

ABSTRACT

Self-Serving Bias: A Review of Research on Variability and Outcomes

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Self-serving bias is a cognitive process by which an individual distorts reality in order to protect their ego. This bias frequently manifests as a tendency to attribute success to the self and failure to external causes, and it is nearly ubiquitous in its prevalence. Although appearing to be important in the maintenance of self-esteem, deviations from “preferred” levels of self-serving bias may lead to negative outcomes. This review investigates the literature on a number of facets of self-serving bias. The variability of the bias in different populations is examined, including differences in expression based on age, gender, culture, emotion, and psychopathology. In addition, both positive and negative outcomes of self-serving bias are considered, as well as the environments in which self-serving bias plays a key role.

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SELF-SERVING BIAS: A REVIEW OF RESEARCH ON VARIABILITY AND
OUTCOMES

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CHAPTER ONE

Introduction

A self-serving bias (also known as self-serving attribution bias, attributional bias, or positivity bias) is a process by which an individual distorts their perception of reality or ignores negative feedback in order to maintain their ego. To put it simply: “people have a need to view themselves positively” (Heine, Lehman, Markus, & Kitayama, 1999, p. 766). This bias often manifests as a failure to identify oneself as the source of errors, instead placing the blame on external, uncontrollable factors. Historically, the existence of a so-called “positivity bias” is both well-documented and widely accepted. For instance, in 1937, Allport called this method of protecting the ego “nature’s eldest law” (Mezulis, Abramson, Hyde, & Hankin, 2004). More recently, Heine et al. (1999) called the presence of this bias “easily the most common and consensually endorsed assumption in research on the self” (p. 766).

Self-serving bias is also a widespread phenomenon not limited to certain groups or types of people. In a 2004 meta-analysis of 266 studies, Mezulis, Abramson, Hyde, and Hankin found an indication of a large bias (average $d = 0.96$, 95% confidence interval of 0.89 to 1.02) and hypothesized that attributional bias was pervasive in nearly all populations (Mezulis et al., 2004). In fact, even a population of individuals that had just been informed about self-serving bias rated themselves less likely to fall prey to it than the average person, itself representing a positivity bias (Friedrich, 1996).

While it is likely that most individuals experience this bias frequently and without negative consequences, there is significant variability in both the level of self-serving

bias expression and the outcomes of this expression. In this paper I will identify variables and environments that may change the level of self-serving bias or the consequences thereof, as well as investigate the neural patterns of self-serving bias.

Neural Basis of Self-Serving Bias

Modern brain imaging techniques have allowed researchers to investigate the neural processes of self-serving bias. Krusemark, Campbell, and Clementz (2008) addressed the neural causes of self-serving bias specifically. Participants completed a facial matching task, and were subsequently asked questions about their performance. Researchers utilized a common method of analyzing self-serving bias: subjects were asked to gauge their performance using either self-serving statements (such as “I am smart” and “It was bad luck”) or non-self-serving statements (such as “I am dense” and “It was luck”). These subjects had the electrical activity of their brain recorded using dense-array electroencephalography while making these attributions. It was found that the main difference in electrical activity between self-serving and non-self-serving attributions was that medial prefrontal cortex, an area of the brain associated with cognitive control and planning, activated during non-self-serving attributions (Krusemark et al., 2008). This implies that self-serving processes are a sort of cognitive default that requires cognitive effort to override. The pervasiveness of self-serving bias in nearly all populations of humans may be influenced to some degree by resulting “mental laziness.”

Zhang and Li (2012) conducted a functional MRI study of the precuneus, a brain area located in front of the occipital lobe, between the cerebral hemispheres. Their results suggested that the ventral portion of the precuneus is implicit in self-related processing. Whether or not this applied to individuals engaged in self-serving

attributions in particular was tested by Cabanis et al. (2013). Interestingly, it was found that self-attributional processes caused activation of the posterior precuneus, but that when those attributions became biased, the primary activated region shifted to the anterior precuneus (Cabanis et al., 2013). Other studies have implicated areas such as anterior cingulate cortex (Seidel et al., 2010).

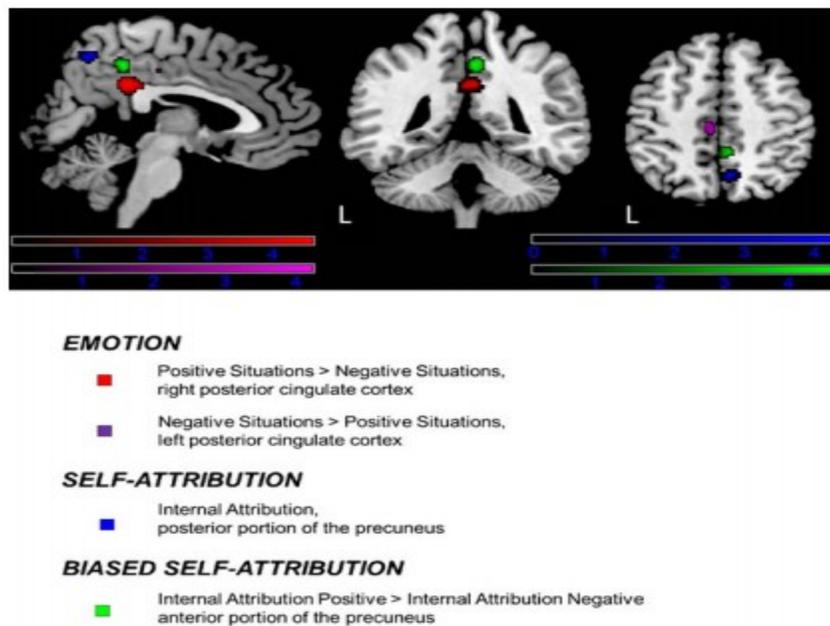


Figure 1: Activation of the precuneus in individuals exhibiting self-serving bias (Cabanis et al., 2013).

Perhaps the most fascinating research to come out of investigation into the neural responses of self-serving bias links the bias to the brain's reward pathway. The dorsal striatum, an area of the brain associated with motivation and reward, is activated in individuals exhibiting self-serving bias. One theory put forth to explain the connection between the dorsal striatum and self-serving bias is that the attribution of positive events to the self and the attribution of negative events to external forces is rewarding to one's

self-esteem, thus reinforcing the behavior. This may be related to the consistency with which the bias is shown in a variety of subjects (Blackwood et al., 2003; Seidel et al., 2010).

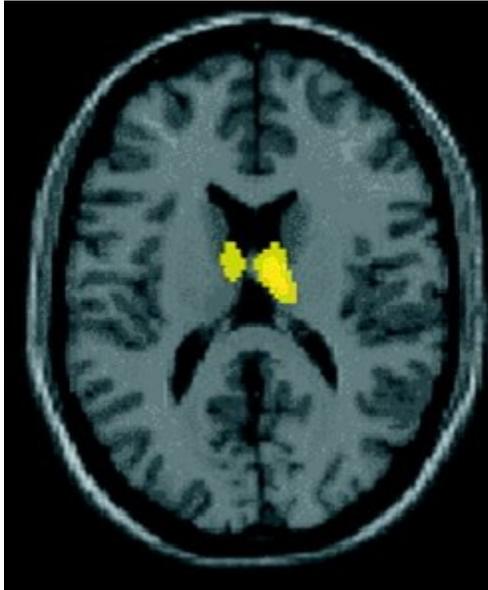


Figure 2: Activation of the dorsal striatum in individuals exhibiting self-serving bias (Blackwood et al., 2003).

