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The Embodied Cognition of Resilience

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Abstract

First impressions can impact our opinions and behaviors towards another person. The act of priming, though, can work to alter a person's perceptions, and subsequent behaviors. Embodiment, the idea that the body is closely tied to the processing of social and emotional information, can result from priming. The current research seeks to answer several questions related to the importance of first impressions, judgments of sympathy and resilience, deep role categorizations, and the power of priming to prompt the embodied cognition of resilience. The results of the current research partially support the initial hypotheses that—when presented with information about a target individual from beginning to end, participants will be more sympathetic and categorize the target into both more good and bad deep roles. And, that when primed with resilience-words, participants will be more sympathetic towards a target individual, rate the target as being more resilient, and categorize the target into more good than bad deep roles. And lastly, that participants primed with resilience-words will embody the cognition of resilience and act more resiliently themselves, as measured by a 5 lb. hand weight task.

Keywords: embodiment, impression-formation, sympathy, resilience, deep roles

The Embodied Cognition of Resilience

First impressions matter—A good first impression could mean landing that dream job or coveted first date, while a bad first impression could mean losing the big client or being denied acceptance into an elite university. But, is it possible that people can change their initial judgments of another person as they learn more about them? Or, are first impressions unalterable? Does the order in which information about a person is presented matter to final judgments of that person? Or are people able to make judgments based on the 'whole picture'? Where judgments of sympathy are concerned, does the order of information presented matter? And, does the order of information presented matter for judgments of deep roles?

The act of priming has been found to unconsciously activate trait concepts in a person (Dijksterhuis & Bargh, 2001). Thus, the act of priming people with 'resilience' words (e.g. success, resilient, overcome, rebound, triumph, recover) should lead to that trait being activated within them. But, does priming people with 'resilience' words affect their sympathy judgments of others? What about their deep role judgments? Or, their judgments of others' resilience? Do people truly embody the trait of resilience when primed with resilience words? And do they consequently act in a more resilient manner when tested? The above questions will be addressed by the literature on impression formation, sympathy, deep roles, and embodiment, as well as the current research.

First impressions tend to be made quickly and intuitively. In fact, as minimal an exposure as 100ms is "sufficient for people to make a specific trait inference from a stranger's face" (Willis & Todorov, 2006). That is to say that in as little as one tenth of a second people make specific judgments of the traits of strangers, based on their facial

appearance alone. Implicit impressions are those "pre-verbal, nonepisodic residues in memory of our observations of, interactions with, and inferences about others." These implicit impressions guide thoughts, emotions, expectations, and behaviors towards others. Spontaneous trait inferences are "trait inferences made in the absence of intentions to form impressions or infer traits about others." These spontaneous inferences occur when comprehending trait-implying behaviors or behavior descriptions (Uleman, Blader, & Todorov, 2005). Undergraduates have been found, for instance, to spontaneously infer that a person was *clever* simply after reading a distractor sentence that read, "The secretary solved the mystery halfway through the book" (Winter, Uleman, & Cunif, 1985). Further, research suggests that these implicit impressions of a person affect our later explicit judgments of them (Uleman, Blader, & Todorov, 2005).

Over time, even with the addition of new information, people's judgments of others tend to be unchanging. The term 'confirmatory bias' refers to the tendency for people to misinterpret new evidence as confirming their current hypotheses about the world. Teachers, for instance, have been found to misread the performance of pupils as supporting their initial impressions of those pupils (Rabin & Schrag, 1999). 'Belief perseverance,' as it has been termed by Nisbett & Ross (1980) expresses the analogous tendency to maintain existing beliefs in the face of evidence that ought to weaken or even totally reverse those beliefs. Similarly, implicit impressions have been found to remain stable even in light of new information. And, even when explicit impressions were corrected when provided with new information, implicit impressions continued to reflect initial beliefs (Wyer, 2010). Implicit impressions, here, are defined as being those "attitudes to which people do not initially have conscious access and whose activation

cannot be controlled." Explicit attitudes, on the other hand, are defined as being those "attitudes that people can report and whose expression can be consciously controlled" (Rydell, McConnell, Mackie, & Strain, 2006). Rydell et al. (2006) found that explicit attitudes towards a target person were easily formed and changed in response to behavioral information. With new evidence that contradicted the initial information, people adjusted their explicit impressions to fit. Their implicit attitudes, in contrast, were impervious to changing behavioral information (2006). It was further demonstrated that people's implicit attitudes remain unchanged even when information is presented that a target person themselves has changed. That is, findings indicate that actual changes in a target's character do not translate into changes in how that target person is implicitly evaluated (Gregg, Seibt, &Banaji, 2006). So, while explicit impressions of a target may be relatively easy to change, implicit impressions are often less flexible.

The impressions formed of others depend on a variety of factors, one being our attribution of responsibility for an action. The fundamental attribution error states that people tend to over ascribe causes or reasons for others' behavior to internal or dispositional factors rather than external or situational factors (Heider, 1958; Ogletree & Archer, 2011). For instance, people would more often attribute a colleague's tardiness to his lack of concern for the time of others, rather than the chance that he encountered traffic on his way to work. In other words, the internal desires and motivations perceived by others influence their attribution of responsibility and thus blame or praise for a person's actions (2011). The addition of new information, though, has been found to distract people from their initial 'reactive attitudes' towards others (Nichols, 2007; Langdridge & Butt, 2004). Specifically, Langdridge & Butt (2004) found that discussing

relevant "historical, cultural, and situational factors" could lead to less harsh personal judgments of a target. Ogletree & Archer (2011) found that background information was related to decreased blame and increased sympathy in three of four regressions. Of interest to the current research, Ogletree & Archer (2011) found that a 'more difficult childhood,' was significantly associated with less blame and more sympathy. Two lines of research may explain the findings of Ogletree & Archer (2011). The first, proposed by Nichols (2007) is that additional information serves to distract people from emotionally reactive attitudes, effectively reducing judgmental, emotional reactions. And second, as proposed by Gilbert & Malone (1995), new information may facilitate movement from initial dispositional attributions to a focus on extenuating circumstances. This, of course, only applies to explicit judgments of a target, since, as previously mentioned, implicit judgments are much less flexible.

Not only has new information been found to influence explicit personal judgments, but the order in which information about a target is presented matters, as well. Tetlock (1983) found that subjects were more likely to perceive a hypothetical defendant as 'guilty' when presented with anti-defendant information followed by pro-defendant information. Likewise, subjects were more likely to perceive the defendant as 'not guilty' when presented with pro-defendant information first, followed by anti-defendant information. However, this was only the case when participants did not expect to justify their decisions later. Consistent with numerous prior studies, Tetlock (1983) demonstrates the primacy effect, which states that information presented early on in a sequence has more influence on final judgments than information presented late in the sequence. That is to say, first impressions matter to a person's ultimate judgment of another. This

suggests that once subjects have integrated information into their impression of a person, they have a difficult time discounting that information, and so maintain their initial impression (1983).

