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Is There a Universal Positivity Bias in Attributions? A Meta-Analytic Review of Individual, Developmental, and Cultural Differences in the Self-Serving Attributional Bias

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Researchers have suggested the presence of a self-serving attributional bias, with people making more internal, stable, and global attributions for positive events than for negative events. This study examined the magnitude, ubiquity, and adaptiveness of this bias. The authors conducted a meta-analysis of 266 studies, yielding 503 independent effect sizes. The average *d* was 0.96, indicating a large bias. The bias was present in nearly all samples. There were significant age differences, with children and older adults displaying the largest biases. Asian samples displayed significantly smaller biases ($d = 0.30$) than U.S. ($d = 1.05$) or Western ($d = 0.70$) samples. Psychopathology was associated with a significantly attenuated bias ($d = 0.48$) compared with samples without psychopathology ($d = 1.28$) and community samples ($d = 1.08$). The bias was smallest for samples with depression (0.21), anxiety (0.46), and attention-deficit/hyperactivity disorder (0.55). Findings confirm that the self-serving attributional bias is pervasive in the general population but demonstrates significant variability across age, culture, and psychopathology.

> People have a need to view themselves positively. This is easily the most common and consensually endorsed assumption in research on the self. (Heine, Lehman, Markus, & Kitayama, 1999, p. 766)

For decades, researchers from diverse perspectives have argued that there is a positivity bias in human cognition. According to this view, people seek a positive image of themselves and their environments with such vigor that reality is at times selectively interpreted and at other times patently ignored. Heider (1958) noted that cognition is influenced not only by the objective evidence but also by the subjective needs, desires, and preferences of the individual such that the individual's positive outlook is maintained. Such positivity seeking may serve an adaptive function. Allport (1937) labeled this positivity seeking "nature's eldest law" (p. 48)—a way for the individual to protect the fragile ego from the blows of reality. Tiger (1979) suggested that such optimism has become pervasive in human cognition through natural selection processes. Taylor and Brown (1988) similarly argued that the tendency to engage in "positive illusions" about the self is a widespread feature of human cognition that allows for the maintenance of mental health. Clinically oriented researchers have long proposed that the breakdown or absence of positive cognitive biases would be associated with a breakdown in normal functioning and may be associated with psychopathology (e.g., Abramson & Alloy, 1981; Alloy, Albright, Abramson, & Dykman, 1990).

The self-serving attributional bias is one positivity bias in cognition. Heider (1976) observed that "one is inclined to attribute to oneself good things, but one suffers when one has to attribute to oneself something that is not so good" (p. 16). The result is the self-serving attributional bias: People are more likely to attribute positive events to themselves but dismiss negative events as attributable to other causes. Several comprehensive reviews have concluded that the self-serving attributional bias is a robust and amply demonstrated phenomenon in human cognition (Anderson, Krull, & Weiner, 1996; Bradley, 1978; W. K. Campbell & Sedikides, 1999; Greenberg, Pyszczynski, & Solomon, 1982; Heider, 1958; D. T. Miller, 1976; D. T. Miller & Ross, 1975; Sedikides & Strube, 1995; Zuckerman, 1979). Moreover, a growing body of evidence has suggested that the self-serving attributional bias is an adaptive feature of human cognition that is consistently associated with mental and physical health. The self-serving attributional bias has been associated with greater self-reported trait happiness (Kuiper, 1978; Rizley, 1978), less depression (Abramson & Alloy, 1981), more positive mood states (McFarland & Ross, 1982), better problem solving (Isen & Means, 1983), better immune functioning (Taylor et al., 2000), and lower mortality and morbidity longitudinally (C. Peterson & Seligman, 1987). By contrast, an attenuated or absent self-serving attributional bias has been associated with depression (Sweeney, Anderson, & Bailey, 1986); worse physical health (Lee & Seligman, 1997; C. Peterson, Seligman, & Vaillant, 1988); and worse academic, work, and athletic performance (C. Peterson & Barrett, 1987; Seligman, Nolen-Hoeksema, Thornton, & Thornton, 1990).

In recent years, however, a heated debate has arisen around the universality of the self-serving attributional bias. Is the self-serving attributional bias truly widespread in human cognition? Is the absence of such a bias always associated with poor adaptation? Heine et al. (1999) suggested that the use of cognitive strategies such as the self-serving attributional bias to fuel a positive self-concept is an assumption by Western researchers that is rarely challenged empirically. They noted that "researchers have a solid

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understanding of self-evaluation for the average North American research participant . . . [but] considerably less research has been conducted outside [of this population]" (Heine et al., p. 766). The bulk of the research supporting the ubiquity of positive illusions in general and the self-serving attributional bias in particular has been conducted with normally functioning college students and adults in predominantly White, Western cultures such as the United States.

The existing narrative and meta-analytic reviews address only small segments of the relevant literature on the self-serving attributional bias and do not represent the wealth of data from the past 40 years on attributional patterns across diverse populations. The classic narrative reviews (Bradley, 1978; Greenberg et al., 1982; D. T. Miller, 1976; D. T. Miller & Ross, 1975; Zuckerman, 1979) that are most often cited as evidence of the self-serving attributional bias are too out of date for a current examination of this issue, and they reviewed only experimental studies in which college students were the primary participants. More recently, three meta-analyses have been conducted on small portions of the self-serving attributional bias literature. Two were restricted to examining the magnitude of the self-serving bias in the specific domains of interpersonal influence (Arkin, Cooper, & Kolditz, 1980) and naturalistic sports events (Mullen & Riordan, 1988). Both had very small sample sizes. More recently, W. K. Campbell and Sedikides (1999) conducted a meta-analysis of 70 studies in which the self-serving bias was examined. However, they selected only experimental studies and excluded any study including children, individuals from non-Western cultures, or individuals with psychopathology. W. K. Campbell and Sedikides also included only studies identified by using the search term *self-serving bias*, thus failing to include a range of studies in which attributional patterns were measured to address research questions not directly related to the self-serving bias. Although these three meta-analyses reported positive effect sizes for the self-serving attributional bias in the moderate to large range (0.38 to 0.67), the actual magnitude and ubiquity of the self-serving attributional bias remain unknown because of the limited scope of reviews to date.

Another important question is whether the self-serving attributional bias is in fact ubiquitous across populations that differ in age, culture, gender, psychopathology, and other factors. Few reviews have examined individual-difference factors that may affect the presence and/or magnitude of the self-serving attributional bias. Moderator analyses of the self-serving bias have been restricted to methodological factors (e.g., question wording style, Whitley & Frieze, 1986; self-threat manipulations, W. K. Campbell & Sedikides, 1999) and three small early reviews of gender differences in attributions (Frieze, Whitley, Hanusa, & McHugh, 1982; Sohn, 1982; Zuckerman, 1979). No review to date has systematically reviewed other individual-difference moderators of the self-serving attributional bias, such as age, culture, and psychopathology. However, several empirical studies and literature reviews have compared the self-serving attributional bias in Western cultures with that observed in Eastern cultures (Anderson, 1999; Crittenden & Bae, 1994; Heine et al., 1999) and concluded that the self-serving bias is a uniquely Western phenomenon that is absent or strongly attenuated in non-Western cultures. It has been similarly argued that the bias may be absent or even reversed in some psychopathological samples, such as individuals with depression (the so-called *negativity bias*; Beck, 1967, 1987; Sweeney et al., 1986). By contrast, developmental researchers have suggested that children may display an inordinately large positivity bias that declines with age (Stipek & MacIver, 1989). Despite these challenges to the assumed ubiquity of the self-serving attributional bias, no comprehensive review has been conducted of this literature to fully address questions regarding the magnitude and ubiquity of this bias in human cognition.

Finally, if in fact the self-serving attributional bias serves an adaptive function in contributing to the maintenance of mental health, does it necessarily follow that the absence or attenuation of this bias is associated with poor mental health? Although several studies have examined the relationship between attributional patterns and depression (see Sweeney et al., 1986, for a review), little is known about the presence or magnitude of the self-serving attributional bias in other psychopathological groups.

The Current Study

In the current study, we use the technique of meta-analysis to address the following core questions about the magnitude, ubiquity, and adaptiveness of the self-serving attributional bias:

1. What is the magnitude of the self-serving attributional bias in the general population?

2. Does the self-serving attributional bias exist among all groups, or is there such a phenomenon as a negativity bias in some populations?

3. Does the magnitude of the self-serving attributional bias vary across the life span? and Developmentally, at what ages is the bias most and least pronounced?

4. Does the magnitude of the self-serving attributional bias vary according to gender?

5. Does the magnitude of the self-serving attributional bias vary with psychopathology?

6. Does the magnitude of the self-serving attributional bias vary across culture?

Defining the Self-Serving Attributional Bias

The *self-serving attributional bias* is defined as the tendency of individuals to make attributions for positive events that are more internal, stable, and global than their attributions for negative events. One important limitation of the existing reviews of the self-serving bias in psychologically healthy populations is that they have defined this bias as a pattern of making more internal attributions for success than for failure (Arkin et al., 1980; Bradley, 1978; W. K. Campbell & Sedikides, 1999; D. T. Miller & Ross, 1975; Mullen & Riordan, 1988; Zuckerman, 1979). "Internal" attributions are typically defined as attributions to either ability or effort. However, Abramson, Metalsky, and Alloy (1989) suggested that the internality of attributions alone gives little information as to whether they are indeed self-serving. Abramson and colleagues have emphasized three dimensions of attributions (internality, stability, and globality) as critical for whether attributions are self-serving. Specifically, they hypothesized that a style of attributing negative events to internal, stable, and global causes

(such as lack of ability, personality flaws, or other traits) would be associated with lowered self-esteem but that attributing such events to internal, unstable, and specific causes (such as lack of effort) would not. When negative events are attributed to internal, unstable, specific causes, the individual may alter his or her behavior to avoid a negative outcome in the future or may realistically expect that negative outcomes in other domains may be avoided. By contrast, attributing negative events to internal, stable, and global causes suggests that negative events are likely to recur in the future across a wide variety of domains, leading to widespread pessimism or hopelessness (Janoff-Bulman, 1979). Thus, the internality dimension alone may be insufficient for establishing a self-serving pattern in attributions. Instead, the combination of the internality, stability, and globality dimensions is crucial for designating the self-serving attributional bias.