Positive and Negative Outcomes of Self-Serving Bias

Positive Outcomes

Despite the fact that it represents a discrepancy in perception and reality, self-serving bias can nonetheless be viewed as a sense of optimism about one's life and abilities, and may be an important part of the maintenance of self-esteem. Taylor and Brown (1988) released a journal article challenging what was, at the time, commonly accepted:

The view that psychological health depends on accurate perceptions of reality has been widely promulgated and widely shared in the literature on mental health...the well-adjusted individual possesses a view of the self that includes an

awareness and acceptance of both the positive and negative aspects of self (p. 194).

Taylor and Brown claim that “the perception of self that most individuals hold is not as well-balanced as traditional models of mental health suggest” and that “most individuals see themselves as better than the average person” (Taylor & Brown, 1988, p. 195). If the majority of humans thus exhibit self-serving bias, it stands to reason that it may have evolved as an adaptive trait.

Abramson and Alloy (1981) suggest that depressed individuals, previously thought to be more likely to succumb to cognitive biases than non-depressed persons, may in fact be perceiving themselves rationally. The use of cognitive biases, including self-serving bias, may actually be a factor as to why normal people are not depressed. Depression and how it relates to self-serving bias will be discussed more in Chapter Two, but this mechanism does provide evidence that this bias may be an adaptive, positive trait (Abramson & Alloy, 1981).

Perhaps the most significant evidence that self-serving bias is not maladaptive is that it is ubiquitous in nearly all parts of the population, yet there is no associated dysfunction with average levels of expression. If the level of self-serving bias seen in the general population was maladaptive, there would be an expected associated disorder or dysfunction, yet no such condition has been observed (Mezulis et al., 2004).

Negative Outcomes

Despite this evidence, one can imagine a situation in which exhibition of self-serving bias may have negative consequences. Although an “average” amount of self-serving bias may be adaptive and important in maintenance of one’s mental well-being, Mezulis et al. suggests that “an exaggerated bias may reflect a break from reality that is

no longer adaptive” (p. 737). They further hypothesize that certain conditions, such as mania, paranoia, and schizophrenia, may exhibit higher-than-normal levels of attributional bias (Mezulis et al, 2004).

Meyer, Barton, Bauer, and Jordan (2010) assessed individuals for their susceptibility to manic traits associated with bipolar disorder, and then given tests of both skill and luck. Those individuals at high risk for bipolar-associated mania were no different from controls when all were told that they did well on a skill-based test. On a luck-based test such as a dice roll, however, the score on the mania scale predicted the level of self-serving attributions. In other words, individuals susceptible to the manic symptoms of bipolar disorder are more likely to take credit for luck-based outcomes. Thus, heightened self-serving tendencies are not always associated with a healthy mental state.

Another common way for self-serving bias to result in a negative outcome is due to overconfidence. If self-serving bias is an adaptive trait that serves to keep one’s self-esteem (and thus confidence) from being eroded, what happens when this process is utilized too frequently? The result is overconfidence, which can lead to excessive risk taking and poor judgment. Overconfidence and its relationship to attributional bias have been extensively studied in the literature (Acker & Duck, 2008; Loughren, Paternoster, Piquero, & Fagan, 2013). One of the most compelling studies investigated financial traders and the process by which they “learn” to become overconfident, stating: “Traders who successfully forecast next period dividends improperly update their beliefs; they overweight the possibility that their success was due to superior ability. In doing so they become overconfident” (Gervais & Odean, 2001, p. 1). Interestingly, overconfident

traders are expected be wealthier than those of less confidence. This is likely due to the fact that this mechanism of overconfidence requires initial success in order to occur; thus, the increased level of wealth is likely due to higher levels of initial success rather than resulting overconfidence. This is supported by the study, which asserts that “overconfident traders behave sub-optimally, thereby lowering their suspected profits” (Gervais & Odean, 2001, p. 20).

CHAPTER TWO

Variability of Self-Serving Bias

If self-serving bias can cause both positive and negative outcomes, the question becomes, what traits influence the outcome of self-serving bias and the degree to which one employs it? We will investigate a number of different factors that may affect levels of self-serving attributions, including age, gender, personality traits, emotions, and cultural differences.

Age

The differing levels of self-serving bias over different ages are a frequently studied topic, perhaps focusing in particular on children. The targeting of attributions of success or failure by children has significant relevance in development and learning. Self-serving bias does occur in children; Snow (1996) found that children in grades 1, 4, and 7 were all more likely to attribute successes to themselves than they were failures in academic and sports tasks.

Differences in levels of self-attribution are seen as children develop. It is a challenge to determine how children of toddler age and younger target their attributions, but Snow did find in her study that children of grade 4 were somewhat less likely to self-attribute success than those in grade 1, and that children of grade 7 were less likely to do so than either group of younger children (Snow, 1996). Similarly, research has shown that early elementary age children typically rate their own intellectual competence relatively highly compared to slightly older children (of late elementary age). Due to the

tendency of children to rate the competency of their classmates lower than their own, these high ratings of competency are likely the result of self-serving bias (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Stipek & Mac Iver, 1989). The cognitive change that causes this decrease in self-serving process has not been pinpointed. It may be due to a decrease in “wishful thinking” and associated increase of the incorporation of facts into their decision making as children age (Mezulis et al., 2004). Another possibility is that self-serving bias decreases as children learn that ability may be an external, uncontrollable factor (Plumert, 1995).

The outcome of expressions of self-serving bias from children depends on the circumstance in which the bias is expressed. In moderation and at the right times, it is likely beneficial; as already discussed, self-serving bias increases confidence and is correlated with self-esteem. In other instances, however, self-serving bias encourage negative behaviors such as lying. Ross, Smith, Spielmacher, and Recchia (2004) interviewed children of between 4.5 and 9.5 years of age who had recently argued with their siblings, as well as interviewing their parents about the content of the argument. Children were unlikely to admit to the negative actions involved in the argument, but readily explained their positive contributions. Interestingly, the older children in the sample would attempt to justify their negative actions rather than denying them. Despite attempts at justification, this evidence does support the idea that as children age, they are more willing to accept personal responsibility for their actions (indicating a decreased self-attributional bias).

Overconfidence in children is usually a negative trait. Plumert (1995) investigated children’s capability to predict their ability to complete physical tasks,

including reaching certain far-away objects and stepping across a gap between two sticks. Children who overestimated their ability on these tasks tended to be more prone to serious accidents.

Teenagers exhibit decreased levels of self-serving bias than do children. An attractive explanation for this decline is that adolescents have experienced more negative and stressful events in their life, and thus are able to survey a broad range of events when making attributions, allowing them to make more accurate ascriptions of credit and blame (Mezulis et al., 2004).

