life (Pellis & Pellis, 2007).

Humor, however, is unlike other positive emotional experiences, in that it is associated with a specific, observable behavior: laughter (Koestler, 1964; Veatch, 1998). Laughter likely originated as a prim-

itive form of communication (Gervais & Wilson, 2005). Laughter develops before speech (e.g., babies, nonhuman primates, and possibly even rats laugh), occurs primarily in social settings, and is universally recognizable (Gervais & Wilson, 2005; Panksepp, 2005; Provine, 2001). Prelanguage communication is severely limited, so each vocalization has to be as informative as possible (Corballis, 2009). Most of the time there is no value in telling others that everything is okay, which is why most benign situations (and their accompanying positive emotion) do not trigger laughter. Signaling that something is benign becomes valuable only when there is some ambiguity of a threat. Thus, humor may have emerged as a way to communicate a false alarm, or that a potential threat is not a concern (Ramachandran, 1998).

The meaning of threat, and consequently the types of stimuli that could produce humor, has expanded substantially since humor made its evolutionary debut. In nonhuman primates, for which social interactions are largely physical rather than cultural or linguistic, laughter occurs primarily in response to mock physical aggression (Gervais & Wilson, 2005; Panksepp, 2005; Provine, 2001). Contemporary human cultures, however, are characterized by a complex array of social norms, identity roles, language, and logic systems, all of which can be breached. Thus, just as disgust evolved from an aversion to oral contaminants to an aversion to a wide range of physical and social behaviors (Rozin et al., 2008; Tybur, Lieberman, Kurzban, & DeScioli, 2013), humor may have similarly expanded from a positive response to a baseless physical threat to a positive response to the wide range of minor setbacks, hypothetical perils, friendly insults, social missteps, cultural misunderstandings, absurdities, and other benign violations that amuse and make people laugh.

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(Appendices follow)

Appendix A

Measure Definitions in Study 4

Surprise + Resolution

A surprise occurs if you think that something will happen in a certain way but it happens in a different way instead or it doesn't happen at all. Something is surprising if you are unable to anticipate, foresee, or predict it. In other words, you encounter something that you don't expect.

For example, someone sarcastically saying, "cool shirt!" when meeting a person for the first time would be surprising. When meeting someone new, we expect people to offer compliments rather than insults. We also expect people to say what they mean, not the opposite. Thus, the sarcastic comment would be surprising both because it is an insult and because its intended meaning (i.e., the shirt is not cool) is the opposite of its literal meaning.

A surprise is resolved if you find a way to explain the surprise. You may be able to explain the surprise because:

1. the presence of a conflicting rule or norm—an alternative rule or norm makes the surprising event seem typical or normal.
2. an alternative explanation—the surprise makes sense according to another perspective or interpretation.
3. a solution—there is a solution to something that initially seemed puzzling or unexpected.

The sarcastic comment could be resolved if you found out that the people were not meeting for the first time but were actually old friends who frequently make fun of one another. The sarcastic comment could also be resolved if there were an alternative explanation or meaning for "cool shirt"; for example, if the shirt included a picture of ice or a refrigerator or something else associated with a cool temperature.

We would like you to separately evaluate whether each of the (most emotional parts) of the videos is surprising, and if so, if the surprise is resolved. Please make each evaluation separately. That is, your judgment for one video should be independent of your judgments of the other videos.

Abnormal + Resolution

Something is abnormal if it is different than what you would normally expect given your knowledge about the situation. Something can be abnormal either because it is better or worse than what typically occurs or because it is different than a typical pattern or social standard. In other words, it differs from your generally expected beliefs, attitudes, or behaviors.

For example, someone sarcastically saying, "cool shirt!" when meeting a person for the first time would be abnormal. When

meeting someone new, people normally offer compliments rather than insults. People also normally say what they mean, not the opposite. Thus, the sarcastic comment would be surprising both because it is an insult and because its intended meaning (i.e., the shirt is not cool) is the opposite of its literal meaning.

An abnormal occurrence is resolved if you find a way to explain it. You may be able to explain the abnormality because:

1. the presence of a conflicting rule or norm—an alternative rule or norm makes the abnormal event seem typical or normal.
2. an alternative explanation—the abnormal occurrence makes sense according to another perspective or interpretation.
3. a solution—there is a solution to something that initially seemed puzzling or unusual.

The sarcastic comment could be resolved if you found out that the people were not meeting for the first time but were actually old friends who frequently make fun of one another. The sarcastic comment could also be resolved if there were an alternative explanation or meaning for "cool shirt"; for example, if the shirt included a picture of ice or a refrigerator or something else associated with a cool temperature.

We would like you to separately evaluate whether each of the (most emotional parts) of the videos seems abnormal, and if so, if the abnormality is resolved. Please make each evaluation separately. That is, your judgment for one video should be independent of your judgments of the other videos.

Violation + Benign

A violation is anything that challenges someone's well-being, identity, or belief about the way something should be. Violations, which can be large or small, occur when someone (you or another person) is hurt or insulted, something seems wrong, breaks a rule or doesn't make sense, or something is different than the way things should be in an ideal world. In other words, something parts from the norm in a potentially negative way.

For example, someone sarcastically saying, "cool shirt!" would be a violation. In general, we believe that people should mean what they say, not the opposite. Therefore, this sarcastic comment would violate a communication norm because its intended meaning (i.e., the shirt is not cool) is the opposite of its literal meaning. The comment would also be a violation because it potentially threatens a person's identity by insulting his or her shirt.