The current research not only focuses on interpersonal judgments in general, but also on judgments of 'deep roles' as described by Moxnes (1999). 'Deep roles,' as defined by Moxnes (1999) are the twelve archetypal roles in groups and organizations, polarized into good and bad, which have their origin in the roles of the essential family. These deep roles can be clearly seen in fairy tales and mythology, specifically. Deep roles are important in that they are essential to ordering interaction and for the creation of purpose and direction essential for survival. Moxnes' six deep role categories include the father, mother, son, daughter, spiritual helper, material helper, and transformative roles. These six categories are further divided into good and evil counterparts. Thus, Moxnes' (1999) twelve deep roles are paired as follows: *God & Devil (father), Queen & Witch (mother), Crown Prince & Black Sheep (son), Princess & Whore (daughter), Wiseman & False Prophet (spiritual helper), Servant & Disloyal Servant (material helper), and Winner/Hero & Loser/Clown (transformative role).* Since judgments of guilty and not guilty are dependent on the order of information presented (Tetlock, 1983), it follows that deep role judgments (good vs. bad), will also be affected by the order of information presented.

Judgments made about others, made either immediately or after receiving extensive information about a person, are important in that social perception has a direct effect on social behavior (Dijksterhuis & Bargh, 2001). That is, perceptual inputs are translated automatically into corresponding behavioral outputs (2001). As explained by

Carpenter (1874) and James (1890), merely thinking about doing something makes it more likely that a person will perform that action. This is known as 'ideomotor action' (Dijksterhuis & Bargh, 2001). The key mediator between perception and behavior is the activation of the mental representation of the behavior. And, this can happen consciously or unconsciously. The concept of ideomotor action acts as an example of the link between cognition and behavior.

Not only do people perceive observables, such as gestures and movements, that influence behavior, but people make trait inferences based on the behavior of others, as well. Trait inferences cannot be literally perceived, but are made upon the perception of behavior that is observed. Examples include inferring honesty or intelligence based on a person's behavior (e.g. Students inferred that the secretary was *clever* because she solved the mystery halfway through the book). Trait inferences are made spontaneously, unconsciously, and constantly; and are an integral part of social perception. Further, this automatic activation of personality trait constructs through social perception has the power to cause behavior that *corresponds* with these trait constructs (2001).

The act of priming is one way to induce behavior via trait inferences. One of the earliest examples of priming participants in order to influence behavior is demonstrated in the work done by Carver, Ganellen, Froming, & Chambers (1983), who based their research on the now-famous Milgram (1963) experiment. Half of the participants in this study were primed with hostility words, while the other half were not. (Carver, Ganellen, Froming, & Chambers, 1983). Participants were then instructed to administer electrical shocks to a second participant (who was actually a confederate) as per the Milgram (1963) methodology. Participants were instructed to administer electrical shocks

whenever the second participants answered a question incorrectly, though they were free to choose the intensity of the shock (Carver, Ganellen, Froming, & Chambers, 1983). Results indicated that participants primed with hostility delivered more intense shocks than control participants primed with neutral words. So, researchers found that priming participants with hostility led to more hostile behavior (1983).

Bargh, Chen, & Burrows (1996, Experiment 1) provide a second example of the powerful influence of priming on behavior. Researchers in this case presented participants with a scrambled sentence task in which they were to construct a meaningful sentence using four out of the five given words, under the guise that the task was meant to test language ability. In one condition, the scrambled sentences included words related to rudeness (e.g. aggressively, bold, rude). In a second condition, the scrambled sentences contained words related to politeness (e.g. respect, patiently, polite). And, in a third condition, the scrambled sentences contained words related neither to rudeness nor politeness (i.e. neutral words). Participants were instructed to meet the researcher in another room upon completion of the scrambled sentence task. Here, participants found the researcher speaking with another 'participant' (a confederate). Participants primed with rudeness were more likely interrupt (63%) than control participants (38%). Participants primed with politeness were least likely to interrupt (17%). Priming participants with rudeness or politeness, then, was found to lead to rude or polite behavior respectively.

Macrae and Johnson (1998) found similar results through priming participants with helpfulness. Using the same methodology as Bargh, Chen, & Burrows (1996), Macrae and Johnson (1998) primed half of their participants with helpfulness, and the

other half with neutral words. Following the scrambled sentence task, the researcher 'accidentally' dropped several possessions en route to another room. Participants primed with helpfulness picked up more items from the floor than control participants, as would be expected. Thus, priming participants with helpfulness led them to act in a more helpful manner.

Research has also demonstrated the effect of priming *stereotype activation* on motor behavior. Bargh, Chen, & Burrows (1996, Experiment 2) primed some participants with the stereotype of the elderly, while other participants were not. Using the same scrambled sentence task, participants in the experimental condition were exposed to words relating to the elderly stereotype (e.g. grey, bingo, Florida). Upon completion of the scrambled sentence task, participants were informed that the experiment was over and that they were free to leave. Results clearly demonstrated that participants primed with the elderly stereotype walked significantly slower than control participants. That is, participants primed with the elderly stereotype displayed behavior in line with the activated stereotype. Since, old age is associated with slowness, the activation of the elderly stereotype led primed participants to move more slowly.

Priming participants with the stereotype of the elderly has similarly been shown to affect memory performance, as well (Levy, 1996). Elderly participants were primed with either positive (e.g. wise, experienced) or negative (e.g. senile, dementia) stereotypes associated with old age. Participants primed with the positive stereotype had improved memory performance, while participants primed with the negative stereotype demonstrated deteriorated performance on the same task (1996).

Numerous other studies indicate similar findings of the effect of priming on behavior. Dijksterhuis, Bargh, & Miedema (2000) found memory effects on college students after priming them with elderly stereotypes in line with the findings of Levy (1996). Dijksterhuis and Corneille (2000) examined the cultural stereotype of women as being poor at mathematics. Subsequently, participants primed with the female stereotype had poorer performance on a calculus task relative to participants who were not primed. Interestingly, this effect was found for both male and female participants (2000).

The concept of priming is closely related to the phenomenon of embodiment. The term 'embodiment' suggests that the body is closely tied to the processing of social and emotional information (Gray, 2010; Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005; Reinmann, Feye, Malter, Ackerman, Castano, Garg, Kreuzbauer, Labroo, Lee, Morrin, Nenkov, Nielsen, Perez, Pol, Rosa, & Yoon, 2012). The main idea underlying all theories of embodied cognition is that cognitive representations and operations are fundamentally grounded in their physical context (2005). That is, cognition relies strongly on actual bodily states. Empathy, which is the understanding of another person's emotional state, requires us to 're-create' the feelings of another person within ourselves, for instance. Further, a distinction can be made between online and offline embodiment. Online embodiment is the knowledge acquisition that occurs as a perceiver interacts actively with the social environment. In contrast, offline embodiment refers to the idea that cognitive operations continue to be supported by bodily states, even when that cognitive activity is separated from the real-world environment. In other words, just thinking about an object (or trait, or stereotype) produces embodied states as

if the object were actually there. To establish the meaning of symbols through offline processing, we rely on previous information gathered through online processing (2005).

Gray (2010) most clearly demonstrated the link between priming, embodiment, and related behavior in his work on moral transformation. Moral transformation, as outlined by Gray (2010), is the hypothesis that doing good or evil increases agency—the capacity for self-control, tenacity, and personal strength. Using data from three separate experiments, Gray (2010) was able to conclude that, "Those who do good or evil become physically more powerful."

