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Moses M. Tincher April 11, 2014

Mindful Attention Reduces Linguistic Expectancy Bias:

Implications for Regulating Prejudice and Stereotypes

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Abstract

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A behavioral experiment demonstrated that mindful attention diminishes the linguistic expectancy bias (LEB). In the LEB, individuals tend to view members of their in-group to behave positively, and members of their out-group to behave negatively. As a consequence, individuals tend to use abstract language full of character inferences to describe these expected behaviors, and in contrast, use concrete, objective, detail-oriented language to describe unexpected behaviors. Eighty-four participants received either a brief mindful attention (observed their thoughts as fleeting mental states) or a control immersion training (absorbed in vivid details of thoughts). After this training, they viewed visual depictions of an imagined in-group or out-group member's positive and negative behaviors, and then selected the best linguistic description for each behavior from a set of descriptions that varied in abstractness. Participants who immersed in the depicted behaviors demonstrated a robust LEB. Participants who were taught to mindfully attend, however, had a markedly reduced LEB, describing in-group positive behaviors and out-group negative behaviors more concretely than the immersion groups. These findings suggest that even brief mindfulness-related training can reduce the propensity to perpetuate stereotypical thinking through language, improving our understanding of mechanisms that may facilitate non-prejudiced thinking.

Keywords:

Mindful attention, immersion, linguistic expectancy bias, stereotypes, non-prejudiced thinking

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Mindful Attention Reduces Linguistic Expectancy Bias: Implications for Regulating Prejudice and Stereotypes

Language is a window to the mind. We use it in our everyday lives to maintain and communicate our expectancies, that is, our privately held beliefs about behavioral events (Douglas & Sutton, 2008). Whether consciously or not, in this way we also transmit and perpetuate prejudices and stereotypes (Maass, 1999; Wigboldus, Semin, & Spears, 2000; Wigboldus, Spears, & Semin, 2005). Previous research has found that prejudice and stereotypes can be measured and conveyed through a quality of language known as linguistic abstraction. Linguistic abstraction refers to specific verbs and adjectives that are used to describe a person or a behavioral event. It is operationalized by the linguistic category model (LCM; Semin & Fiedler, 1988; 1991; 1992), which identifies four levels of linguistic abstraction. These four levels vary in the amount of interpretation the speaker expresses in the description. Level 1 descriptive action verbs (DAVs; e.g., Joe *shakes* Mark's hand) are the most concrete because they provide a non-interpretive description of an event or behavior. Level 2 interpretive action verbs (IAVs; e.g., Joe *helps* Mark) also describe a specific event but are slightly more abstract than level 1 because they describe behaviors with some interpretation. Level 3 state verbs (SVs; e.g., Joe *cares* for Mark) are more abstract than the previous two because they describe an emotional state of the person rather than a specific event. Level 4 adjectives (ADJs; e.g., Joe is *considerate*) are the most abstract because they describe the specific characteristics of the person performing the behavior, not the behavior itself.

Mechanisms

Previous research has determined mechanisms that underlie the communication of stereotypes using abstract language. One such mechanism involves differential expectancies

(Maass, 1999). That is, in general, we tend to use more abstract, interpretive language when we describe a behavior that matches our expectations because the behavior is believed to be typical of the individual or group (Maass, 1999; Maass, Milesi, Zabbini, & Stahlberg, 1995; Wigboldus et al., 2000). For example, if one believes all politicians are corrupt, then any behavior that could be interpreted as corrupt will be described abstractly, since one infers from previously held beliefs. On the other hand, we tend to use more concrete, non-interpretive language when we describe a behavior that violates our expectations because the behavior is believed to be uncharacteristic of the individual or group (Maass, 1999; Maass et al., 1995; Wigboldus et al., 2000). For example, if one believes all politicians are corrupt, then any behavior that does not fit that interpretation will be described concretely, since one neither relies on nor infers from previously held beliefs. This linguistic phenomenon is called the linguistic expectancy bias or LEB (Maass et al., 1995; Wigboldus et al., 2000).

The second mechanism is in-group protection, which involves maintaining a positive in-group and self-image even when faced with disconfirming evidence (Maass, Salvi, Arcuri, & Semin, 1989). Based on in-group protective motives, another linguistic phenomenon has been identified called the linguistic intergroup bias (LIB; Maass et al., 1989). The linguistic intergroup bias is a specific example of the LEB, and it occurs in intergroup situations when people tend to describe positive in-group (e.g., friends) and negative out-group (e.g., enemies) behaviors abstractly, as if they are protecting the in-group and self-image, while describing positive out-group and negative in-group behaviors concretely, as if these behaviors are exceptions to typical behavior and can be separated from the actor (e.g., Arcuri, Maass, & Portelli, 1993; Cole & Leets, 1998; Maass, 1999). Because the two linguistic biases in the

context of our study lead to the same predicted outcomes in stereotypical expectancies of behaviors, we will refer to the more general phenomenon of the LEB for the rest of the article.

Interestingly, when people have strong expectations about certain groups, it becomes difficult for them to inhibit the effect of these biased expectancies on linguistic tasks (Franco & Maass, 1996). People are often not aware of the linguistic expectancy bias, transmitting their beliefs about certain events, individuals, or groups (Franco & Maass, 1996; Schnake & Ruscher, 1998; von Hippel, Sekaquaptewa, & Vargas, 1997). Thus, linguistic expectancy bias may be used as an implicit indicator of people's prejudice towards certain groups or individuals (von Hippel et al., 1997). Although there is some evidence that this prejudice can be reduced through explicit means, for example, telling people to view their out-group member in a favorable way or telling them to be unbiased (Douglas & Sutton, 2003; 2008), this reduction of prejudice may simply be due to social desirability concerns. If the bias could be reduced or removed through implicit manipulation, that is, outside the individual's conscious awareness, however, social desirability would not be a concern.

Mindfulness

One potential implicit modulator of the LEB is mindfulness. Broadly speaking, mindfulness is present-centered, nonjudgmental awareness (Kabat-Zinn, 1990; 2003). It is a form of mental training that helps one sustain attention to ongoing sensory, cognitive, and emotional experience without becoming susceptible to one's natural tendency to react, elaborate, or evaluate (Bishop, Lau, Shapiro, & Carlson, 2004). Over the past few decades, mindfulness has been associated with a number of benefits including increased self-control, objectivity, affect tolerance, improved concentration and mental clarity, emotional intelligence, and the ability to relate to others and one's self with kindness, acceptance, and compassion (Adele & Feldman,

2004; Bishop et al., 2004; Brown, Ryan, & Creswell, 2007; Fulton, 2005; Leary & Tate, 2007; Wallace, 2001; Walsh & Shapiro, 2006).

There is also evidence that mindfulness can modulate linguistic and emotional processing. Roberts-Wolfe and colleagues (2012) found that after an 8-week mindfulness based intervention participants recalled more positive words from a previously memorized list compared to the control group. Similarly, Alberts and colleagues (2011) found that after a brief mindfulness intervention, participants recalled a significantly lower number of negative words from a previously memorized list compared to a control group. These studies demonstrate that mindfulness interventions can implicitly modulate emotion, memory recall, and linguistic processing.

