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INGROUP BIAS IN THE CONTEXT OF MEAT CONSUMPTION. DIRECT AND INDIRECT ATTITUDES TOWARD MEAT-EATERS AND VEGETARIANS

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ABSTRACT

Ingroup bias is a general effect of group evaluations. However, as meat eating is controversial behavior, I expect conscious meat-eaters (flexitarians) to lack ingroup bias while vegetarians and meat-lovers experience that bias. To test this hypothesis, flexitarians (n = 43), vegetarians (n = 33), and meat-lovers (n = 22) reported their direct and indirect attitudes (positive focal Brief Implicit Association Test) toward meat-eaters and vegetarians. Results support the hypothesized lack of ingroup bias for the flexitarians and the ingroup bias for the vegetarians. Surprisingly, the meat-lovers lacked ingroup bias. Lack of ingroup bias may strengthen cognitive dissonance.

INTRODUCTION

Most social groups tend to show an ingroup bias, a preference for one's ingroup to the outgroup (Tajfel & Turner, 1979). However, not all groups express such ingroup bias. Ingroup bias depends on several factors such as group status, the permeability of the group, or the sexual orientation of the individuals (Bettencourt et al., 2000; Emig & Jörgensen, 2017). I postulate that implicit conscious meat-eaters (flexitarians) may lack ingroup bias. Meat eating is a controversial behavior and may influence ingroup bias: Attitudes toward meat-eating range from positive associations about meat eating (e.g., masculinity and strength; Rothgerber, 2012; Setzwein, 2004), to negative associations about meat eating (e.g., murder and immorality; Ruby & Heine, 2011).

There is initial evidence for the postulated lack of ingroup bias in meat-eaters. For instance, Monin and Norton (2003) asked participants to rate vegetarians and meat-eaters on a semantic differential (Osgood et al., 1957). Most participants were meat-eaters and evaluated their outgroup (vegetarians) more positively than their ingroup (meat-eaters). This evaluation may indicate a lack of ingroup bias in the meat-eaters.

However, Monin and Norton (2003) did not account for there being different types of meat-eaters. In later work, Cordts et al. (2013) and Verain et al. (2015) developed categories of meat-eaters and the categorization may influence the meat-eaters' ingroup bias. The categorization

was based on the meat-eaters amount of eaten meat and their norms to meat eating. The categorization of the meat-eaters consisted of three to five subcategories, ranging from conscious flexitarians to meat-lovers (Cordts et al., 2013; Verain et al., 2015). Flexitarians were defined as participants with conscious meat-eating habits and high concern about moral and sustainability. The flexitarians ate on average 3.7 times meat per week (scale ranged from 0 to 21; 0 = *ate no meat*, 21 = *ate meat on three meals on all 7 days*; Cordts et al., 2013). The flexitarians stated that they want to stop or reduce eating meat (Verain et al., 2015). The flexitarians may perceive eating meat to be especially controversial as they have greater moral concerns than meat-lovers (Cordts et al. 2013; Verain et al. 2015). Consequently, flexitarians would have a more positive attitude to vegetarians, the group that had already succeeded in not eating meat.

Several researchers used indirect measurements such as the Implicit Association Test (IAT; Greenwald et al., 1998) to gain a deeper understanding of the participants' attitudes toward vegetables and meat (e.g., Barnes-Holmes et al., 2010; de Houwer & de Bruycker 2007; Swanson et al., 2001). Results indicate that vegetarians show a stronger pro-vegetable bias in the IAT than meat-eaters. However, attitudes toward food (e.g., meat) may differ from attitudes toward groups (e.g., meat-eaters) because objects differ from groups in several ways (for a detailed discussion see, Campbell, 1958). Different psychological evaluation processes apply for groups but not for objects, e.g., ingroup bias. No research appears to have tested participants' indirect attitudes toward the meat-eater group and the vegetarian group.

In this study, I assess direct and indirect attitudes [1] toward meat-eaters and vegetarians. I hypothesize that both, meat-lovers and vegetarians, show an ingroup bias while flexitarians lack ingroup bias and have a more positive attitude to vegetarians.

METHODS

Procedure

I invited my participants to an approximately 20 minute-lasting study on "reaction times" in exchange for course credit and a reward. The participants were lead to the laboratory one at a time. In the laboratory, the participants completed several tasks: a positive focal Brief Implicit Association test about meat-eaters and vegetarians (brief IAT with solely one category and a focal concept; BIAT) and self-reported attitudes toward meat-eaters, vegetarians, and meat-eating. Additionally, the participants answered some filler questions, reported demographics, and were then debriefed about the real purpose of the experiment, thanked, and dismissed [2].

Participants and Power Analysis

I run a statistical power analysis (conducted with GPower 3.1; Faul et al., 2017) for an analysis of variance (ANOVA) with one between-subjects factor (meat consumption pattern of the participants: meat-lover, flexitarian, vegetarian) and two within-subjects factors (direct and indirect attitudes toward meat-eaters and vegetarians). The analysis suggested 66 participants to achieve a power (1- beta) of .95, alpha = .05 for detecting a medium-sized effect. The analyses began after all data were collected.

Participants were $N = 102$ students (*mean age* = 22.6, *standard deviation age* = 3.3; 65 female, 37 male) of various majors at the Leuphana University Lüneburg, Germany. The participants self-reported to be meat-eaters ($n = 55$, *Mean meat consumption per week* = 2.3, $SD = 1.3$), vegetarians or vegans ($n = 33$) [3], or "others" ($n = 14$) [4]. I categorized the self-reported meat-eaters into flexitarians (self-report to eat less than three times per week meat) and meat-lovers (self-report of eating three or more times per week meat; Cordts et al., 2013; Verain et al., 2015). This categorization resulted in 43 flexitarians and 22 meat-lovers.

Dependent measures

Indirect Attitudes

I assessed the indirect attitudes of the participants with a web-based online BIAT (adapted from Sriram & Greenwald, 2009), which I launched with the website SoSci Survey. The BIAT (*meat-eater - vegetarian/positive - (negative)*) instructed participants to focus on positive words and the group of *meat-eaters (*respectively *vegetarians*). The response key "E" corresponded to the focal category and "I" to *other*. I took the positive and negative words from a previous study that tested the words on valence ($N = 28$; Emig & Jörgensen, 2017; see Appendix A for the selected words). I balanced all stimuli sets to have approximately the same word length and the same amount of special characters.

