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LAUGH IT OFF: THE REAPPRAISAL OF NEGATIVE LIFE EVENTS THROUGH
HUMOROUS MEMOIR WRITING

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Abstract

The present study was conducted to examine the effects of both increased accessibility of specific schemas and the transfer of physiological excitation on the reappraisal of negative life events in a series of humorous and non-humorous memoir activities. Participants in the present study wrote either write a memoir of a negative life event followed by a memoir containing humorous reinterpretation of the event (accessibility, increased excitation), write a memoir of a negative life event followed by an unrelated humorous memoir (no accessibility, increased excitation), or an affectively neutral memoir followed by an unrelated humorous memoir (no accessibility, no increased excitation). A total of 64 undergraduate students completed the study. The results showed that humorous memoir writing has beneficial effects beyond simple distraction, and that contrary to our original hypothesis, negative event-unrelated humor is more beneficial than related humor.

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Chapter 1 Laugh it off: The reappraisal of negative life events through humorous memoir writing

Humor and laughter have long been recognized as important contributors to general mental health, and since the inception of psychology as a unique discipline, it has been an area of research and speculation worthy of the science's greatest minds. Freud referred to his conceptualization of humor as "the highest of defense mechanisms (1928). Others have also recognized the potential mental health benefits of humor, including Maslow (1954), Allport (1961), and O'Connell (1976). Many studies have been conducted that support the beneficial effects of humor and laughter. Humor has been found to reduce experimentally-induced dysphoric moods (Danzer, Dale, and Klions, 1990), and higher scores on various sense-of-humor scales are positively related to self-esteem (Kuiper & Martin, 1993). Humor has been shown to reduce stress induced by a film (Lefcourt & Martin, 1986). Humorous stimuli (i. e. clips of standup comedy) have also been shown to activate reward centers in the brain (Franklin & Adams, 2011). A wealth of scientific literature has demonstrated that humor may be an important component in the regulation of emotions – a key component of mental health (Gross & Munoz, 1995). There is additional research that suggests that humor may be especially helpful when an individual is dealing with negative life events.

Henman (2001) conducted extensive interviews with 60 former prisoners of war (POW's) from the United States-Vietnam conflict. Many of the former POW's emphasized the importance of humor in maintaining their humanity, specifically, that they tended to joke about their captors and make light of their present situation. Similarly, Holocaust survivor Victor Frankl (1984) states, that humor was an important aspect in his and his fellow prisoners' fight for "soul preservation" (p.63). Frankl writes that the jokes he and the other prisoners made while in the

concentration camp were often centered around their day-to-day experiences. However, as evidenced by seemingly conflicting research results, the relationship between humor and successful coping with negative life experiences is more complex than it may first appear. Several studies have suggested that humor may have a negative relationship with mental health. One study of AIDS and cancer health care staff suggests that frequent use of coping humor may lead to negative outcomes like increased stress (Dorz, Novara, Sica, & Sanavio, 2003). When testing their newly developed COPE scale (a scale designed to measure the efficacy of various coping methods including humor), Carver, Scheier, and Weintraub (1989) concluded that the use of humor as a coping mechanism was related to greater levels of emotional exhaustion.

Other studies have shown mixed results. For instance, large-scale study of 500 Internet Crimes Against Children task force personnel was studied to determine the effects of two different humorous coping styles on levels of secondary traumatic stress. The researchers in this study discovered that “Gallows” humor, which they described as “humor that makes fun of a life-threatening, disastrous, or terrifying situation” (p. 841), was weakly related to high scores on a measure of secondary traumatic stress. However, they also found that lighthearted humor, which was measured by asking participants to indicate how often they “joke and play around lightheartedly with others at work” (p. 845), was weakly related to lower levels of secondary traumatic stress (Craun & Bourke, 2014). Seeming to conflict with these results, Riolli & Savicki (2010), found that humor, defined as “seeing the absurdities and potentially funny side of a stressful event. It may include jokes, sarcasm, irony, wit, and other ways of reevaluating the event through humor” (p. 103), was the *strongest* predictor of positive psychological adjustment. Additionally, it was a stronger predictor than positive reinterpretation, which suggests that humor has benefits beyond a simple positive reinterpretation of negative events. Yet other studies found

no relationship. In their study of breast cancer patients Culver, Arena, Wimberly, Antoni, and Carver (2004), found no significant relationship between humor and levels of emotional distress. These mixed results indicate the need for a greater understanding of the underlying mechanisms that drive the beneficial effects of humor in dealing with negative emotions, in order to determine when and how humor can be used to deal with negative life events.

Humor is a phenomenon we experience daily, but is still not widely understood. In his textbook on humor, Martin (2007) asserts a dichotomy between the cognitive and emotional aspects of the humor process. He purports that the two mechanisms are separate but highly related, and different types of humor (e.g. slapstick, puns, etc.) subtly work vis-à-vis differing levels of both mechanisms. These two mechanisms are related to the cognitive and emotional aspects of the humor appreciation process.

Cognitive aspects of humor

At its core, much of the humor we use in our daily lives involve a series of cognitive processes. To be perceived as humorous, a stimulus needs to be cognitively appraised in such a way that makes it seem odd, incongruous, unexpected, or surprising (Martin, 2007). In his treatise on creativity, Koestler (1964), refers to the cognitive aspects of humor as “bisociation.” According to Koestler, bisociation is the process in which a single event is appraised such that it aligns with an individual’s currently held schemas and beliefs, but at the same time, it seems incongruous or unexpected. In his own words, Koestler believed that to be perceived as humorous, “an event must vibrate simultaneously on two different wavelengths” (p. 35). Building on this, Apter (1982) theorized that when we experience humor, we oscillate back and forth between two seemingly incompatible interpretations of the same event.

Emotional aspects of humor

Humor has obvious effects on our affective state, and experiencing humor is often associated with a positive mood state (Szabo, 2003). Like other pleasing stimuli, such as fatty-foods (Perello, et. al., 2010), gambling (Nestler, 2005), sex (Balfour, Yu, & Coolen, 2004), and even cocaine (Dackis & O'Brien, 2001), humorous stimuli activates the mesolimbic reward system in the brain (Franklin & Adams, 2011; Mobbs, Greicius, Abdel-Azim, Menon, & Reiss, 2003). Instead of solely acting as a tool for the elicitation of positive emotions such as happiness, humor elicits a unique emotion that, like any other emotion, is brought on by specific stimuli in our everyday environment. This emotion of humor is referred to by Martin (2007) as "mirth." As with any emotion, mirth can vary in intensity from mild enjoyment to blustering hilarity (Ruch, 1993). Mirth is also associated with a fixed set of physiological responses involving biochemical, autonomic, endocrine, and neurotransmitter changes (Panksepp, 1993). It is important to recognize how both of these humor mechanisms may affect the reappraisal of negative life events into humorous experiences.