Finally, Ostafin (personal communication, 25th March, 2014) is currently performing research demonstrating that mindfulness modulates the level of descriptions at which participants represent alcohol drinking behavior. Using two subscales for low action identification (e.g., lifting a glass) and for high action identification (e.g., passing time) from Vallacher and Wegner's (1987) action identification scale, Ostafin found that high action identification scale is positively correlated with difficulty in controlling drinking behavior. More relevant for us, however, he also found that trait mindfulness may induce people to better control their drinking behavior because they are less likely to represent their alcohol consumption in terms of higher-order goals (e.g., emotion regulation). This intriguing finding further suggests that mindfulness may similarly modulate the linguistic expectancy bias of interest in the research reported here.

The Present Study

The present study aimed to use aspects of mindfulness to reduce biases caused by linguistic abstraction. We adapted an in-group/out-group paradigm used in previous research to

demonstrate the LEB (Maass et al., 1995; Douglas & Sutton, 2003). In this in-group/out-group paradigm, participants in one group imagined their "best friend" (in-group) behaving in expected (positive) ways or unexpected (negative) ways depicted by cartoon events. A second group imagined their "worst enemy" (out-group) behaving in expected (negative) or unexpected (positive) ways. Their task was simply to then pick the linguistic description that best described the behavior from a choice of four. Unbeknownst to the participant, the four choices varied in abstractness based on the LCM levels.

Using this general paradigm, we then sought to replicate and modulate the LEB for in-group and out-group members using differential perspective training with four groups. Two control groups received "immersion" training (adapted from Papies, Barsalou, & Custers, 2012; Wilson-Mendenhall, Barrett, L.F., Simmons, & Barsalou, 2011). Participants were trained to vividly experience their friend (or enemy) in the cartoon event almost as if it were actually occurring in the present moment. Because they were fully immersed in their thoughts and emotional reactions to the cartoons in this way, we expected the immersion groups to replicate or even augment biases reported in previous LEB experiments. That is, participants would abstractly describe actions that match their expectations (e.g., friend behaving positively; enemy behaving negatively), and concretely describe actions that violated their expectations (e.g., friend behaving negatively; enemy behaving positively).

To modulate these bias effects, we adapted a mindful attention manipulation from Papies et al. (2012). Mindful attention is an aspect of mindfulness. In the two mindful attention groups, participants were taught to just observe their thoughts and reactions to the cartoon events depicting their friend (or enemy), and to recognize these reactions as transient mental events. We hypothesized that in contrast to the immersion groups, individuals in the mindful attention

groups would report more concrete descriptions overall, regardless of whether their in-group (friend) or out-group (enemy) member acted in line with their expectations. This would eliminate, or at the very least, attenuate the linguistic expectancy bias. Furthermore, this modulation would occur because participants were simply observing their thoughts and reactions without becoming deeply involved in the events and making abstract inferences about their friend's (or enemy's) character.

Overview

The present study aimed to replicate the friend vs. enemy paradigm from previous studies (Douglas & Sutton, 2003; Maass et al., 1989; Maass et al., 1995), and additionally attempted to modulate the effect of linguistic expectancy bias with two different perspective-taking instructions, immersion (IMM) and mindful attention (MA). Participants were taught to either mindfully attend or immerse, and then when viewing cartoons depicting positive and negative actions conducted by either an individual in their in-group (friend) or out-group (enemy), their task was to choose which linguistic description best described the action. Unbeknownst to the four groups (immersion friend, immersion enemy, mindful attention friend, mindful attention enemy), the linguistic descriptions varied in levels of linguistic abstraction based on the four levels described in the LCM.

We hypothesized that the immersion groups would replicate or perhaps even augment the linguistic expectancy bias results from previous studies. Participants who were told to immerse and imagine their best friend as the main actor in the cartoon would select more abstract descriptions of positive behaviors and more concrete descriptions of negative behaviors since people expect their friends to behave positively. For example, after immersing in the cartoon where their best friend is helping someone get up from the ground, participants would choose the

"is considerate" description, whereas if their friend was littering, they would choose the "is throwing trash on the ground" description. In contrast, participants who were told to immerse and imagine their main cartoon character as their worst enemy would select more abstract descriptions of negative behaviors and more concrete descriptions of positive behaviors, since we expect our enemies to behave negatively. For example, after immersing in the cartoon where their worst enemy helps someone get up from the ground, participants would choose the "is picking someone off the ground" description, whereas in the cartoon where their enemy litters, they would select a "is disrespectful" description.

We predicted, however, that the mindful attention groups would show a different pattern compared to the immersion groups and classical linguistic bias studies. We hypothesized that the participants in the mindful attention friend and participants in the mindful attention enemy group would select more concrete descriptions of expected actions for both friend and enemy because they were learning how to focus their thoughts on the present moment, rather than making judgments or inferring qualities about the main actor. That is, participants who were told to observe their thoughts in response to the cartoon where their best friend is helping someone get up from the ground, would select "is picking someone off the ground" or "is helping someone" instead of choosing a more abstract description that says their friend "is considerate." In contrast, participants who were told to observe their thoughts in response to the cartoon where their worst enemy litters on the ground would select "is throwing trash on the ground" or "is littering the park," instead of choosing a more abstract description that the enemy "is disrespectful."

Method

Participants

Eighty four (21 per group) students (24 men and 60 women) from Emory University participated for either course credit or sweets. Their age ranged from 18 to 26, (M = 19). The sample was 59% Caucasian, 21% Asian, 11% Hispanic, 7% African American, and 2% other. Of the 84 participants, 25 stated that they had previous experience with meditation (6 in immersion/friend, 4 in immersion/enemy, 7 in mindful attention/friend, and 8 in mindful attention/enemy). These participants had meditation experiences that ranged from taking yoga classes periodically to engaging in daily prayers and breathing exercises. We obtained informed consent from each participant and treated them in accordance with the ethical standards of the American Psychological Association.

Design

This repeated measures design consisted of a within-subjects factor of behavior valence (positive/negative), with two between-groups manipulations, character (friend/enemy), and perspective strategy (mindful attention/immersion), which yielded four groups. Participants were randomly assigned to be in one of the four groups – 1) mindful attention/friend; 2) mindful attention/enemy; 3) immersion/friend; and 4) immersion/enemy. All cartoons were presented in a random order in the practice and testing phase. Response time (RT) and the cartoon description choices were recorded for each trial.

Materials

The participants viewed four practice cartoon and eight critical cartoon events. Each cartoon event was one frame. Half of the critical cartoons depicted positive behaviors including walking an elderly person across the road, recycling trash, picking another person up off the

ground, and running. The other half depicted negative behaviors that included telling a sexist joke, throwing trash on the ground, spray-painting a wall, and hitting another person. Each cartoon had a main actor clearly labeled with the letter "A." The main actors were drawn in a stylized way such that they were somewhat neutral with regard to sex and age.