(Appendices continue)

A violation is benign if it seems okay to you. The subjective feeling that a violation seems okay depends on:

1. the situation—it is easier for a violation to seem okay if the situation seems playful rather than serious.
2. the presence of a conflicting rule or norm—a violation is easier to seem okay if some other rule or norm makes the situation seem normal or acceptable.
3. an alternative explanation—a violation seems okay if it makes sense according to another perspective or interpretation.
4. lack of commitment—it is easier to see a violation as okay if you don't care much about the rule being broken or the person being subject to the violation

5. distance—violations are more likely to seem okay if they happened a long time ago, victimize someone else, or do not seem real compared to violations that are happening now, victimize you, or that are really happening.

The sarcastic comment “cool shirt” would seem benign if it was delivered in a playful or friendly manner, it seemed appropriate given the social context, or you did not personally feel insulted by it. The sarcastic comment would also seem benign if there were an alternative meaning of “cool shirt”; for example, if the shirt included a picture of ice or a refrigerator or something else associated with a cool temperature.

We would like you to separately evaluate whether each of the (most emotional parts) of the videos contains a violation, and if so, if the violation seems benign. Please make each evaluation separately. That is, your judgment for one video should be independent of your judgments of the other videos.

Appendix B

Measure Definitions in Study 5

Surprise + Resolution

A surprise occurs if you think that something will happen in a certain way but it happens in a different way instead or it doesn't happen at all. Something is surprising if you are unable to anticipate, foresee, or predict it. In other words, you encounter something that you don't expect.

A surprise is resolved if you find a way to explain the surprise. You may be able to explain the surprise because:

1. the presence of a conflicting rule or norm—an alternative rule or norm makes the surprising event seem typical or normal.
2. an alternative explanation—the surprise makes sense according to another perspective or interpretation.
3. a solution—there is a solution to something that initially seemed puzzling or unexpected.

We would like you to separately evaluate whether each of the (most emotional parts) of the videos is surprising, and if so, if the surprise is resolved. Please make each evaluation separately. That is, your judgment for one video should be independent of your judgments of the other videos.

Abnormal + Resolution

Something is abnormal if it is different than what you would normally expect given your knowledge about the situation. Something can be abnormal either because it is better or worse than what typically occurs or because it is different than a typical pattern or

social standard. In other words, it differs from your generally expected beliefs, attitudes, or behaviors.

An abnormal occurrence is resolved if you find a way to explain it. You may be able to explain the abnormality because:

1. the presence of a conflicting rule or norm—an alternative rule or norm makes the abnormal event seem typical or normal.
2. an alternative explanation—the abnormal occurrence makes sense according to another perspective or interpretation.
3. a solution—there is a solution to something that initially seemed puzzling or unusual.

We would like you to separately evaluate whether each of the (most emotional parts) of the videos seems abnormal, and if so, if the abnormality is resolved. Please make each evaluation separately. That is, your judgment for one video should be independent of your judgments of the other videos.

Juxtaposition + Benign

Juxtaposition occurs when you perceive two things that don't normally go together combined in some way. Juxtaposition includes simultaneously perceiving two ideas, interpretations, thoughts, attributes, features, or concepts that aren't normally compatible with one another. In other words, when there is a connection or association between two generally disparate concepts or ideas.

(Appendices continue)

A juxtaposition is benign if it seems okay to you. The highly subjective feeling that a juxtaposition seems okay depends on:

1. the situation—it is easier for a juxtaposition to seem okay if the situation seems playful rather than serious.
2. a way to connect the disparate ideas—a juxtaposition is easier to see as okay if there is a broader concept that explains the association between the disparate ideas.
3. lack of commitment—it is easier to see juxtaposition as okay if you don't care much about the concepts or ideas being juxtaposed
4. psychological distance—juxtapositions that happened a long time ago, to someone else, or that do not seem real are easier to see as okay than a juxtaposition that is happening now, affects you, or that is really happening.

We would like you to separately evaluate whether each of the (most emotional parts) of the videos contains juxtaposition, and if so, if the juxtaposition seems benign. Please make each evaluation separately. That is, your judgment for one video should be independent of your judgments of the other videos.

Violation + Benign

A violation is anything that challenges someone's well-being, identity, or belief about the way something should be. Violations, which can be large or small, occur when someone (you or another person) is hurt or insulted, something seems wrong, breaks a rule or doesn't make sense, or something is different than the way things should be in an ideal world. In other words, something parts from the norm in a potentially negative way.

A violation is benign if it seems okay to you. The subjective feeling that a violation seems okay depends on:

1. the situation—it is easier for a violation to seem okay if the situation seems playful rather than serious.
2. the presence of a conflicting rule or norm—a violation is easier to seem okay if some other rule or norm makes the situation seem normal or acceptable.
3. an alternative explanation—a violation seems okay if it makes sense according to another perspective or interpretation.
4. lack of commitment—it is easier to see a violation as okay if you don't care much about the rule being broken or the person being subject to the violation
5. distance—violations are more likely to seem okay if they happened a long time ago, victimize someone else, or do not seem real compared to violations that are happening now, victimize you, or that are really happening.

We would like you to separately evaluate whether each of the (most emotional parts) of the videos contains a violation, and if so, if the violation seems benign. Please make each evaluation separately. That is, your judgment for one video should be independent of your judgments of the other videos.

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