Research on moral typecasting defines the term as "the tendency for people to perceive good and evildoers as relatively more able to endure physical discomfort to achieve a goal;" that is, more capable of agency and less sensitive to experience (Gray, 2010). While previous research concerned the perception of others, Gray (2010) instead re-focused the research on the question of whether those who do moral or immoral deeds would perceive *themselves* to possess increased agency. Self-perception is powerful, since research finds that people tend to act in ways that confirm their self-perception. The perceptual association between moral deeds and agency has physical effects because many such associations are embodied, extending beyond cognition to the body (Barsalou, 1999; Gray, 2010; Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005; Reinmann, Feye, Malter, Ackerman, Castano, Garg, Kreuzbauer, Labroo, Lee, Morrin, Nenkov, Nielsen, Perez, Pol, Rosa, & Yoon, 2012; Williams & Bargh, 2008). Gray (2010) hypothesized that the embodiment of moral typecasting would predict moral transformation, leading those who help or harm others to become more tenacious and more able to withstand discomfort.

Gray (2010, Experiment 1), measured embodiment by instructing participants to hold a 5 lb. weight for as long as possible. The first instance served as a pretest measure of strength, while the second instance was meant to measure their agency. In between pre- and post-tests, participants were given a dollar. Participants in the 'virtuous' condition were given the opportunity to donate their dollar to charity, and all participants complied. While pretest times did not differ by condition, participants in the 'virtuous' condition held the 5 lb. weight for 7s longer on average than those in the control condition. In this experiment, Gray (2010) found that doing good seemed to increase agency.

In a second experiment, Gray (2010, Experiment 2) sought to determine if merely *thinking about* doing good or evil would increase agency the same as if participants actually *did* good or evil. In this experiment, participants were instructed to hold a 5 lb. weight for as long as possible while they wrote a fictional story about themselves either helping, harming, or having a neutral interaction with another person. Just as in experiment 1, participants were given a weight pretest, and then this was followed by the writing task. Again, pretest times did not differ by condition. But, participants in both the help and harm conditions held the weight for significantly longer than those in the control condition. Interestingly, participants in the harm condition held the weight somewhat longer than those in the help condition, though the difference was not significant. This second experiment added to the literature by noting that not only can doing good increase agency, but merely thinking of oneself as a hero increases agency. Moreover, thinking about oneself as a villain was also found to increase agency. This demonstrates that effects of embodiment extend across the good-evil spectrum.

In a third experiment by Gray (2010), participants were instructed to squeeze a handgrip for as long as possible. This experiment mirrored experiment 1 in all ways besides the alternate measure (handgrip vs. 5 lb. weight). Results were similar in that pretest measures did not differ by condition. And, participants in the virtuous condition held the handgrip for 23s longer on average than those in the control condition. This experiment functioned to demonstrate moral transformation using a different dependent variable.

From this research, it is clear that a relationship exists between personal judgments of others, sympathy, embodiment, and action. But, further research is needed to determine how first impression affect judgments, what information affects judgments of sympathy, and how priming influences embodiment to produce action.

In the current research, therefore, the strength of first impressions and the embodied cognition of resilience are examined. Understanding first impressions could influence a variety of domains from college admissions to the criminal justice system. For instance, lawyers may take into account the order in which they present information about their client in order to garner the greatest amount of sympathy from a jury. Further, understanding the embodied cognition of resilience could lead to strategies for increasing resilience in people. With this knowledge, doctors may be able to help patients enduring a difficult rehabilitation, for instance.

It is hypothesized that first impressions will have a stronger impact on final judgments of a person than any additional information received. So, information presented first will have the strongest impact on ‘deep role’ categorizations. Thus, participants in the forward-reading condition—who first hear about a target individual’s

difficult childhood that contributed to the onset of his criminal activity—will categorize the target in more positive *and* negative deep roles. Participants in the backward-reading condition— who first encounter a target individual's success—are hypothesized to categorize that target in more positive deep roles. Further, it is hypothesized that information presented early on will impact people's judgments of sympathy towards a target individual, so that participants in the forward-reading condition would be more sympathetic towards the individual's early plight than participants in the backward-reading condition, since a difficult childhood has been found to be significantly associated with less blame and more sympathy. Further, it is hypothesized that, when primed with resilience words, participants will embody this cognition and go on to act more resiliently themselves. Participants should demonstrate this resilience by holding a 5 lb. weight for longer than participants in the control condition. And, participants in the resilience condition will judge a target more favorably; that is they will be more sympathetic and place the target in more positive deep role categories.

Method

Participants (Experiment 1)

Participants were 9 male and 33 female undergraduate students from the University of Richmond enrolled in the Psychology 100 course. Participants ranged in age from 18-22 years old. Course credit was granted as compensation for participation in the study.

Materials and Procedure (Experiment 1)

Participants were randomly assigned to one of two conditions—the 'forward-reading' condition or the 'backward-reading' condition. In the forward-reading condition,

participants were presented with a story about a fictional boy named Michael via the online survey website, Qualtrics. The story was told through a series of nine short excerpts, with Time 1 describing the beginnings of Michael's life and Time 9 describing Michael at the present time. In the backward-reading condition, participants were presented with the same story of Michael, also separated into nine excerpts. In the backward-reading condition, Time 1 described Michael at the present time, while Time 9 described Michael at the beginning of his life.

The fictional story of Michael Collins (told in the forward-reading condition) begins with his early life growing up in poverty, being raised by a single mother while his father is incarcerated. The story of Michael's life goes on to depict the beginning of his involvement in crime and gang-activity out of necessity to support his struggling family. Over time, though, Michael's crime escalates in severity, and he is eventually imprisoned both as a juvenile and later as an adult. While in prison as an adult, though, Michael cuts his gang ties and becomes the 'model inmate,' even earning his degree while incarcerated. Upon release, Michael becomes a lawyer who defends young criminals like his former self. Later, he becomes a motivational speaker and best-selling author. The backward-reading condition presents the story of Michael in the opposite direction, beginning with his success as a lawyer, speaker, and author, and working back in time to explain his early criminal beginnings.

Time 1 (forward-reading) and Time 9 (forward-reading) examples are included below. The full story of Michael Collins can be found in Appendix A.

Time 1: *Michael, born into poverty by teenage parents, struggled in school. Education was not a priority emphasized by his mother. With his father incarcerated for most of his life, Michael learned at a young age that he would have to do anything possible to help*

his mother and his siblings survive. Michael skipped school often and became involved with a local gang by the age of eleven.

Time 9: *Michael Collins is now a New York Times Best Selling author. His works are famous in both academia and popular society. Michael used his years of experience as a criminal lawyer to inform his novels. Additionally, Michael has ventured into the realm of motivational speaking. He hopes to reach the lives of young people to inspire them to reach success. Because of his success, Michael has gained notoriety all over the world.*

After each excerpt presented, participants were asked to rate their current feelings of sympathy towards Michael on a scale ranging from 1 (Very unsympathetic) to 7 (Very sympathetic).

Lastly, participants were instructed to categorize Michael into any and all deep roles that applied to him. The deep role categories adapted from Moxnes (1999) included: God, Devil, Crown Prince, Black Sheep, Winner, Loser, Servant, Disloyal Servant, and Hero. These deep role categories were chosen because of their male orientation, as well as their representation of the good/evil dichotomy.

Ratings of sympathy, and deep role categorizations were evaluated after each story excerpt. So, participants were questioned nine separate times in order to gauge changes in their judgments over time with the presentation of new information about Michael. Responses were recorded via Qualtrics.