Direct Attitudes

I asked the participants to self-report how positive and negative they felt toward meat-eaters and vegetarians (e.g., "*Please rate how positive you feel toward meat-eaters*", 1 = *neutral,* 7 = *very positive, prefer not to say*). Moreover, I gave them items about their identification with the two groups and the two dishes (e.g., "*To what extent do you overall identify with meat-eaters?*", 1 = *no identification at all*, 4 = *neutral*, 7 = *strong identification, prefer not to say*). I asked the participants to categorize themselves in one group ("*I am [] meat-eater [] vegetarian [] vegan [] other :_____*"). Afterward, I let the participants rate seven statements about meat consumption, their values, actual behavior, and their intentions to change behavior (Cordts et al. 2013; Verain et al. 2015; e.g., "*For a complete meal, meat is absolutely necessary*", 1 = *totally disagree*, 7 = *totally agree*). Additionally, I asked the participants to report some of their demographics (gender, age, study program, and number of IATs done previously) and to answer filler questions (computer usage habits and experience with reaction time measurements). Neither the participants' demographics (all $p > .35$) nor the filler questions significantly influenced the results (all $p > .23$).

RESULTS

Indirect Attitudes

To test the hypothesis that meat-lovers and vegetarians show an ingroup bias, while flexitarians do not, I analyzed the raw data for indirect and direct attitudes separately.

For the indirect attitudes, I conducted a repeated-measures ANOVA with attitude objects (meat-eaters vs. vegetarians) as within-subjects factors and personal meat consumption pattern of the participants (meat-lovers, flexitarians, vs. vegetarians) as between-subjects factors. Surprisingly, neither the interaction of the personal meat consumption with attitude objects returned a significant effect, $F(2, 95) = 1.19$, $p = .31$, partial eta squared =.02 nor did the main effect of personal meat consumption, $F(2, 95) = 0.71$, $p = .50$, partial eta squared =.02, (see Table 1). This result indicates that there was no difference between the personal meat consumption of the participants and their responses in the BIAT. The participants had a more positive attitude to the vegetarians, regardless of their meat consumption. Taken together, the results indicate that the ingroup bias on the indirect measurement occurred only for vegetarians and not for meat-lovers or flexitarians.

Direct Attitudes

For the direct attitudes, I conducted a repeated-measures ANOVA with attitude objects (meat-eaters vs. vegetarians) as within-subjects factors and personal meat consumption as between-subjects factors. As expected, the interaction of the personal meat consumption with attitude objects (meat-eaters vs. vegetarians) returned a significant effect, $F(2, 91) = 14.64$, $p < .001$, partial eta squared =.24, indicating a large effect). Means indicate that the vegetarians responded more extremely than the two other groups (see Table 1 for all means). I conducted three paired-samples t-tests to scrutinize the differences for the three personal meat consumption patterns. Surprisingly, the meat-lovers rated the meat-eaters ($M = 2.8$, $SD = 1.1$) and the vegetarians ($M= 2.6$, $SD = 1.0$) with no significant difference, $t(21) = 0.49$, $p = .63$, eta squared = .01), indicating a lack of ingroup bias of the meat-lovers. The flexitarians rated the vegetarians significantly more positive ($M= 2.7$, $SD = 0.9$) than they rated the meat-eaters, $M = 3.4$, $SD = 0.9$, $t(41) = 3.645$, $p = .001$, eta squared = .25, indicating a large effect and indicating the expected lack of ingroup bias of the flexitarians. The vegetarians rated the vegetarians significantly more positive ($M = 2.1$, $SD = 1.0$) than they rated the meat-eaters, $M=4.1$, $SD = 0.9$, $t (30) = 7.22$, $p <.001$, eta squared = .64, indicating a large effect. The results of the vegetarians indicate that they showed the expected ingroup bias (see Appendix B for analyses about the relations between the direct and indirect measurements).

Together, the results indicate that ingroup bias of the indirect and indirect measurements occurred only for vegetarians and neither for meat-lovers nor flexitarians.

TABLE 1

Means of Indirect and Direct Attitudes Separated by Personal Meat Consumption Pattern of the Participants

	Personal Meat Consumption	Attitudes
	Meat-lovers	2,085.4 (457.2)

Indirect Attitudes toward Meat-Eaters	Flexitarians	1,982.9 (442.3)
	Vegetarians	2,052.2 (708.2)
	Total	2,029.0 (540.1)
Indirect Attitudes toward Vegetarians	Meat-lovers	1,852.8 (451.6)
	Flexitarians	1,752.4 (391.1)
	Vegetarians	1,597.5 (284.3)
	Total	1,726.5 (384.9)
Direct Attitudes toward Meat-eaters	Meat-lovers	2.8 (1.1)
	Flexitarians	3.4 (0.9)
	Vegetarians	4.1 (0.9)
	Total	3.5 (1.0)
Direct Attitudes toward Vegetarians	Meat-lovers	2.6 (1.0)
	Flexitarians	2.7 (0.9)
	Vegetarians	2.1 (1.0)
	Total	2.5 (1.0)

Note. Indirect attitudes: Values are response latencies in milliseconds. Lower scores indicate a stronger positive association toward the group.

Direct attitudes: Scale ranging from 1 (*very positive feelings toward the group*) to 7 (*neutral feelings toward the group*). Lower scores indicate a stronger positive self-reported attitude toward the group.

Standard deviations in parentheses.

Self-categorization and Identification

The participants' self-reported amount of meat consumption and their group categorization coincided. Those who reported eating no meat self-categorized as vegetarians and those who reported eating meat self-categorized as meat-eaters, except for two cases, which were excluded from the analysis.

The self-reported group categorization of the vegetarians and the meat-lovers was in line with their identity toward their ingroup. Vegetarians identified more strongly with vegetarians (M = 6.8, SD = 2.1) than with meat-eaters (M = 3.5, SD = 2.1), $t(31) = -6.61$, $p <$ .001, eta-squared = .59. Meat-lovers identified more strongly with meat-eaters (M = 5.9, SD = 1.9) than with vegetarians (M = 4.4, SD = 1.6), $t(21) = 3.12$, p = .01, eta-squared = .33. Flexitarians, however, identified more strongly with vegetarians (M = 5.3, SD = 1.8) than with meat-eaters (M = 4.1, SD = 1.7), $t(41) = -3.45$, p = .001, eta-squared = .23.

DISCUSSION

This research was intended to demonstrate that both meat-lovers and vegetarians show an ingroup bias while flexitarians do not. The hypothesis was confirmed for the vegetarians, who showed an ingroup bias, and for the flexitarians, who showed the expected lack of ingroup bias. The results of the meat-lovers were not in line with my hypothesis: The meat-lovers lacked ingroup bias on the indirect measurement and their results were not significant on the direct measurement.