The lower levels of attributional bias in teenagers may be associated with negative outcomes. For instance, Toner and Heaven (2005) gave 82 high-school students (mean age: 14 years) tests that measured their self-serving bias, as well as their self-perceived levels of loneliness, victimization, and depression. All three were positively correlated with a lack of self-serving bias: loneliness had a correlation of 0.41; victimization had a correlation of 0.41; and depression had a correlation of 0.33. Clearly, low levels of self-serving attributional bias are sub-optimal and are associated with negative consequences, yet Gerrard, Gibbons, Reis-Bergan, and Russel (2000) report negative consequences (overconfidence) associated with high levels of self-serving bias as well. This evidence suggests that there is a preferred, optimal level of the bias present in normal teenagers that results in positive outcomes such as increased self-esteem and confidence, and that significant deviation either above or below this level causes negative outcomes.

The trend of self-serving bias decreasing as one ages continues for both young and middle-aged adults. Results are different for the elderly, however. In fact, levels of self-serving attributions in the elderly rise to levels similar to and even surpassing those

of young children (Mezulis et al., 2004). Despite the fact that the elderly are faced with numerous stressors, including debilitation of both physical and mental fitness, they exhibit no significant drop in life satisfaction ratings. Self-serving bias is one possible explanation for this phenomenon. De Raedt and Ponjaert-Kristoffersen (2006) had 84 individuals between the ages of 65 and 96 complete a task involving a driving simulator and then rate their own performance afterwards. Participants also took tests for mood disorders. Over half of the subjects overestimated their performance on the task. Interestingly, researchers found a statistically significant relationship ($p < 0.05$) between overconfidence and lower depressed mood, suggesting that overestimation of ones abilities (a form of self-serving bias) may be an effective coping mechanism by which the elderly deal with decreased levels of performance.

Mezulis et al. (2004) analyzed 266 articles concerning self-serving bias, resulting in 523 independent effect sizes. She found that there was a significant difference in the magnitude of self-serving attributional bias as a function of age group ($p < 0.01$). The six age groups analyzed, and their effect sizes, were as follows: 8-11 years ($d = 1.27$); 12-14 years ($d = 0.78$); 15-18 years ($d = 1.02$); 19-24 years ($d = 0.97$); 25-55 years ($d = 0.70$); and over 55 years ($d = 1.38$). These results confirm past findings: self-serving bias is typically expressed most strongly in young children and in the elderly, and that it is lowest as an adolescent and as an adult. Two other observations are important: first, the effect size in each age category is not only significant, but large; this supports the idea that self-serving bias is ubiquitous and not a rare cognitive process. Second, the difference in effect size between the 12-14 group and the 15-18 group (0.24 units) appears to be large, but the p value is greater than 0.05, and thus the difference is not significant; the only values that

are statistically significant in their differing effect sizes are those for the 8-11 group and the 55+ group compared to the other four age groups.

Gender

The existence of differences in self-serving attributions between genders has long been disputed. It appears that there is no significant difference in overall levels of self-serving attributions between genders. Mezulis et al. (2004) calculated a *d* score of 0.98 for males and 0.79 for females in her meta-analysis. Though this difference may seem noteworthy, it is not statistically significant. Furthermore, the *d* statistic for studies comprised of mixed genders was 0.99, not between the scores for males and females as would be expected. This indicates a large degree of sampling bias in the data, further supporting the lack of differences in overall levels of self-serving attributions between genders.

Differences between the genders for certain activities may exist, however. Eccles, Wigfield, Harold, and Blumenfeld (1993) found that children's self-ratings of competency reflected those of the common cultural stereotypes of the time for their gender. In other words, males rated their own competency at traditionally masculine pursuits such as math and sports higher than did females, while females rated their competency at traditionally feminine pursuits such as music or tumbling higher than did males. Societal pressures may influence children to overrate their abilities in tasks that their culture expects their gender to excel at. This is especially prominent with the example of females' estimations of their tumbling ability. Since tumbling is an athletic practice requiring physical fitness, there is little reason that girls who are skilled at tumbling would expect themselves to exhibit low performance in other sports. It is likely

that cultural perceptions of gender influenced this bias in the children. Although the children likely displayed a self-serving bias in regards to their performance on “gender-appropriate” activities, they seem to display the opposite (a so-called “negativity bias”) in regards to “gender-inappropriate” activities.

Differences in attributional bias between genders can also vary with age. Mezulis et al. (2004) found that males and females did not show significantly significant differences in their levels of self-attributional bias as they age except in the 25-55 year category: adult females ($d=0.38$) exhibited a statistically significantly lower effect ($p<0.05$) of self-serving bias than did adult males ($d=1.05$). See Figure 3. This may be related to the fact that adult women are more likely to experience depression than are men (Faravelli, Scarpato, Castellini, & Lo Sauro, 2013), and depression is associated with marked decreases in expression of a self-serving bias (Abramson & Alloy, 1981).

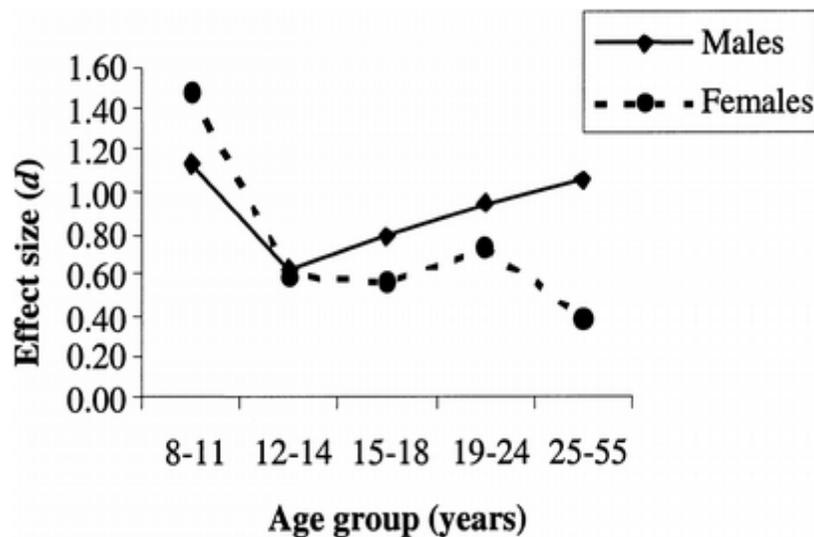


Figure 3: The difference in effect size of self-serving bias between the genders as age varies. (Mezulis et al., 2004)

A number of personality traits have been linked to self-serving bias. One example is narcissism. Brown, Budzek, and Tamborski (2009) defined narcissism as being comprised of two dimensions: grandiosity and entitlement. Although both of these categories may involve self-enhancing cognitive strategies, grandiosity in particular relies on self-serving bias. Tamborski, Brown, and Chowning (2012) had 107 undergraduate students assessed using the Narcissistic Grandiosity Scale, as well as answer questions designed to measure their “unrealistic optimism,” or their belief that difficult-to-predict events such as winning a sweepstakes were more likely to happen to them than to others. Grandiosity did, in fact, significantly predict unrealistic optimism. Thus, grandiosity (and consequently narcissism) seems to be associated with an increased positivity bias.