The interplay of cognitive and emotional aspects of humor

There is an abundance of evidence in the literature to support the use of humor as a method to reappraise negative emotions. The researchers in the Danzer et al. (1990) study used the Velten (1968) mood induction states to put participants into a depressed state. Subsequently, the participants were exposed to a humorous audiotape, a non-humorous tape, or no tape at all. Only the humor group returned to their baseline affect states. Cann, Calhoun, and Nance (2000) exposed the participants in their study to humorous or non-humorous videos following a stressful film, and the humorous video condition resulted in lower ratings of depression and anger and more positive moods. In a later study, these results are supported by the results of another study

that followed a video depicting a plane crash with humorous videos (Cann, Holt, & Calhoun, 1999). Yovetich, Dale, and Hudak (1990) used an interesting methodology to show that humor can also reduce anticipatory anxiety. The researchers in this study (falsely) informed participants that they would soon be given painful shocks. While waiting, they listened to either humorous or non-humorous audiotapes, and those in the humor condition showed a lesser increase in anxiety. The use of a neutral tape condition demonstrates that humor has benefits beyond simple distraction.

Fredrickson and Levenson (1998) propose an “undoing model” of positive emotions, which includes mirth. In this model, positive emotions are viewed as random arousal that serves to undo the arousal of negative emotions. In a study conducted by Zillman, Bryant, and Cantor (1974), the researchers found that negative emotions can actually increase humor appreciation. In this study, participants were shown cartoons depicting minimally, moderately, and highly brutal assaults, and all three resulted in increased feelings of mirth. The researchers concluded that the negative emotions were likely misattributed as positive arousal.

These studies all show the powerful effects that being exposed humor can have on reappraising negative emotions into positive emotions. Other studies have established that humor production (as opposed to appreciation) has similar effects. One such study, had participants watch a distressing video depicting a circumcision ritual. While watching, one group was asked to create a humorous narrative relating to the film, a second group created a non-humorous narrative, and a third only watched the film. The humorous narrative group showed fewer behavioral indicators of distress (Lefcourt & Martin, 1986). The results of this study were replicated by Newman and Stone (1996) using a similar methodology (a distressing video of lumber-mill accidents), and found that their humorous narrative group reported less distress,

lower skin conductance, lower heart rate, and higher skin temperature. Each of these are all indicative of lower stress levels. Both of these humor production studies made use of humor that was *related* to the stressor. The importance of this will become evident in a later section.

It is not well established whether or not the ability to use humor to reappraise humor is mediated by any number of individual differences. Martin and Lefcourt (1983), developed the Coping Humor Scale (CHS) which was designed “specifically to assess the degree to which the subjects report using humor as a means of coping with stressful experiences” (p. 1316). Using the CHS, Kuiper and Martin (1993), examined the relationship between scores on the measure and undergraduate students’ appraisals of a difficult exam. Students with higher CHS scores viewed the exam as a positive challenge as opposed to a threat. Also, if they had done well, students with higher CHS scores appraised the test as to be more important and a positive challenge. Conversely, those who had done poorly viewed it as less important, likely reducing their stress and anxiety related to their low scores. Finally, compared to students with low CHS scores, those with high CHS scores were able to realistically adjust their future performance expectations of their performance on later exams. The results of this study suggest that the ability to successfully reappraise negative emotions by using humor may depend on certain individual differences.

People’s ability to use humor to reappraise negative emotions and stress into mirth is well documented, however, the reasons as to why or how this works are less well understood. Dixon (1980) argues that humor may have evolved in humans specifically as a strategy for coping with negative emotions. The “broaden and build” theory of positive emotions (Fredrickson, 1998, 2001; Fredrickson & Branigan, 2005) postulates that positive emotions (e.g. mirth) serve to increase people’s creative thinking by broadening their thought processes and increasing mental

flexibility. This theory also suggests that humor may have an “undoing” effect, to the extent that, negative emotions are incompatible with positive emotions. Fredrickson suggests that because negative emotions restrict our cognitions to focus on important biological goals (e.g. running or fighting when scared), positive emotions serve as an effective antidote and “undo” this restriction. Research results have supported this postulate of the broaden and build theory. For example, research has shown that participants who viewed an amusing film following a distressing one were quicker to return to baseline levels of cardiovascular activation (Fredrickson & Levenson, 1998; Fredrickson, Mancuso, Branigan, & Tugade, 2000). Fredrickson (2001) notes, however, that “the precise mechanism ultimately responsible for this incompatibility has not been adequately identified” (p. 222). The present study intends to provide evidence for two mechanisms that drive the reappraisal process, these are accessibility and excitation transfer. These mechanisms work in tandem on both the cognitive and emotional-physiological aspects of the humor appreciation process to help individuals reappraise negative life events into positive-humorous events.

Excitation transfer mechanism

One of the first psychologists to take interest in humor, Freud (1960 [1905], 1928) recognized that different mechanisms were responsible for the differing aspects of humor appreciation. He theorized there were different categories of humorous phenomena. His first category are jokes that use cognitive techniques that he referred to as “jokework.” This category of humor is closely related to the cognitive elements of humor referred to by Martin (2007) in his book on the psychology of humor. However, the Freudian conceptualization of jokework also draws parallels to theories pertaining to the emotional elements of humor appreciation. Freud believed that the cognitive elements of jokes distracted the superego and allowed pent-up sexual

or aggressive energy from the Id to be released. Freud referred to jokes containing sexual or aggressive themes as “tendentious.” He asserted that tendentious themes contributed to our enjoyment of humor. This theory built on the hydraulic theory of laughter (Spencer, 1860). These topics may actually add to humor appreciation by increasing physiological arousal (not releasing libidinal energy). Another Freudian category is referred to as “humor.” Freud (1928) describes “humor” as occurring in situations that would normally elicit negative emotions (e.g. fear or sadness), but are found to be amusing. This is an important aspect of the proposed reappraisal phenomenon. Freud’s observations about the nature of what we find funny were correct, but he misidentified the underlying causes.

Berlyne (1960, 1972) rejected Spencer’s (1860) and Freud’s (1928) hydraulic theories, and was one of the first to propose the relationship between physiological arousal and the appreciation of humor, specifically, that increased arousal leads to more pleasure derived from humor. A now-famous series of studies conducted by Stanley Schachter and his colleagues (Schachter & Wheeler, 1962), supports Berlyne’s arousal theory. In this study, the researchers discovered that increasing physiological arousal (via epinephrine injections) increased humor appreciation, and that decreasing arousal (via chlorpromazine injections) decreased humor enjoyment. This study artfully demonstrates the linear relationship between arousal and humor appreciation, as the feelings of increased arousal were interpreted as feelings of mirth upon exposure to humor.

Psycho-physiological research provides even more convincing evidence for the emotional-arousal based aspects of humor (and the emotion of mirth). Female office workers who viewed comedic, fear-inducing, or anger-inducing films had higher levels of epinephrine and norepinephrine in their urine compared to a neutral condition. Suggesting sympathetic-

adrenal-medullary activation (the fight-or-flight response) (Levi, 1965). Another study found increased skin conductance (a measure of arousal) in response to a humorous video (Averill, 1969). Finally, Langevin and Day (1972), compared heart rate and skin conductance when participants viewed a series of comics. Funnier comics were related to higher levels of both skin conductance and heart rate. More recent physiological work using modern methodology confirms this early work.