As hypothesized, the flexitarians lacked ingroup bias. Their lack of ingroup bias was in line with their strong identification with vegetarians: The flexitarians rated vegetarians more positively than meat-eaters and identified more strongly with vegetarians than with meat-eaters. However, they self-reported being meat-eaters, which indicates a difference between their behavior and attitudes. This difference may result in *cognitive dissonance*, which is a state of unease that a person perceives when one's behavior or attitudes do not coincide with another attitude one holds (Festinger, 1978; see Rothgerber, 2014 for a summary of potential reasons for cognitive dissonance of meat-eaters).

For further analyses, it would be interesting to assess the participants' cognitive dissonance to divulge potential differences between flexitarians and vegetarians.

Lack of Ingroup Bias of Meat-lovers

The meat-lovers showed a more positive attitude towards vegetarians on the indirect measurement despite their self-reported identification with their ingroup. What accounts for the meat-lovers lack of ingroup bias?

An explanation for the meat-lovers lack of self-reported ingroup bias may be that they were less committed to eating meat than meat-eaters in previous studies were (in this study, meat-lovers ate on 3.9 days per week meat; Verain et al., 2015: 5.2 days per week). Additionally, in this research, the participants' attitudes about meat consumption were all similar. The self-declared meat-eaters largely agreed that it is important to reduce meat consumption. For further analyses, the sample should be more diverse because participants who eat more meat may commit more strongly to meat consumption and, consequently, the participants may show the expected ingroup bias.

CONCLUSION

Ingroup bias depends on several factors such as group status and the permeability of the group (Bettencourt et al., 2000). My results indicate that the controversial behavior of meat eating can be another factor influencing ingroup bias. Vegetarians showed ingroup bias while flexitarians and meat-lovers lacked ingroup bias. Further studies are needed to test *why* the lack of ingroup bias occurred. Potential explanations could be the perceived controversy of meat consumption but also perceived group status or context. However, the finding that meat-eaters lacked ingroup bias may help to understand and reduce cognitive dissonance in meat-eaters. To conclude, this

research is a first attempt to show the potential influence of the controversial behavior of meat consumption on ingroup bias.

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ENDNOTES

[1] I decided to avoid the termini "implicit" and "explicit", as well as "conscious" and "unconscious" as these termini may be delusive. For a comprehensive review of this discussion, see Corneille & Hütter, 2020.

[2] The participants conducted also a positive focal BIAT about vegetarian dishes and dishes, which contain meat, and completed an actual food choice task. The order of the tasks was randomized. Tests of order were not significant, all $p > .17$, indicating no effect of the additional tasks on the reported direct and indirect group attitudes.

[3] As a reference: Approximately 7 % of the German population reports to be vegetarian (Statista, 2020).

[4] Those who categorized themselves as "other" described themselves as, e.g., flexitarians, omnivores, or eating only once a year meat. If possible, I categorized them into one of the existing categories.

APPENDIX A

Selected Words, Mean of Their Valence, and Group Fit

Category Label	Used Words	Valence	Group fit
Fleischesser [meat-eaters]	Fleischkonsument [meat consumer], Fleischgenießerin [meat connoisseur], Karnivor [carnivore], Omnivor [omnivore], Steakesser* [steak eater]	3.4 (0.8)	1.9 (0.6)
Vegetarier [vegetarians]	Vegetarierin [vegetarian], Veganer [vegan], Laktovegetarier [lacto-vegetarian], Gemüsesser [vegetable-eater], Pflanzenesser [plant-eater]	4.4 (1.1)	6.7 (0.4)

Note. Valence = scale ranging from 1 (*negative*) to 7 (*positive*). Group fit = scale ranging from 1 (*meat-eater*) to 7 (*vegetarian*). English translations in square brackets and standard deviation in parentheses.
* No values available as this word has been added after the pretest.

APPENDIX B

Relationship between Indirect and Direct Attitudes

To analyze the relationship between the indirect and the direct attitudes, I calculated d-scores of the reaction times (Greenwald et al., 2003; Nosek et al. 2014; the D-Score is the difference between the means of the response latencies in the conditions divided by the standard deviation across the conditions). Afterward, I z-transformed the data of the direct and the indirect measurements and conducted a repeated-measures ANOVA with the z-transformed data. I entered the attitude objects (meat-eaters vs. vegetarians) and the attitude assessments (indirect vs. direct) as within-subjects factors and the personal meat consumption (vegetarians, meat-lovers vs. flexitarians) as a between-subjects factor into the analysis. As expected, neither the interaction of attitude objects and the attitude assessments returned a significant effect, $F(1, 91) = 0.33$ $p = .57$, partial eta-squared =.004, nor the interaction of the personal meat consumption pattern and the attitude assessments, $F(2, 91) = 2.65$, $p = .08$, partial η2 =.026). The main effect of attitude assessments did not return a significant effect, $F(1, 91) = 0.12$, $p = .74$, partial eta-squared =.001. These results indicate that there was no significant difference between indirect and direct attitude assessments.

To analyze the relationship between indirect and direct attitudes in more detail, I computed several correlations. Indirect attitudes and positive direct attitudes toward the groups correlated significantly for the vegetarian participants, $r(29) = .50$, $p = .01$ but not for the meat-lovers and the flexitarians, both $p > .05$. Consequently, there might be some extent of discriminant validity between the two different types of measures (indirect and direct attitudes, Perugini, 2005; Richetin et al., 2007; for all correlations see Table B1).

Table B1

Summary of Correlations for Indirect and Direct Attitudes (Positive and Negative) as a Function of Self-reported Group Classification

Measure	1	2	3
Pos. indirect attitude	—	.05	.00
Pos. direct attitude	.50**	—	<u>.55**</u>
Neg. direct attitude	.26	.68**	—

Note. Correlations for meat-eaters ($n = 65$) are presented above the diagonal and correlations for vegetarians ($n = 33$) are presented below the diagonal. Correlations of meat-lovers and flexitarians are presented in this table together. Underlined values indicate that this correlation yielded for both subgroups (meat-lovers and flexitarians) significance. All other cases were solely for the flexitarians significant.

1 = d-score of the BIAT. Higher d-scores in the BIAT are associated with a stronger positive association toward meat-eaters than vegetarians; 2 = positive direct attitude toward meat-eaters; 3 = negative direct attitude toward vegetarians.
* $p < .05$. ** $p < .01$.