Callous-unemotional traits, and the anti-social behavior associated with those traits, were investigated in the context of self-serving cognitive distortions by van Leeuwen, Rodgers, Gibbs, and Chabrol (2014). The study defines callous-unemotional traits as “egocentricism, a callous use of others, poor empathy and emotionality, lack of responsibility for one’s own actions, and a lack of remorse” (p. 229). These traits are, unsurprisingly, linked with antisocial behaviors. They studied 972 French high school students, each of which completed three tests testing for the expression of self-serving cognitive bias, callous-unemotional traits, and anti-social behaviors. They found that self-serving cognitive processes were strongly correlated with both callous-unemotional traits ($r=0.44$) and anti-social behaviors ($r=0.58$). Since neither of these traits could be considered positive (indeed, callous-unemotional traits are associated with an increased risk of psychopathy), this represents another example of a possible negative outcome of self-serving bias.

Extraversion and introversion also affect self-serving bias. Despite the fact that extraverted individuals have higher incidence rates of vehicle crashes, traffic fatalities, traffic violations, and driving under the influence than do introverts, they rated their own driving ability more highly than did introverts after taking a driving test. Since self-serving bias is higher in the elderly than it is in any other portion of the population that can legally drive, it is unsurprising that this effect is particularly pronounced in elderly drivers (McPeck, Nichols, Classen, & Breiner, 2011). Although it is theoretically possible for an individual to be both extroverted and exhibit anti-social behaviors, these results differ enough from those of van Leeuwen et al. (2014) to warrant further research into the correlation between extraversion, anti-social behaviors, and self-serving bias.

High self-esteem individuals tend to use self-serving attributional biases more frequently (Heine et al., 1999). Gerrard et al. (2000) investigated the tendency of these high self-esteem individuals to use attributional biases to justify risky behaviors. 500 adolescents completed the Rosenberg Self-Esteem Scale and were sorted into either a high self-esteem (HSE) group or a low self-esteem (LSE) group. The adolescents reported about how much alcohol they had consumed in the last three months. Parents also reported on their approval of their children's activities. They completed the same questions one year later. HSE teens reported lower amounts of alcohol consumption on their first interview than did LSE teens, though parental approval of both groups was the same. HSE adolescents also reported smaller increases in alcohol consumption between their first and second interviews than did the LSE group; the disapproval of the parents of both groups went up proportional to their drinking. HSE teens whose drinking had increased by the second interview, however, predicted that their parents' disapproval

rating would actually decrease, while LSE teens correctly predicted the increased disapproval of their parents. In other words, teenagers with high self-esteem adjusted their perceptions of their parents' opinions on their behavior to justify their increase in alcohol consumption. This is a clear case of self-serving bias, and it has the negative consequence of encouraging the risky behavior of underage drinking. (Gerrard et al., 2000)

Emotions

An individual's emotional state at the time of self-judgment can also exert an effect on the magnitude of self-serving bias expressed. Jundt and Hinsz (2002) investigated the effect that positive and negative affect would have on self-serving bias. Those with higher levels of negative affect and lower levels of positive affect were more likely to be biased in their self-judgment. This is likely a positive outcome; individuals experiencing negative affect need to protect what self-esteem they have, as well as attempt to raise it. Self-serving bias is an effective method of maintaining and even raising self-esteem and confidence, and thus may improve negative affect.

Not all studies agree, however. Coleman (2011) conducted a research study on college students in which the specific emotions of either guilt or revulsion were stimulated in subjects before they made attributions for success or failure on a quiz. It was found that subjects who felt guilty or repulsed both tended to make fewer self-serving attributions about their quiz performance than did those with no stimulated emotion. These results are opposite those reported by Jundt and Hinsz (2002); guilt and revulsion are both emotions associated with negative affect, yet they showed less self-serving bias, not more. Coleman suggests that this is due to the "self-threat model,"

which hypothesizes that individuals with positive affect have more self-esteem to lose, and thus are more protective of it (shown by an increase in self-serving judgments), than are those with negative affect. Regardless, it is clear that more research needs to be conducted in this area to determine with certainty the effect of positive and negative emotions on the self-serving bias.

Cultural Differences

Differences in expression of self-serving bias are seen across different cultures. It makes logical sense that different nations and societies would handle success and failure differently. For instance, Americans have been shown to exhibit a statistically significantly larger degree of self-serving bias than Finns (Nurmi, 1992). Another example comes from a study comparing differences in attributions between Asian Indians and Canadians. Indians were more likely to ascribe negative events to external causes than were Canadians. One possible explanation for this effect is the common belief held among Indians of “karma.” They may attribute events to external causes more readily than other cultures due to a common belief that it is “karma” catching up with them (Higgins & Bhatt, 2001).

Another possible cause for some of the differences between cultures is based on a society’s emphasis on individualism versus collectivism. Western countries such as the United States or Canada tend to be more individualistic, placing great emphasis on personal achievement, and thus would be expected to exhibit greater levels of self-serving attributions of success. Eastern countries tend to be more collectivistic and thus would be expected to ascribe less of their success to internal processes (Heine & Lehman, 1997; Higgins & Bhatt, 2001).

Japanese culture has been of particular interest to researchers due to its surprising lack of self-serving biases (Heine & Lehman, 1997). While the bias is merely smaller in most Asian cultures than it is in Western cultures, the bias appears to be nonexistent or perhaps even reversed (a negativity bias) in Japan specifically. Mezulis et al. (2004) calculated a d-statistic of -0.30 for the effect size of self-serving bias in Japan, the only country (and indeed, the only grouping of individuals) studied with a negative effect size. The Japanese are notorious for being very tough on personal failure, so it is reasonable to assume that this trait may influence the Japanese to ascribe failure to internal, personal causes rather than to external, uncontrollable factors.

Mental Disorders

The self-serving bias is important in maintenance of proper mental health (Taylor & Brown, 1988). It is thus expected that many mental disorders would be associated with decreased self-serving bias (Mezulis et al., 2004). At the same time, high levels of self-serving bias are associated with overconfidence (Loughran et al., 2013) and risky behaviors (Gerrard et al., 2000). These traits are associated with a number of disorders, including attention deficit hyperactivity disorder (ADHD), a well-studied topic in regards to self-serving bias. The fact that various mental disorders are associated with either too much or too little self-serving bias supports the idea that there is an average, ideal degree of self-serving bias vital to mental health.

Abramson and Alloy (1981) proposed a model of depression in which individuals become significantly more susceptible when they attribute negative events to internal sources, i.e. they blame themselves when bad things happen to them. An average, non-depressed person would be more likely to exhibit self-serving bias and ascribe blame for

negative events to outside sources, thus protecting their ego. There is no evidence that decreased self-serving bias is the cause of depression. Rather, it is a risk factor associated with an increased incidence of depression.

The decreased level of self-serving bias associated with depression may be due only to attributions of failure, rather than success. Kuiper (1978) found that both depressed and non-depressed female college students made internal attributions for success. The difference between the groups was related to their attributions for failure: nondepressed persons primarily attributed failure externally, while depressed persons primarily attributed failure internally. Thus, it seems to be only attributions of failure that indicate depression. The fact that depressed individuals tend to make only internal attributions, regardless of an event being a success or a failure, indicates that depression may be related to self-centeredness.

Non-self-serving attributions activate areas of the brain involved in cognitive control such as medial prefrontal cortex (Krusemark et al., 2008). fMRI scans of depressed patients, however, do not follow this trend. These individuals have instead shown increased activity in prefrontal cortex when making self-serving attributions (Seidel et al., 2012).