A study conducted by Hubert and de Jong-Meyer (1990) showed that humorous stimuli activated the sympathetic-adrenal-medullary system (SAM), also known as the fight-or-flight response, that is involved in emotional fear and anger responses. Additionally, Hubert, Moeller, and de Jong-Meyer (1993) showed that periods of humorous arousal are associated with activation of the hypothalamic-pituitary-adrenocortical (HPA) system, which is a well-known stress response system. These studies show the close neural relationship between positive and negative emotional arousal. Additionally, the aforementioned fMRI research that shows that humor activates the brain's mesolimbic reward system (Franklin & Adams, 2011; Mobbs, et. al., 2003) validates the assumption that humor and arousal are closely linked. Specifically, that arousal can lead to humor and humor leads to arousal. However, this still begs the question, however, as to how arousal increases humor appreciation?

Cantor, Bryant, and Zillman (1974) suggest an excitation transfer mechanism. In an experiment testing this mechanism, participants read passages that elicited high or low positive or negative arousal. Participants then rated unrelated jokes. Participants in the high positive and high negative arousal condition rated the jokes as more humorous compared to the low positive and low negative conditions. The arousal that was initially elicited was reinterpreted and transferred into humorous arousal after viewing the joke. This excitation transfer mechanism was

also demonstrated in a study in which participants were (falsely) told that they would soon need to either hold (low-anxiety/arousal) or inject a rat with a large needle (high-anxiety/arousal). Participants in the injection condition experienced more mirth when they discovered that the rat was a toy than those in the hold condition. Suggesting that in the injection condition the high levels of arousal were transferred and resulted in higher levels of mirth (Shurcliff, 1968). A recent theory of humor appreciation is related to earlier arousal theories and may help to clarify the relationship between the two variables.

McGraw, Warren, Williams, and Leonard (2012) propose the “benign violation” theory of humor. According to this theory, “humor arises when something that threatens a person’s well-being, identity, or normative belief structure simultaneously seems okay, safe, or acceptable” (McGraw, Lawrence, Williams, & Warren, 2013, p. 2). To clarify, a violation or threatening event is humorous when it has been reduced to a benign violation. Therefore, a moderate level of violation has the most humorous potential. An event or idea can be too benign (e.g. stubbing your toe a year ago), or too threatening (e.g. a car crash you were in a week ago). McGraw et. al. (2013) demonstrated this effect by obtaining ratings of hurricane sandy related jokes one day before and up to 99 days after the deadly hurricane. Too close to the event, jokes were not rated as humorous (too threatening). At a moderate distance the humor ratings peaked (benign violation). Eventually the ratings began to decrease and level off (too benign). If one were to equate violation with arousal, McGraw’s theory provides further evidence for the excitation transfer mechanism. Negative arousal caused by a threat is transferred into humorous arousal. Also, the Benign Violation theory provides convincing evidence for a level of aversion threshold, after which negative excitation cannot be transferred into positive (e.g. the day after a deadly hurricane). The excitation transfer mechanism allows for negative physiological arousal

to be transferred into positive-mirthful arousal. A second mechanism, the accessibility of related schemas (e.g. Lefcourt & Martin, 1986 and Newman & Stone, 1996), helps to facilitate this relationship.

Accessibility mechanism

In addition to the emotional or tendentious aspects of humor, the aforementioned Freudian theories (Freud, 1960 [1905], 1928) also emphasize the importance of the cognitive aspects of humor. Freud suggest that, to “get” a joke, one must exert a cognitive effort. He believed that it was this cognitive effort that served to distract the superego, so that libidinal id-related drives could be released. Like his ideas about arousal and humor, Freud’s conceptualization of the cognitive aspects of humor were close to the mark.

The idea that humor involves the perception of incongruities has distant roots. 18th century Philosopher Schopenhauer, suggested that laughter stems from the sudden perception of incongruity (in *The World as Will and Idea*, reprinted in Morreall, 1987). More recently, Eysnck (1942) believed that “laughter results from the sudden, insightful integration of contradictory or incongruous ideas, attitudes, or sentiments, which are experienced objectively” (p. 307). One of the first falsifiable theories of humorous incongruity came from Koestler (1964) and his theory of bisociation. Taking this idea one step further, Shultz (1972) theorized that to be perceived as humorous, incongruity must be “resolved,” or made sense of under the given circumstances. Building on Shultz’s theory, humor researcher Suls (1972, 1983) created the two-stage model of incongruity resolution.

In this model, when you begin to read or hear a joke, initial information is extracted and schemas are formulated. Then, predictions about the rest of the text are made based on these schemas. In the second stage, the reader notices the incongruity between their predictions and the

given punch-line. The reader then engages in a problem-solving process that either fails and the reader is confused, or it succeeds and mirth ensues because the reader “got” the joke. Suls (1977) also suggested that certain personal beliefs such as racial stereotypes could explain the humorous nature of disparaging jokes. For example, if an individual were told a joke about an African American male that related to some widely-held stereotype, the joke may be easier to resolve, and thus would be more likely to be perceived as humorous. Based on this researchers Goldstein, Suls, and Anthony (1972) developed the salience hypothesis. According to this theory, increased salience eases processing fluency and makes jokes easier to resolve, which then leads to increased humor appreciation. To investigate this, Goldstein and colleagues (1972) primed participants with automobile or aggression-related images (increasing accessibility of relevant schemas). Next, participants were randomly assigned to view car-related or aggression-related humor. Those who were primed with car images found car-related humor as funnier, and those primed with aggression schema found aggression-related comics as more humorous.

Other research seems to confirm the ideas of Goldstein and Suls. Byrne (1956) presented male psychiatric patients with humor containing aggressive or non-aggressive themes. All of the patients have been previously rated by staff on their levels of aggression. Bryne found that participants in the study that tended to be more aggressive in their everyday interactions rated humor with aggressive themes as more humorous than their less aggressive counterparts. This research suggests that for individuals with more aggressive personalities, aggressive schema may be highly accessible. Another accessibility-based study provides evidence for Suls’ (1977) assertion that personally-held stereotypes are salient and contribute to humor appreciation. In this study, participants who scored high on a measure of hostile sexism rated female-disparaging jokes as more humorous and less offensive, compared to male participants low in hostile sexism

(Thomas & Esses, 2004). The specific way that accessibility increases humor appreciation is evidenced in a study by Cunningham and Derks (2005). These researchers asked participants to click a button as they processed each part of a joke in a series of jokes. The participants also rated the jokes for level of humorousness. The researchers found that the quicker the participants processed a joke, the funnier they found it to be. In the second part of this study, the researchers found that increased accessibility led to a boon in processing speed. Therefore, making certain schemas more cognitively accessible helps to increase humor appreciation for related jokes because it increases processing fluency.