Participants (Experiment 2)

Participants were 8 male and 30 female undergraduate students from the University of Richmond enrolled in the Psychology 100 course. Participants ranged in age from 18-22 years old. Course credit was granted as compensation for participation in the study.

Materials and Procedure (Experiment 2)

Survey data for Experiment 2 was collected using Qualtrics. A 5 lb. hand weight was used to measure the embodied cognition of resilience.

Participants were randomly assigned to one of two conditions—the experimental or control condition. Part one of Experiment 2 was conducted via Qualtrics. Participants in the experimental (resilience-primed) condition, were primed with words related to resilience (e.g. success, resilient, overcome, rebound, triumph, recover) using the scrambled sentence task taken from Bargh, Chen, & Burrows (1996). Participants were given five different sentences and instructed to form a coherent sentence for each one using only four of the five words given. For example, participants were instructed to form a coherent sentence using the words 'the, was, victim, resilient, dictionary.' The sentence should have been formed to read 'The victim was resilient.' Participants in the control (neutral) condition were presented with neutral words, unrelated to resilience (e.g. monopoly, computer, rabbit, kindergarten, grass) using the same scrambled sentence task. Participants were given five different sentences and instructed to form a coherent sentence for each one using only four of the five words given. For example, participants were instructed to form a coherent sentence using the words 'love, rabbit, to, ski, I.' The sentence should have been formed to read 'I love to ski.'

In both conditions, participants were then presented with the same story of Michael, a fictional character. The story was taken from the excerpts in Experiment 1 and condensed into a full-length story. After reading the story of Michael, participants in both conditions were asked to rate their feelings of sympathy towards Michael on a scale ranging from 1 (Very unsympathetic) to 7 (Extremely sympathetic).

Then, participants in both conditions were asked to rate their judgments of Michael's resilience on a scale from 1 (Not at all resilient) to 7 (Extremely resilient), meaning they rated Michael as being 'Not at all resilient' to being 'Extremely resilient.'

Lastly, participants were instructed to categorize Michael into any and all deep roles that applied to him. The deep role categories adapted from Moxnes (1999) included: God, Devil, Crown Prince, Black Sheep, Winner, Loser, Servant, Disloyal Servant, and Hero. These deep role categories were chosen because of their male orientation, as well as their representation of the good/evil dichotomy. Responses were recorded via Qualtrics.

Part two of Experiment 2 consisted of a physical task meant to measure participants' resilience after being primed with resilience words (experimental condition) or neutral words (control condition). In part two, participants were placed in a room with only the experimenter in order to eliminate strong effects of peer influence, feelings of embarrassment, or a need to impress others with their strength, etc. Participants were instructed to hold a 5 lb. hand weight. The weight was held with their dominant hand, directly out from the side of their body, with a fully extended arm. Participants were not told of the purpose of the physical task, only that they were to hold the weight for 'as long as possible.' The experimenter recorded participant times using a stopwatch. This procedure was adapted from Gray (2010, Experiment 1).

Results

Experiment 1

The effect of the order of information presented about a target individual on participants' judgments of sympathy, and deep role categorizations was examined. The

independent variable was the order of information presented about a target individual named Michael (forward-reading, backward-reading conditions). The dependent variables were ratings of sympathy toward the target individual, and deep role categorizations.

It was hypothesized that participants in the forward-reading condition would be more sympathetic towards Michael, since they would have encountered his difficult childhood early on, and thus formed their impression of him based on that early information. And, that this would be true even as new information about his achievements were presented later on. And, lastly, it was hypothesized that participants in the forward-reading condition would categorize Michael in more negative and positive deep roles, since they were presented with powerful information about the target individual early on that would have led them to hold very strong opinions of him.

Similarly, it was hypothesized that participants in the backward-reading condition, which is from end to beginning, would also form their impression of Michael using the information presented earliest on. So, it was hypothesized that participants in the backward-reading condition would be less sympathetic towards Michael, since they encountered his adult achievements early on, which were likely viewed as socially expected, and were left less powerfully impacted by his early childhood struggles. And, lastly, it was hypothesized that participants in the backward-reading condition would categorize Michael in more positive deep roles than negative, since they were presented with positive information about the target individual first, followed later by more negative information.

Participants were tested nine times with each test occurring after another part of Michael's life story was presented. Time 1 denotes the beginning of Michael's life, while Time 9 denotes Michael's later life. Participants in the forward-reading condition were presented with information beginning at Time 1 and ending with Time 9, and participants in the backward-reading condition were presented with information beginning at Time 9 and ending with Time 1.

A multivariate analysis was performed to examine the effect of condition (forward-reading, backward-reading) on judgments of sympathy towards the target individual over time. Overall sympathy scores by condition were also calculated. The effect of condition on ratings of sympathy towards Michael was significant, $F(1, 37) = 3.13$, $p < .01$, showing that participants in the forward- reading condition were more sympathetic towards Michael overall ($M = 5.135$, $SD = .302$) than participants in the backward-reading condition ($M = 4.164$, $SD = .302$).

Frequencies were calculated to determine the effect of condition on deep role categorizations of the target individual. Participants in the forward-reading condition most frequently categorized the target individual as a servant (83 of 481 responses), hero (75 of 481 responses), or loser (75 of 481 responses) (Participants were instructed to choose all deep roles that applied). Participants in the backward-reading condition most frequently categorized the target individual as a winner (69 of 407 responses), or servant (68 of 407 responses). Participants in the forward-reading condition responded more frequently, categorizing Michael in more deep roles than participants in the backward-reading condition. And further, participants in the forward-reading condition assigned Michael to both more good roles (304 good roles vs. 240 good roles) and more bad roles

(177 bad roles vs. 167 bad roles) than participants in the backward-reading condition (Figure 1).

A chi square analysis was performed to examine the differences in deep role judgments of God and Devil, in particular, in both the forward and backward-reading conditions. Results indicated a significant effect of condition on judgments of the God role, χ^2 (1, 37) = 23.2, $p < .01$, showing that participants in the forward-reading condition more often assigned Michael to the God role (n = 48) than participants in the backward-reading condition (n = 11). A chi square analysis was also performed to examine the deep role judgments of Devil as made by participants in both the forward and backward-reading conditions. A marginally significant effect of condition on judgments of the Devil role was found, χ^2 (1, 37) = 3.66, $p < .06$, showing that participants in the forward-reading condition also more often assigned Michael to the Devil deep role (n = 48) than participants in the backward-reading condition (n = 31).

Overall, participants in the forward-reading condition were more sympathetic towards Michael, and more frequently placed him in both good and bad deep role categories, compared to participants in the backward-reading condition. Further, participants in the forward-reading condition more often categorized Michael into the God and Devil deep roles than participants in the backward-reading condition.

Experiment 2

The effect of condition (experimental, control) on participants' judgments of sympathy, ratings of the resilience of a target individual, deep role categorizations, and embodiment of resilient cognition (as measured by the 5 lb. weight task) was examined. The independent variable was the condition (experimental = primed with resilience

words, control = primed with neutral words). The dependent variables were judgments of sympathy towards the target individual, ratings of the target individual's resilience, deep role categorizations, and participants' embodied cognition of resilience as measured by the 5 lb. weight task.