Individual-Difference Factors Influencing the Magnitude of the Self-Serving Attributional Bias

Psychopathology. One of the repeated claims about the self-serving attributional bias is that it serves to maintain or enhance a positive self-image that is necessary for the maintenance of mental health (Heider, 1958; Taylor & Brown, 1988). Thus, examining the association of this bias with mental health provides the strongest evidence regarding its adaptive function. If the self-serving attributional bias is necessary for mental health, then it is to be expected that an absent or attenuated self-serving attributional bias will be associated with psychopathology.

As early as 1978, Abramson and colleagues (Abramson, Seligman, & Teasdale, 1978; Abramson & Alloy, 1981; Abramson et al., 1989; Alloy et al., 1990) proposed a cognitive model of depression featuring a "depressive" attributional style that stands in stark contrast to the self-serving attributional bias displayed by individuals without depression. They suggested that people who attribute negative events to internal, stable, and global causes (such as incompetence, inability, or a personality flaw) would be particularly vulnerable to depression when negative events occur, whereas people who dismissed negative events as caused by external, unstable, and specific factors (such as bad luck) would not. This perspective foreshadowed Taylor and Brown's (1988) argument that positive illusions such as the self-serving attributional bias serve an adaptive function for mental health, namely to buffer individuals from negative psychological consequences of negative events.

Since Abramson and colleagues introduced the concept of a depressive attributional style, many studies have examined attributional biases among depressed individuals. In a thorough meta-analysis, Sweeney et al. (1986) found that internal, stable, and global attributions for failure were positively related to depression and that internal, stable, global attributions for success were negatively related to depression. Similar meta-analyses evaluating the relationship of attributional style and depression have been conducted with children and adolescents, with comparable findings (Gladstone & Kaslow, 1995; Joiner & Wagner, 1995).

We expected to find that the overall magnitude of the bias in depressed samples is less than that found in nondepressed populations. However, it is less clear whether depressed individuals will show an attenuated, absent, or reverse positivity bias relative to nondepressed individuals. Alloy et al. (1990) argued that depressed individuals display "depressive realism" or a greater even-handedness in their interpretations of events relative to nondepressed individuals that would suggest an attenuated or absent bias. Beck (1967, 1987), on the other hand, has argued that depressed individuals in fact display a negativity bias. A negativity bias is present if depressed individuals make less internal, stable, global attributions for success than they do for failure; in other words, a person who exhibits a negativity bias takes more blame for failure than credit for success.

Second, if the self-serving attributional bias contributes to mental health, then it is to be expected that an absent or attenuated self-serving attributional bias may be associated with other types of psychopathology. Extending the study of the self-serving attributional bias to nondepressed psychopathological groups will address whether this bias is negatively associated with psychopathology in general, with certain types of psychopathology, or is attenuated in depression only. Given the claim that the self-serving attributional bias is associated with the maintenance of a positive self-image, we predicted that an attenuated bias may be associated not only with depression but also with other types of internalizing psychopathological disorders in which self-blame and/or poor self-esteem are typically present, such as anxiety (Garber, Weiss, & Shanley, 1993; Girodo, Dotzenroth, & Stein, 1981; Hope, Gansler, & Heimberg, 1989). To date, however, there have been no systematic reviews of attributional patterns in anxious individuals.

Another group of interest to the current study is individuals who have been sexually, physically, or emotionally abused. Rose and Abramson (1992) hypothesized that abuse or maltreatment may contribute to a child's development of maladaptive attributional patterns because it is typically associated with explicit or implicit emotional abuse, in which the perpetrator tells the victim that the victim is personally responsible for the abuse. In turn, the victim may develop a pattern of making more internal, stable, and global attributions for negative events. Rose, Abramson, Hodulik, Halberstadt, and Leff (1994) found that retrospective reports of sexual assault predicted more internal, stable, and global attributions for negative events in psychiatric inpatients.

As several researchers have noted, there may be conditions under which positive illusions compromise, rather than enhance, mental health (Alloy et al., 1990; Taylor & Brown, 1994). Excessively unrealistic self-enhancing biases may result in illusions of invulnerability. Thus, an exaggerated self-serving attributional bias may be associated with poor mental health as well. We expected that the self-serving attributional bias may be exaggerated in some psychopathological groups, such as those with psychotic or externalizing symptoms. The current meta-analysis examined the self-serving bias in psychotic samples, such as individuals with schizophrenia, paranoid disorder, delusional disorder, and bipolar disorder. Such populations are reputed to have a more tenuous grasp on reality and may exaggerate their own personal invulnerability. In so doing, they may display a larger self-serving attributional bias than individuals without these psychological disorders. We also examined the self-serving attributional bias in individuals with attention-deficit/hyperactivity disorder (ADHD). Some researchers suggest that ADHD is associated with excessively optimistic self-perceptions (Hoza, Waschbusch, Pelham, Molina, & Milich, 2000).

Age. To date, no systematic review has examined the developmental trajectory of the self-serving attributional bias. Even if a

self-serving bias is present in all age ranges, its magnitude may vary, shedding light on the origins and development of this bias across the life span. Several studies have suggested that children may display a particularly large positivity bias in attributions compared with other age groups. Children's self-ratings of ability, competence, self-esteem, and expectations of future success are high in early childhood but decline with age (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Plumert, 1995; Stipek, 1984; Stipek & MacIver, 1989). The decline in children's positive self-evaluations has been attributed to motivational factors, such as a need to maintain self-esteem and self-worth that is strongest in childhood (Ruble, Eisenberg, & Higgins, 1994; Stipek, 1984). The decline in children's apparent positivity bias also has been attributed to cognitive development, with children progressing from "wishful thinking," or an inability to distinguish wishes from reality, to cognitive processing that increasingly takes into account actual information and conforms to information-processing rules used by adults (Klaczynski & Fauth, 1997; Schuster, Ruble, & Weinert, 1998). For example, in the middle childhood period (8–11 years old), children begin to conceptualize ability as a stable trait that they may not have; thus, at about this age, one should expect to see some declines in the positivity of attributions as ability attributions for failure begin to appear (Harter, 1993). Thus we expected that children may display a larger positivity bias in attributions relative to other age groups.

Adolescence is a developmental period associated with increased rates of depression and decreased self-esteem. The prevalence of depression is relatively low in children under age 11 (less than 6%), but it rises dramatically to between 12% and 25% by age 18 (Hankin et al., 1998). With age, individuals also may accumulate more negative events and be able to observe systematic relationships between aspects of their own dispositions and negative outcomes. For example, the transition from grade school to junior high or middle school (at around age 12 or 13) has been documented as a very stressful transition that is associated with declines in self-esteem and competence beliefs (Blyth, Simmons, & Carlton-Ford, 1983; Fenzel, 2000; Hankin et al., 1998; Wigfield & Eccles, 1994). We expected to see an associated decline in the magnitude of the self-serving attributional bias in the adolescent period. If the magnitude of the self-serving attributional bias displays a similar developmental trajectory to depression, we would expect that the magnitude of the bias may stabilize by adulthood.

Some studies have suggested that older adults may show a reduced positivity bias (Lachman & McArthur, 1986). Observers typically make attributions for the failures and successes of older adults that are more negative than the attributions they make for the failures and successes of younger individuals. Compared with younger adults, failures of older people are more likely to be attributed to internal and stable causes, such as age or inability, and successes of older people are attributed less to internal and stable causes (Banziger & Drevenstedt, 1982; Reno, 1979). It is possible that these external perceptions have negative effects on the self-attributions of older adults. It is also possible that such negative external attributions are accurate and are selected by older adults as attributions for their own successes and failures.

Gender. Whether gender differences in attributional patterns exist has been a subject of extensive investigation, and several theoretical models of gender differences in attributions have been proposed. Several reviews, however, have challenged the expectation of gender differences in attributional patterns. In a meta-analysis of 21 studies, Frieze and colleagues (1982) concluded that "there are no strongly supported sex differences in attributions" (p. 341). Sohn (1982) reported in another meta-analysis that the average effect size for gender differences in attributions was 0.01, indicating no meaningful difference between the sexes. However, these meta-analyses are not only dated but also did not directly address gender differences in the magnitude of the self-serving attributional bias, defined as the difference in attributions for success as compared with failure.

Perhaps one of the reasons previous reviews have not found a gender difference in attributions is that they have not examined age by gender interactions. Most self-report studies of attributional style in children have yielded no gender differences, although in some cases, boys had the more negative attributional pattern (see, e.g., Nolen-Hoeksema, Girgus, & Seligman, 1991). Dweck's behavioral studies have found that in early elementary school, girls tend to make more ability attributions for failure than do boys (e.g., Diener & Dweck, 1978). Other studies have found that gender differences vary by domain, with boys citing more competency in traditionally masculine activities (sports and math) and girls citing more competency beliefs in traditionally feminine activities (reading and music; Eccles, Wigfield, Harold, & Blumenfeld, 1993). Studies of attributional styles in adolescent (Hankin & Abramson, 2001) and adult (Boggiano & Barrett, 1991) samples have suggested that women have more negative attributional styles than men.

Gender differences in attributions may vary by age in patterns similar to those found in age trends for gender differences in depression and self-esteem, domains in which attributions play a pivotal role. For example, although there is virtually no gender difference in depression prior to age 11 or boys are more likely to be depressed in childhood, a gender difference emerges in adolescence such that by age 18, females are approximately twice as likely as males to become depressed (Hankin et al., 1998). Similarly, gender differences in self-esteem grow larger from early adolescence to late adolescence (Kling, Hyde, Showers, & Buswell, 1999). We examined the age trend in gender differences in attributions, anticipating that gender differences in the magnitude of the self-serving attributional bias may not emerge until adolescence.

Culture. One of the broadest challenges to the claim of the ubiquity of the self-serving attributional bias is that the majority of the research has been conducted with White, Western participants. Several cultural researchers have suggested that the self-serving attributional bias may be a uniquely Western phenomenon (Heine et al., 1999; Markus & Kitayama, 1991). Thus, examining the presence and magnitude of the self-serving attributional bias outside the U.S. and other Western cultures is critical.

One cross-cultural difference that may affect attributional patterns is the cultural emphasis on individualism versus collectivism. In individualistic cultures, such as most Western cultures, priority is assigned to the goals and identity of the individual (Triandis, 1989). In collectivist cultures, priority is given to the extended family and cultural groups, and the individual is seen not as independent but as interdependent with these groups. Markus and Kitayama (1991) suggested that independent cultures reference behavior and events to an individual's internal thoughts and ac-

tions, whereas interdependent cultures understand behavior as influenced more strongly by others. Similarly, Anderson et al. (1996) described how attributional processes are influenced by cultural "theories" about the causes of behavior. In Western cultures, theories about causality emphasize the individual as the source of outcomes. Consequently, Western individuals may reference dispositional rather than situational explanations for behavior. Other cultures, however, may have theories that emphasize situational factors. Individuals in collectivist cultures often believe that behavior is strongly influenced by context and social relationships (Shweder & Bourne, 1982; see also Choi, Nisbett, & Norenzayan, 1999). Thus, culturally based differences between self-focused attributions and other-focused attributions may contribute to differences in the self-serving attributional bias across cultural groups.