Wyer and Collins (1992) proposed their own humor appreciation theory that draws parallels with Suls (1972) two-stage model, but contains important differences. Like Suls' model, Wyer and Collins' comprehension-elaboration model requires that an individual first notice an incongruity and then elaborate on this initial conceptualization until the incongruity is resolved. However, their theory requires that the second interpretation involves a degree of diminishment, in which the original cause of the incongruity is seen as less important. This concept of diminishment has obvious implications for the reappraisal process, that once they are appraised as humorous, previously distressing events are seen as more trivial. The final aspect of the accessibility mechanism that bears discussion is that even *unwanted* thoughts are highly accessible. A study conducted by Adams (Unpublished Manuscript) found that participants who anxiously awaited a painful dental procedure rated dentist-related humor as more funny, and those who were about to take an exam rated exam-related (compared to unrelated) humor as more funny. Also, participants who viewed related humor reported a more positive mood after the exam or dental procedure. In the second part of the study, exposure to humor that was thematically related to the topic of a distressing video resulted in more positive moods. Working

together increased accessibility and excitation transfer may explain why humor can be used to reappraise negative life events.

Proposed reappraisal mechanism

I propose, and will explore in the present study, a reappraisal mechanism (see Figure 1) that involves both increased accessibility and excitation transfer. When an individual remembers a negative life event, all thoughts, memories, and schemas become accessible. At the same time, the negative emotions associated with the event come to the surface and increase physiological arousal. If the individual is asked to find humor in the event, it is easier because of the schema activation (Cunningham & Derks, 2005). The increase in processing allows for the negative excitation to be transferred into positive and humorous arousal. Additionally, the increased arousal and accessibility make the new appraisal of the event even more humorous. The original seeming importance of the negative event is diminished (Wyer & Collins, 1992), and the event becomes associated with mesolimbic reward activation (Franklin & Adams, 2011; Mobbs, et. al., 2003). The present study intends to provide evidence for the proposed reappraisal mechanism, and determine if both increased accessibility and increased excitation are necessary for successful reappraisal and its related benefits (i.e. increased positive mood and feelings of mirth).

Hypotheses

First, I predict that the two humorous memoir conditions will have an affectively-beneficial effect beyond simple distraction (i.e. the neutral control condition). Second, I predict that the related humor condition will result in the strongest relationship between the decrease in negative affect following the negative memoir writing and the increase in positive affect following the humorous memoir writing, and the strongest relationship between the increase in negative affect following the negative memoir writing and the decrease in negative affect

following the related humorous writing, compared to the unrelated humor condition.

Chapter 2 Method

Condition 1: Accessibility, increased excitation (Related Humor)

In part one of the study, will first complete the 10-item PANAS to acquire a baseline measure, next participants will briefly describe a negative life event and rate on a 7-point scale how they felt at the time of the event. Participants will rate negative the event was (1 is most negative and 7 is most positive).

Next the participants will be asked to write for 10 minutes about a negative life event, while trying their best to re-experience all of the emotions they felt at the time of the event. After completing the writing task, participants will complete the 10-item Positive Negative Affect Scale (PANAS).

Following this, participants will be instructed to write for 10 minutes about the same negative life event they described in the previous task, but this time they will be asked to write about the event in the most humorous manner as possible. Immediately following the second writing task, they will complete the 10-item PANAS for a third time.

Condition 2: No accessibility, increased excitation (Unrelated Humor)

The procedure for part one will mirror that of condition one part one (Negative memoir writing).

Part two will mirror that of condition 1, but participants will be asked to write about an unrelated humorous event. Any data for participants who write about two similar events will be discarded.

Condition 3: No accessibility, no excitation (Neutral Control)

The procedure for part one will mirror that of condition one part one (Negative memoir writing).

Part two will mirror that of condition 1, but participants will be asked to write about their morning routine in as much detail as possible.

Participants

A total of 73 participants completed the study with 24 (12 female, 12 male) in Condition 1, 25 (13 female, 12 male) in Condition 2, and 24 (12 female, 12 male) in Condition 3. The data from 8 participants was removed from the study. 4 participants were removed because they initially rated their first memoir experience as positive (i.e. above 4 on the 7-point scale with 1 being the most negative and 7 being the most positive). 4 participants were removed due to computer errors, or because they failed to follow directions. After removal, there were a total of 22 (11 female, 11 male) participants in Condition 1, 21 (11 female, 10 male) participants in condition 2, and 22 (10 female, 12 male) participants in condition 3.

Chapter 3 Results

To ensure parity in the affective states of the participants in the two experimental groups and the control group we compared the positive and negative affect scores from the PANAS completed prior to the negative memoir exercise. Using a repeated measures mixed model ANOVA with one within-subjects variable with two levels (negative and positive affect) and one between subjects variable with three levels (conditions). There was no significant interaction ($F(2,60) = .38, p = .686, PE2 = .01$). There was a marginal effect for condition, therefore, the participants in the two experimental groups (Condition 1 and Condition 2) and the neutral control group (Condition 3) differed in positive or negative affect at baseline (PANAS time 1) ($F(2, 60) = 3.09, p = .053, PE2 = .093$).

This marginal effect is due to the unrelated humor condition, in which participants rated themselves as having higher overall affect compared to the two other conditions. Subsequent t-tests revealed that the participants in the unrelated condition were marginally different than the neutral condition ($t(40) = 1.93, p = .06; M_{Unrelated} = 4.94, SD = .87, M_{Neutral} = 4.39, SD = .97$). Comparing unrelated to related, there was a significant difference ($t(39) = 2.43, p = .020; M_{Related} = 4.30, SD = .81$). Comparing neutral to related there was no significant difference ($t(41) = .32, p = .75$). Overall, there was a main effect for affect. Participants began the study feeling more positive affect and less negative affect ($F(1,60) = 243.45, p < .001, PE2 = .80$; Positive $M = 3.06, SD = .68$, Negative $M = 1.47, SD = .52$). Therefore, to avoid these slight differences in overall affect between conditions at the start of the experiment effecting the results, the PANAS scored from time 2 to time three (i.e. the change in affect following the negative memoir writing and the change in affect following the humorous or control memoir writings).

Next, to confirm the first hypothesis we examined the relationship between the change (PANAS 2 – PANAS 1) in affect following the negative memoir activity to the change (PANAS 3 – PANAS 2). First, we compared the control conditions to the two humorous conditions to assure that humor had an effect beyond simple distraction.