It was hypothesized that participants in the experimental condition, who were primed with resilience words (e.g. success, resilient, overcome, rebound, triumph, recover), would be more sympathetic towards Michael, rate him as being more resilient, categorize him in more favorable (positive, good) deep roles, and would embody the cognition of resilience in order to hold the 5 lb. weight for longer than control participants.

Further, it was hypothesized that participants in the control condition, who were primed with neutral words (e.g. monopoly, computer, rabbit, kindergarten, grass), would be less sympathetic towards Michael, rate Michael as being less resilient, categorize him in less favorable deep roles (negative, bad), and hold the weight for less time than participants in the experimental condition.

An independent-samples T test was performed to examine the effect of condition (resilience-primed, control) on judgments of sympathy towards the target individual. A non-significant effect of condition was found on judgments of sympathy, with those in the resilience-primed condition actually reporting less sympathy ($M=4.79$, $SD=1.13$) than those in the control condition ($M= 5.32$, $SD = 1.16$), $t (37) = -1.41$, $p > .05$.

An independent-samples T test was performed to examine the effect of condition (resilience-primed, control) on ratings of Michael's resilience. A non-significant effect was found for resilience, although participants in the resilience-primed condition gave

higher resilience ratings (M =5.47, SD = 1.31) than those in the control condition (M = 5.11, SD = 1.59), t (37) = + .78, p > .05. Despite being non-significant, results indicate that participants in the resilience-primed condition more often rated the target individual as being 'extremely resilient' than those in the control condition (33% of participants in the resilience-primed condition as compared to 21% of participants in the control condition).

The main effect of role was significant, F (1, 37) = 31.22, p < .001, showing that participants most often chose the roles of winner/loser (M = .645, SD = .057) and hero (y/n) (M = .500, SD = .000) more often than the roles of father, son, and servant (Figure 2). A main effect of good/bad deep roles was also found to be significant, F (1, 37) = 4.41, p < .05, with participants more often judging Michael as good (M = .389, SD = .034) than bad (M = .295, SD = .036), overall (Figure 3). A main effect for the interaction between condition and the good/bad dichotomy was marginally significant, F (1,37) = 1.96, p = .17.When primed with resilience words, participants were more likely to choose positive deep roles (M = .41, SD = .048) than negative deep roles (M= 25, SD = .051) (Figure 4). Lastly, a main effect for the interaction between role and the good/bad dichotomy was significant, F (1, 37) = 18.08, p < .001, showing that participants more often assigned Michael to a good deep role for all deep roles except the son, where they assigned him the role of black sheep (M= .395 SD= .078) more often than the prince (M= .026 SD = .026) (Figure 5).

An independent-samples T test was performed to examine the effect of condition on the 5 lb. weight task times. A marginally significant effect of condition on the 5 lb. weight task times was found, t (37) = + 1.36, p < .08 with participants in the experimental

condition on average holding the weight longer (M = 67.09, SD = 28.06), than participants in the control condition (M = 55.12, SD = 26.41) (Figure 6). That is, participants in the experimental condition held the 5 lb. weight 18% longer, on average, than participants in the control condition.

Overall, participants in the resilience-primed condition reported lower levels of sympathy than participants in the control condition. But, participants in the resilience-primed condition judged the target individual as being more resilient than participants in the control condition. Further, participants in the resilience-primed condition more often categorized the target individual in a good deep role than a bad deep role, as compared to participants in the control condition. And, participants in the resilience-primed condition were more resilient, holding the 5 lb. weight for longer than participants in the control condition.

Discussion

The results fully support the original hypotheses for Experiment 1. The first hypothesis—that participants in the forward-reading condition would be more sympathetic towards Michael than participants in the backward-reading condition—was supported. And, the second hypothesis—that participants in the forward-reading condition would categorize Michael in more positive and negative deep roles as compared to participants in the backward-reading condition—was also supported.

The results partially support the original hypotheses for Experiment 2. The first hypothesis—that participants in the resilience-primed condition would be more sympathetic towards Michael—was not supported. Rather, participants in the resilience-primed condition were actually *less* sympathetic towards Michael, overall. The second

hypothesis—that participants in the resilience-primed condition would rate Michael as being more resilient—was supported. The third hypothesis—that participants in the resilience-primed condition would categorize Michael in more good deep roles than bad deep roles, as compared to participants in the control condition—was also supported. And, lastly, the fourth hypothesis—that participants in the resilience-primed condition would embody the cognition of resilience and be able to hold the 5 lb. weight for longer than participants in the control condition—was supported.

As was the original hypothesis in experiment 1, participants in the forward-reading condition were more sympathetic towards Michael overall than participants in the backward-reading condition. This finding supports the findings of Ogletree & Archer (2011), who found that a more difficult childhood was significantly associated with less blame and more sympathy for a target individual.

In line with the original hypothesis of experiment 1, participants in the forward-reading condition categorized Michael into more good and bad deep roles, as compared to participants in the backward-reading condition. Participants in the forward-reading condition were able to follow Michael on his heroic journey, without knowing the ending of his life story. Michael was presented at the onset as a young boy who had a very difficult childhood, who later went on to be incarcerated for crimes he committed as he aged. In the end, Michael was able to turn his life around to become a success. The story of Michael, presented in this order (beginning to end), may have been more powerful, or jarring, for readers, and thus they may have felt more strongly about their deep role assignments. That is, participants may have felt strongly that he was a ‘devil’ for partaking in criminal activity, but also felt strongly that he was a ‘God’ for turning his

life around to achieve success later on. In contrast, participants in the backward-reading condition were presented with Michael's adult achievements from the very beginning. His successes were likely viewed by participants as socially expected, and thus not particularly impressive. The information about Michael's early beginnings likely mattered less to the ultimate judgments made by these participants since they already knew his successful outcome. So, it follows that participants in the backward-reading condition would feel less strongly about their deep roles assignments and categorize Michael into less deep roles than participants in the forward-reading condition.

Contrary to the original hypothesis of experiment 2, participants in the resilience-primed condition rated themselves as being less sympathetic towards Michael than participants in the control condition. However, this could be because past research with primed participants makes a clearer connection between priming words and behavioral outcomes (Bargh, Chen, & Burrows 1996, Experiment 1; Carver, Ganellen, Froming, & Chambers, 1983; Dijksterhuis, Bargh, & Miedema, 2000; Gray, 2010; Levy, 1996; Macrae and Johnson, 1998). It is possible that participants who were primed with resilience words did not find a strong enough association between resilience and sympathy. And so, it follows that resilience-primed participants would not have necessarily rated themselves as being more sympathetic towards Michael.

In line with the original hypothesis of experiment 2, participants in the resilience-primed condition judged Michael as being more resilient than participants in the control condition. This hypothesis was based on the notion that participants who are primed with resilience words would embody the cognition of resilience and become more resilient themselves. The current research expanded this idea further by proposing that, not only

would participants become more resilient themselves, but also they would judge a target individual faced with adversity as also being more resilient. And, as indicated by the results of the current research, such was the case.

As predicted, participants in the resilience-primed condition categorized Michael in more good deep roles than bad deep roles, as compared to participants in the control condition. And, moreover there was a greater difference between the number of good and bad deep roles assigned by participants in the resilience-primed condition, as compared to the difference in good and bad deep role assignments made by participants in the control condition. Thus, when primed with resilience words, participants more strongly rated Michael as good over bad, whereas participants in the control condition assigned Michael to good or bad deep roles nearly the same amount of times.