Each cartoon was paired with four unique descriptions of increasing abstractness. The participants were not aware that the four descriptions for each cartoon represented the levels of linguistic abstraction from the LCM (Semin, 1994; Semin & Fiedler, 1998), which became increasingly abstract from DAVs to ADJs. For example, the four options for the positive "running" cartoon event were as follows:

1) A is *running* (DAV)
2) A is *training* (IAV)
3) A *loves* sports (SV)
4) A is *athletic* (ADJ)

Option 1 is the most concrete and option 4 is the most abstract.

The eight critical cartoons, one practice cartoon, and their associated descriptions were the same as those used in Douglas & Sutton (2003). Three additional practice cartoons and associated descriptions were newly constructed for this experiment. These additional materials were added to ensure that participants viewed an equal distribution of positive and negative behavior cartoon events and that each cartoon event depicted a different behavior. All four groups used the same practice and critical materials. In addition, all materials were normed in previous studies to ensure that people perceived the desirable behaviors as positive and the undesirable behaviors as negative (Douglas & Sutton, 2003; Maass et al., 1995). All practice and critical cartoons with their corresponding four description options are provided in Appendix A.

Procedure

The study took place in individual cubicles in either a lab setting or the library. The participants were not aware that our study dealt with mindfulness or meditation, but were told that our study involved how we viewed our friends and enemies. All the instructions were provided on the computer and verbally by the experimenter. First, the participants were asked to imagine that the person labeled with the letter A was either their friend or enemy, depending on their group. They viewed four practice cartoons and rated whether they felt negative, neutral, or positive emotions while viewing them. This task resulted in participants attending to their reactions about the cartoons.

Mindful attention instructions. After viewing the practice cartoons and rating their emotions, the participants in the mindful attention group were asked to view and think about the cartoon events using an "observing perspective." The words "mindfulness" or "mindful attention" were never used to describe this perspective to prevent any potential bias. Participants learned how to observe specific thoughts and reactions that they would have after viewing the cartoons, and rather than being involved in the event, they were asked to treat their thoughts and reactions as transitory fleeting mental states. They were taught that these thoughts and reactions are not really part of the cartoon events, but are what the mind constructs at that moment. Thus, when the participants practiced this "observing perspective," they remained aware that they were simply observing their thoughts and reactions to the events in the present moment instead of living them out (see Appendix B for the complete set of instructions).

Control immersion instructions. The participants in the control group, "immersion perspective," were asked to completely immerse themselves in the cartoon events. They were taught to "live" the experience by projecting themselves into the events, and by attempting to

experience vivid details such as colors, sounds, smells, as well as emotions, physical sensations and bodily states. The participants were encouraged to experience the events almost as if they were actually occurring in the present moment (see Appendix B for the complete set of instructions).

The mindful attention and control instructions were presented in a similar style and length. After the training, the experimenter ensured that the participants completely understood the concepts introduced, and asked them to rate how well they understood aspects of immersion or observing their thoughts on a scale of 1 to 7, 1 being not at all, and 7 being very well. Next, to practice immersing in or mindfully attending to thoughts and reactions about their friend or enemy displayed in the cartoon, participants viewed the four practice cartoons again. They had 10 seconds to observe or immerse in each cartoon before the screen advanced to the next practice cartoon. This procedure repeated for all four practice cartoons. After this second phase of practice was completed, participants rated how well overall they were able to immerse or mindfully attend to the cartoons. Once this training was complete, participants moved on to the critical task.

Multiple-choice task. This task was introduced as a new and different part of the experiment. Participants were instructed to continue observing or immersing in their reactions to each cartoon. After 10 seconds of observing/immersing, however, four descriptions appeared beneath the cartoon. Their task was simply to select the description (1, 2, 3, or 4) that they felt best represented what was occurring in the cartoon. The descriptions went from very concrete (1) to very abstract (4), though the participants were never explicitly given this detail. The participants had an unlimited amount of time to select the description that they felt was best.

After they made their selection, there was a two second pause before the computer screen advanced to the next cartoon.

Before the critical trials, the participants completed four more practice trials with the same practice cartoons they had already seen twice previously, this time selecting a description. The experimenter answered any questions before the participants moved on to the eight critical trials with eight novel cartoons. This procedure continued until they had performed all eight critical trials. At the top of each screen for all practice and critical trials, the participants were reminded to either "Observe Your Thoughts" or "Immerse Yourself," and to also imagine that the actor performing the behavior in the cartoons was either their "Friend" or "Enemy." After participants completed the experiment, they were asked to describe what they were doing when viewing the cartoons, and to rate on a scale of 1 to 7 how difficult it was for them to treat their thoughts about the events in a certain way (observe or immerse). Then, they were asked to describe any personal meditation experience. Finally, they were debriefed and received compensation for participating.

Results

A priori contrasts and a repeated measures analysis of variance (ANOVA) were completed to assess our hypotheses. In addition, all the contrasts were sidak corrected for multiple comparisons. Table 1 includes the descriptive statistics for the cartoon description responses. All the effect sizes are Hedges' g_s[1] calculated using Lakens' (2013) spreadsheet. We transcribed the participants' responses on the critical multiple-choice task into numbers based on the LCM, with 1 representing most concrete and 4 representing most abstract, and entered them into our analyses. We also averaged each participant's response for positive behaviors and for

negative behaviors, creating two data points for each participant. We then performed analyses across the four groups of participants on these two measures.

Our results replicated the linguistic expectancy bias (e.g., Douglas & Sutton, 2003; Maass et al., 1995). Collapsed across perspective type (immersion vs. mindful attention), the omnibus interaction between valence and character that characterizes the LEB was significant ($F(1,80) = 36.94$, $p < .001$, $\eta p^2 = .32$). The mean difference in the linguistic abstraction scores between friend (2.26) and enemy (1.49) for a positive behavior was .77 ($t(82)=7.00$, $SE = .11$, $p < .001$, $g_s = .34$). Conversely, the mean difference in the scores between friend (1.88) and enemy (2.16) for a negative behavior was -.28 with a trend toward a significant difference ($t(82)=1.87$, $SE = .15$, $p = .068$, $g_s = .53$). Assuming higher numbers mean more abstraction, a positive sum in the mean difference for a positive behavior indicates that the linguistic abstraction scores for the friend group are more abstract than the scores for the enemy group. In contrast, a negative sum in the mean difference for a negative behavior indicates that the linguistic abstraction scores for the friend condition are less abstract than the scores for the enemy condition. Thus, overall, participants described behaviors that matched their expectations (friend positive, enemy negative) more abstractly, and those that violated their expectations (enemy positive, friend negative) more concretely.

Next, we were interested in the main effect for perspective type (immersion vs. mindful attention). We hypothesized that mindful attention would elicit more concrete responses overall compared to immersion. We found a significant main effect of perspective type ($F(1,80) = 9.60$, $p = .003$, $\eta p^2 = .11$). Collapsed across character (friend and enemy) groups, there were more concrete responses overall in the mindful attention group ($M=1.79$, $SE=.07$) than in the immersion group ($M=2.10$, $SE=.07$; M difference = .31).