We next used a repeated measures mixed model ANOVA with one within-subjects variable with two levels (change in negative affect 2-1, change in positive affect 2-1) and one between-subjects variable with two levels (Humor or Control condition). The dependent variable was the change in negative affect from PANAS 2 to PANAS 3. The overall model was significant ($F(5,57) = 17.99, p < .001$). For the following analysis, the humorous conditions were contrast coded as .5 and the control condition was coded as -.5. There was not main effect of condition (humor or control) ($\beta = .08, t(57) = .91, p = .368, 95\% \text{ CI}[-.07, .19]$). However, when comparing the change in negative affect from time 1 to time 2, to the change in negative affect from time 2 to time 3 there is a main effect ($\beta = -.58, t(57) = -7.69, p < .001, 95\% \text{ CI}[-.73, -.43]$). This effect shows that regardless of condition, as negativity increases following the first memoir writing, it decreases following the second memoir writing. This result shows that both humor and distraction (e.g. from the control memoir) reduce negative affect. The change in affect X condition interaction was not significant ($\beta = -.01, t(57) = -.14, p = .892, 95\% \text{ CI}[-.16, .14]$).

We next looked at the same relationship with the same analysis, but changed the dependent variable to the change in positive affect from PANAS 2 to PANAS 3. There was no main effect for positive affect ($\beta = .21, t(57) = .09, p = .286, 95\% \text{ CI}[-.80, .286]$). However, there was a significant change in affect X condition interaction ($\beta = -.207, t(57) = 2.32, p < .05, 95\% \text{ CI}[-.03, .32]$). Specifically, for the two humorous conditions combined, there was a direct

relationship ($\beta = .301, t(38) = 2.561, p < .015, 95\% \text{ CI} [.036, .539]$). As negativity increased from PANAS 1 to PANAS 2 (following the negative memoir), positivity increased from PANAS 2 to PANAS 3, following the humorous memoirs (see figure 2). These data confirm our first hypothesis, that the effects of the two humorous conditions will have benefits beyond those found in the control condition.

After establishing that the effects of the humorous conditions differed from the control condition, we next differentiated the specific effects of the related-humor and unrelated-humor conditions. We utilized a repeated measures mixed model ANOVA with one within-subjects variable levels (change in negative affect 2-1, change in positive affect 2-1) and one between-subjects variable with two levels (Related Humor condition or Unrelated Humor condition).

First, for the change in negative affect following the humorous memoirs, the overall model was significant ($F(5, 35) = 21.74, p < .001, \text{PE}2 = .870$). Like the above analyses, we first examined the predictors of the change in negative affect from PANAS 2 to PANAS 3. There was a significant negative relationship between the change in negative affect between time 1 and time 2 and the above-mentioned dependent variable ($\beta = -.806, t(40) = -9.21, p < .001, 95\% \text{ CI} [-.81, -.52]$). This main effect shows that regardless of humorous condition, as negativity increases following the negative memoir writing, it decreases in scale following the related or unrelated memoir writing. There was also a significant change in affect X humor condition interaction ($\beta = .343, t(40) = 3.29, p = .002, 95\% \text{ CI} [.18, .77]$). Unpacking this interaction, we found that for the related humor condition, there was a significant negative relationship between the change in negativity between the first and second PANAS measures and the change in negativity between the second and third PANAS measures ($\beta = -.591, t(19) = -3.99, p = .001, 95\% \text{ CI} [-.65, -.20]$).

This same relationship was found to be significant in the unrelated humor condition, but it was almost twice as powerful ($\beta = -.921$, $t(18) = -9.81$, $p < .001$, 95% CI [-1.10, -.71]; see figure 3). There was also a significant inverse relationship between the change in positive affect from time 1 to time 2 and the change in negativity from time 2 to time 3 ($\beta = -.323$, $t(40) = 3.66$, $p = .001$, 95% CI [.17, .58]). There was no significant change in affect X humor condition interaction ($\beta = .019$, $t(40) = .21$, $p = .836$, 95% CI [-.37, .46]). These data seem to disconfirm our second hypothesis, that the humorous condition with both increased excitation and cognitive accessibility would have the most affectively-beneficial effect, but further analysis were needed to further explain the differences between conditions.

Next, we examined the predictors of the change in positive affect between PANAS 2 and PANAS 3. The overall model was marginally significant ($F(5, 35) = 2.232$, $p = .072$, $PE2 = .492$). There was a significant main effect between the change in negative affect from time 1 to time 2 ($\beta = .343$, $t(40) = -2.22$, $p < .05$, 95% CI [-.358, -.016]). There was also a change in affect X humor condition interaction ($\beta = -.397$, $t(40) = 2.157$, $p < .05$, 95% CI [.021, .706]). Unpacking this interaction, we found that there was a significant relationship between the change in negativity between the first and second PANAS measures and the change in positivity between the second and third PANAS measures ($\beta = -.580$, $t(19) = 2.961$, $p = .009$, 95% CI [-.62, -.11]). This result revealed that as negative affect increases following the negative writing activity, positivity decreases following the unrelated humorous memoir (see figure 4). However, there was no significant relationship between these variables in the related condition ($\beta = -.011$, $t(19) = -.05$, $p = .963$, 95% CI [-.24, .23]). Thus, showing that in the current study, the effects of both related and unrelated humor do not appear to transfer between differently valenced affects. Finally, there was no main effect for the change in positive affect from PANAS 1 to PANAS 2 (β

= -.166, $t(40) = -1.06$, $p = .295$, 95% CI [-.37, .12]), and no change in affect X humor condition interaction ($\beta = -.057$, $t(40) = -.36$, $p = .721$, 95% CI [-.57, .40]).

Chapter 4 Discussion

The results of the current study confirmed our first hypothesis, more specifically, we found that the increase in negative affect following the negative memoir writing predicted the increase in positive affect following the humorous memoir writings. Importantly, this relationship did not exist for the neutral control hypothesis. Thus, confirming that humorous memoir writing has beneficial effects beyond simple distraction.

The second hypothesis was partially disconfirmed by the above results. The unrelated humor condition showed the strongest relationship between the increase in negative affect following the negative memoir exercise and the decrease in negative affect following the humorous memoir exercise. This effect demonstrates that immediately following the induction of a negative affective state, humor without cognitive accessibility results in the most affective benefits. Interestingly however, related humor was not without its benefits, as the relationship between the increase in negative affect after the first memoir and the decrease in negative affect was about half as strong as the unrelated condition. Importantly, in the unrelated humor condition the increase negative affect following the negative memoir writing significantly predicted a *decrease* in positive affect following the unrelated humor writing activity. To clarify these effects, we choose to differentiate between intra-affect excitation transfer and *inter*-affect excitation transfer. Applying these terms to the above results, both related and unrelated humor resulted in the of *intra*-affect excitation transfer (e.g. negative to negative) while neither related or unrelated humor showed the expected beneficial *inter*-excitation transfer (e.g. negative to positive).