AUTHOR'S NOTE

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CURRENT RESEARCH IN SOCIAL PSYCHOLOGY

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A NOVEL APPROACH FOR MEASURING SELF-AFFIRMATION

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ABSTRACT

Psychological priming could benefit from more parsimonious manipulation checks that apply to a variety of priming methods. The present study applies the framework of Affect Control Theory-Self to measure changes in self-evaluation, potency, and activity from self-affirmation and self-uncertainty primes. The results demonstrate that self-evaluation significantly captures self-sentiment change between self-affirmation and self-uncertainty whereas the traditional self-integrity scale did not. Self-sentiment measures offer an alternative for capturing the effects of psychological priming and their intersection generates avenues for future research.

INTRODUCTION

Self-Affirmation Priming

Self-affirmation posits that individuals are motivated to maintain their sense of self-integrity (Cohen & Sherman 2014) to cope with the stresses of their environment. Experiments that increase feelings of self-integrity through self-affirmation primes have been shown to increase openness to threatening information. This includes a wide range of information from being more open to health messaging (Sweeney & Moyer 2015) to opposing political viewpoints (Binning et al 2010). However, despite consistent evidence for its impact on cognition and behavior (McQueen and Klein 2006), there lacks a "common currency" that accounts for understanding of the mechanism behind the self-affirmation and how its impact relates to other types of psychological primes (McGregor 2006).

Researchers have argued a variety of concepts can explain the self-affirmation process including self-integrity (Sherman and Cohen 2006), self-clarity (Boucher, Bloch, and Pelletier 2016), morality salience (Heine, Proulx and Vohs, 2006), meaning (Fritsche et al., 2008), or self-transcendence (Crocker, Niiya, and Mischkowski 2009). Additionally, the variety of theoretical frameworks applied to self-affirmation have created many different types of manipulation checks (McQueen & Klein 2006; Napper, Harris, & Epton 2009; Sherman et al 2009). The abundance of new scales add conceptual confusion and longer scales for self-affirmation manipulation checks may even add unwanted noise (McQueen & Klein 2006; Schwinghammer, Stapel, & Blanton 2006). I argue that using a more parsimonious scale from Affect Control Theory (ACT) that measures the self-concept into three well-studied dimensions of meaning (Osgood 1962) would be beneficial for studying self-affirmation.

Affect Control Theory of Self

According to ACT, individuals have a motivation to maintain consistency between cultural meanings and social situations (Heise 2007). These social situations are broken down into smaller components (actors, behaviors, and objects), which are measured on evaluation, potency, and activity through semantic differential scales. Evaluation, potency, and activity have also been found as central components for describing constructs across cultures (Osgood 1962). When an individual experiences a discrepancy between their social situation and their cultural expectations, this is called *deflection.* Because the social components each have a numerical rating, the difference between one's cultural expectations and their current situation can be quantified. For example, "mother" may have a very positive evaluation rating. If we hear about a mother hurting a child (a negatively rated behavior), then this would cause deflection. Individuals are motivated to avoid deflection and can do so by reframing different components of the situation (Nelson 2006). In our "mother hurts child" example, we may reframe the situation in our mind to "monster hurts child" to reduce deflection because a "monster" hurting a child is more consistent with our cultural expectations.

Affect Control Theory of Self (ACT-Self) extends from ACT and provides a framework for understanding how different self-evaluations impact behavior. ACT-Self measures this process through the interaction of fundamental and transient self-sentiments (MacKinnon 2015). An individual's overall and static view of themselves is called the fundamental self-sentiment. The current state the individual is viewing themselves is the transient self-sentiment. These self-sentiments are measured on the dimensions of evaluation, potency, and activity, just like ACT uses the same dimensions to measure social events. For measuring the self, the evaluation dimension refers to how worthy or unworthy an individual considers themselves. The potency dimension captures one's perception of self-competence and activity measures feelings of overall liveliness. These self-sentiment measures can also predict an individual's report of their emotions and identities (Boyle 2017).

ACT-Self posits that individuals have a motivation to maintain consistency between how they rate themselves in their fundamental sentiments and how they are currently feeling through their transient sentiments (Heise and MacKinnon 2010). When an individual behaves in a manner that is inconsistent with how they typically view themselves (generating a mismatch between their fundamental and transient sentiments), they experience *inauthenticity* (Heise and MacKinnon 2010; MacKinnon 2015). For example, if someone considers themselves to be a good and competent person, then making a mistake could generate negative feelings, creating the experience of inauthenticity. Deflection in the broader ACT operates similarly to inauthenticity in ACT-Self. Individuals resolve inauthenticity by engaging in a behavior that is consistent with their fundamental sentiments. Importantly, any deviation from fundamental sentiments (positive or negative) can create inauthenticity. On a methodological level, ACT-Self measures self-sentiments through semantic differential scales which reduces ambiguity and conceptual confusion found in more traditional self-esteem scales (MacKinnon 2015). Thus, the measures used in ACT-Self may offer utility for measuring the impact of psychological priming as well.

Psychological primes that impact the self would create inauthenticity due to a mismatch between transient self-sentiments and fundamental self-sentiments. People perceive themselves to be moderately good, potent, and active (MacKinnon 2015). Self-affirmation involves reflecting on one's positive qualities and competence through their behavior (Cohen & Sherman 2014). Focusing on one's positive qualities through a self-affirmation prime could make a person feel overly good, potent, and active compared to their self-sentiment baseline (thereby creating inauthenticity). Using the measures involved in the ACT-Self framework could capture self-sentiment change in a way that is more parsimonious and more generally applicable than specific priming manipulation checks.

The Present Study

The present study applies ACT-Self to measure self-sentiment change from self-affirmation primes. In addition to contrasting self-affirmation and a control condition, I also added a self-uncertainty condition. Research has shown that self-affirmation and self-uncertainty have been found to cancel each other's effects when primed in succession (McGregor 2006). Additionally, priming individuals to feel uncertain about themselves makes them less open to new information (McGregor et al 2001; Sherman, Hogg, and Maitner 2009), which also suggests self-affirmation and self-uncertainty could operate on a compensatory mechanism (McGregor 2006). Common methods to prime both self-affirmation and self-uncertainty involve recall tasks. Priming self-affirmation can be achieved when the individual reflects on a value they deem personally important. Priming self-uncertainty can be achieved when the individual reflects on a time they felt uncertain in their lives. A self-affirmation prime could make a person feel overly good, potent, and active compared to their baseline, but a self-uncertainty prime may cause the inverse effect because uncertainty is often a negative, powerless, and inactive state. Feelings towards oneself can be inflated or deflated depending on the priming method used.

The framework of ACT-Self allows for measuring the effects of self-affirmation through three simple and well-defined measures of meaning (evaluation, potency, and activity). Additionally, it would allow changes of various primes (such as self-uncertainty and self-affirmation) to all be captured on the same self-sentiment measurements. Applying the ACT-Self framework to psychological primes adds parsimony and creates a "common currency" to capture self-sentiment change. Thus, the present study predicts that self-affirmation primes should elevate one's transient self-sentiments and self-uncertainty should decrease one's transient self-sentiments.