Our key hypotheses involved the three-way interaction between perspective type (mindful attention/immersion), character (friend/enemy), and behavior valence (positive/negative). We hypothesized that the immersion groups would robustly replicate the linguistic expectancy bias, and the mindful attention groups would show either no bias at all, or an attenuated bias. The omnibus three-way interaction was significant ($F(1,80) = 10.09$, $p = .002$, $\eta p^2 = .11$). Please see Figure 1 for these results. In line with our hypotheses and previous studies, the immersion groups exhibited a linguistic expectancy bias. Behaviors that matched their expectations (friend positive, enemy negative) were rated more abstractly (Positive behaviors: friend vs. enemy, *M* difference = 1.17, $t(40)=7.31$, $SE = .16$, $p < .001$, $g_s = 2.15$); Negative behaviors: friend vs. enemy, *M* difference = -.43, $t(40) = -2.05$, $SE = .21$, $p = .048$, $g_s = .57$).

The mindful attention groups also exhibited the bias, but only for positive behaviors (Positive behaviors: friend vs. enemy, *M* difference = .37, $t(40) = 2.31$, $SE = .16$, $p = .019$, $g_s = .79$); Negative behaviors: friend vs. enemy, *M* difference = -.13, $t(40) = -.62$, $SE = .21$, $p = .542$, $g_s = .20$). The LEB exhibited for MA groups, however, had a much smaller effect size compared to IMM groups (IMM, $g_s = 2.15$ vs. MA, $g_s = .79$). Although the MA groups still had a large effect size, indicating that the LEB is hard to overcome, again it was much smaller compared to the IMM groups, indicating that the LEB effect was reduced by mindful attention.

Furthermore, in comparison to the immersion groups, the bias exhibited by the mindful attention groups was greatly attenuated for *expected* behaviors. That is, positive behaviors for friends and negative behaviors for enemies were rated much more concretely in the mindful attention groups compared to the immersion groups (Positive friend behaviors: IMM vs. MA, *M*

difference = .63, $t(40)=3.94$, $SE = .16$, $p < .001$, $g_s = 1.01$; Negative enemy behaviors: IMM vs. MA, *M* difference = .54, $t(40)=2.57$, $SE = .21$, $p = .014$, $g_s = .76$).

In contrast, there was no difference between immersion and mindful attention groups on behaviors that violated expectations (friend negative, enemy positive behaviors). Behaviors that violated expectations were rated concretely in both the immersion and mindful attention groups (Negative friend behaviors: IMM vs. MA, *M* difference = .24, $t(40)=1.14$, $SE = .21$, $p = .269$, $g_s = .34$; Positive enemy behaviors: IMM vs. MA, *M* difference = -.17, $t(40) = -1.06$, SE = .16, $p = .284$, $g_s = .47$). This is perhaps not so surprising given that unexpected behaviors are already described more concretely in the IMM groups, and MA elicits concrete descriptions. This result is further explored in the discussion section.

In addition, the main effect of the character was significant ($F(1,80)=5.97$, $p=.017$, $\eta p^2 = .07$). That is, collapsed across perspective type and behavior valence, the friend group received more abstract responses ($M=2.07$, $SE=.07$) than the enemy group ($M=1.82$, $SE=.07$). The main effect of valence, the interaction between valence and group, and the interaction between group and character were not significant ($F(1,80)=2.98$, $p = .088$, $\eta p^2 = .04$; $F(1,80)=.81$, $p = 0.372$, $\eta p^2 = .37$; and $F(1,80)=1.57$, $p = .214$, $\eta p^2 = .02$, respectively). These results do not limit or have a bearing on our main overall hypotheses, and are not discussed further.

Discussion

Previous research identified that people are unaware of their biased tendencies and that the linguistic expectancy bias may be an implicit indicator of prejudice (Franco & Maass, 1996; von Hippel et al., 1997). Adapting a friend/enemy paradigm (Douglas & Sutton, 2003; Maass et al., 1995), our results replicated the linguistic expectancy bias in the immersion groups, and reduced the bias in the mindful attention groups.

LEB Replication

When participants were taught to immerse themselves in a situation, they described expected behaviors more abstractly than unexpected behaviors. This bias may have occurred with immersion training specifically because it involves actively projecting oneself into an event. Participants were encouraged to become absorbed in their thoughts and reactions to the event, and to vividly imagine actually being in the situation. In this way, immersion training may have encouraged inferential linguistic descriptions.

Interestingly, the present study found a significant difference between both positive behaviors for friend and enemy (friend's positive behaviors described more abstractly) and negative behaviors for friend and enemy (enemy's negative behaviors described more abstractly) in the immersion condition. Previous LEB experiments in a similar paradigm do not always find a significant difference between friend and enemy for negative behaviors. We may have found a significant difference for both contrasts because of the explicit immersion instruction and training. Participants learned and practiced experiencing events in vivid detail, and during critical trials continued to treat the cartoon events this way, which may have augmented the linguistic bias effect. Previous research simply instructed participants, one time, to imagine their friend or enemy performing the behaviors depicted in the cartoon events without explicitly telling them how to do so.

LEB Modulation

Previous research found that the linguistic expectancy bias can be reduced by strategic communication goals (Douglas & Sutton, 2003; 2008; e.g., telling participants to view their out-group member in a more positive light). By modifying the LEB with mindful attention, an aspect of mindfulness, our results demonstrate that mindful attention is also an implicit

modulator of linguistic abstraction, effectively reducing the linguistic expectancy bias. Although the mindful attention groups did not show a LEB for negative behaviors, they still demonstrated a linguistic expectancy bias for positive behaviors. That is, they still described positive behaviors for friends more abstractly than those for enemies. This suggests that the LEB is very difficult to overcome, even with the brief mindful attention manipulation.

Although mindful attention groups still showed a LEB, they had lower average linguistic abstraction scores overall compared to the control immersion groups. Additionally, there was a significant difference between the MA groups and the control IMM groups regarding the LEB effect. We found that for expected action events (friend positive behavior; enemy negative behavior), the behavioral responses were significantly more concrete in the MA groups than in the IMM groups. This indicates that observing one's thoughts and reactions to events as fleeting states may induce less personal interpretations and more objective viewpoints to describe the events.

One potential mechanism that may have contributed to reducing the LEB in the MA groups is the decrease in subjective realism of thought (Papies et al., 2012). Subjective realism is the sense that the experience of a thought seems so real it triggers an emotional reaction in the present moment. The thought is experienced almost as if the imagined event were actually happening in the present moment – as if one had time travelled to the imagined event. Participants in the mindful attention groups were taught to resist this natural tendency, and instead, view the expected and unexpected events as constructs of the mind that come and go, which may have yielded more concrete behavioral descriptions.