While a decrease in induced negative affect is a beneficial result, inter-affect excitation transfer is the most favorable outcome because it is the most likely to lead to a humorous reappraisal of a negative life event. Several questions then remain. First, is why related humor did not result in inter-excitation transfer and therefore did not lead to a humorous reappraisal. McGraw and colleague's (2012) benign violation model may be useful in explaining this unexpected result. According to this theory, stimuli that are found to be too aversive (i.e. a violation) are not appraised as humorous while less aversive (i.e. a benign violation) are appraised as humorous. Studies applying this theory found that increased psychological distance (e.g. physical, temporal etc.) can render a violation benign and increase its ability to elicit mirth (McGraw et al., 2013). In the present study, asking participants to find humor in a negative event that they just re-experienced likely constituted too serious of a violation to result in inter-affect excitation transfer and a lower level of intra-affect excitation transfer. Conversely, there was no such violation in the unrelated humor condition allowing for the previously state results so it resulted in more intra-affect excitation transfer, and would be expected that there may have been inter-affect excitation transfer. However, unrelated humor is lacking the likely-essential ingredient of cognitive accessibility, and therefore did not result in this type of transfer. The present study demonstrates, that humor without cognitive accessibility is the most beneficial immediately following the negative event because the rise in negative affect following the negative memoir more strongly predicts the fall in negative affect following the humorous memoir in the unrelated condition.

Later studies, should consider the effects of psychological distance from the aversive stimuli. Specifically, subsequent research should have participants to write about a negative life event in the same manner as the present study, but wait a period of time (e.g. a week) before

asking them to write about the event in a humorous way. This study would likely demonstrate that after temporal psychological distance increases humor containing cognitive accessibility will result in the highest levels of inter-affect excitation transfer. Additionally, it may be possible to increase physical psychological distance, and therefore causing related humor to be the most beneficial, by having participants change the room they are in after writing about a negative life event.

The present study also did not examine the effect of cognitive accessibility without increased excitation, and subsequent research should account for this limitation. Specifically, later studies should include a condition in which the participants write about a negative life event as if they observed it as a neutral third party, and taking special care not to include humor. This would possibly further demonstrate the possible utility of humorous reappraisal mechanism, if accessibility without increased excitation resulted in less inter-affective excitation.

A third limitation of the present study was that it did not consider a potentially important aspect of the proposed reappraisal mechanism, that is, that after humorous reappraisal occurs, the original negative event is diminished in importance. This aspect of the proposed mechanism can be explored in later studies.

Later research on this topic should also include measures of physiological arousal such as galvanic skin response, heart rate, respiration rate, and blood pressure. Follow-up studies could determine if related or unrelated humor with and without increased psychological distance produces a higher level of physiological arousal. Additionally, neurological imaging studies could determine whether or not one of these types of humor produces more mesolimbic reward system response and under which conditions.

Follow-up studies should determine which individual differences mediate or moderate the results found in the present research. These differences could be determined by administering humor questionnaires such as the Coping Humor Scale (Martin and Lefcourt, 1983), which assess the degree to which individuals utilize humor to cope with life stressors.

Lastly, future research should examine the long-term benefits of humorous memoir writing, and utilize text analysis software to determine the number of negative and positive emotion words in each memoir in line with research conducted Pennebaker, Mayne, and Francis (1997). In this study, the researchers found that the use of negative and positive emotion words in trauma memoirs predicted long-term health effects. For example, individuals who used a moderate number of negative emotion words experienced a decrease in doctor visits in the months following the memoir writing. Future research should examine these effects in terms of humorous memoir writing.

The present study was able to demonstrate the value of humor as a tool to cope with negative life events. However, the present study was not able to confirm key aspects of the proposed reappraisal mechanism such as inter-affect excitation transfer and diminishment. Therefore, future research should focus on methodologies that are designed to confirm these important aspects of the mechanism, and further demonstrate the emotional benefits of humor when dealing with negative life events.

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Appendix A

Figure 1: Proposed Reappraisal Mechanism

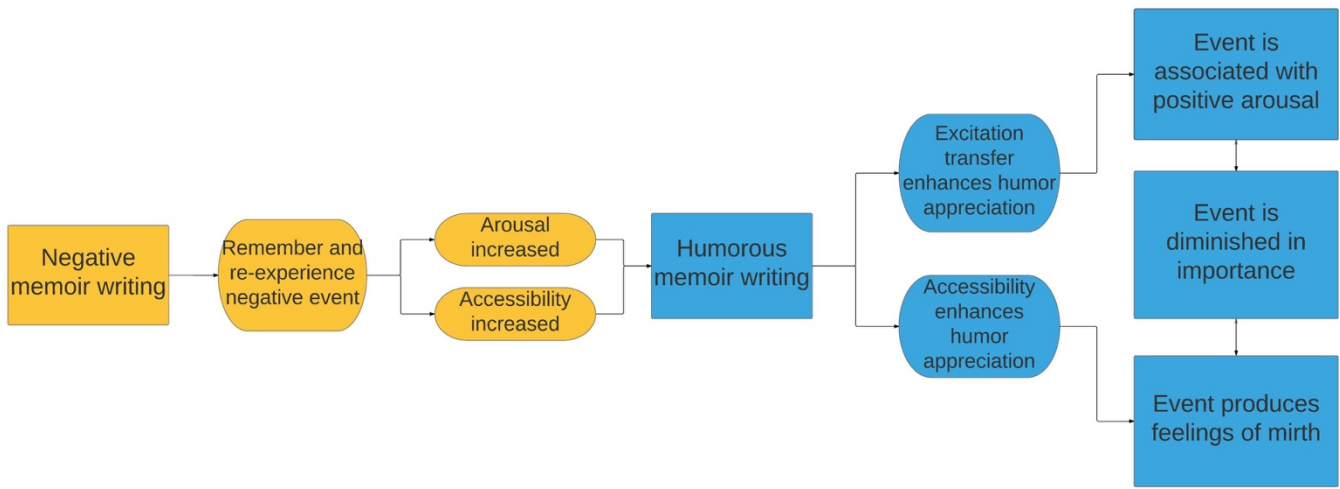
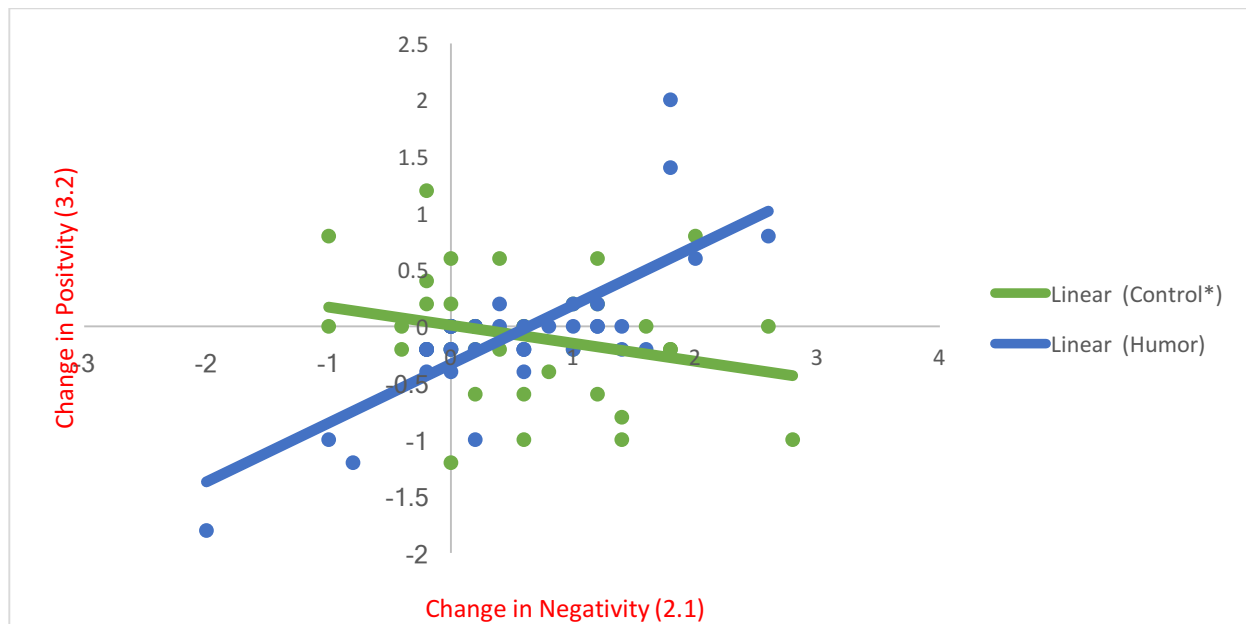