Heider's (1976) assertion that causal attributions serve to maintain self-esteem also may predict different patterns of attributions for success and failure across different cultural groups. Heine et al. (1999) argued that the need for maintaining a positive self-regard as currently conceptualized may be a uniquely North American phenomenon, because the concepts of *self* and *regard* differ significantly across cultures. Thus, a pattern of making internal, stable, and global attributions for success but not failure may not be self-serving in some cultures. Crittenden and Bae (1994) similarly argued that attributions are a social activity and that individuals in Asian cultures use attributions to manage their impressions on others, in part by making more self-effacing attributions than their Western counterparts. Markus and Kitayama (1991) have argued that self-criticism, not self-promotion, may be the prevalent social norm in many Asian cultures.

There also may be cultural differences in the relative importance of ability (an internal, stable, and global attribution) compared with effort (an internal, unstable, and typically specific attribution) as explanations for achievement or success. Salili (1996) argued that Asians make more effort attributions for both successes and failures than do Westerners, who are more likely to emphasize ability as an explanation for success.

No meta-analytic review of the self-serving attributional bias across cultures has yet been conducted. The majority of studies examined in the reviews to date (Arkin et al., 1980; Bradley, 1978; W. K. Campbell & Sedikides, 1999; D. T. Miller & Ross, 1975; Mullen & Riordan, 1988; Zuckerman, 1979) include Western, primarily U.S., samples that are predominantly White. The current meta-analysis includes studies from Western cultures, including both U.S. and non-U.S. samples (e.g., Canada, Australia, United Kingdom, and other parts of Western Europe), Asian, and non-Asian, non-Western cultures (e.g., Eastern Europe and Africa). In addition, we examine cultural differences in the self-serving attributional bias within the United States, comparing predominantly European American (referred to throughout as *White*) U.S. samples with Hispanic American, Asian American, African American, and Native American samples.

Methodological Issues in Research on the Self-Serving Attributional Bias

Given the vast literature accumulated on attributional patterns, it is not surprising that there is marked variability in methodology across studies. Methodological differences may affect the measurement of the self-serving attributional bias and thus must be considered as possible moderators of that bias as well.

Studies may assess the internality, stability, and globality of attributions for positive and negative events in categorical or dimensional terms. Categorically, it is typical for research participants to make attributions to one of four causes: ability, effort, task difficulty, or luck. Attribution to ability is typically interpreted as an internal, stable, and global attribution. Many studies examine the pattern of ability attributions for success as compared with failure events. Other studies use a dimensional approach, measuring internality, stability, and globality separately. The use of this dimensional operationalization of attributions became widespread with the 1982 publication of the Attributional Style Questionnaire (ASQ; C. Peterson et al., 1982), which assesses the internality, stability, and globality of attributions for hypothetical positive and negative events. The ASQ and adaptations of it are among the most commonly used self-report instruments of attributional patterns.

Another potential moderator is the type of outcome about which attributions are made. We categorized each study into one of three outcome types: hypothetical outcomes, experimentally manipulated outcomes, and naturalistic or real life event outcomes. Although Sweeney et al. (1986) similarly included studies using a range of event outcomes, other meta-analyses of the self-serving bias have been restricted to either experimentally manipulated outcomes (W. K. Campbell & Sedikides, 1999) or naturalistic studies (Mullen & Riordan, 1988).

Method

Sample of Studies

We used multiple methods to obtain relevant data. First, computerized database searches of PsycINFO and the Educational Resources Information Center for the years 1967 through 2001 were conducted to generate a pool of potential articles. Individual searches were run for the following search terms, with the asterisk being a truncation symbol that would retrieve any matching word string: *attribution**, *self-serving* or *self serving*, *explanatory style*, *optimis**, *causal** and (*explan** or *infer**), and *positiv** and (*bias* or *illus**). These terms were selected to capture the wide variety of theoretical approaches seen in this literature. Second, several reference lists were searched for relevant studies, including all prior meta-analyses and reviews of the self-serving attributional bias (Arkin et al., 1980; Bradley, 1978; W. K. Campbell & Sedikides, 1999; Frieze et al., 1982; Gladstone & Kaslow, 1995; Greenberg et al., 1982; Joiner & Wagner, 1995; D. T. Miller, 1976; D. T. Miller & Ross, 1975; Mullen & Riordan, 1988; Sohn, 1982; Sweeney et al., 1986; Whitley & Frieze, 1986; Zuckerman, 1979). Third, we used the ancestry method, searching the reference lists of retrieved studies for additional studies. In all, more than 17,500 studies were identified by these methods and considered for inclusion.

We included in the meta-analysis studies that met the following criteria. First, studies had to use a measure of attributions that allowed for classification along the dimensions of internality, stability, and globality. Specifically, studies had to use either dimensional ratings of internality, stability, and globality that allowed computation of a composite attributional style or use the attribution of ability, which may be considered an internal, stable, and global attribution. Second, study participants had to make attributions for both positive (or success) and negative (or failure) events in either a between-subjects or within-subjects design. Third, participants had to make attributions at the level of the self. Thus, we excluded all studies in which participants made attributions for others' behavior or for team performance. Finally, studies had to report data in such a way that an effect size could be calculated. In accordance with American Psycho-

logical Association recommendations on maintaining data, we contacted authors of articles from 1994–2001 for more information if necessary.

These search and review procedures led to a total of 266 useable articles. From these 266 articles, we computed 523 independent effect sizes. These studies comprised 41,538 participants.

In any meta-analysis, publication bias is a concern. Publication bias is most likely to occur if studies finding insignificant results for the effect being examined are systematically less likely to be published than studies finding significant results. In the current study, the search yielded a large number of studies in which examining the self-serving attributional bias was not the primary research question. We examined this hypothesis empirically, coding each article for whether the positivity bias in attributions was one of the central questions in the study. This was broadly operationalized as being mentioned in the title, abstract, or introduction and/or being cited as a research question or hypothesis. The results indicated that of 266 studies included in the meta-analysis, only 53 (20%) had the positivity bias in attributions as one of the central questions of the study. These 53 studies accounted for 105 (20%) of the 523 effect sizes included in the meta-analysis. Thus, the majority of studies, and effect sizes, included in the current meta-analysis did not have the positivity bias in attributions as a central research question. If the positivity bias was not one of the central questions, it should have no effect on whether the article was published. This significantly reduces the risk of publication bias.

Coding of Studies

Studies were coded for the following variables: (a) study design (within subjects or between subjects); (b) date of publication; (c) number of participants rating attributions for positive and negative events; (d) age (if the article reported no age but reported "undergraduates" or students in an introductory college course, the age was set equal to 20; if a grade level was reported, 6 years was added to that level to yield the age [e.g., fifth graders were recorded as 11-year-olds], and if only an age range was given, the midpoint of that range was used); (e) gender of the sample (90% or more male was coded male, 90% or more female was coded female; if the study reported less than 90% of one gender, it was coded mixed and coded unreported if no information was provided); (f) culture (U.S. with mixed or unreported ethnicity; U.S., 85% or more White; African American; Asian American; Hispanic American; Native American; United Kingdom/Canada; Western Europe; Australia/New Zealand; Russia/Eastern Europe; Indian; Japanese; Pacific Islander; other Asian [China and Korea]; and African); (g) psychopathology (unselected for presence or absence of psychopathology; selected for absence of psychopathology; depressive disorder; bipolar disorder; psychotic disorder [schizophrenia, paranoid disorder, or delusional disorder]; ADHD or externalizing disorder; substance abuse; anxiety disorder; abused; multiple diagnoses; and mixed psychopathology and nonpsychopathology); (h) type of outcome (hypothetical, experimental, naturalistic); (i) operationalization of attributions (categorical or dimensional); and (j) measure (ASQ; adaptations of the ASQ; Children's Attributional Style Questionnaire [CASQ; Seligman, Peterson, et al., 1984] or Children's Attributional Style Questionnaire—Revised [CASQ–R; Thompson et al., 1998]; Cognitive Style Questionnaire [CSQ; Alloy et al., 2002]; content analysis of verbal attributions; Math Attribution Scale [Fennema et al., 1979]; Multidimensional-Multiattributional Causality Scale [Lefcourt, von Baeyer, Ware, & Cox, 1979]; Intellectual Achievement Responsibility Questionnaire [Crandall, Katkovsky, & Crandall, 1965]; and other).

Calculation of Effect Sizes

We scored attribution measures in the internal, stable, and global direction (i.e., the higher the score, the more internal, stable, and global the attribution). When means and standard deviations were available, the effect size computed was *d*, defined as the mean internal, stable, global attribution for positive/success events minus the mean for negative/failure events, divided by the mean standard deviation (Hedges, 1981). Means and standard deviations were available for 380 (72.7%) of the 523 effect sizes.

When means and standard deviations were not available, the effect size was estimated. For 83 (15.9%) effect sizes, means and standard deviations were available for the unique dimensions of internality, stability, and globality but no composite mean or standard deviation was reported. Six articles reported correlations among the unique dimensions separately for positive and negative events. These correlations were averaged and used to compute average covariances between the dimensions. A composite mean was computed by summing the means for internality, stability, and globality separately for positive and negative events. A composite standard deviation (s^2_{comp}) was computed using the formula

$$s^2_{comp} = s^2_i + s^2_s + s^2_g + 2(c_{is} + c_{ig} + c_{sg}),$$

where s^2_i, s^2_s, and s^2_g are the standard deviations for internality, stability, and globality (respectively), and c_{is}, c_{ig}, and c_{sg} were computed average covariances from available data.

When *F* or *t* statistics were reported (30 effect sizes, or 5.7%), *d* was computed using the formula

$$d = \frac{(N_p + N_n) * F}{(N_p * N_n)},$$

where N_p is the number of participants making attributions for positive events, and N_n is the number of participants making attributions for negative events. If the study was a within-subjects design (12 effect sizes, or 2.3%), this estimated *d* value was then corrected for the correlation between participants' attributions for positive and negative events. Twenty-three studies reported a within-subjects correlation for attributions for positive and negative events, yielding an average correlation of .11 (range –.58 to .30). The within-subjects effect size estimates (d_{wi}) were corrected using the following formula provided by Morris and DeShon (2002):

$$d = d_{wi} * \sqrt{2}(1 - r).$$

If *F* or *t* tests were not available but significance level was reported (7 effect sizes, or 1.3%), the *F* value associated with that significance level was found and used to estimate effect size in the formula reported above.