Mindful attention may have further modulated two mechanisms responsible for the LEB: differential expectancies and in-group protection. Again, differential expectancies are a

cognitive strategy we use to store expected information more abstractly and unexpected information more concretely (Maass et al., 1995; Wigboldus et al., 2000; 2005). It is possible that by observing one's thoughts in the present moment, the typical pattern completion that leads to stereotypical expectations and inferences about people and events does not occur. In other words, rather than relying on previously stored beliefs about a person or an event, one may simply learn to observe the behavioral event occurring in that moment.

Mindful attention may also work against the in-group protection mechanism that underlies the LEB. Again, in-group protection is the internal motivation to maintain a positive in-group and self-image by describing desirable in-group behaviors and undesirable out-group behaviors abstractly (Maass et al., 1989; Maass 1999). Previous literature has found that mindfulness meditation induces feelings of acceptance and compassion not just towards ourselves but to others as well (Condon, Desbordes, Miller, & DeSteno, 2013). Therefore, when practicing mindful attention, an aspect of mindfulness, participants may have felt more accepting and compassionate towards themselves and towards members of their out-group. With this mindset, they may not have felt the need to shield their self-image by attributing positive inferences to their in-group; likewise, they may not have felt the need to degrade their out-group members by attributing negative inferences to them.

Furthermore, the present experiment found nonsignificant differences between the MA and IMM groups for unexpected behaviors. The unexpected behaviors (friend negative behaviors, enemy positive behaviors) were already described concretely in the IMM control groups; therefore, similar to a floor effect, there was no room for these behaviors to be described more concretely in the mindful attention groups. Although our main focus was to reduce the linguistic bias by triggering more concrete descriptions for expected behaviors, one could

imagine it would be desirable to describe, to a certain extent, the unexpected positive behaviors of our out-group members slightly more abstractly. That is, the LEB could potentially be attenuated if individuals are willing to attribute slightly more positive characteristics to their out-group members when they act positively, similar to how they attribute some positive characteristics to their in-group members during positive behavior actions in the MA group.

Cognitive based compassion training is one method by which we could potentially modulate reactions to unexpected positive behaviors of our out-group. The goal of this training is two-fold: to examine the inner feelings and actions we have towards others, and to create spontaneous empathy and compassion for the self and others (Mascaro, Rilling, Negi, & Raison, 2013; Pace, Negi, Dodson-Lavelle, Silva, Reddy, Cole, Danese, Craighead, & Raison, 2013). Compassion training also emphasizes equanimity, that is, staying centered or impartial in response to both pleasant and unpleasant thoughts (Desbordes, Gard, Hoge, Hölzel, Kerr, Lazar, Olendzki, & Vago , 2014). Cultivating equanimity in response to individuals in both our in-group and out-group could eliminate the LEB by matching the positive descriptions of out-group members with the positive response descriptions we ascribe to our in-group members. In this way, compassion meditation may bring the average linguistic abstraction scores for positive behaviors between the MA friend and enemy groups closer together.

Contributions

The present research contributes to the psychological literature on mindfulness and linguistic abstraction because it not only provides another benefit of mindfulness related to linguistic and emotional processing, but it also suggests that mindful attention, and potentially other implicit methods, can serve as regulators of linguistic biases that reflect deeper cognitive biases. Moreover, our study demonstrates that even brief mindfulness manipulations can reduce

our tendency to perpetuate stereotypical thinking through language. As a result of our findings, we are now better able to understand the underlying mechanisms that may facilitate the prevention of prejudice.

Limitations

Some participants in our sample had previous experience with meditation (25 out of 84). While not a majority of the sample size, these participants still may have biased the data toward our hypothesized outcomes. To address this issue, we conducted a supplemental analysis excluding individuals who had previous meditation experience. The same pattern of results found with all 84 participants emerged for the 59 without meditation experience. That is, the immersion groups still demonstrated the LEB, and the mindful attention groups still had a reduced LEB effect when compared to immersion groups.

Another potential limitation is that participants could freely retrieve any example of a friend or enemy, and the extent of how positive or negative they viewed their friend or enemy was unknown. One possible solution would be to use a more controlled set of materials where participants are given, for example, well-known historical figures that could represent both the in-group and the out-group (e.g., in-group, Gandhi; out-group, Hitler). Yet, previous studies, as well as our current experiment, still demonstrated the LEB with current experimental materials; thus, this limitation may not be a major concern.

Future Directions

Future research could measure individual differences in relation to the effect of mindful attention on linguistic biases. For example, individuals with trait mindfulness, or present-moment awareness, people who ruminate over negative feelings, people who have strong empathy, and people with high or low self-esteem may be interesting samples to include. These

individual differences could potentially be predictive of LEB strength; for example, individuals high in trait mindfulness, empathy, or self-esteem may naturally exhibit lower LEB, while individuals high in rumination may exhibit more dramatic LEB. Future studies could also examine cultural differences to determine if there are certain cultures that are more or less likely to exhibit these biases through their language, and what characteristics of their culture or language cause this differential outcome.

Previous research has demonstrated that for individuals to respond to out-group members without prejudice, they must overcome years of exposure to stereotypical information (Devine, 1989). Controlling prejudice often requires the development of effortful, regulatory strategies (Devine & Monteith, 1993; 1999; Devine, Plant, Amodio, Harmon-Jones, & Vance, 2002). Our modulation of the LEB through a brief mindful attention training suggests that another way to reduce bias and prejudice is to cultivate mindfulness and compassion through a meditation practice.

One final direction for future research is to run a similar study with experienced meditators. Although we only had 25 people of varied meditation experience in our sample, after running an exploratory analysis, we found that those in the immersion groups demonstrated the LEB while those in the mindful attention groups did not. Again, this finding would need to be verified in a larger sample consisting of only meditators with more uniform meditation experience. It does suggest, however, that more consistent, extended practice with mindfulness meditation may have a stronger effect on linguistic biases. It would also be interesting to compare the LEB in participants who practice mindfulness meditation vs. those who practice, for example, cognitive based compassion training to see if the groups demonstrate similar reductions or removal of the LEB.

Conclusion

Our current study confirmed that mindful attention is an implicit modulator of linguistic bias, particularly the linguistic expectancy bias. In contrast to explicit discrimination, this linguistic bias involves the transmission of stereotypes that are difficult to access (Franco & Maass, 1996; von Hippel et al., 1997). Previous research has implemented explicit strategies to reduce this bias such as directing participants to monitor their language (Douglas & Sutton, 2003; 2008). Other studies have identified this bias in cross-cultural settings, and have provided explicit strategies to try and overcome years of exposure to stereotypes (Devine, 1989; Devine & Monteith, 1993; 1999; Devine et al., 2002). Our experiment, however, is the first to use an implicit modulator to regulate the LEB. We found that brief mindful attention training elicits more concrete descriptions of expected behaviors, suggesting that even brief training in aspects of mindfulness may be an accessible tool for reducing stereotypical thinking. Although future research will need to assess how long this modulation lasts, we imagine with a regular mindfulness or compassion practice that these biases and linguistic transmission of prejudice could be reduced and eliminated in the long term.