CONTROLS VS. PATIENTS

NON SELF-SERVING VS. SELF-SERVING

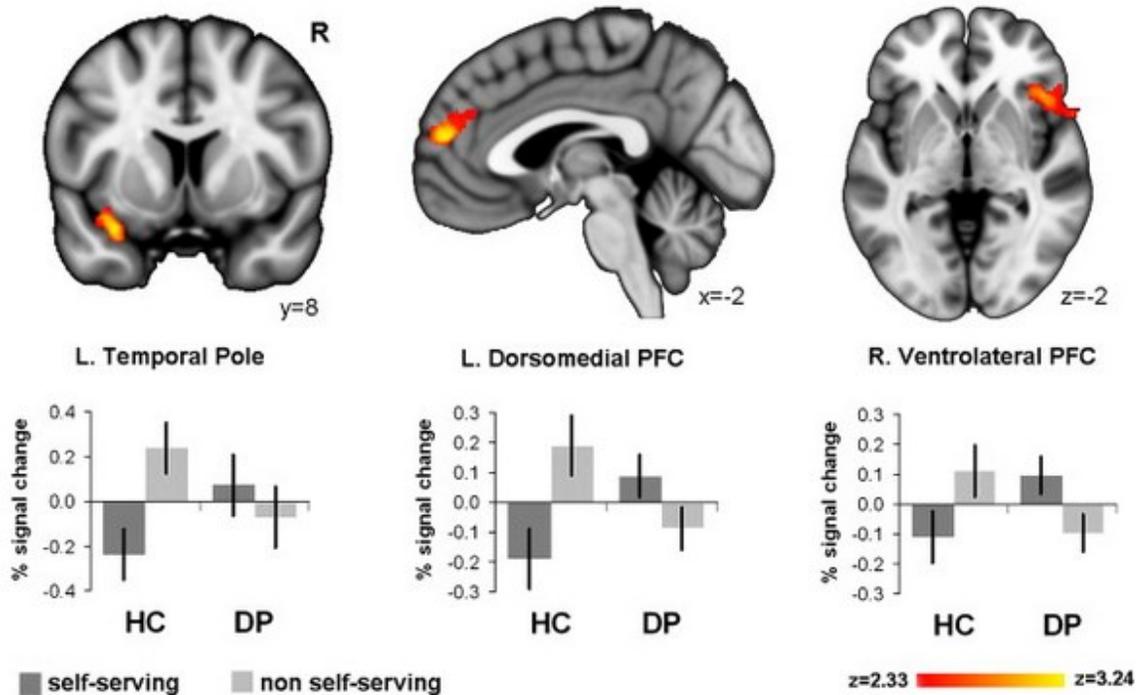


Figure 4: fMRI results in controls and in depressed patients. Controls show prefrontal activation when making non-self-serving attributions, while depressed patients show activation when making self-serving attributions (Seidel et al., 2012).

One possible explanation is that normal, non-depressed individuals have a “positive self-concept.” They think highly of themselves and tend to make attributions that support this belief (i.e. self-serving attributions). Depressed individuals, however, seem to have a “negative self-concept;” they do not think highly of themselves and instead tend towards self-negativity. Like normal individuals, they too tend to make attributions that support this belief. Higher levels of cognitive control would be required in order to make attributions that conflict with an individual’s self-concept, thus explaining the differing activational patterns seen in healthy versus depressed persons (Seidel et al., 2012). Depressed individuals do not experience a negativity bias. They do

exhibit self-serving bias, but is just highly attenuated compared to normal individuals. (Mezulis et al., 2004)

The relationship between decreased self-serving bias and depression holds true across cultures. The relative paucity of self-serving attributions in the Japanese population is frequently studied, but despite the significantly different base level of self-serving bias in Japanese individuals, the relationship between depression and self-serving bias remains the same. Hymes and Akiyama (1991) found that Japanese and Americans both had a need to protect their self-image, and that self-serving bias was associated with nondepressives. Japanese individuals were, on average, more depressed than American individuals. The lower baseline of self-serving bias expressed by the Japanese subjects likely accounts for this greater incidence of depression.

As has been mentioned, self-serving bias is associated with the manic symptoms of bipolar disorder (Meyer et al., 2010). Manic patients as a whole, however, exhibit normal levels of self-serving bias (Lyon, Startup, & Bentall, 1999). Bipolar patients tend to alternate between episodes of mania and depression. The higher-than-average and lower-than-average levels of self-serving attributions respectively associated with these traits may in effect “cancel each other out” and lead to an overall normal level of attributions.

Reports on the relationship between paranoid schizophrenia and the self-serving bias have been mixed. Both greater and lesser levels of self-serving bias are observed in those with schizophrenia. Moritz, Woodward, Burlon, Braus, and Andresen (2007) reconciled these results by suggesting that paranoid schizophrenics did not actually experience altered levels of self-serving bias, but instead tended to attribute a greater-than

average number of events to external causes, whether they were successes or failures. Controls (normal individuals), depressives, sufferers of anxiety, and non-paranoid schizophrenics all tend to attribute events to themselves more than to external forces in general. Paranoid schizophrenics, however, attributed events to themselves and to external factors about equally. Self-serving bias, however, was similar between paranoid schizophrenics and normal individuals.

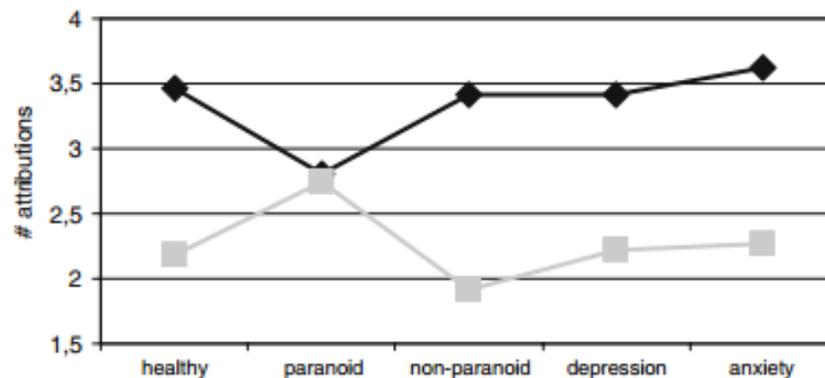


Figure 5: Paranoid schizophrenics attribute internally (black line) and externally (grey line) to a roughly equal extent. (Moritz et al., 2007)

Self-serving biases are common in those with eating disorders. Research has long held that the cause of eating disorders was a biased body image. Jansen, Smeets, Martijn, and Nederkoorn (2006) seems to indicate otherwise. In the study, women with an eating disorder, as well as healthy women in a control condition, were asked to rate their own level of attractiveness. A panel of men subsequently viewed pictures of the women and were asked to rate their attractiveness. Normal women in the control group rated their own attractiveness higher than did the panel of men, indicating the presence of a self-serving bias for their self-perception of attractiveness. The self-attractiveness rating of women with eating disorders, however, was no higher than the ratings by the panel of

men. Individuals with eating disorders, then, hold an unbiased view of their own attractiveness, while normal individuals consider themselves more attractive than they really are. This further supports one of the central assertions of this paper: that there is a preferred, healthy level of self-serving bias conducive to maintenance of mental health.