Self-affirmation Higher Evaluation Hypothesis: Self-affirmation prime will yield higher self-sentiments on evaluation compared to self-uncertainty prime

Self-affirmation Higher Potency Hypothesis: Self-affirmation prime will yield higher self-sentiments on potency compared to self-uncertainty prime

Self-affirmation Higher Activity Hypothesis: Self-affirmation prime will yield higher self-sentiments on activity compared to self-uncertainty prime

METHODS

Subjects

Participants were recruited from *Prolific*, which is an online platform of research participants who complete studies in exchange for monetary rewards (Palan and Schitter 2018). Participants were randomly assigned into a self-affirmation, self-uncertainty, or control condition. One hundred participants were recruited for each condition for a total of 300 participants. Participants were dropped from the study if they did not complete the prime accurately or did not appear to take the study seriously. This resulted in dropping five participants from the control group, one from the self-affirmation group, and five from the self-uncertainty group. The overall sample was 53.97% female, 82.69% white, had a mean age of 35.67 (SD =13.46), and 56.05% had a college degree or higher.

Procedure

After participants consented to complete the study, they were given an essay box to complete the prime depending on the condition they were randomly assigned into. The self-affirmation prime asked participants to pick a value that was important to them and then write three reasons why it was important to them and provide an example illustrating its importance (Sherman et al 2009). The control condition was a common control prime in self-affirmation studies (McQueen & Klein 2006) where participants picked a value that was least important to them and wrote about how someone else may find it important. Those in the self-uncertainty prime wrote about a time when they felt about themselves and their future (McGregor 2001). Each condition required participants to write at least 100 characters to try and ensure participants had some reflection during their prime. After completing the prime, participants then answered the eight item self-integrity scale (see Appendix A), which has been used as a manipulation check for self-affirmation primes (Sherman et al 2009). After answering the self-integrity scale, participants then rated themselves on "myself as I currently feel" on evaluation, potency, and activity to capture transient self-sentiments (see Appendix B). This new measure was inspired by the ACT-Self, which asks participants to rate "myself as I really am" on evaluation, potency, and activity. Finally, participants answered basic demographics questions (age, race, sex, and education) and were debriefed once the study ended.

RESULTS

Table 1. Means and standard deviations for evaluation, potency, activity, and self-integrity across conditions.

Self-sentiment (or scale)	**Self-uncertainty condition**	**Control condition**	**Self-affirmation condition**
Self-evaluation	1.26 (1.68)	1.41 (1.64)	1.82 (1.52)
Self-potency	0.40 (1.69)	0.44 (1.75)	0.48 (1.70)
Self-activity	-0.10 (1.63)	0.26 (1.69)	0.30 (1.61)
Self-integrity scale mean	5.49 (0.945)	5.58 (0.964)	5.67 (0.856)

Note: Self-integrity scale measure ranged from 1 (strongly disagree) to 7 (strongly agree) and self-sentiment scales ranged from -4 to 4.

Table 1 shows the means and standard deviations for the three sentiments (evaluation, potency, and activity) and self-integrity scale across the three conditions. I ran a series of ANOVAs to evaluate whether the three conditions produced significantly different effects on how participants currently felt about themselves (as measured by evaluation, potency, and activity).

Table 2. Mean differences on evaluation between the three priming conditions

Priming Condition	Control	Self-Affirmation
Self-Affirmation	0.41 0.235	
Self-Uncertainty	-0.15 1.000	-0.56 0.049*

Note: Top number in cell equals the row mean subtracted from column mean and the bottom number is the p value after the Bonferroni test. * = $p < .05$

For self-evaluation, an ANOVA revealed a significant difference between the three conditions (F= 2,286) 3.14; p = .045). The Bonferroni post-hoc test found that the self-evaluation ratings were significantly higher in the self-affirmation condition compared to the self-uncertainty condition (see Table 2). The control group was in the middle of these two means, but was not significantly different from either prime. This result provides support for the *Self-affirmation Higher Evaluation Hypothesis.* ANOVAs did not find significant differences between conditions for potency (p = .94) or activity (p = .16). Thus, neither the *Self-affirmation Higher Potency* nor the *Self-affirmation Higher Activity Hypothesis* were supported.

Table 3. Pearson's correlation among self-sentiments and self-integrity scale.

	Evaluation	**Potency**	**Activity**	**Self-Integrity**
Evaluation	1.000			
Potency	0.597**	1.000		
Activity	0.419**	0.595**	1.000	
Self-Integrity	0.673**	0.574**	0.353**	1.000

Note: ** = $p < .001$

Pearson's correlation results reveal that evaluation, potency, and activity positively correlate with each other (see Table 3). While sentiments measuring "myself as I really am" have been found to modestly correlate with each other (MacKinnon 2015), the new measure of "myself as I currently feel" had much higher positive correlations among sentiments. Self-integrity scale scores also positively correlated with self-evaluation, potency, and activity. However, an ANOVA did not reveal any significant differences between the priming conditions when compared on self-integrity scores (p = .38). Interestingly, the standard manipulation check for self-affirmation could not detect an effect, but the simple self-evaluation scale did yield a significant difference between the self-affirmation and the self-uncertainty conditions.

DISCUSSION

This study evaluated whether measures of self-evaluation, potency, and activity could capture sentiment changes of self-affirmation and self-uncertainty primes. I found that the self-affirmation condition was significantly higher on the evaluation dimension compared to the self-uncertainty condition. However, potency and activity were not statistically significant (though activity was trending in the predicted directions). Importantly, the self-integrity scale, a scale commonly used to measure self-affirmation, was not significant for measuring any differences between the three conditions. This suggests that a simple self-evaluation scale inspired by ACT-Self may offer utility for capturing sentiment change from psychological priming.

This study is limited by its generalizability due to using a small online sample. Additionally, because the study was not conducted in a controlled setting, it is unknown what kind of distractions participants were exposed to while doing the experiment. Another limitation is the difficulty in parsing out what elements of the prime influenced one's self-sentiments. For example, by simply taking action to write about oneself, this may influence their self-activity ratings, regardless of what they write about. Despite these limitations, I still found a significant effect on the self-evaluation measure between my two primes. Neither prime was statistically significant from the control condition, but this could be due to a small sample size and low statistical power. The results from the present study suggest priming can be measured through self-sentiment change, but I cannot conclude self-sentiment measures offer greater predictive validity than the Self-Integrity Scale.