Lastly, as predicted, participants in the resilience-primed condition embodied the cognition of resilience, and thus held the 5 lb. weight longer than participants in the control condition. As evidenced by previous research, a scrambled sentence task is effective in priming participants with some feeling or stereotype (Bargh, Chen, & Burrows 1996, Experiment 1; Gray, 2010). In line with these findings, the current research demonstrates that when primed with resilience words, participants embody the cognition of resilience and thus act more resiliently. In this case, participants demonstrated their resilience by holding a 5 lb. weight 18% longer, on average, than participants in the control condition who were not primed with resilience.

The current research examined the power of first impressions. When information was presented about a target individual in the order from beginning to end, participants felt more strongly about their deep role judgments, placing him in more deep role

categories than participants who were presented with the story's end first, followed by its beginning. This finding is positive in that it supports the idea that a person can turn one's life around and be recognized for their success, despite a colored past.

Further, the current research indicates that attitudes and emotional reactions towards others can be altered, simply by priming people with the desired attitude or emotion. So, negative attitudes or emotions could be changed, for instance, to benefit charity organizations, victims of poverty, former criminals, etc. so that they may be supported or accepted by society.

And lastly, the current research demonstrates that thoughts and feelings are closely tied to our bodies; that is, they are *embodied*. Not only can attitudes and emotions be altered by simple priming tasks, but behaviors can be influenced as well. The simple act of priming could thus be used to alter behaviors in some desired direction.

Limitations of the current research include the fact that participants may have known that they were being primed through the scrambled sentence task. While we cannot know for certain if this was the case, anecdotal evidence indicates that most participants were completely unaware of the purpose of the task. A second limitation is that participants were only primed with resilience words, not sympathy words. So, the priming task may not have been designed in a manner that allowed for higher sympathy ratings from participants in the experimental condition. Third, the time between priming and the physical task (holding the 5 lb. weight) may have been too long to fully impact participant's resilience. That is, placing the questions about sympathy, resilience, and deep roles in the middle of the priming task and the 5 lb. weight task, may have hindered participants' full physical potential. And lastly, the population sample used (University of

Richmond Psychology 100 students) may not have been representative of the population as a whole, and more participants would have been available for testing, ideally.

Future research on embodiment could focus more specifically on long-term embodied cognitions. That is, is it possible to influence the cognition of others through priming in the long-term, rather than for only a short time after a priming task? Other questions of interest might include: Are certain groups of people, perhaps people who are determined to be easily influenced, more susceptible to priming effects? Do people primed with resilience words still embody the cognition of resilience when given a more difficult task? Or, a differentially difficult task (e.g. a difficult cognitive task)?

The current findings are important in that they contribute to the knowledge on first impressions, judgments towards others, and the accuracy of deep role categorizations. No other research, besides Moxnes (1999) has looked this in depth into deep roles and their pervasiveness in society. Moreover, this research highlights the importance of the order in which information about a person is presented and its impact on judgments of that individual. And, moreover, the present research adds yet another example of embodied cognition to the already-existing wealth of data on the phenomenon.

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Appendix A

Forward-Reading Condition

Michael, born into poverty by teenage parents, struggled in school. Education was not a priority emphasized by his mother. With his father incarcerated for most of his life, Michael learned at a young age that he would have to do anything possible to help his mother and his siblings survive. Michael skipped school often and became involved with a local gang by the age of eleven.

His criminal activity began on a small-scale. At first, Michael started out by running drugs for the local drug dealers in order to make some fast cash. But quickly, due to gang pressure, his criminal activity escalated. Michael was first arrested at the age of twelve for drug possession and armed robbery. Michael and two of his fellow gang members had held up a local convenience store and were caught with heroin and marijuana in their possession. Michael served time in a juvenile detention center for his crimes. But, the only lessons he learned while incarcerated were how to be a *better* criminal. Michael's fellow inmates taught him how to better avoid the cops, where to hide drugs, and who the local arms dealers were. Over time, Michael began to resent his term and grew angrier by the day. Michael left juvenile detention with more knowledge and frustration over his situation than ever before.

By the age of eighteen, Michael had risen in rank within his gang. Now, Michael was the one to mentor and educate his younger followers on the ways of the streets. Using the knowledge he acquired in juvenile detention, Michael escalated the severity of his crimes and the violence that accompanied them. Michael was arrested again at eighteen and charged with assault. Because of his age he was tried as an adult and sent to a medium security prison far away from his neighborhood, family, and friends.

Michael experienced a wake-up call upon being sent to prison, especially one so far removed from the bad influences that had encouraged his problem behavior. Michael began taking high school courses in prison and was able to receive his diploma, and even went on to receive his college degree, as well. Michael started work in the prison library, where he helped tutor his fellow inmates. Michael soon became known as a model-inmate. Specifically, guards and staff came to appreciate his calm and benevolent demeanor amongst the chaos and violence of the rest of the prison.

Michael was released from prison after serving only seven years of his fifteen-year sentence due to good behavior. Upon his release, Michael enrolled in a local law school. He hoped to work in criminal law so that he could help young people like his former self. Michael eventually earned his law degree and went on to practice criminal law with a well-respected firm in Washington DC. There, he spent years working to defend young, disadvantaged criminals. By the age of thirty, Michael was known as the best defender in Washington DC.

Michael Collins is now a New York Times Best Selling author. His works are famous in both academia and popular society. Michael used his years of experience as a criminal lawyer to inform his novels. Additionally, Michael has ventured into the realm of motivational speaking. He hopes to reach the lives of young people to inspire them to reach success. Because of his success, Michael has gained notoriety all over the world.

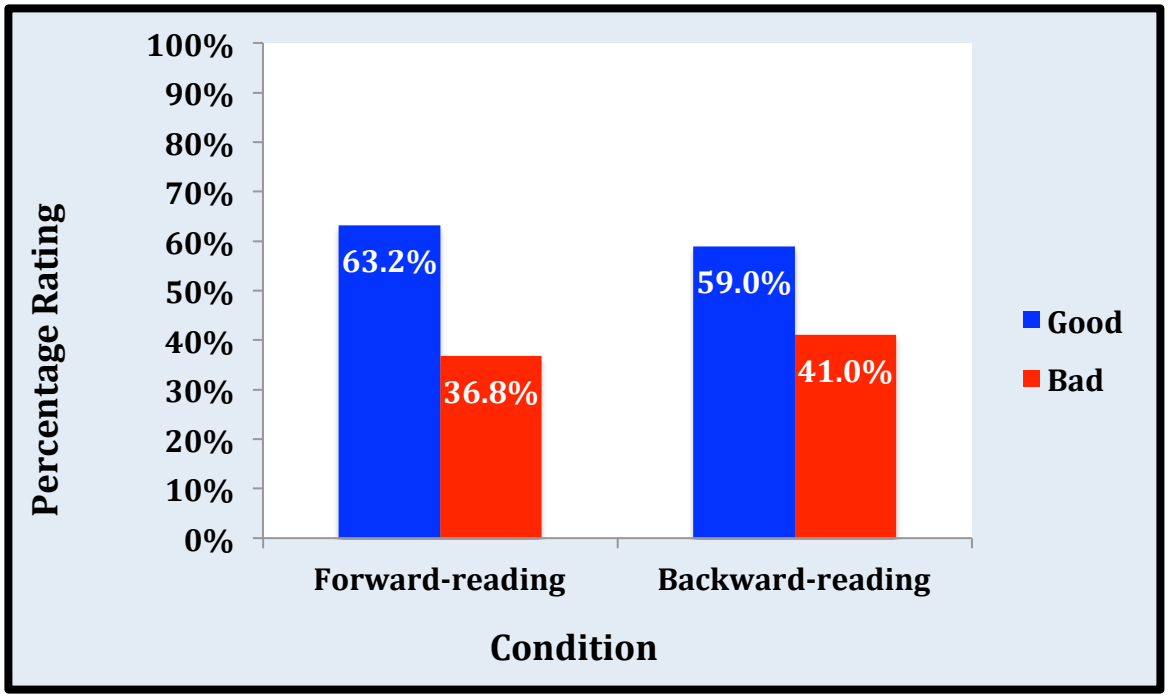

Figure 1. Experiment 1: Good vs. Bad deep role categorizations separated by condition (forward-reading vs. backward-reading).