Unlike many of the mental disorders mentioned previously, attention deficit hyperactivity disorder (ADHD) appears to be associated with an increased self-serving bias. ADHD children tend to rate their own performance on tasks higher than do normal children. This optimistic rating of self-performance is an example of positive illusory bias, a subtype of self-serving bias. Interestingly, these same children were also more likely to attribute success to external factors than were normal children (Hoza Waschbusch, Pelham, Molina, & Milich, 2000). Internal attributions of success and external attributions of failure represent only one type of self-serving bias, so these results are not contradictory, yet it is still surprising that the same children who rate their own performance highly nevertheless fail to ascribe success to the self. This overrating of performance, combined with externalization of success, may be a hallmark of ADHD.

CHAPTER THREE

Self-Serving Bias in Different Environments

So far, the research has indicated that different populations variably express self-serving bias. Self-serving bias can be adaptive, but that when an individual expresses an abnormal amount of the bias, either too much or too little, negative consequences can result. It is unlikely, however, that a given person expresses a constant amount of self-serving bias regardless of their environment. Not only is the setting expected to change the expression of self-serving bias, but that expression likely has different outcomes, either positive or negative, depending on the context in which it is experienced.

Classroom

One frequently studied environment in which self-serving bias often occurs is the classroom. Unsurprisingly, students are self-serving about their classroom performance. Teachers exhibit self-serving bias as well, however: when a student performs well, they tended to take credit, but when a student performs poorly, they place the blame on the student. One interesting note is that both students and teachers are aware of each other's self-serving bias. For instance, students and teachers both accurately predict that the other group would attribute student success to themselves (McAllister, 1996). In light of Friedrich (1996), in which individuals did not believe that they were as susceptible to self-serving bias as others, these results imply that individuals can accurately predict the self-serving attributions of others but are relatively oblivious to their own.

The McAllister study above has a significant flaw in terms of application to real-world situations: both the students and teachers in the study were, in fact, college students simply assigned to a test condition. While still a useful study for analyzing the attributions of those in a teaching role, it has lessened applicability to an actual classroom scenario in which teachers tend to be older, which as has been shown can affect levels of self-serving bias. The self-serving bias of actual teachers for their students' performance has been studied, however, and it supports the conclusions of McAllister (Yehudah, 2002).

Sports

Though self-serving bias is expressed by sports players, an interesting effect is observed in this environment. Individuals who lose sporting events should attribute their failure to external causes, and they do, but they actually tend to rate their own performance as being more important than external factors in determining the outcome (Scanlan & Passer, 1980). Self-serving bias is still observed due to a greater level of internal attribution by winners compared to losers, but the fact that losers accept the majority of the blame is relatively unique to sporting environments. Sports competitions are specifically designed to be tests of prowess, undisturbed by outside forces. While luck and other external factors such as referees play a role in outcomes, losers may simply have fewer outside targets on which they can ascribe blame.

Strong evidence for the idea that self-serving bias can vary drastically from the average level seen in certain populations based on environment comes from Aldridge and Islam (2012). They compared the attributions for success and failure of Olympic athletes from Australia and Japan. They expected Japanese athletes to exhibit little to no self-

serving bias, consistent with previous research on the Japanese population. Instead, Japanese athletes exhibited almost equal amounts of self-serving bias to Australian athletes. Although methodological differences may account for these results, high-level athletes may simply exhibit more ego than the average person; thus, there is more self-esteem at risk to non-self-serving judgments. This explanation is consistent with the “self-threat” model of self-serving bias espoused by Coleman (2011).

Sporting environments also illustrate the ability of individuals to exhibit a subtype of self-serving bias known as group-serving bias. This phenomenon is essentially analogous to self-serving bias, except that individuals tend to make attributions of success and failure based on causes internal and external to the group, respectively, rather than the self. Being a part of a group leads to individuals making group-serving attributions in addition to standard self-serving attributions. (Sherman & Kim, 2002) In fact, at least in athletic groups, group-serving bias can supersede self-serving bias in instances where they are pitted against each other. (Taylor & Doria, 1981)

Politics

It should come as no surprise that individuals express self-serving bias (often in the form of group-serving bias) with respect to questions of political opinion. Kriss, Loewenstein, Wang, and Weber (2011) asked American and Chinese students how the burden of responsibility for the reduction of greenhouse gas emissions between the United States and China should be split fairly. Each group’s definition of “fair” tended toward decisions that favored their own national interests. Yet when the countries were instead referred to as “country A” and “country B,” the difference in responses between groups was eliminated. This exemplifies the group-serving bias: subjects make decisions

that benefit groups that they are part of, even if it does not accurately reflect their personal opinion as expressed when they have no vested interest in the involved groups. This may inhibit everyday political conversations. Individuals may vehemently defend positions that do not accurately reflect their actual opinion due to a perceived self-interest or affiliation in a political group.

Parenting

Although self-serving bias is adaptive in that it protects an individual's ego, there may be circumstances in which the benefit of this protection is outweighed by the bias's effect on others. While this likely applies to a number of circumstances, including political leaders and individuals otherwise in charge of groups of people, perhaps the most salient example is that of parenting. Failures in parenting can harm the development of a child, and one facet of good parenting is the ability to identify the source of a child's behavior.

Montemayor and Ranganathan (2012) asked Indian parents to identify the cause of positive and negative behaviors in both their own children and in the children of others. Parents attributed positive behaviors of children to good parenting and the child's personality, regardless of whether they were their own. Negative behaviors of other people's children were attributed to poor parenting and the child's personality. Negative behaviors of their own children, however, they primarily attributed to situational and non-parental effects, shielding themselves from the possibility that it was poor parenting on their part that led to negative behaviors. Although this attribution strategy may protect the ego of the parents, it likely inhibits the ability of the parents to correctly identify any deficits in their parenting technique and correct the negative behavior.

CHAPTER FOUR

Conclusions

The popular nature of research in self-serving bias means that there is a considerable amount of data to sift through in order to draw meaningful conclusions. This paper is merely a start to the endeavor that is necessary if answers are to be deduced with any degree of certainty. Regardless, several key points emerge from the presented research:

- *There exists a “preferred,” adaptive level of self-serving bias.* It has been demonstrated in a variety of different circumstances that both higher-than-average and lower-than-average expression of self-serving bias results in negative outcomes. This preferred value likely varies between individuals depending on a number of factors, including age, gender, and culture.
- *Level of self-serving bias expressed varies between populations.* Based on the information here, it is possible to characterize individuals that would be expected to exhibit very high or very low levels of self-serving bias. The highest level of self-serving bias would be expected in a very young or elderly, extroverted, narcissistic, ADHD individual from a Western culture. The lowest level of self-serving bias would be expected in an adult Japanese female who is both introverted and suffers from depression.
- *Level of self-serving bias within an individual can vary with environment.* A person may be more self-serving about classroom performance than about politics, for instance.

- *Various mental disorders are correlated with a modified self-serving bias.*

There are studies showing relationship between self-serving bias and depression, mania, bipolar disorder, eating disorders, schizophrenia, ADHD, and more. Some of these diseases (like depression) have been well-studied in relation to self-serving bias, while others (like schizophrenia) have yet to demonstrate conclusive results.

These are a few of the conclusions that can be made with relative certainty from available research on self-serving bias. More research is clearly required for the many other hypotheses in the literature to be tested.