Finally, 37 studies (7.1%) reported percentages of participants selecting ability as their attribution for positive and negative events. According to the procedure described by Glass, McGaw, and Smith (1981), these percentages were converted to *z*-scores. The effect size was computed as $d = z_p - z_n$.

All effect sizes were then corrected for bias in the estimation of population effect size using the formula provided by Hedges (1981). A positive effect size indicates the presence of a self-serving attributional bias (i.e., that participants made more internal, stable, and global attributions for positive/success events than they did for negative/failure events). A negative effect size indicates the reverse of a self-serving attributional bias (i.e., that participants made more internal, stable, and global attributions for negative/failure events than they did for positive/success events).

Given the variety of study designs and available data in the current meta-analysis, it was important to ensure the calculation of comparable effect sizes. Morris and DeShon (2002) outlined the requirements for combining effect sizes from different study designs. One requirement is that effect sizes from each design must estimate the same effect. In this case, all computed effect sizes estimated the difference in internal, stable, and global attributions made for positive versus negative events. Second, all effect sizes must be transformed into a common metric and reflect the appropriate variance in the sample. In the current study, within-subjects studies for which *d* was estimated from the *F* or *t* statistic were corrected for the correlation between participants' attributional ratings of positive and negative events.

Results

Magnitude of the Self-Serving Attributional Bias

Averaged over 523 independent effect sizes, the weighted mean effect size for the self-serving attributional bias was 0.88. The 95% confidence interval for *d* was 0.86 to 0.89. Descriptive information on each of the 523 effect sizes is included in Table 1. We used the procedure described by Huffcutt and Arthur (1995) to identify outlier data points. This procedure is specifically designed for detecting outliers in meta-analytic data and takes into account sample size and variability of the effect size in identifying outlier data points. This procedure identified 20 outlier effect sizes (3.8% of all effect sizes). These 20 effect sizes were eliminated from all further analyses. Averaged over the remaining 503 independent effect sizes, a fixed-effects model of the weighted mean effect size for the self-serving attributional bias was 0.90 (95% confidence interval = 0.88, 0.92). Homogeneity analyses using procedures specified by Hedges and Becker (1986) indicated that the set of 503 effect sizes was significantly nonhomogeneous ($H = 7{,}040$), compared with a critical value, $\chi^2(501, N = 503) = 553.00$, $p < .01$ (approximation; W. Beyer, 1966). We concluded that the set of effect sizes was heterogeneous.

To facilitate inferences from the current data to be generalized beyond the studies included in this meta-analysis, we chose to conduct random-effects analyses of the current data. Random-effects analyses allow inferences to be generalized beyond the observed studies to the population of similar studies (Hedges & Vevea, 1998). Random-effects analyses may also be more appropriate in situations in which there is significant heterogeneity among effect size parameters (Hedges & Vevea, 1998), as is clearly the case in the set of studies examined here.

Averaged over the 503 independent effect sizes, the random-effects estimate of the weighted mean effect size for the self-serving attributional bias was 0.96, representing a very large effect by Cohen's (1969) criteria. The 95% confidence interval for *d* was 0.89 to 1.02. The positive value indicates that, overall, individuals made more internal, stable, global attributions for positive/success events than they did for negative/failure events, reflecting a self-serving attributional bias. Homogeneity analyses indicated that the set of 503 effect sizes continued to be significantly nonhomogeneous ($H = 773$) compared with a critical value, $\chi^2(501, N = 503) = 553.00$, $p < .01$ (approximation; W. Beyer, 1966), although heterogeneity was considerably reduced by use of random-effects estimation. We concluded that the set of effect sizes was heterogeneous and continued with moderator analyses that partitioned the set of studies into more homogeneous subgroups, using the moderating factors that we hypothesized would predict effect size.

To test for publication bias, we plotted the inverse of the variance (where variance is v*, or variance adjusted by the between-studies variance component; see Hedges & Vevea, 1998) against the corrected effect size for each study. This funnel plot is shown in Figure 1. Trim and fill procedures (Duval & Tweedie, 2000a, 2000b) indicated that no studies needed to be trimmed to correct for publication bias.

Impact of Moderator Variables

Table 2 displays the number of effect sizes in each category of moderator variable and in pairwise combination of moderators.

Age differences. Effect sizes were divided into six subgroups on the basis of the average age of participants: (a) 8-to-11-year olds; (b) 12-to-14-year olds; (c) 15-to-18-year olds; (d) 19-to-24-year olds; (e) 25-to-55-year olds; and (f) over 55. These age groupings correspond generally to middle childhood or elementary school, early adolescence or middle school, late adolescence or high school, early adulthood or college, adulthood, and older adults, respectively.

The results of the analysis for age differences are shown in Table 3. Homogeneity analyses indicated that there were significant differences in the magnitude of the self-serving attributional bias (H_B) as a function of age group ($H_B = 40.36$) compared with a critical value, $\chi^2(5, N = 6) = 15.09$, $p < .01$. Overall, the self-serving attributional bias was most pronounced in children and in older adults. The self-serving attributional bias was least pronounced in adolescence and adulthood. However, it is important to note that the self-serving attributional bias demonstrated a large (greater than 0.60; Cohen, 1969) effect in all age groups. To compare specific age groups, we tested the contrasts using the procedure described in Hedges and Becker (1986). Children and older adults had significantly larger self-serving attributional biases compared with all other adolescent and adult age groups ($z^2 = 11.55$), compared with a critical value, $\chi^2(1, N = 2) = 6.63$, $p < .01$. Although it appears as if the self-serving bias has declined in early adolescence ($d = 0.78$) and then increased in middle adolescence ($d = 1.02$), the effect sizes from those two developmental periods are not significantly different from each other ($z^2 = 3.26$, $p > .05$). This is consistent with the hypothesis that children's exaggerated "positivity bias" attenuates as they approach adolescence (Ruble et al., 1994; Stipek, 1984).

Gender differences. The self-serving attributional bias was compared for samples that were all-male, all-female, and with mixed or unreported gender composition. Homogeneity analyses indicated that there were no significant differences in the magnitude of the self-serving attributional bias as a function of gender. Although it may appear that males have a larger self-serving bias ($d = 0.98$) than do females ($d = 0.79$), the two effect sizes are not significantly different from each other. Moreover, the magnitude of the bias for mixed-gender groups was 0.99, whereas logically it should fall between the values for all-male and all-female samples, supporting the conclusion that overall differences between effect sizes for males and females represent only sampling fluctuation.

The within-groups homogeneity analyses indicated that there continued to be significant heterogeneity within each gender sample. The within-groups homogeneity statistic (H_W) for males was equal to 160.16, compared with, $\chi^2(86, N = 87) = 119.41$, $p < .01$. Similarly, the within-groups homogeneity statistic for females was equal to 165.93, compared with, $\chi^2(72, N = 73) = 102.82$, $p < .01$. To further explore the magnitude of the self-serving attributional bias within male and female samples, we conducted an analysis of the Age × Gender interaction. Some researchers have suggested that gender differences in attributional style are most pronounced in adolescence and adulthood and least pronounced in childhood (Hankin & Abramson, 2001; Mezulis,

(*text continues on page 729*)

Table 1
Studies of the Self-Serving Attributional Bias

Study	*N*		Age category	Gender	Culture	Psychopathology	Design	Method	Domain	Measure	*d*
	Positive events	Negative events									
Ahrens & Haaga, 1993	94	94	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.37
Alden, 1986	20	20	19–24	Mix/unrep.	US mix/unrep.	Unreported	Between	Experimental	Interpersonal	Other	−0.01
Alden, 1986	20	20	19–24	Mix/unrep.	US mix/unrep.	Unreported	Between	Experimental	Interpersonal	Other	0.33
Allen & Drabman, 1991	16	6	8–11	Males	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	0.86
Allen & Drabman, 1991	18	8	8–11	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	1.00
Alloy et al., 1999	12	12	15–18	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	ASQ	2.15
Alloy et al., 1999	8	8	15–18	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.00
Alloy et al., 1999	13	13	15–18	Mix/unrep.	US mix/unrep.	Bipolar	Within	Hypothetical	Varied	ASQ	1.30
Alloy et al., 1999	10	10	15–18	Mix/unrep.	US mix/unrep.	Bipolar	Within	Hypothetical	Varied	ASQ	1.90
Ames, 1981	42	42	8–11	Mix/unrep.	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	3.68
Ames et al., 1977	10	10	8–11	Males	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.43
Ames et al., 1977	10	10	8–11	Males	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	1.85
Anderson, 1999	193	193	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	Other	0.80
Anderson, 1999	198	198	19–24	Mix/unrep.	China	Unreported	Within	Hypothetical	Varied	Other	0.33
Arntz et al., 1985	101	101	25–55	Mix/unrep.	West Europe	Unreported	Within	Experimental	Achiev/Cog	Other	0.86
Austin & Vispoel, 1998	76	77	12–14	Mix/unrep.	US mix/unrep.	Unreported	Between	Hypothetical	Other	Other	0.50
Bachelor, 1996	12	12	Over 55	Females	US mix/unrep.	Mix	Within	Hypothetical	Varied	ASQ	0.85
Bachelor, 1996	12	8	Over 55	Males	US mix/unrep.	Mix	Within	Hypothetical	Varied	ASQ	2.83
Bachelor, 1996	19	19	Over 55	Females	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.54
Bachelor, 1996	6	6	Over 55	Males	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.90
Bachelor, 1996	11	11	Over 55	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.37
Bachelor, 1996	17	17	Over 55	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.45
Barber & DeRubeis, 2001	12	12	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	−1.05
Barthe & Hammen, 1981	39	21	19–24	Mix/unrep.	US mix/unrep.	None	Between	Naturalistic	Achiev/Cog	Other	1.77
Barthe & Hammen, 1981	15	46	19–24	Mix/unrep.	US mix/unrep.	Depressed	Between	Naturalistic	Achiev/Cog	Other	0.36
Basow & Medcalf, 1988	149	149	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Naturalistic	Achiev/Cog	Other	1.04
Baumgardner et al., 1986	20	20	19–24	Mix/unrep.	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.13
Baumgardner et al., 1986	20	20	19–24	Mix/unrep.	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.75
Bell et al., 1994	38	38	8–11	Males	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.08
Bell et al., 1994	30	30	8–11	Females	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.37
Bell et al., 1994	28	28	8–11	Females	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.91
Bell et al., 1994	42	42	8–11	Males	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.93
Bell et al., 1994	31	31	8–11	Males	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	2.57
Bell et al., 1994	48	48	8–11	Females	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	2.78
Bell et al., 1994	44	44	8–11	Females	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	3.59
Bell et al., 1994	33	33	8–11	Males	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	3.67
Bempechat et al., 1996	100	100	8–11	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.24
Bempechat et al., 1996	125	125	8–11	Mix/unrep.	African American	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.88
Bempechat et al., 1996	94	94	8–11	Mix/unrep.	Asian American	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.08
Bempechat et al., 1996	66	66	8–11	Mix/unrep.	Hispanic American	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.96
Bempechat et al., 1999	280	280	8–11	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.36
Bempechat et al., 1999	71	71	8–11	Mix/unrep.	African American	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.84
Bempechat et al., 1999	77	77	8–11	Mix/unrep.	Asian American	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.51
Bempechat et al., 1999	163	163	8–11	Mix/unrep.	Hispanic American	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.86
S. Beyer, 1998–1999	156	156	19–24	Females	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.15