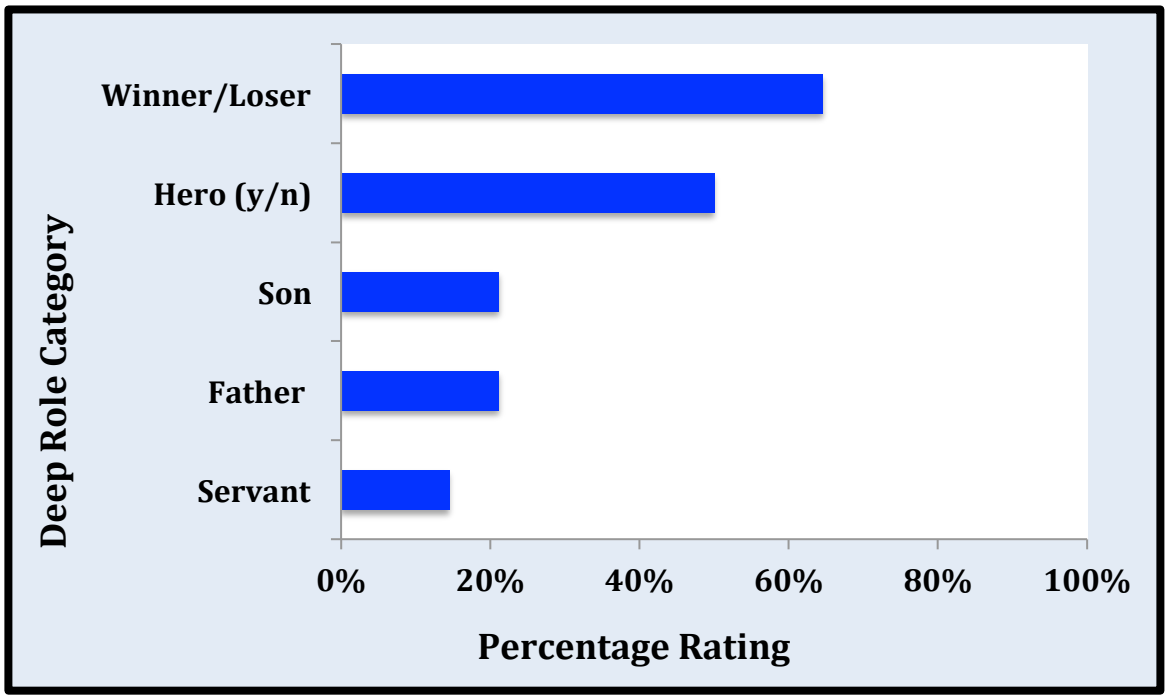

Figure 2. Experiment 2: Deep role categorizations by percentage assigned by participants in both the resilience-primed and control condition.

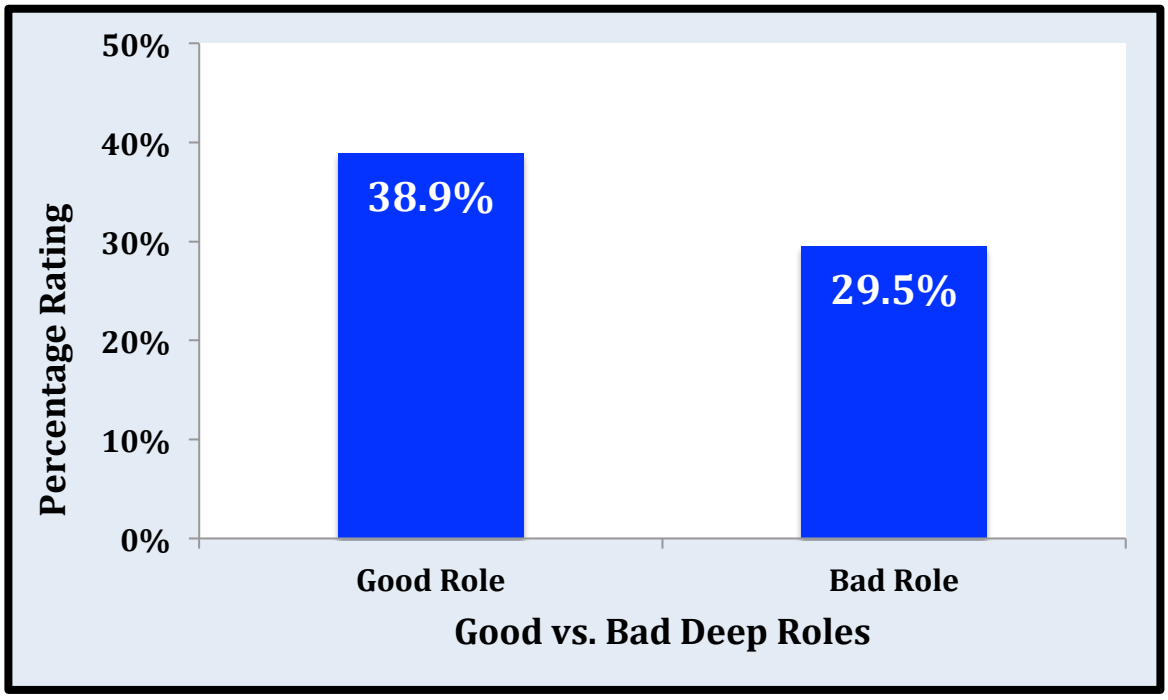

Figure 3. Experiment 2: Good vs. Bad deep role categorizations by percentage assigned by participants in both the resilience-primed and control conditions.