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Footnote

[1]All effect size calculations were made with Lakens' (2013) open source spreadsheet.

Table 1
Mean and standard deviation for the between and within factors and their respective levels

		Behavior Valence	
		Positive	**Negative**
Perspective Type	**Character**	***M* (*SD*)**	***M* (*SD*)**
Immersion (IMM)	Friend	2.57 (.69)	2.00 (.74)
	Enemy	1.40 (.31)	2.43 (.75)
	Overall	1.99 (.79)	2.21 (.77)
Mindful Attention (MA)	Friend	1.94 (.52)	1.76 (.63)
	Enemy	1.57 (.39)	1.89 (.64)
	Overall	1.76 (.49)	1.83 (.63)

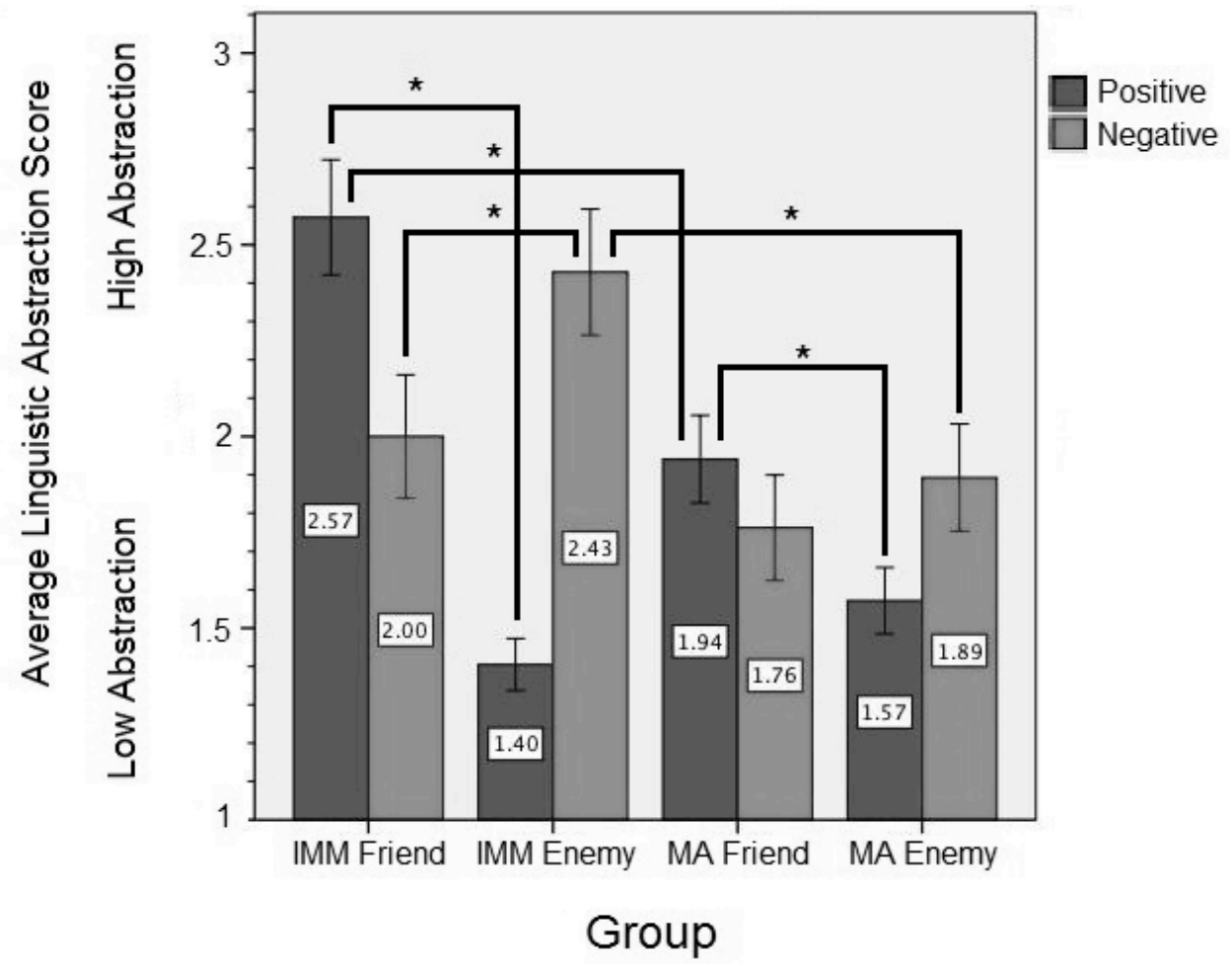
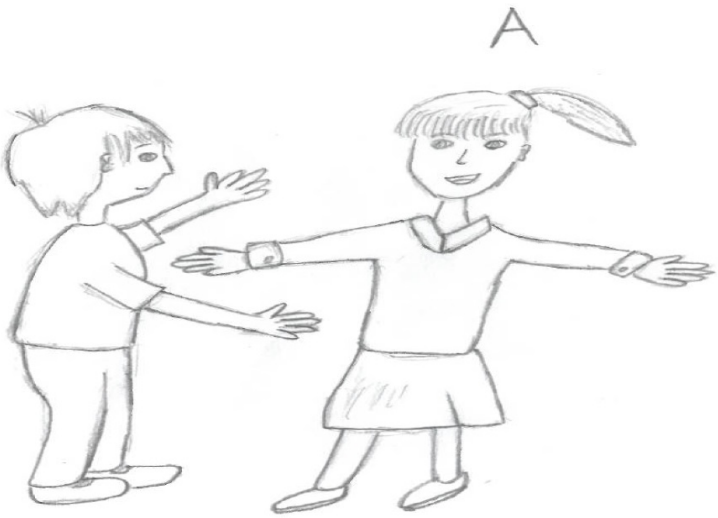


Figure 1. Average linguistic abstraction scores of the four groups by behavior valence. This bar graph displays the average linguistic abstraction response for each of the four groups broken out by positive and negative behaviors. IMM = immersion. MA = mindful attention. * = $p < .05$. Standard error bars are +/-_one SEM.

Appendix A

Four Practice Cartoon Events with Their Corresponding Description Options

Positive Behavior Examples (embracing someone and reading a book)



1) A is reaching out to the other person.

2) A is about to hug the other person.

3) A likes the other person.

4) A is nice.