Table 1 (*continued*)

Study	*N*		Age category	Gender	Culture	Psychopathology	Design	Method	Domain	Measure	*d*
	Positive events	Negative events									
S. Beyer, 1998–1999	90	90	19–24	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.27
Bhojak et al., 1989	30	30	25–55	Males	India	Depressed	Within	Hypothetical	Varied	ASQ	−1.24
Bhojak et al., 1989	30	30	25–55	Males	India	Psychotic	Within	Hypothetical	Varied	ASQ	0.85
Bhojak et al., 1989	30	30	25–55	Males	India	Unreported	Within	Hypothetical	Varied	ASQ	0.30
Biddle & Hill, 1992	37	37	25–55	Mix/unrep.	UK	Unreported	Between	Naturalistic	Athletic	Other	0.33
Biddle & Hill, 1992	37	37	25–55	Mix/unrep.	UK	Unreported	Between	Naturalistic	Athletic	Other	0.33
Birke et al., 1990	11	11	25–55	Mix/unrep.	US mix/unrep.	Sub. abuse	Within	Hypothetical	Varied	ASQ	0.12
Birke et al., 1990	10	10	25–55	Mix/unrep.	US mix/unrep.	Sub. abuse	Within	Hypothetical	Varied	ASQ	0.30
Boski, 1983	72	72	19–24	Males	Africa	Unreported	Between	Experimental	Achiev/Cog	Other	1.28
Boski, 1985	160	160	19–24	Males	Africa	Unreported	Within	Experimental	Achiev/Cog	Other	1.53
Brennan & Charnetski, 2000	108	108	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.79
Brounstein et al., 1991	156	156	12–14	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Interpersonal	ASQ	1.85
Brounstein et al., 1991	156	156	12–14	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Interpersonal	ASQ	1.74
J. Brown & Rogers, 1991	20	20	19–24	Mix/unrep.	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	1.20
R. Brown et al., 1991	28	28	12–14	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.58
R. Brown, Kaslow, Doepke, et al., 1993	9	9	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	0.91
R. Brown, Kaslow, Doepke, et al., 1993	16	16	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	2.14
R. Brown, Kaslow, Madan-Swain, et al., 1993	61	61	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.85
R. Brown, Kaslow, Madan-Swain, et al., 1993	15	15	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	3.55
Bunce & Peterson, 1997	56	56	15–18	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.28
Bunce & Peterson, 1997	49	49	15–18	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.35
Burke, 1978	45	45	19–24	Males	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.79
Burke, 1978	45	45	19–24	Males	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.79
Burns & Seligman, 1989	30	30	Over 55	Mix/unrep.	US mix/unrep.	Unreported	Within	Naturalistic	Varied	Other	0.74
Bush et al., 1995	57	57	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.42
Bush et al., 1995	100	100	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.92
Cadinu et al., 1993	40	40	25–55	Mix/unrep.	West Europe	Unreported	Between	Experimental	Interpersonal	Other	0.73
C. Campbell & Henry, 1999	113	113	19–24	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.61
C. Campbell & Henry, 1999	94	94	19–24	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.72
N. Campbell, 1990	102	102	15–18	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.70
N. Campbell, 1990	69	69	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.27
Candido & Romney, 1990	15	15	25–55	Females	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	−2.12
Candido & Romney, 1990	15	15	25–55	Mix/unrep.	US mix/unrep.	Psychotic	Within	Hypothetical	Varied	ASQ	0.80
Candido & Romney, 1990	15	15	25–55	Mix/unrep.	US mix/unrep.	Psychotic	Within	Hypothetical	Varied	ASQ	2.25
Carlson et al., 1993	26	26	8–11	Males	US Caucasian	ADHD/ext.	Within	Experimental	Achiev/Cog	CASQ/CASQ–R	0.35
Carlson et al., 2000	40	40	8–11	Mix/unrep.	US Caucasian	ADHD/ext.	Within	Hypothetical	Varied	CASQ/CASQ–R	−0.38
Carlson et al., 2000	40	40	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	0.61
Carr & Kurtz, 1991	24	24	8–11	Mix/unrep.	West Europe	Unreported	Within	Hypothetical	Varied	Other	0.05
Carr & Kurtz, 1991	24	24	8–11	Mix/unrep.	West Europe	Unreported	Within	Hypothetical	Varied	Other	0.28
Carron & Spink, 1980	21	21	15–18	Males	Canada	Unreported	Between	Naturalistic	Achiev/Cog	Other	1.43
Carver et al., 1985	94	94	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.83
Cerezo-Jimenez & Frias, 1994	19	19	8–11	Mix/unrep.	US mix/unrep.	Abused	Within	Hypothetical	Varied	CASQ/CASQ–R	0.95

(*table continues*)

Table (*continued*)

Study	*N*		Age category	Gender	Culture	Psychopathology	Design	Method	Domain	Measure	*d*
	Positive events	Negative events									
Cerezo-Jimenez & Frias, 1994	26	26	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	2.23
Chambers & Abrami, 1991	108	82	8–11	Mix/unrep.	Canada	Unreported	Between	Naturalistic	Achiev/Cog	Other	0.32
Chan, 1994	16	16	8–11	Mix/unrep.	Austral/NewZeal	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.65
Chan, 1994	41	41	12–14	Mix/unrep.	Austral/NewZeal	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.43
Chan, 1994	22	22	15–18	Mix/unrep.	Austral/NewZeal	Unreported	Within	Hypothetical	Achiev/Cog	Other	−0.04
Chan, 1994	80	80	8–11	Mix/unrep.	Austral/NewZeal	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.47
Chan, 1994	87	87	12–14	Females	Austral/NewZeal	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.18
Chan, 1994	73	73	15–18	Mix/unrep.	Austral/NewZeal	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.30
Chan, 1996	71	71	12–14	Males	Austral/NewZeal	Unreported	Within	Hypothetical	Achiev/Cog	Other	2.21
Chan, 1996	62	62	12–14	Females	Austral/NewZeal	Unreported	Within	Hypothetical	Achiev/Cog	Other	2.48
Chan, 1996	78	78	12–14	Males	Austral/NewZeal	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.81
Chan, 1996	49	49	12–14	Females	Austral/NewZeal	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.06
Chandler et al., 1981	126	126	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	Other	0.38
Chandler et al., 1981	99	99	19–24	Mix/unrep.	E. Europe/Russia	Unreported	Within	Hypothetical	Varied	Other	0.43
Chandler et al., 1981	78	78	19–24	Mix/unrep.	India	Unreported	Within	Hypothetical	Varied	Other	0.49
Chandler et al., 1981	250	250	19–24	Mix/unrep.	Japan	Unreported	Within	Hypothetical	Varied	Other	0.27
Chandler et al., 1981	131	131	19–24	Mix/unrep.	Africa	Unreported	Within	Hypothetical	Varied	Other	0.37
Cheng & Furnham, 2001	30	30	19–24	Males	UK	Unreported	Within	Hypothetical	Varied	ASQ	0.49
Cheng & Furnham, 2001	90	90	19–24	Females	UK	Unreported	Within	Hypothetical	Varied	ASQ	0.57
Choroszy et al., 1984	139	139	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	IAR	−0.14
Choroszy et al., 1987	69	69	19–24	Females	Pacific Islanders	Unreported	Within	Hypothetical	Achiev/Cog	IAR	0.01
Choroszy et al., 1987	57	57	19–24	Males	Pacific Islanders	Unreported	Within	Hypothetical	Achiev/Cog	IAR	0.43
Chorpita et al., 1998	93	93	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.71
Chubb et al., 1999	100	100	25–55	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	ASQ	0.79
Chubb et al., 1999	37	37	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	−0.50
Chubb et al., 1999	50	50	25–55	Mix/unrep.	US mix/unrep.	Mix	Within	Hypothetical	Varied	ASQ	0.87
Clock, 2000	95	95	12–14	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.64
Cohen et al., 1985	119	119	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Experimental	Achiev/Cog	Other	0.48
Collins et al., 1992	106	106	19–24	Females	US Caucasian	Unreported	Within	Hypothetical	Varied	ASQ	1.70
Compas et al., 1991	151	151	12–14	Mix/unrep.	US Caucasian	None	Within	Hypothetical	Varied	Other	0.89
Compas et al., 1991	27	27	12–14	Mix/unrep.	US Caucasian	Depressed	Within	Hypothetical	Varied	Other	−0.21
Compas et al., 1991	9	9	12–14	Mix/unrep.	US Caucasian	ADHD/ext.	Within	Hypothetical	Varied	Other	0.00
Compas et al., 1991	12	12	12–14	Mix/unrep.	US Caucasian	Mix	Within	Hypothetical	Varied	Other	−0.60
Corcoran & Theilbahr, 1989	45	45	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	0.74
Corcoran & Theilbahr, 1989	45	45	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	0.97
Corr & Gray, 1995a	196	196	25–55	Males	UK	Unreported	Within	Hypothetical	Varied	ASQ	3.22
Corr & Gray, 1995b	200	200	25–55	Mix/unrep.	UK	Unreported	Within	Hypothetical	Varied	ASQ	1.05
Corr & Gray, 1995b	100	100	25–55	Mix/unrep.	UK	Unreported	Within	Hypothetical	Varied	ASQ	2.32
Corr & Gray, 1995b	75	75	25–55	Males	UK	Unreported	Within	Hypothetical	Varied	ASQ	0.87
Corr & Gray, 1995b	100	100	25–55	Males	UK	Unreported	Within	Hypothetical	Varied	ASQ	2.34
Corr & Gray, 1996	200	200	25–55	Mix/unrep.	UK	Unreported	Within	Hypothetical	Varied	ASQ	1.05
Corr & Gray, 1996	100	100	25–55	Males	UK	Unreported	Within	Hypothetical	Varied	ASQ	2.32
Cramer & Oshima, 1992	20	20	8–11	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.62
Cramer & Oshima, 1992	20	20	8–11	Females	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	4.22
Cramer & Oshima, 1992	28	28	12–14	Females	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.12
Cramer & Oshima, 1992	26	26	12–14	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.62
Cramer & Oshima, 1992	29	29	15–18	Females	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	−1.81