Sources of Error

Mezulis et al. (2004) reported an attenuated self-serving bias in ADHD individuals, contradicting the results of a variety of studies, including that of Hoza et al. (2000). One possible reason for this discrepancy highlights an important issue in research on self-serving bias: self-serving bias is a somewhat broad term that encompasses multiple, more specific biases, including processes such as positive illusory bias and self-enhancement bias. Furthermore, certain groups may exhibit one type of self-serving bias without exhibiting another. Thus, researchers should be thorough in their research and, if claims about self-serving bias as a whole are made, to have evaluated multiple types of self-serving bias to ensure that such claims are substantiated.

Duval and Silva (2002) stated that while the evidence for a tendency to internally attribute positive events was strong, the evidence for a tendency to externally attribute negative events is conflicting and inconsistent. This throws the entire concept of a self-serving bias into question. They blame excessively varying methodologies for this

confusion regarding failure attributions. Although they raise a valid argument, a cognitive process does not have to involve self-serving attributions of both success and failure for it to be self-serving bias. Self-serving bias is any cognitive process by which an individual distorts their perception of reality in order to maintain their ego. Over-attribution of success internally falls under this definition without failure being involved, so to call the existence of self-serving bias as a whole into question is likely unfounded.

Directions for Future Research

A number of areas need further research related to self-serving bias. Perhaps foremost among these is the relationship between mental disorders other than depression and self-serving bias. Such research in this area may lead to psychotherapeutic treatments for the studied disorders; at the very least, they will broaden our understanding of the disease.

Duval and Silva (2002), suggested that future research focus on the differences between attributional bias for success and failure. While attributions for success remain relatively consistent, attributions for failure are more varied, raising the question of which cases exhibit both sides of self-serving bias and which exhibit only modified attributions for failure.

The effect of emotional state on self-serving bias has received conflicting reports, meriting further investigation. This may be especially significant, as it is likely that the success or failure that leads to possibly biased attributions will also prompt changes in affect. It is thus possible that many self-serving attributions are, in fact, made when an individual is experience either positive or negative affect, rather than a neutral emotional

state. More evidence for how emotion affects self-serving bias is necessary to further our understanding of the process.

Finally, one type of study is no longer necessary. The vast majority of studies on self-serving bias, including current research, merely investigate whether or not self-serving bias occurs in a certain population. The ubiquitous nature of self-serving bias is no longer in question. Some populations, however, display different noteworthy levels of self-serving bias, such as adult females and the Japanese. Research comparing the levels of self-serving bias between such populations is needed. The time spent on research confirming that self-serving bias is exhibited in yet another specific population could be better spent elsewhere.

REFERENCES

- Abramson, L. Y., & Alloy, L. B. (1981). Depression, nondepression, and cognitive illusions: Reply to Schwartz. *Journal of Experimental Psychology: General*, *110*, 436–447. doi:10.1037/0096-3445.110.3.436
- Acker, D., & Duck, N. W. (2008). Cross-cultural overconfidence and biased self-attribution. *The Journal of Socio-Economics*, *37*, 1815–1824. doi:10.1016/j.socec.2007.12.003
- Aldridge, L., & Islam, M. R. (2012). Cultural differences in athlete attributions for success and failure: The sports pages revisited. *International Journal of Psychology*, *47*, 67–75. doi:10.1080/00207594.2011.585160
- Blackwood, N. J., Bentall, R. P., ffytche, D. H., Simmons, A., Murray, R. M., & Howard, R. J. (2003). Self-responsibility and the self-serving bias: An fMRI investigation of causal attributions. *NeuroImage*, *20*, 1076–1085. doi:10.1016/S1053-8119(03)00331-8
- Brown, R. P., Budzek, K., & Tamborski, M. (2009). On the meaning and measure of narcissism. *Personality and Social Psychology Bulletin*, *35*, 951–964. doi:10.1177/0146167209335461
- Cabanis, M., Pyka, M., Mehl, S., Müller, B. W., Loos-Jankowiak, S., Winterer, G., ... Kircher, T. (2013). The precuneus and the insula in self-attributional processes. *Cognitive, Affective & Behavioral Neuroscience*, *13*, 330–345. doi:10.3758/s13415-012-0143-5
- Coleman, M. D. (2011). Emotion and the self-serving bias. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues*, *30*, 345–354. doi:10.1007/s12144-011-9121-2
- de Raedt, R., & Ponjaert-Kristoffersen, I. (2006). Self-serving appraisal as a cognitive coping strategy to deal with age-related limitations: An empirical study with elderly adults in a real-life stressful situation. *Aging & Mental Health*, *10*, 195–203. doi:10.1080/13607860500311904
- Duval, T. S., & Silvia, P. J. (2002). Self-awareness, probability of improvement, and the self-serving bias. *Journal of Personality and Social Psychology*, *82*, 49–61. doi:10.1037/0022-3514.82.1.49
- Eccles, J., Wigfield, A., Harold, R. D., & Blumenfeld, P. (1993). Age and gender differences in children's self- and task perceptions during elementary school. *Child Development*, *64*, 830–847. doi:10.2307/1131221

- Faravelli, C., Scarpato, M. A., Castellini, G., & Lo Sauro, C. (2013). Gender differences in depression and anxiety: The role of age. *Psychiatry Research, 210*, 1301–1303. doi:10.1016/j.psychres.2013.09.027
- Friedrich, J. (1996). On seeing oneself as less self-serving than others: The ultimate self-serving bias? *Teaching of Psychology, 23*, 107–109. doi:10.1207/s15328023top2302_9
- Gerrard, M., Gibbons, F. X., Reis-Bergan, M., & Russell, D. W. (2000). Self-esteem, self-serving cognitions, and health risk behavior. *Journal of Personality, 68*, 1177–1201. doi:10.1111/1467-6494.00131
- Gervais, S., & Odean, T. (2001). Learning to be overconfident. *Review of Financial Studies, 14*, 1–27. doi:10.1093/rfs/14.1.1
- Heine, S. J., & Lehman, D. R. (1997). The cultural construction of self-enhancement: An examination of group-serving biases. *Journal of Personality and Social Psychology, 72*, 1268–1283. doi:10.1037/0022-3514.72.6.1268
- Heine, S. J., Lehman, D. R., Markus, H. R., & Kitayama, S. (1999). Is there a universal need for positive self-regard? *Psychological Review, 106*, 766–794. doi:10.1037/0033-295X.106.4.766
- Higgins, N. C., & Bhatt, G. (2001). Culture moderates the self-serving bias: Etic and emic features of causal attributions in India and in Canada. *Social Behavior and Personality, 29*, 49–61. doi:10.2224/sbp.2001.29.1.49
- Hoza, B., Waschbusch, D. A., Pelham, W. E., Molina, B. S. G., & Milich, R. (2000). Attention-deficit/hyperactivity disorder and control boys' responses to social success and failure. *Child Development, 71*, 432–446. doi:10.1111/1467-8624.00155
- Hymes, R. W., & Akiyama, M. M. (1991). Depression and self-enhancement among Japanese and American students. *The Journal of Social Psychology, 131*, 321–334.
- Jacobs, J. E., Lanza, S., Osgood, D. W., Eccles, J. S., & Wigfield, A. (2002). Changes in children's self-competence and values: Gender and domain differences across grades one through twelve. *Child Development, 73*, 509–527. doi:10.1111/1467-8624.00421
- Jansen, A., Smeets, T., Martijn, C., & Nederkoorn, C. (2006). I see what you see: The lack of a self-serving body-image bias in eating disorders. *British Journal of Clinical Psychology, 45*, 123–135. doi:10.1348/014466505X50167
- Jundt, D. K., & Hinsz, V. B. (2002). Influences of positive and negative affect on decisions involving judgmental biases. *Social Behavior and Personality, 30*, 45–52. doi:10.2224/sbp.2002.30.1.45