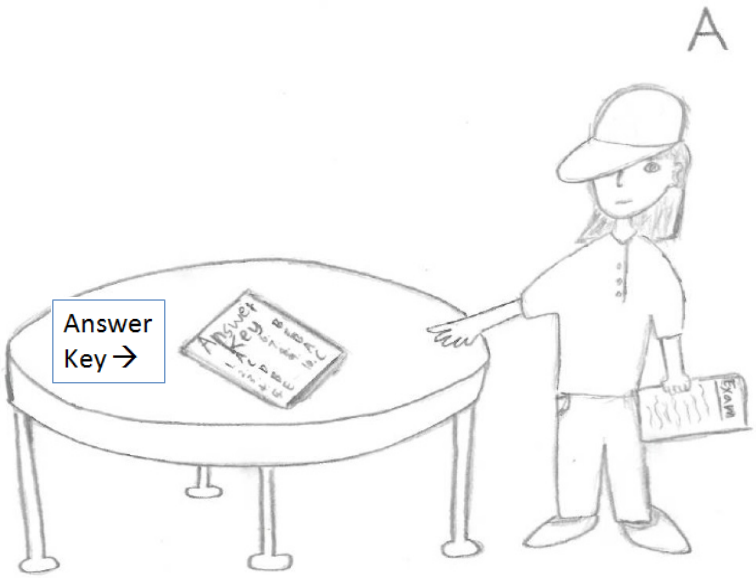
1) A is writing notes.

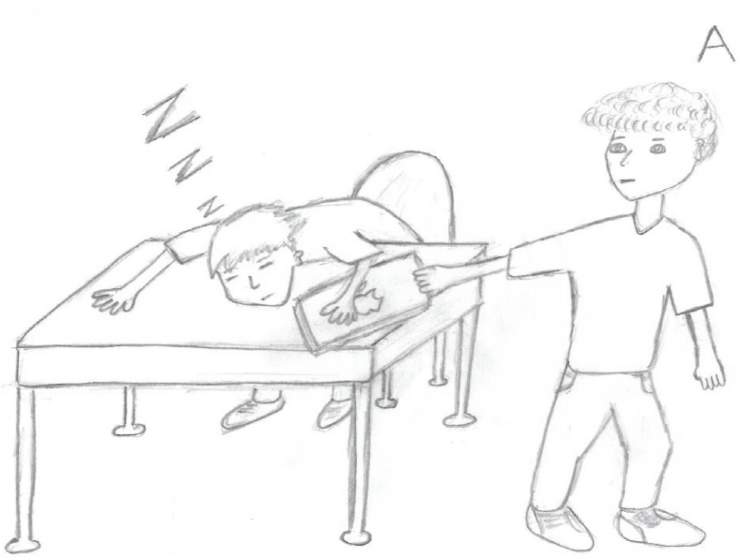
2) A is studying.

3) A enjoys studying.

4) A is motivated.

Negative Behavior Examples (cheating on a test and stealing a laptop)





1) A is reaching for the answer key to the test.

2) A is going to cheat on a test.

3) A doesn't care about cheating on the test.

4) A is dishonest.

1) A is grabbing someone's laptop.

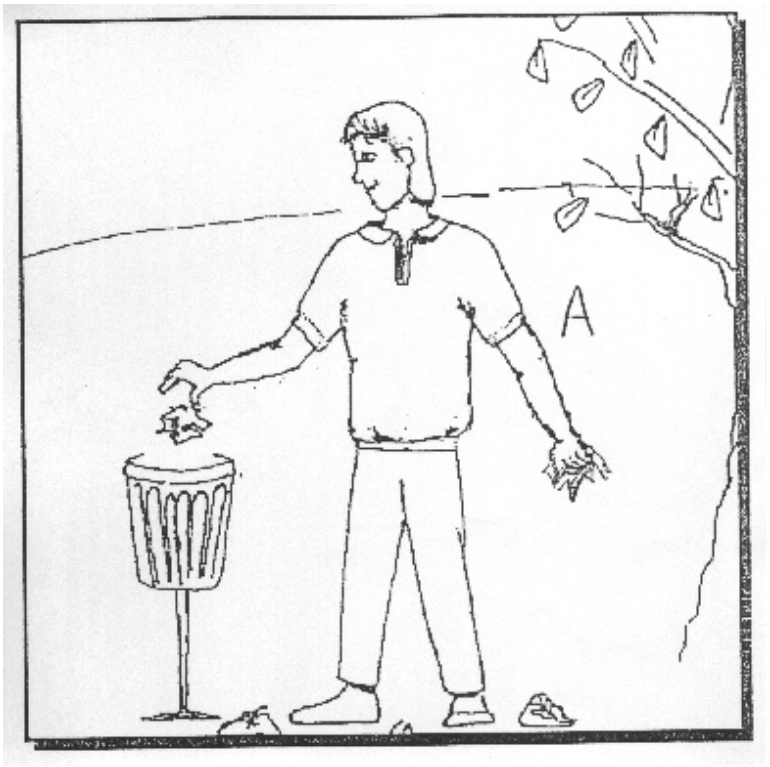
2) A is stealing.

3) A doesn't mind stealing someone's laptop.

4) A is immoral.

Eight Critical Cartoon Events with Their Corresponding Description Options

Positive Behavior Examples (walking an elderly person across the road, recycling trash, picking another person up off the ground, and running)



1) A is walking an elderly person across the road.

2) A is helping an elderly person across the road.

3) A cares for elderly people.

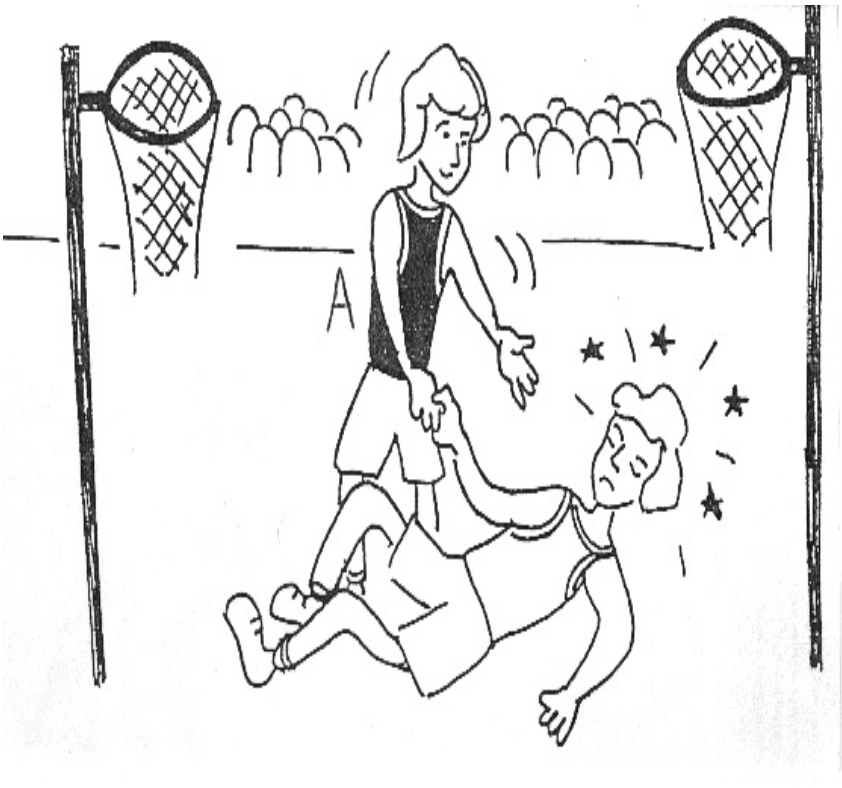
4) A is caring.