Table 1 (*continued*)

Study	*N*		Age category	Gender	Culture	Psychopathology	Design	Method	Domain	Measure	*d*
	Positive events	Negative events									
Cramer & Oshima, 1992	30	30	15–18	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	3.37
Cramer & Oshima, 1992	22	22	8–11	Females	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	−0.28
Cramer & Oshima, 1992	21	21	8–11	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.26
Cramer & Oshima, 1992	27	27	12–14	Females	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	−3.61
Cramer & Oshima, 1992	27	27	12–14	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	−2.65
Cramer & Oshima, 1992	26	26	15–18	Females	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	−8.59
Cramer & Oshima, 1992	27	27	15–18	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	−3.36
Craven et al., 1991	79	79	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	Other	2.05
Crocker et al., 1988	23	23	19–24	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	ASQ	2.93
Crocker et al., 1988	23	23	19–24	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.29
Curry & Craighead, 1990	14	14	15–18	Mix/unrep.	US Caucasian	None	Within	Hypothetical	Varied	CASQ/CASQ–R	2.03
Curry & Craighead, 1990	18	18	15–18	Mix/unrep.	US Caucasian	Depressed	Within	Hypothetical	Varied	CASQ/CASQ–R	0.30
Davis & Zaichkowski, 1998	19	19	15–18	Males	Canada	Unreported	Within	Hypothetical	Varied	ASQ	0.50
Davis & Zaichkowski, 1998	19	19	15–18	Males	Canada	Unreported	Within	Hypothetical	Varied	ASQ	0.82
DeBoer, 1984	25	56	15–18	Females	US mix/unrep.	Unreported	Between	Naturalistic	Achiev/Cog	Other	0.40
DeBoer, 1984	17	63	15–18	Males	US mix/unrep.	Unreported	Between	Naturalistic	Achiev/Cog	Other	0.43
DeBoer, 1985	363	304	15–18	Mix/unrep.	US mix/unrep.	Unreported	Between	Naturalistic	Achiev/Cog	Other	0.98
Dembo & Vaughn, 1989	20	20	8–11	Males	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	3.94
DeMoss et al., 1993	71	71	15–18	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.16
DeMoss et al., 1993	57	57	15–18	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.63
Dowd et al., 1986	25	25	19–24	Mix/unrep.	US Caucasian	None	Within	Hypothetical	Varied	ASQ	0.58
Dowd et al., 1986	25	25	25–55	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	ASQ	0.27
Dowd et al., 1986	25	25	25–55	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	ASQ	0.13
Dua, 1994	240	240	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.42
Dummer et al., 1987	130	130	25–55	Males	UK	Unreported	Within	Hypothetical	Varied	ASQ	2.87
Duncan & McAuley, 1987	229	229	8–11	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Interpersonal	Other	1.23
Durrant, 1993	15	15	8–11	Mix/unrep.	US mix/unrep.	Mix	Within	Experimental	Achiev/Cog	Content analysis	0.21
Durrant, 1993	15	15	8–11	Mix/unrep.	US mix/unrep.	None	Within	Experimental	Achiev/Cog	Content analysis	0.15
Durrant, 1993	15	15	8–11	Mix/unrep.	US mix/unrep.	None	Within	Experimental	Achiev/Cog	Content analysis	0.40
Durrant, 1993	15	15	8–11	Mix/unrep.	US mix/unrep.	ADHD/ext.	Within	Experimental	Achiev/Cog	Content analysis	0.00
Durrant, 1993	15	15	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Experimental	Achiev/Cog	Content analysis	0.22
Ehrlich et al., 1993	63	63	12–14	Mix/unrep.	West Europe	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	−0.06
Ehrlich et al., 1993	64	64	12–14	Mix/unrep.	West Europe	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	0.40
Fear et al., 1996	20	20	25–55	Mix/unrep.	UK	None	Within	Hypothetical	Varied	ASQ	1.76
Fear et al., 1996	29	29	25–55	Mix/unrep.	UK	Psychotic	Within	Hypothetical	Varied	ASQ	1.30
Fear et al., 2000	15	15	25–55	Mix/unrep.	UK	Mix	Within	Hypothetical	Varied	ASQ	−0.07
Fear et al., 2000	30	30	25–55	Mix/unrep.	UK	None	Within	Hypothetical	Varied	ASQ	0.41
Fear et al., 2000	29	29	25–55	Mix/unrep.	UK	Psychotic	Within	Hypothetical	Varied	ASQ	0.06
Fear et al., 2000	29	29	25–55	Mix/unrep.	UK	Psychotic	Within	Hypothetical	Varied	ASQ	0.34
Feather & Simon, 1971	36	41	15–18	Males	Austral/NewZeal	Unreported	Between	Experimental	Achiev/Cog	Other	0.12
Feather & Tiggemann, 1984	100	100	19–24	Mix/unrep.	Austral/NewZeal	Unreported	Within	Hypothetical	Varied	Other	1.62
Feather & Tiggemann, 1984	68	68	19–24	Mix/unrep.	Austral/NewZeal	Unreported	Within	Hypothetical	Varied	Other	0.80
Feather & Tiggemann, 1984	78	78	19–24	Mix/unrep.	Austral/NewZeal	Unreported	Within	Hypothetical	Varied	Other	1.77
Feiring et al., 1998	142	142	8–11	Mix/unrep.	US mix/unrep.	Abused	Within	Hypothetical	Varied	CASQ/CASQ–R	2.00
Fielstein et al., 1985	101	101	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	Other	0.29
Fielstein et al., 1985	100	100	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	Other	1.45

(*table continues*)

Table 1 (*continued*)

Study	*N*		Age category	Gender	Culture	Psychopathology	Design	Method	Domain	Measure	*d*
	Positive events	Negative events									
Flett et al., 1995	138	138	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	Adapted ASQ	0.78
Flett et al., 1995	117	117	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	Adapted ASQ	0.54
Flett et al., 1998	40	40	19–24	Males	UK	Unreported	Within	Hypothetical	Interpersonal	Other	0.21
Flett et al., 1998	84	84	19–24	Females	UK	Unreported	Within	Hypothetical	Interpersonal	Other	0.30
Fox, 1997	40	40	25–55	Mix/unrep.	Africa	Unreported	Within	Hypothetical	Varied	Adapted ASQ	1.71
Frank et al., 1997	86	86	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	2.10
Friedlander et al., 1986	55	55	8–11	Mix/unrep.	US mix/unrep.	Sub. abuse	Within	Hypothetical	Varied	CASQ/CASQ–R	1.73
Friedman et al., 2001	283	283	25–55	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.52
Fry & Ghosh, 1980	50	50	8–11	Mix/unrep.	US Caucasian	Unreported	Within	Experimental	Achiev/Cog	Other	4.35
Fry & Ghosh, 1980	50	50	8–11	Mix/unrep.	Asian American	Unreported	Within	Experimental	Achiev/Cog	Other	0.88
Furnham et al., 1992	90	90	25–55	Mix/unrep.	UK	Unreported	Within	Hypothetical	Achiev/Cog	Adapted ASQ	−0.10
Furnham et al., 1994	100	100	25–55	Mix/unrep.	UK	Unreported	Within	Hypothetical	Interpersonal	Adapted ASQ	0.19
Gillham & Reivich, 1999	114	114	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CSQ	1.91
Gillis, 1979	60	60	19–24	Mix/unrep.	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.30
Giola & Sims, 1985	24	24	25–55	Males	US mix/unrep.	Unreported	Within	Experimental	Achiev/Cog	Other	1.65
Giola & Sims, 1985	24	24	25–55	Males	US mix/unrep.	Unreported	Within	Experimental	Achiev/Cog	Other	1.06
Girodo et al., 1981	42	42	19–24	Males	Canada	Unreported	Within	Hypothetical	Interpersonal	Other	−1.94
Girodo et al., 1981	36	36	19–24	Males	Canada	Unreported	Within	Hypothetical	Interpersonal	Other	2.30
Gladstone et al., 1997	865	865	15–18	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	0.98
Gladstone et al., 1997	796	796	15–18	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.02
Goldberg & Evenbeck, 1976	24	24	19–24	Mix/unrep.	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.59
Golin et al., 1981	180	180	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.89
Graham, 1988	176	176	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.08
Gutierres et al., 1994	30	30	25–55	Males	Native American	Sub. abuse	Within	Hypothetical	Varied	ASQ	1.66
Gutierres et al., 1994	28	28	25–55	Females	Native American	Sub. abuse	Within	Hypothetical	Varied	ASQ	1.29
Gutkovich et al., 1999	9	9	25–55	Mix/unrep.	E. Europe/Russia	None	Within	Hypothetical	Varied	ASQ	0.84
Gutkovich et al., 1999	25	25	25–55	Mix/unrep.	E. Europe/Russia	Depressed	Within	Hypothetical	Varied	ASQ	0.13
Gutkovich et al., 1999	22	22	25–55	Mix/unrep.	E. Europe/Russia	Unreported	Within	Hypothetical	Varied	ASQ	0.91
Hale, 1993	92	92	15–18	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	ASQ	2.13
Haraoka, 1991	71	48	12–14	Mix/unrep.	Japan	Unreported	Between	Naturalistic	Achiev/Cog	Other	0.70
Hargreaves, 1985	50	50	25–55	Mix/unrep.	UK	None	Within	Hypothetical	Varied	ASQ	0.73
Hargreaves, 1985	50	50	25–55	Mix/unrep.	UK	Depressed	Within	Hypothetical	Varied	ASQ	0.39
Hartouni, 1992	20	20	25–55	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	ASQ	−1.82
Hartouni, 1992	20	20	25–55	Mix/unrep.	US Caucasian	Mix	Within	Hypothetical	Varied	ASQ	1.86
Heaven, 1994	140	140	25–55	Mix/unrep.	Austral/NewZeal	Unreported	Within	Hypothetical	Achiev/Cog	Adapted ASQ	−0.05
Heimberg et al., 1987	13	13	25–55	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	ASQ	1.58
Heimberg et al., 1987	16	16	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	−0.62
Heimberg et al., 1987	17	17	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	−0.20
Heimberg et al., 1987	37	37	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.15
Heimberg et al., 1987	31	31	25–55	Mix/unrep.	US mix/unrep.	Anxiety	Within	Hypothetical	Varied	ASQ	1.40
Henry et al., 1993	35	35	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.85
Heppner et al., 1985	10	10	15–18	Males	US Caucasian	Unreported	Within	Hypothetical	Varied	ASQ	1.39
Heppner et al., 1985	10	10	15–18	Females	US Caucasian	Unreported	Within	Hypothetical	Varied	ASQ	1.72
Hiebert et al., 1984	41	41	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.20
Hiebert et al., 1984	41	41	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.84
Hiebert et al., 1984	41	41	12–14	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.00
Hiebert et al., 1984	41	41	12–14	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	2.29