Future research can determine to what extent a controlled laboratory setting increases the effects of self-affirmation and self-uncertainty primes compared to an online environment. Furthermore, future researchers can also work to determine what elements (i.e. character limits, time spent writing essay, complexity of answers, etc.) comprise the proper "dosage" for these primes. It is also important to note how the impact of psychological primes can be more likely to be observed when outcome variables are more relevant for specific groups (Facciani 2019). The measure of self-sentiment change used in the current study may be useful for researchers studying ACT-Self who wish to capture the concept of inauthenticity directly instead of observing it through behavioral changes. ACT databases may offer insight on how concepts involved in the psychological priming vary between each other and also across cultures (Heise 2010). Finally, the present study opens potential avenues of research for how psychological primes impact self-sentiments, meanings, behaviors, and emotions.

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APPENDIX A

Self-integrity Scale from Sherman and colleagues (2009)

_____ 1. I have the ability and skills to deal with whatever comes my way.

_____ 2. I feel that I'm basically a moral person.

_____ 3. On the whole, I am a capable person.

_____ 4. I am a good person.

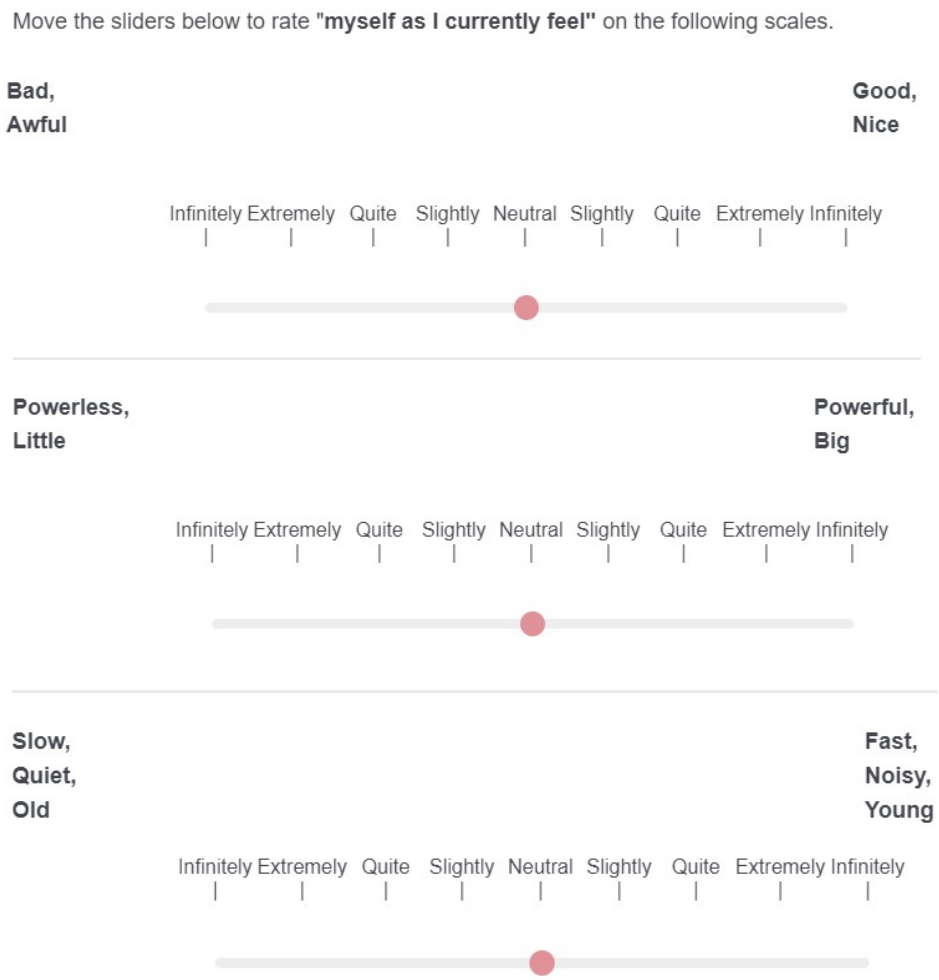
_____ 5. When I think about the future, I'm confident that I can meet the challenges that I will face.

_____ 6. I try to do the right thing.

_____ 7. Even though there is always room for self-improvement, I feel a sense of completeness about who I fundamentally am.

_____ 8. I am comfortable with who I am

APPENDIX B



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CURRENT RESEARCH IN SOCIAL PSYCHOLOGY

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Parental Rejection and Peer Acceptance: The Mediating Role of Cognitive Bias

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ABSTRACT

Understanding what influences peer attachments is vitally important. Consistent with organizational/transactional theory, we examined the roles of emotional dysregulation and cognitive bias, in the relationship between parental rejection and peer acceptance. Early adult participants reported their perception of parental acceptance/rejection in childhood and current levels of emotional, cognitive, and social wellbeing. Results replicate findings that the quality of a parent-child relationship relates to psychological functioning, including one's ability to regulate emotions, understand others' emotions and intentions, and form quality relationships. However, maladaptive cognitions mediate the relationship between parental and peer acceptance.

INTRODUCTION

The need to belong drives us to engage in behaviors that increase the chances of peer acceptance and reduce the chances of social rejection (Baumeister & Leary, 1995). Appropriate socialization processes in development are maximal, as peer acceptance is linked to self-esteem, communication opportunities, and emotional regulation (Mostow et al., 2002; Onoda et al., 2010). An inability to establish and preserve peer relationships can have negative effects, including aggression and peer victimization (Ettekal & Ladd, 2019), and cognitive persistence impairment on tasks and increased risk-taking (King et al., 2018).

It is vital that children experience positive peer relationships, as this allows them to develop appropriate social and emotional skills which aids in their later behavioral and cognitive development (Izard et al., 2000; Lim & Lee, 2017; Mostow et al., 2002; Tyler et al., 2006; Youngblade & Belsky, 1989). Individuals who are rejected by their peers often engage in subsequent aversive behaviors (e.g., hostile peer interactions) that promote further peer rejection (Ettekal & Ladd, 2019). That is, the lack of peer acceptance creates a social context in which the individual is deprived of normal interactions, and then maladaptive behaviors are increased in retaliation for the initial rejection (Ettekal & Ladd, 2019). As such, peer rejection appears to be longitudinally stable, in that rejected individuals tend to stay rejected (Lewis et al., 2000). Thus, it is imperative to examine what factors may predict peer rejection. We examined potential mediators in the relationship between parental rejection and peer acceptance.