Figure 1. The figure depicts the proposed humorous reappraisal mechanism that is tested in condition one. A negative event is reappraised through humor into positive feelings of mirth, and the original importance of the event is diminished (Wyer & Collins, 1992).

Figure 2: Hypothesis 1



* = $p > .05$

Figure 2. The figure illustrates the positive relationship between the change in negative affect following the negative memoir writing activity and the change in positive affect following the combined humorous memoir activities ($\beta = .301$, $t(38) = 2.561$, $p < .015$, 95% CI[.036, .539]).

Figure 3: Hypothesis 2

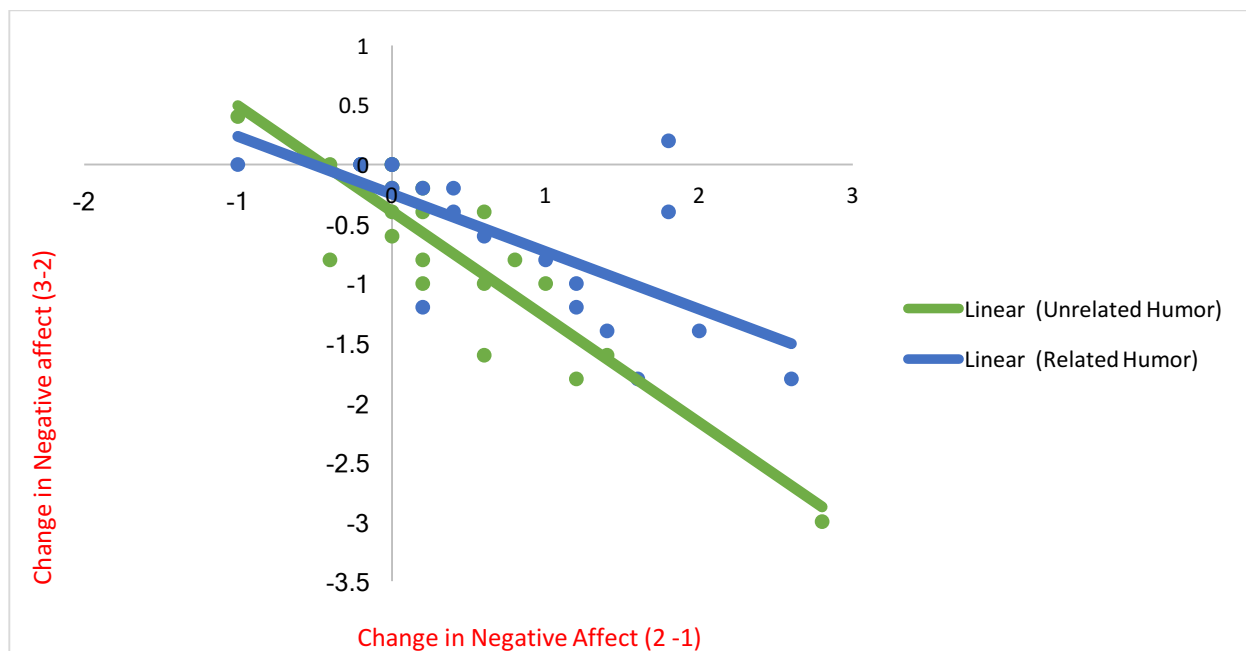
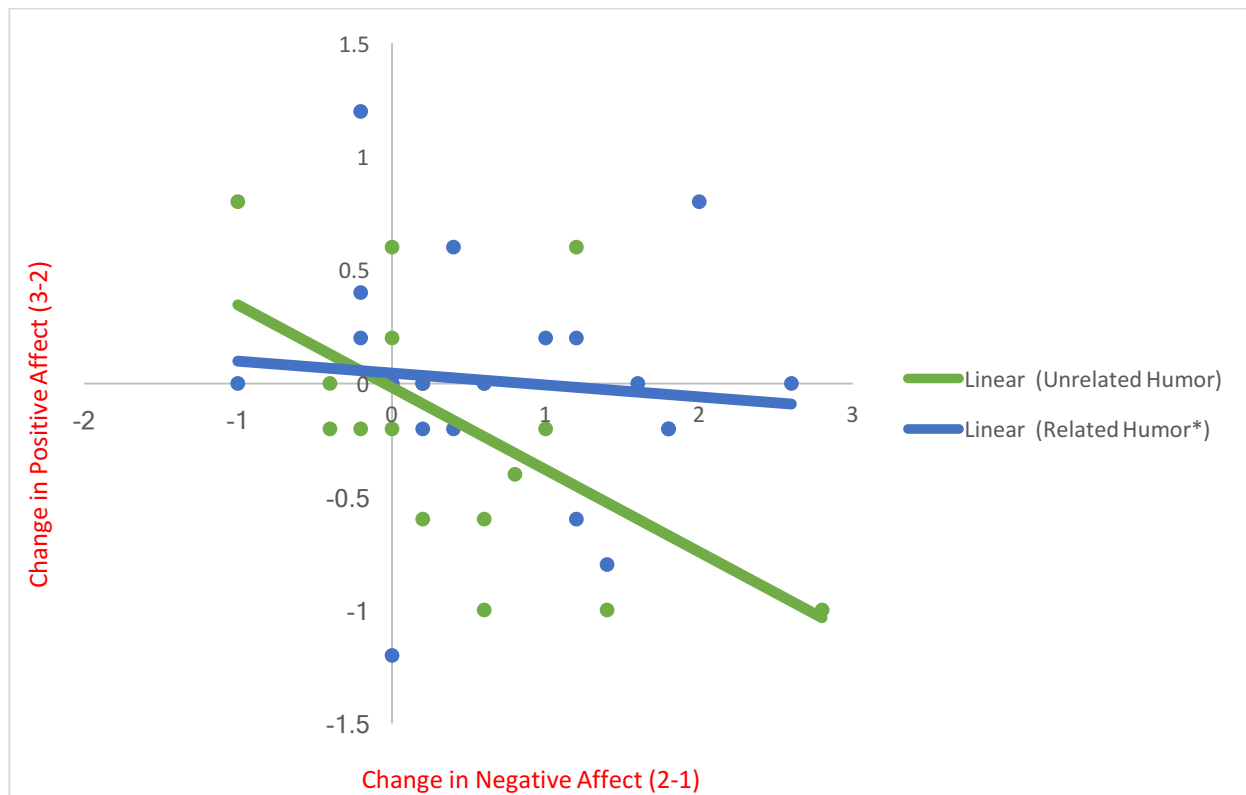