Table 1 (*continued*)

Study	*N*		Age category	Gender	Culture	Psychopathology	Design	Method	Domain	Measure	*d*
	Positive events	Negative events									
Hill & Hill, 1982	14	14	8–11	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	Other	1.12
Hill & Hill, 1982	14	14	12–14	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	Other	0.95
Hill & Hill, 1982	14	14	8–11	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	Other	2.61
Hill & Hill, 1982	14	14	12–14	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	Other	1.32
Hillman et al., 1994	139	139	12–14	Mix/unrep.	African American	Unreported	Within	Hypothetical	Varied	ASQ	1.46
Hjelle et al., 1996	94	94	19–24	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	3.59
Hjelle et al., 1996	342	342	19–24	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	3.73
Ho & McMurtrie, 1991	15	15	12–14	Mix/unrep.	Austral/NewZeal	Unreported	Within	Experimental	Achiev/Cog	Other	0.51
Ho & McMurtrie, 1991	15	15	12–14	Mix/unrep.	Austral/NewZeal	Unreported	Within	Experimental	Achiev/Cog	Other	0.77
Ho & McMurtrie, 1991	15	15	15–18	Mix/unrep.	Austral/NewZeal	Unreported	Within	Experimental	Achiev/Cog	Other	0.48
Hoffart & Martinsen, 1990	38	38	25–55	Mix/unrep.	West Europe	Depressed	Within	Hypothetical	Varied	ASQ	−0.83
Hoffart & Martinsen, 1990	33	33	25–55	Mix/unrep.	West Europe	Unreported	Within	Hypothetical	Varied	ASQ	−0.60
Hoffart & Martinsen, 1990	29	29	25–55	Mix/unrep.	West Europe	Anxiety	Within	Hypothetical	Varied	ASQ	−0.02
Hoffart & Martinsen, 1991	10	10	25–55	Mix/unrep.	West Europe	Anxiety	Within	Hypothetical	Varied	ASQ	−0.28
Hoffart & Martinsen, 1991	12	12	25–55	Mix/unrep.	West Europe	Anxiety	Within	Hypothetical	Varied	ASQ	0.07
Hoffart & Martinsen, 1991	14	14	25–55	Mix/unrep.	West Europe	Anxiety	Within	Hypothetical	Varied	ASQ	0.19
Hoffart & Torgensen, 1991	17	17	25–55	Mix/unrep.	West Europe	Mix	Within	Hypothetical	Varied	ASQ	0.89
Hoffart & Torgensen, 1991	17	17	25–55	Mix/unrep.	West Europe	Depressed	Within	Hypothetical	Varied	ASQ	1.87
Hoffart & Torgensen, 1991	17	17	25–55	Mix/unrep.	West Europe	Mix	Within	Hypothetical	Varied	ASQ	0.16
Hoffart & Torgensen, 1991	26	26	25–55	Mix/unrep.	West Europe	Anxiety	Within	Hypothetical	Varied	ASQ	0.77
Hovemyr, 1998	267	267	19–24	Mix/unrep.	E. Europe/Russia	Unreported	Within	Hypothetical	Achiev/Cog	Other	2.11
Hoza et al., 1993	25	25	8–11	Males	US mix/unrep.	None	Within	Hypothetical	Varied	CASQ/CASQ–R	1.08
Hoza et al., 1993	27	27	8–11	Males	US mix/unrep.	ADHD/ext.	Within	Hypothetical	Varied	CASQ/CASQ–R	1.08
Hoza et al., 2000	120	120	8–11	Males	US mix/unrep.	ADHD/ext.	Within	Experimental	Interpersonal	Other	0.63
Huber et al., 1986	593	593	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.84
Huselid et al., 1991	16	16	25–55	Females	US mix/unrep.	Sub. abuse	Within	Naturalistic	Varied	Other	0.27
Huselid et al., 1991	14	14	25–55	Females	US mix/unrep.	Sub. abuse	Within	Naturalistic	Varied	Other	0.50
Ilardi & Craighead, 1999	40	40	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.75
Ilardi et al., 1997	28	28	25–55	Mix/unrep.	US Caucasian	None	Within	Hypothetical	Varied	ASQ	1.43
Ilardi et al., 1997	22	22	25–55	Mix/unrep.	US Caucasian	Depressed	Within	Hypothetical	Varied	ASQ	−0.16
Ingram et al., 1990	20	20	25–55	Males	US mix/unrep.	None	Within	Hypothetical	Varied	ASQ	1.73
Ingram et al., 1990	20	20	25–55	Males	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.66
Ingram et al., 1990	20	20	25–55	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.44
Isaacowitz & Seligman, 2001	71	71	Over 55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	Adapted ASQ	2.45
Iso & Seppo, 1979	40	40	8–11	Mix/unrep.	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.70
Jack & Williams, 1991	71	71	25–55	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	ASQ	0.94
Jack & Williams, 1991	60	60	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.63
Jack & Williams, 1991	31	31	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.73
Jansen et al., 1998	18	18	19–24	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.47
Jansen et al., 1998	21	21	19–24	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.32
J. Johnson et al., 1996	32	32	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	−0.29
J. Johnson et al., 1998	52	52	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Naturalistic	Varied	Adapted ASQ	−0.14
S. Johnson et al., 2001	16	16	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	0.81
S. Johnson et al., 2001	16	16	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.63
S. Johnson et al., 2001	22	22	25–55	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.32
Joiner, 2000	51	51	12–14	Mix/unrep.	US Caucasian	Mix	Within	Hypothetical	Varied	CASQ/CASQ–R	0.17
Joiner, 2000	6	6	12–14	Mix/unrep.	African American	Mix	Within	Hypothetical	Varied	CASQ/CASQ–R	1.59

(*table continues*)

Table 1 (*continued*)

Study	*N*		Age category	Gender	Culture	Psychopathology	Design	Method	Domain	Measure	*d*
	Positive events	Negative events									
Joiner, 2000	3	3	12–14	Mix/unrep.	Hispanic American	Mix	Within	Hypothetical	Varied	CASQ/CASQ–R	0.00
Juvonen, 1988	84	84	12–14	Mix/unrep.	West Europe	Unreported	Within	Naturalistic	Achiev/Cog	Other	−0.43
Kapci & Cramer, 2000	37	37	19–24	Mix/unrep.	UK	None	Within	Hypothetical	Varied	ASQ	1.74
Kapci & Cramer, 2000	18	18	19–24	Mix/unrep.	UK	Depressed	Within	Hypothetical	Varied	ASQ	0.42
Kaufman, 1991	16	16	8–11	Mix/unrep.	US mix/unrep.	Abused	Within	Hypothetical	Varied	CASQ/CASQ–R	0.50
Kaufman, 1991	40	40	8–11	Mix/unrep.	US mix/unrep.	Abused	Within	Hypothetical	Varied	CASQ/CASQ–R	2.10
Kenardy et al., 1990	21	21	25–55	Mix/unrep.	US mix/unrep.	Anxiety	Within	Hypothetical	Varied	ASQ	0.35
Kenardy et al., 1990	28	28	25–55	Mix/unrep.	US mix/unrep.	Anxiety	Within	Hypothetical	Varied	ASQ	1.07
Kendzierski & Sheffield, 2000	41	41	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.74
Kendzierski & Sheffield, 2000	115	115	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.03
Kennedy, 1999	82	82	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.65
Kennedy, 1999	21	21	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.11
Kennedy, 1999	41	41	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.14
Kennedy, 1999	74	74	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.21
Kovenklioglu & Greenhaus, 1978	176	77	15–18	Females	US mix/unrep.	Unreported	Between	Naturalistic	Achiev/Cog	Other	0.18
Krstev et al., 1999	62	62	19–24	Mix/unrep.	Austral/NewZeal	Psychotic	Within	Hypothetical	Varied	ASQ	0.15
Kurtz-Costes et al., 1995	62	62	12–14	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	−0.07
Kurtz-Costes et al., 1995	78	78	12–14	Mix/unrep.	African American	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	0.28
Kurtz-Costes et al., 1995	159	159	12–14	Mix/unrep.	West Europe	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	0.34
Kurtz-Costes & Schneider, 1994	46	46	8–11	Mix/unrep.	West Europe	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.84
Kuyken & Brewin, 1999	18	18	25–55	Females	UK	Abused	Within	Hypothetical	Varied	ASQ	−1.23
Kuyken & Brewin, 1999	9	9	25–55	Females	UK	Abused	Within	Hypothetical	Varied	ASQ	−0.60
Kuyken & Brewin, 1999	10	10	25–55	Females	UK	Abused	Within	Hypothetical	Varied	ASQ	0.18
Kuyken & Brewin, 1999	19	19	25–55	Females	UK	Unreported	Within	Hypothetical	Varied	ASQ	−0.73
Lachman, 1990	66	66	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.11
Lachman, 1990	66	66	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.11
Lachman, 1990	54	54	Over 55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.60
Lachman, 1990	54	54	Over 55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.60
Laffoon et al., 1989	39	39	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	0.89
Laffoon et al., 1989	62	62	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	0.49
Laffoon et al., 1989	36	36	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	1.45
Landsbergis et al., 1992	297	297	25–55	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.51
J. Larson, 1977	34	31	19–24	Males	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.64
L. Larson & Sailors, 1997	15	16	19–24	Mix/unrep.	US Caucasian	Unreported	Between	Experimental	Interpersonal	Other	0.50
Lewinsohn et al., 2000	67	67	15–18	Mix/unrep.	US mix/unrep.	Mix	Within	Hypothetical	Varied	CASQ/CASQ–R	0.65
Lewinsohn et al., 2000	87	87	15–18	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	CASQ/CASQ–R	0.71
Lewinsohn et al., 2000	58	58	15–18	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	CASQ/CASQ–R	0.28
Lewinsohn et al., 2000	62	62	15–18	Mix/unrep.	US mix/unrep.	Mix	Within	Hypothetical	Varied	CASQ/CASQ–R	0.35
Licht et al., 1989	93	93	8–11	Females	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.13
Licht et al., 1989	99	99	8–11	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.88
Lieber et al., 2000	86	86	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Experimental	Varied	Other	1.64
Lieber et al., 2000	118	118	19–24	Mix/unrep.	China	Unreported	Within	Experimental	Varied	Other	0.93
Love, 1988	37	37	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.07
Love, 1988	54	54	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.41
Luchow et al., 1985	25	25	12–14	Females	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	0.84
Luchow et al., 1985	28	28	12–14	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	0.88
Lynd-Stevenson, 1996	200	200	19–24	Mix/unrep.	Austral/NewZeal	Unreported	Within	Hypothetical	Varied	ASQ	1.03