1) A is picking up trash.

2) A is looking after the park.

3) A respects nature.

4) A is conscientious.



1) A is picking up the other person

2) A is helping the other person.

3) A is concerned about the other person.

4) A is considerate.

1) A is running.

2) A is training.

3) A loves sports.

4) A is athletic.

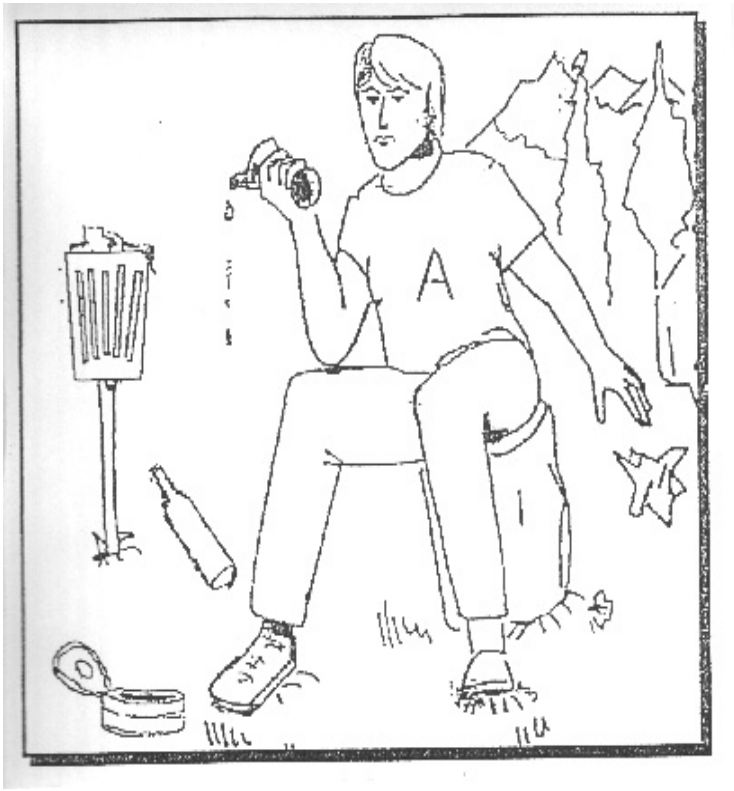
Negative Behavior Examples (telling a sexist joke, throwing trash on the ground, spray-painting a wall, and hitting another person)

1) A is telling a sexist joke.

2) A is spreading a sexist joke.

3) A enjoys sexist humor.

4) A is sexist.

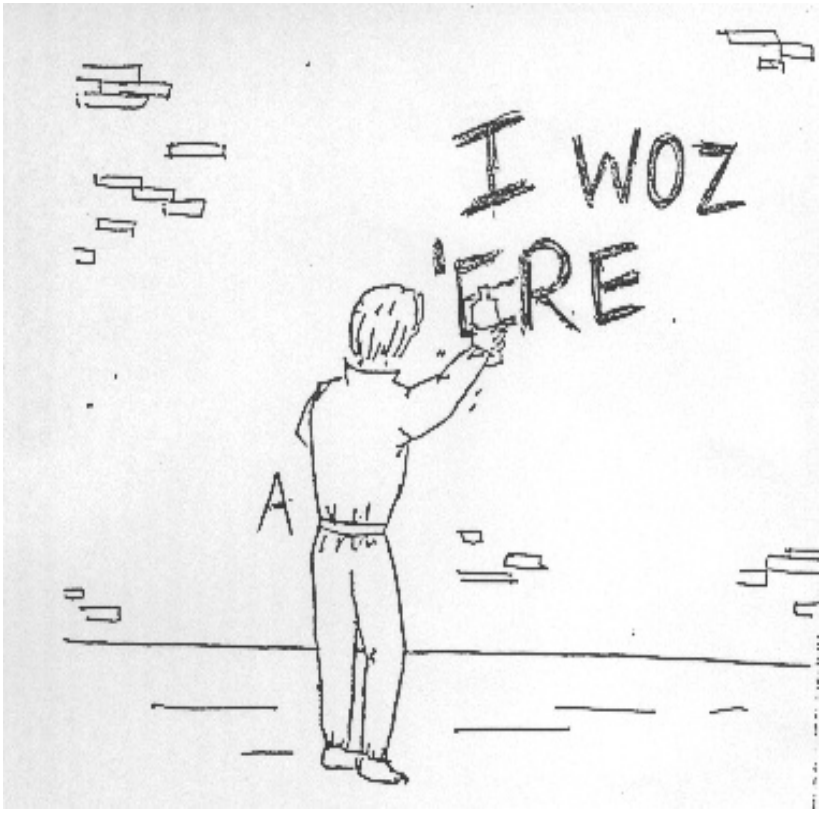


1) A is throwing trash on the ground.

2) A is littering the park.

3) A disrespects nature.

4) A is disrespectful.



1) A is spray-painting the wall.

2) A is vandalizing the wall.

3) A doesn't care about other people's property

4) A is destructive.

1) A is hitting the other person.

2) A is hurting the other person.

3) A hates the other person.

4) A is aggressive.

Appendix B

Mindful Attention Instructions:

"We would like you to view and think about these scenes using the "observing perspective."

- First, observe the thoughts and other reactions you have about these scenes. As you have a specific thought or reaction, you'll notice that it first arises, and then it dissipates - similar to how waves arise on the ocean and then dissipate.
- Second, understand that these thoughts and reactions are just transitory, fleeting mental states. These fleeting mental states may include thoughts about the scene, internal bodily reactions, emotional reactions, and so forth.

What's different about this "observing" perspective is that you experience your thoughts and reactions about the scene as fleeting mental states. You remain aware that they're just thoughts and reactions as you are sitting here in the room. In summary, when you use the "observing perspective" rather than live out the event, you simply observe your thoughts and reactions to it in the present moment. As you notice your thoughts and reactions to the events in the scenes, please don't try to avoid or suppress them. Just remain aware that they're thoughts and reactions, and observe them as mental states that arise and dissipate."

Control Immersion Instructions:

"We would like you to view and think about these scenes by completely immersing yourself in them. When you completely "immerse yourself" in an event, you live the experience. You travel in time to the event. You project yourself into it. It seems like you're actually there. It's as if the event were happening in the moment. When you completely "immerse yourself" in an event, you also often experience it in vivid detail that might include:

- colors, sounds, smells, and other sensory aspects of being there in the situation
- emotions and feelings that arise while living the event
- physical sensations and bodily states that also arise while living the event, such as your heartbeat, an adrenaline rush, tightening of the chest, feeling tense, and faster breathing
- you might seem to hear what yourself and other people are saying in the situation

In summary, when you completely "immerse yourself" in an event, it's as if you were having a vivid daydream that you enter and live to the fullest. As a result of living the event in vivid detail, it almost seems real to you. You experience it almost as if it were actually happening."