Parental Rejection

Parent-child relationships play a major role in children's psychological well-being (Khaleque & Rohner, 2012), and later peer relationships (Cicchetti, 1989). According to the organizational/transactional theory, adaptations arising from challenges in one developmental stage affect how individuals react to challenges in later stages (Cicchetti, 1989). Consistent with this theory, parental acceptance is related to decreased problem behaviors, higher academic performance, and better socialization with similar aged children (Aunola & Nurmi, 2005). Conversely, low-quality parenting predicts similar negative outcomes (e.g., peer rejection, aggression, interpersonal anxiety, and anger; Casselman & McKenzie, 2015; Giotsa et al., 2018; Rohner, et al., 2012). A recent meta-analysis indicated that adult recollections of parental rejection predicted hostility and aggression in adulthood (Khaleque & Rohner, 2012). However, newer studies suggest the parent-child relationship does not just directly influence aggression; instead, the low quality of a parent-child relationship has negative influences on other linked interpersonal outcomes, such as interpersonal anxiety (Giotsa et al., 2018), interpersonal communication/shyness (Miller et al., 2011), and adult attachment style (Pinquart et al., 2013).

Importantly, the parent-child relationship is directly linked with the peer relationship quality in adolescence and adulthood (Giotsa et al., 2018; Pinquart et al., 2013). One explanation for this association is that individuals maintain an internal working model (IWM) of attachment that influences their perception of social experiences and how they react to social situations in adulthood (Lewis, et al., 2000). The IWM mediates the association between childhood attachment and adulthood wellbeing (Thompson, 2008), and is negatively influenced by situations such as parental divorce (Lewis, et al., 2000), emotional abuse (Wright et al., 2009), and sexual abuse (Seltmann & Wright, 2013) in childhood. While secure IWMs are associated with relationship satisfaction and perceiving adult attachment situations positively, insecure IWMs are associated with interpreting attachment situations as hostile and fearful (Lewis, et al., 2000). Consistently, children with insecure attachment styles are more likely to exhibit insecure attachment behaviors in young adulthood (Pinquart et al., 2013), and individuals displaying higher levels of attachment anxiety are less likely to form adult relationships (Chopik et al., 2013). This is consistent with the organizational/transactional theory, as it suggests that an individual's IWM that was created through childhood attachment experiences impacts how they respond to social situations in adulthood.

Given that parental neglect and other negative childhood attachment experiences impact the ability to form friendships throughout life (Aunola & Nurmi, 2005; Giotsa et al., 2018; Lewis, et al., 2000; Pinquart et al., 2013; Seltmann & Wright, 2013; Wright et al., 2009), it is important to understand mediating mechanisms. The organizational/transactional theory would suggest that maladaptive cognitions and emotional understanding arising from parental rejection prevent individuals from understanding the emotions and intentions of others (Ettekal & Ladd, 2019; Mostow et al., 2002). Therefore, we examined emotional dysregulation and cognitive bias as potential mediators in the relationship between parental rejection and peer acceptance.

Emotional Dysregulation

Mostow and colleagues (2002) argue that if children have high levels of emotional knowledge, they are more accurate at evaluating their own emotions and interpreting the emotions of others,

compared to individuals who have low levels of emotional knowledge. For example, children high in emotional knowledge could interpret a shoulder pat as a positive gesture; children low in emotional knowledge could interpret a shoulder pat as an aggressive act. Following a correct interpretation, children should respond with the appropriate behavior (Mostow et al., 2002).

Emotional dysregulation, the inability to control negative emotions, is linked to peer rejection and aggression (Casselman & McKenzie, 2015; Ettekal & Ladd, 2019). This is because peer rejection elicits a strong, negative, emotional response and emotionally over-reactive children are more likely to respond aggressively compared to emotionally appropriate children (Ettekal & Ladd, 2019). Children with poor emotion regulation skills may misinterpret emotional cues more frequently and act on their immediate emotional responses, whereas children who are skilled at emotion regulation may correctly interpret emotions and respond appropriately. Thus, this process of social cue interpretation is directly related to peer acceptance and the ability to form and maintain friendships (Izard et al., 2000; Mostow et al., 2002; Tyler et al., 2006). Although emotions evolve with age and the way individuals respond to situations in childhood are different than how they respond in adulthood (Abe & Izard, 1999), the organizational/transactional theory would suggest that emotional regulation difficulties may result from poor child-parent relationships (Khaleque & Rohner, 2012). Consistently, Khaleque and Rohner (2012) found that perceptions of father rejection predicted emotional instability, and emotional instability mediated the relationship between parental rejection and aggression in young adults (Casselman & McKenzie, 2015). Therefore, emotional dysregulation should mediate the relationship between parental rejection and peer rejection.

Cognitive Biases

Similar to emotional processing, individuals encounter social situations in which they are required to use available information to make cognitive decisions. Cognitions, including biases, may adaptively allow individuals to respond to novel situations with minimal cognitive effort, and allow individuals to detect and respond to threatening stimuli (LeDoux, 1998). However, these biases can become oversensitive and lead individuals to misinterpret non-threatening social information as threatening. For example, when encountering social situations such as public speaking, socially anxious individuals might only pay attention to ambiguous or potentially threatening faces when scanning a crowd of people while ignoring positive ones. This attentional bias may cause anxious individuals to misinterpret situations as threatening and avoid future social situations (MacNamara et al., 2013).

The organizational/transactional theory would suggest that these cognitive biases result from childhood experiences and affect an individual's ability to interpret information in adulthood. Consistent with this theory, individuals raised by authoritative parents are more likely to report adaptive cognitive skills, whereas children of overprotective and neglectful parents are more likely to report maladaptive cognitive biases (Ren & Edwards, 2014). Additionally, neglected children are more likely to display a theory of mind deficit in which they have difficulty understanding the actions of individuals with different thought patterns (Kay & Green, 2015). Thus, the inability to understand the emotions and intentions of others may mediate the relationship between parental rejection in childhood and peer rejection later in life (Cicchetti, 1989).

We examined the relationship between parental rejection, peer acceptance, emotional dysregulation, and maladaptive social cognitions (i.e., bias). We hypothesized that parental rejection would be related to lower peer acceptance, greater emotional dysregulation, and higher maladaptive cognitive bias (H1). Additionally, we hypothesized that emotional dysregulation and cognitive bias would mediate that parent-peer relationship (H2).

METHOD

The exact data collection procedure and plans, in addition to all other materials can be found at https://osf.io/hpga9/?view_only=1a2e238b7a4341878628b5f709fb901a

Participants

Undergraduate participants voluntarily completed studies in psychology classes. A-priori power analyses using GPower indicated a minimum of 150 participants was necessary. Of the 173 participants who completed this study, six participants were removed due to either failing attention checks (n = 4) or missing data (n = 2). The final sample (N = 167) was 18 to 38 years (M = 19.05, SD = 2.60), 85% female, and 90.4% White (4.8% African Americans, 1.8% Biracial, 0.6% Hispanic, 0.6% Asian, and 0.6% Middle Eastern).