- Kriss, P. H., Loewenstein, G., Wang, X., & Weber, R. A. (2011). Behind the veil of ignorance: Self-serving bias in climate change negotiations. *Judgment and Decision Making*, *6*, 602–615.
- Krusemark, E. A., Campbell, W. K., & Clementz, B. A. (2008). Attributions, deception, and event related potentials: An investigation of the self-serving bias. *Psychophysiology*, *45*, 511–515. doi:10.1111/j.1469-8986.2008.00659.x
- Kuiper, N. A. (1978). Depression and causal attributions for success and failure. *Journal of Personality and Social Psychology*, *36*, 236–246. doi:10.1037/0022-3514.36.3.236
- Loughran, T. A., Paternoster, R., Piquero, A. R., & Fagan, J. (2013). A good man always knows his limitations: The role of overconfidence in criminal offending. *Journal of Research in Crime and Delinquency*, *50*, 327–358.
- Lyon, H. M., Startup, M., & Bentall, R. P. (1999). Social cognition and the manic defense: Attributions, selective attention, and self-schema in bipolar affective disorder. *Journal of Abnormal Psychology*, *108*, 273–282. doi:10.1037/0021-843X.108.2.273
- McAllister, H. A. (1996). Self-serving bias in the classroom: Who shows it? Who knows it? *Journal of Educational Psychology*, *88*, 123–131. doi:10.1037/0022-0663.88.1.123
- McPeck, R., Nichols, A. L., Classen, S., & Breiner, J. (2011). Bias in older adults' driving self-assessments: The role of personality. *Transportation Research Part F: Traffic Psychology and Behaviour*, *14*, 579–590. doi:10.1016/j.trf.2011.06.001
- Meyer, T. D., Barton, S., Baur, M., & Jordan, G. (2010). Vulnerability factors for bipolar disorders as predictors of attributions in ability-based and chance-based tests. *Journal of Individual Differences*, *31*, 29–37. doi:10.1027/1614-0001/a000004
- Mezulis, A. H., Abramson, L. Y., Hyde, J. S., & Hankin, B. L. (2004). Is there a universal positivity bias in attributions? A meta-analytic review of individual, developmental, and cultural differences in the self-serving attributional bias. *Psychological Bulletin*, *130*, 711–747. doi:10.1037/0033-2909.130.5.711
- Montemayor, R., & Ranganathan, C. (2012). Asian-Indian parents' attributions about the causes of child behavior: A replication and extension with parents from Chennai, India. *The Journal of Genetic Psychology*, *173*, 374–392. doi:10.1080/00221325.2011.614649
- Moritz, S., Woodward, T. S., Burlon, M., Braus, D. F., & Andresen, B. (2007). Attributional style in schizophrenia: Evidence for a decreased sense of self-causation in currently paranoid patients. *Cognitive Therapy and Research*, *31*(3), 371–383. doi:10.1007/s10608-006-9070-5

- Nurmi, J.-E. (1992). Cross-cultural differences in self-serving bias: Responses to the Attributional Style Questionnaire by American and Finnish students. *The Journal of Social Psychology, 132*, 69–76. doi:10.1080/00224545.1992.9924689
- Plumert, J. M. (1995). Relations between children's overestimation of their physical abilities and accident proneness. *Developmental Psychology, 31*, 866–876. doi:10.1037/0012-1649.31.5.866
- Ross, H., Smith, J., Spielmacher, C., & Recchia, H. (2004). Shading the truth: Self-serving biases in children's reports of sibling conflicts. *Merrill-Palmer Quarterly: Journal of Developmental Psychology, 50*, 61–85. doi:10.1353/mpq.2004.0005
- Scanlan, T. K., & Passer, M. W. (1980). Self-serving biases in the competitive sport setting: An attributional dilemma. *Journal of Sport Psychology, 2*, 124–136.
- Seidel, E.-M., Eickhoff, S. B., Kellermann, T., Schneider, F., Gur, R. C., Habel, U., & Derntl, B. (2010). Who is to blame? Neural correlates of causal attribution in social situations. *Social Neuroscience, 5*, 335–350. doi:10.1080/17470911003615997
- Seidel, E.-M., Satterthwaite, T. D., Eickhoff, S. B., Schneider, F., Gur, R. C., Wolf, D. H., ... Derntl, B. (2012). Neural correlates of depressive realism — an fmri study on causal attribution in depression. *Journal of Affective Disorders, 138*, 268-276. doi:10.1016/j.jad.2012.01.041
- Sherman, D. K., & Kim, H. S. (2005). Is there an “I” in “team”? The role of the self in group-serving judgments. *Journal of Personality and Social Psychology, 88*, 108–120. doi:10.1037/0022-3514.88.1.108
- Snow, R. D. (1996, May). The self-serving bias in children. *Dissertation Abstracts International, 56*, 6422. Abstract retrieved from PsycInfo database. (Accession No. 1996-95009-024)
- Stipek, D., & Iver, D. M. (1989). Developmental change in children's assessment of intellectual competence. *Child Development, 60*, 521. doi:10.2307/1130719
- Tamborski, M., Brown, R. P., & Chowning, K. (2012). Self-serving bias or simply serving the self? Evidence for a dimensional approach to narcissism. *Personality and Individual Differences, 52*, 942–946. doi:10.1016/j.paid.2012.01.030
- Taylor, D. M., & Doria, J. R. (1981). Self-serving and group-serving bias in attribution. *The Journal of Social Psychology, 113*, 201–211. doi:10.1080/00224545.1981.9924371

- Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, *103*, 193–210.
doi:10.1037/0033-2909.103.2.193
- Toner, M. A., & Heaven, P. C. L. (2005). Peer-social attributional predictors of socio-emotional adjustment in early adolescence: A two-year longitudinal study. *Personality and Individual Differences*, *38*, 579–590.
doi:10.1016/j.paid.2004.05.013
- van Leeuwen, N., Rodgers, R. F., Gibbs, J. C., & Chabrol, H. (2014). Callous-unemotional traits and antisocial behavior among adolescents: The role of self-serving cognitions. *Journal of Abnormal Child Psychology*, *42*, 229–237.
doi:10.1007/s10802-013-9779-z
- Yehudah, Y. B. (2002). Self-serving attributions in teachers' explanations of students' performance in a national oral essay competition. *Social Behavior and Personality*, *30*, 411–416. doi:10.2224/sbp.2002.30.4.411
- Zhang, S., & Li, C.-S. R. (2012). Functional connectivity mapping of the human precuneus by resting state fMRI. *NeuroImage*, *59*, 3548–3562.
doi:10.1016/j.neuroimage.2011.11.023