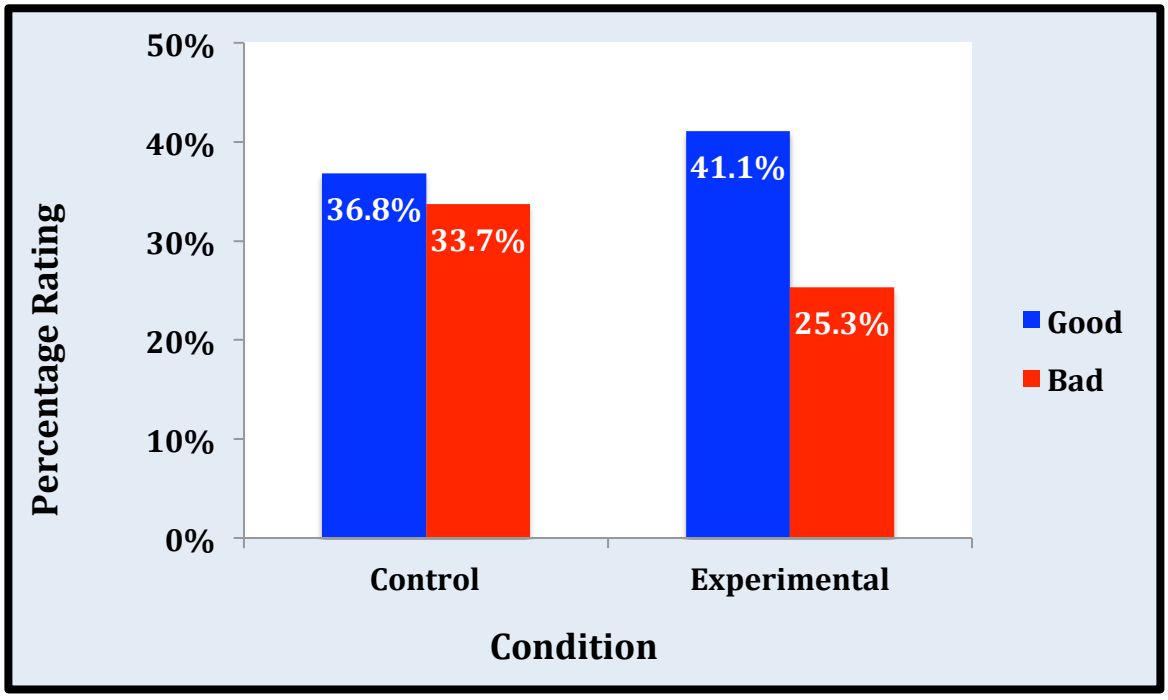

Figure 4. Experiment 2: Good vs. Bad deep role categorizations separated by condition (experimental, resilience-primed vs. control).

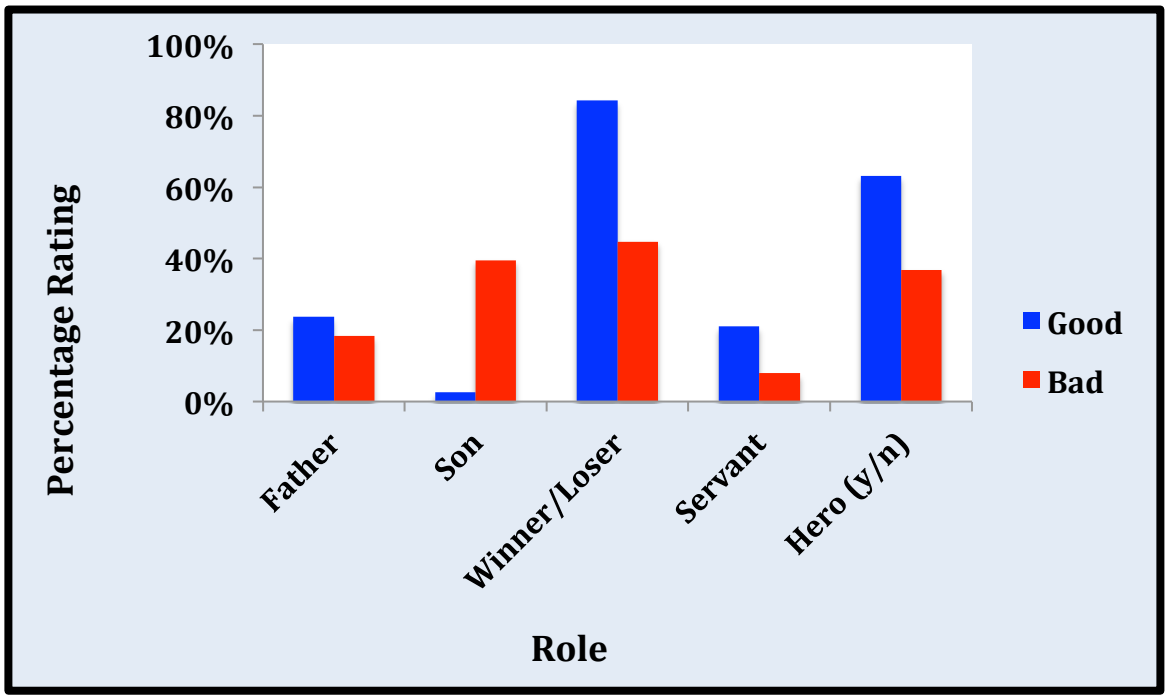

Figure 5. Experiment 2: Good vs. Bad deep role categorizations divided by type of role as assigned by participants in both the resilience-primed and control conditions.

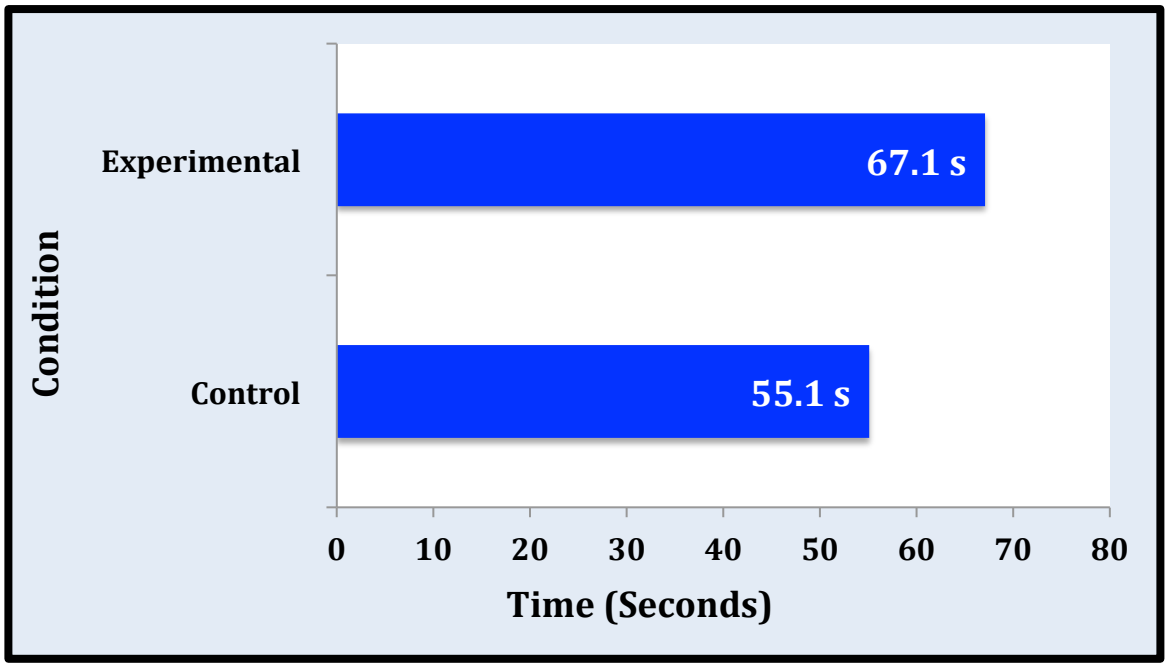

Figure 6. Experiment 2: Average time (seconds) that participants in both the resilience-primed and control conditions were able to hold a 5 lb. hand weight.