Measures and Procedure

Participants completed an online survey, listed among other studies, under the title of "The ABC's and Acceptance". Upon consent, participants were presented with the following measures, in randomized order:

Parental Rejection

Permission was obtained from the Ronald and Nancy Rohner Center for the Study of Interpersonal Acceptance and Rejection for the use of this scale (February, 2020). The Parental Acceptance and Rejection Questionnaire (PARQ; Rohner & Khaleque, 2008) consists of 24 items that assess adults' perceptions of childhood parental acceptance/rejection. Participants rated their agreement with various statements on a scale from 1(Almost Never True) to 4(Almost Always True) regarding their primary childhood caregiver (e.g., "Paid no attention to me"). Higher scores indicate more parental rejection. Scores were highly skewed and kurtotic, and were transformed via square root transformation (alpha= 0.94).

Peer Acceptance

The Inventory of Parent and Peer Attachment-Revised (IPPA-R; Gullone & Robinson, 2005) contains 25 items assessing an individual's current level of perceived acceptance by adult peers. Participants rated their agreement with statements (e.g., "I trust my friends") on a scale from 0(*Never True*) to 2(*Always True*). Higher scores indicate greater peer acceptance (*alpha*= 0.92).

Emotion Dysregulation

The Difficulties in Emotion Regulation Scale (DERS-16, Bjureberg et al., 2016) measures participants' inability to regulate emotional responses to stimuli via 16 items. Participants rated how much statements (e.g., "I have difficulty making sense of my feelings") apply to them on a scale of 1(*Almost Never*) to 5(*Almost Always*). Higher scores indicate greater emotion dysregulation (*alpha*= 0.94).

Cognitive Bias

The Davos Assessment of the Cognitive Bias Scale (DACOBS; van der Gaag, et al., 2013) consists of 42 items designed to assess an individual's level of maladaptive social cognitions. Participants rated their agreement of various items (e.g., "People surprise me with their reactions") on a scale of 1(*Strongly Disagree*) to 7(*Strongly Agree*), with higher scores indicating greater levels of cognitive bias (*alpha*= 0.84).

RESULTS

Pearson's bivariate analyses supported the first hypothesis that the variables were interrelated. Correlation coefficients and descriptive information for all variables are shown in Table 1.

Table 1. *Correlations between parental rejection, peer acceptance, and potential mediators.*

	1	2	3	4
1. Parental Rejection	-			
2. Emotion Dysregulation	0.27***	-		
3. Cognitive Bias	0.32***	0.44***	-	
4. Peer Acceptance	-0.43***	-0.19**	-0.31***	-
Mean(SD)	34.80(11.34)	38.66(13.75)	57.49(14.19)	64.23(8.04)
Range	24-78	16-74	18-99	38-75

Note: *$p < 0.05$, **$p < 0.01$, *** $p < 0.001$

The second hypothesis was that emotional dysregulation and cognitive bias would mediate the relationship between parental rejection and peer acceptance. A simple linear regression revealed that parental rejection significantly predicts peer acceptance $F(1,165) = 38.01$, *MSE* = 52.89, $p <$ .001, *R-SQUARED* = .19, *beta* = -.43, CI[-5.28,-2.72].

Then, mediated regression analyses using the SPSS Macro PROCESS (Hayes, 2018) tested each of the mediators individually. Analyses revealed that cognitive bias ($F(2,164) = 23.34$, *MSE* = 50.96, *R-SQUARED* = 0.22, *beta* = -.11, CI[-.19,-.03], $p = .008$) partially mediated the

relationship, but not emotional dysregulation ($F(2,164) = 19.61$, *MSE* = 52.84, *R-SQUARED* = 0.19, *beta* = -.05, CI[-.13,.04], $p = .282$).

Finally, a mediated regression was conducted that included both variables simultaneously. Results revealed that only cognitive bias significantly mediated the relationship. The overall model was supported (*beta* = -.06, *SE* = .03, CI[-.13, -.01]). See Figure 1 for the coefficients and pathways of the full mediation model.

Fig1 *Double Mediation Model of Parental Rejection and Peer Acceptance. [included as attachment GIF]*

Note: *$p < 0.05$, **$p < 0.01$, *** $p < 0.001$; (X) = standard error; significant pathways are bolded for clarity in reading

DISCUSSION

We examined potential mediators in the relationship between parental rejection and peer acceptance. We expected that parental rejection would negatively relate to cognitive and emotional skills, which in turn would relate to peer acceptance. As expected, there was a strong relationship between parental rejection and one's emotional dysregulation, cognitive bias and peer acceptance. This is consistent with research that shows parent-child relationships affect a child's psychological functioning throughout their lifetime (Giotsa et al., 2018; Kay & Green, 2015; Khaleque & Rohner, 2012; Ren & Edwards, 2014).

Despite expectations, cognitive bias was the only significant mediator in the relationship between parental and peer acceptance. This supports, and connects, prior research that shows maladaptive parenting influences the ability to interpret others' actions (Kay & Green, 2015; Ren & Edwards, 2014) and that interpretative skills positively influence peer acceptance (Mostow et al., 2002). However, the primary relationship remained significant despite the cognitive bias mediator, indicating there are other variables that mediate the relationship. One potential mediator may be verbal ability. Mostow and colleagues (2002) found that verbal ability predicts positive peer relationships. Logically, the ability to interpret another's behavior is only as good as the ability to use one's social skills and verbal acuity to react. Future studies should include other tenets that interact with cognitive bias to see where the actual mechanism lies.

Emotional dysregulation was related to parental neglect, but not peer acceptance, inconsistent with our second hypothesis and prior research (Kim & Cicchetti, 2010). There are a few potential explanations for our lack of mediating evidence. First, while Kim and Cicchetti's (2010) sample exhibited high dysregulation, our sample exhibited low dysregulation. Thus, the two samples are inconsistent. Additionally, the floor effect may have resulted in too little variance to adequately see a pattern within the analyses. Future research should collect from a more varied sample including individuals both high and low in emotional dysregulation. It is still important to examine emotional dysregulation as a mediator in this relationship.

Conclusion

The current study revealed that cognitive biases were a significant mediator in the relationship between parental rejection and peer acceptance. Peer acceptance is vital to an individual's social and emotional development throughout life, and it is important to try to understand what can impact this relationship.

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