Figure 3. The figure illustrates the negative relationship between the change in negative affect following the negative memoir writing activity and the change in negative affect following the unrelated humor activity ($\beta = -.921$, $t(18) = -9.81$, $p < .001$, 95% CI [-1.10, -.71]), and related humor activity ($\beta = -.591$, $t(19) = -3.99$, $p = .001$, 95% CI [-.65, -.20]). Note that the relationship is almost twice as powerful in the unrelated condition.

Figure 4: Hypothesis 2



* = $p > .05$

Figure 4. The figure illustrates the negative relationship between the change in negative affect following the negative memoir writing activity and the change in positive affect following the unrelated humor activity ($\beta = -.580$, $t(19) = 2.961$, $p = .009$, 95% CI $[-.62, -.11]$).

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Curriculum Vitae

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EDUCATION

Bachelor of Arts, Psychology May 2017
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Bachelor of Arts, Criminology May 2017
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Paterno Fellowship Program August 2013 – May 2017
Penn State University, University Park, PA

- Honors Program including advanced academic coursework, thesis, study abroad and/or internship, ethics study and leadership/service commitment

Schreyer's Honors College August 2015 – May 2017
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- Penn State University's honors college. Schreyer's scholars are given additional opportunities for academic enrichment, and career advancement. In return Schreyer's Scholars are expected to maintain a high GPA, enroll in rigorous honors courses, and complete an honors thesis

TEACHING EXPERIENCE

Teaching Assistant, Basic Research Methods in Psychology August - December 2015
Penn State University, University Park, PA

- Primary duties: Facilitated classroom learning activities with 150 undergraduate students, answered students' questions regarding course material in class and via email, created weekly practice quizzes, and aided in curriculum planning
- Teaching responsibilities: Facilitated review sessions prior to each examination

Teaching Assistant, Corrections January 2016 – May 2017
Penn State University, University Park, PA

- Primary duties: Created a service learning project in which students will create a lecture designed to help inmate gain employment upon community re-entry

- Teaching responsibilities: Held regular meetings to aid students with project progress, and to ensure timely completion

Invited Lecturer, Forensic Psychology

September 2016

Penn State University, University Park, PA

- Invited to lecture on experiences in the field of mental health treatment with a correctional population

RESEARCH EXPERIENCE

Research Assistant

January 2014 – May 2017

Social Perception and Emotion Lab, Penn State University, University Park, PA

- Worked closely with researchers to generate research ideas
- Prepared experimental stimulus
- Created experimental programs
- Collected, analyzed, and interpreted data
- Designated as the head of a research project, which required me to work closely with the principal investigator of the lab as well as graduate students, submit research proposals to the University's institutional review board for approval, design and run experiments, analyze data, and manage other undergraduate research assistants
- Gained experience with various research related software including Qualtrics, Open Sesame, Psychomorph, Gimp, Adobe Photoshop, XN Convert, and Microsoft Excel

INTERNSHIPS / RELATED EXPERIENCE

Mental Health Unit Intern

July 2016 - September 2016

Mental Health Management Services, Inc, State Correctional Institute-Pittsburgh, Pittsburgh, PA

- Worked closely with an interdisciplinary team including psychiatrists, social workers, music therapists, psychiatric nurses, mental health workers, and clinical psychologists
- Assisted in the stabilization of acute psychiatric patients with severe psychopathologies including Schizophrenia, Schizoaffective, Bipolar I, Major Depressive Disorder, Pervasive Depressive Disorder, Antisocial Personality Disorder, Obsessive Compulsive Disorder, and Substance Induced Psychotic Disorder on the SCI-Pitt Mental Health Inpatient Treatment Unit
- Observed or assisted with the clinical work of a Master's level psychologist, music therapist, social worker, and psychiatrist
- Created and facilitated large group (up to 10 inmates), small group (2-5 inmates), and one-on-one therapeutic discussions and activities
- Set clinical boundaries
- Built rapport with a variety of inmates on a daily basis through close interaction
- Observed and conducted informal diagnostic intake assessments

- Wrote clinical progress notes on a weekly basis, or following therapeutic interactions
- Utilized empirically supported cognitive behavioral and other therapeutic activities in large group, small group, or one-on-one settings to help inmates reach treatment goals

PAPERS AND PRESENTATIONS

Posters / Presentations

McCormick, B. F., Steiner, T. G., & Adams, R. B. (2016, April). *Reappraisal of Negative Life Events Through Humorous Memoir Writing* (Theoretical). Psi Chi Psychology National Honors Society Undergraduate Research Conference, University Park, PA

Honors Thesis Presented at:

McCormick, B. F., Steiner, T. G., & Adams, R. B. (2017, April). *Laugh it off: Reappraisal of Negative Life Events Through Humorous Memoir Writing*. Psi Chi Psychology National Honors Society Undergraduate Research Conference, University Park, PA

AWARDS

Mona Shibley Bird Memorial Scholarship for Excellence as an Undergraduate in Psychology

Penn State University, University Park, PA

Distinguished Graduating Senior in Criminology Award

Penn State University, University Park, PA

Hintz Honors Scholar Endowment in the College of the Liberal Arts

Penn State University, University Park, PA

College of the Liberal Arts Student Activity Enrichment Funding

Penn State University, University Park, PA

William G. and Elizabeth K. Leitzell Merit Scholarship

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PROFESSIONAL MEMBERSHIPS

- Psi Chi Psychology National Honor Society

CLUBS / OTHER RELATED EXPERIENCE

Executive Board

Psych Squad, Psychology Interest Club, Penn State University, University Park, PA

August 2014-Present

RESEARCH INTERESTS

- Forensic assessment, criminal competency and responsibility evaluations especially for individuals with severe psychopathologies
- Effective treatment of forensic mental health populations, including the treatment of sex offenders
- Impression management in forensic assessment
- The treatment and assessment of juveniles in the criminal justice system
- Improving adjustment to correctional environments and clinical outcomes for individuals with severe psychopathologies
- Reducing recidivism in forensic mental health populations
- Increasing the efficacy of trauma-informed treatment of forensic mental health populations
- Risk factors associated with domestic violence
- Effects of the dual-stigmatization of a mental health diagnosis and a history of incarceration
- Humor theory and the use of humor to cope with negative emotions and life events
- Judge and Jury perception of individuals with mental illness
- Dual-Diagnosis in forensic settings