Table 1 (*continued*)

Study	*N*		Age category	Gender	Culture	Psychopathology	Design	Method	Domain	Measure	*d*
	Positive events	Negative events									
Lynd-Stevenson, 1997	153	153	25–55	Mix/unrep.	Austral/NewZeal	Unreported	Within	Hypothetical	Varied	ASQ	0.98
Lyon et al., 1994	14	14	25–55	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	ASQ	0.30
Lyon et al., 1994	14	14	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.12
Lyon et al., 1994	14	14	25–55	Mix/unrep.	US mix/unrep.	Psychotic	Within	Hypothetical	Varied	ASQ	0.41
Lyon et al., 1999	15	15	25–55	Mix/unrep.	UK	None	Within	Hypothetical	Varied	ASQ	0.64
Lyon et al., 1999	15	15	25–55	Mix/unrep.	UK	Bipolar	Within	Hypothetical	Varied	ASQ	1.69
Lyon et al., 1999	15	15	25–55	Mix/unrep.	UK	Bipolar	Within	Hypothetical	Varied	ASQ	−0.54
Madan-Swain et al., 1993	19	19	8–11	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.48
Madan-Swain et al., 1993	10	10	8–11	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	0.69
Madan-Swain et al., 1993	32	32	8–11	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.09
Manly et al., 1982	60	60	25–55	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.62
Mannarino & Cohen, 1996	77	77	8–11	Females	US mix/unrep.	Abused	Within	Hypothetical	Varied	CASQ/CASQ–R	2.07
Mannarino & Cohen, 1996	88	88	8–11	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	2.13
Mansfield & Wade, 2000	30	30	25–55	Females	Austral/NewZeal	None	Within	Hypothetical	Varied	Adapted ASQ	2.52
Mansfield & Wade, 2000	17	17	25–55	Females	Austral/NewZeal	Depressed	Within	Hypothetical	Varied	Adapted ASQ	−0.57
Mansfield & Wade, 2000	30	30	25–55	Females	Austral/NewZeal	Mix	Within	Hypothetical	Varied	Adapted ASQ	−0.55
Marsh et al., 2001	204	204	19–24	Mix/unrep.	Austral/NewZeal	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.85
M. Martin et al., 1987	13	13	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Naturalistic	Varied	ASQ	1.15
M. Martin et al., 1987	13	13	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Naturalistic	Varied	ASQ	2.19
V. Martin & Nivens, 1987	41	41	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.36
Martinek & Griffith, 1994	14	14	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Naturalistic	Athletic	Content analysis	0.76
Martinek & Griffith, 1994	13	13	12–14	Mix/unrep.	US mix/unrep.	Unreported	Within	Naturalistic	Athletic	Content analysis	0.25
McCullough et al., 1994	18	18	25–55	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	ASQ	1.74
McCullough et al., 1994	24	24	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	−0.34
McMahan, 1973	199	144	15–18	Females	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.26
Meyer et al., 1989	36	36	8–11	Mix/unrep.	US Caucasian	None	Within	Experimental	Achiev/Cog	Other	0.93
Meyer et al., 1989	36	36	8–11	Mix/unrep.	US Caucasian	Depressed	Within	Experimental	Achiev/Cog	Other	−0.14
I. Miller et al., 1982	30	30	25–55	Mix/unrep.	US mix/unrep.	Mix	Within	Hypothetical	Varied	Adapted ASQ	0.98
I. Miller et al., 1982	40	40	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	Adapted ASQ	1.25
Misra & Misra, 1986	40	40	15–18	Mix/unrep.	India	Unreported	Between	Naturalistic	Achiev/Cog	Other	0.46
Mitchell, 1989	329	329	19–24	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	ASQ	1.57
Mooney & Thornton, 1999	150	150	12–14	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.93
Mooney & Thornton, 1999	114	114	12–14	Mix/unrep.	African American	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.40
Morrongiello et al., 1998	30	30	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Naturalistic	Achiev/Cog	Other	1.28
Mukherji et al., 1982	18	18	19–24	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	2.27
Mukherji et al., 1982	18	18	19–24	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	2.80
Murphy et al., 1997	40	40	12–14	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.28
Nauta et al., 1999	46	46	19–24	Females	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.17
Nauta et al., 1999	209	209	19–24	Females	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.05
Neimeyer & Feixas, 1992	71	71	25–55	Mix/unrep.	US Caucasian	Depressed	Within	Hypothetical	Varied	ASQ	−0.11
Neimeyer & Weiss, 1990	111	111	25–55	Mix/unrep.	US Caucasian	Depressed	Within	Hypothetical	Varied	ASQ	−0.03
Newman & Stevenson, 1990	48	48	15–18	Females	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.78
Newman & Stevenson, 1990	57	57	15–18	Males	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.92
Nolen-Hoeksema et al., 1992	508	508	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	2.08
Nurmi, 1992	44	44	19–24	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	ASQ	2.74
Nurmi, 1992	46	46	19–24	Mix/unrep.	West Europe	Unreported	Within	Hypothetical	Varied	ASQ	1.02

(*table continues*)

Table 1 (*continued*)

Study	*N*		Age category	Gender	Culture	Psychopathology	Design	Method	Domain	Measure	*d*
	Positive events	Negative events									
Palmer, 1995	16	16	25–55	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.37
Palmer, 1995	11	11	25–55	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.47
Park & Kim, 1998	98	98	19–24	Mix/unrep.	Korea	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.84
Park & Kim, 1998	136	136	19–24	Mix/unrep.	Korea	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.11
Pedro et al., 1981	331	331	15–18	Females	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	IAR	−0.18
Pedro et al., 1981	302	302	15–18	Females	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	IAR	0.03
Pedro et al., 1981	328	328	15–18	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	IAR	0.41
Pedro et al., 1981	244	244	15–18	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	IAR	0.77
Pelham et al., 1993	38	38	8–11	Males	US mix/unrep.	ADHD/ext.	Within	Naturalistic	Interpersonal	Other	0.73
Persons & Rao, 1985	20	20	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.29
Persons & Rao, 1985	29	29	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.78
C. Peterson et al., 1982	130	130	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.79
S. Peterson, 1992	84	84	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.34
Pinto & Francis, 1993	44	44	12–14	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	CASQ/CASQ–R	1.03
Pinto & Francis, 1993	36	36	12–14	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	CASQ/CASQ–R	−0.75
Pinto et al., 1996	19	19	15–18	Females	US mix/unrep.	Mix	Within	Hypothetical	Varied	CASQ/CASQ–R	−1.22
Pinto et al., 1996	21	21	15–18	Females	US mix/unrep.	Depressed	Within	Hypothetical	Varied	CASQ/CASQ–R	−0.48
Pintrich et al., 1994	20	20	8–11	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.57
Pintrich et al., 1994	19	19	8–11	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	2.63
Porac et al., 1981	80	80	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	2.16
Powers & Douglas, 1984	74	74	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.23
Powers & Rossman, 1984	99	99	19–24	Mix/unrep.	Native American	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.73
Powers & Rossman, 1984	112	112	19–24	Mix/unrep.	Native American	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.74
Powers & Wagner, 1984	70	70	12–14	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.23
Powers & Wagner, 1984	212	212	12–14	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.82
Powers & Wagner, 1984	227	227	12–14	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.85
Powers & Wagner, 1984	30	30	15–18	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.70
Powers & Wagner, 1984	62	62	15–18	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.29
Powers et al., 1984	118	118	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	IAR	1.24
Powers et al., 1985	110	110	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	IAR	1.03
Powers et al., 1986	127	127	19–24	Mix/unrep.	Pacific Islanders	Unreported	Within	Hypothetical	Achiev/Cog	IAR	0.23
Powers et al., 1987	132	132	19–24	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Achiev/Cog	IAR	0.29
Powers et al., 1987	132	132	19–24	Mix/unrep.	Asian American	Unreported	Within	Hypothetical	Achiev/Cog	IAR	−0.06
Proudfoot et al., 2001	103	103	25–55	Mix/unrep.	UK	Unreported	Within	Hypothetical	Varied	Other	1.39
Raps et al., 1982	30	30	25–55	Males	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.03
Raps et al., 1982	15	15	25–55	Males	US mix/unrep.	Psychotic	Within	Hypothetical	Varied	ASQ	0.62
Raps et al., 1982	61	61	25–55	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	0.58
Reilly-Harrington et al., 1999	23	23	19–24	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	ASQ	1.97
Reilly-Harrington et al., 1999	97	97	19–24	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	1.63
Reilly-Harrington et al., 1999	49	49	19–24	Mix/unrep.	US mix/unrep.	Bipolar	Within	Hypothetical	Varied	ASQ	1.43
Rennie & Dunne, 1994	286	286	19–24	Females	Pacific Islanders	Unreported	Within	Hypothetical	Achiev/Cog	Other	−0.22
Rennie & Dunne, 1994	266	266	19–24	Males	Pacific Islanders	Unreported	Within	Hypothetical	Achiev/Cog	Other	−0.07
Rennie & Dunne, 1994	252	252	19–24	Males	Pacific Islanders	Unreported	Within	Hypothetical	Achiev/Cog	Other	−0.02
Rennie & Dunne, 1994	249	249	19–24	Females	Pacific Islanders	Unreported	Within	Hypothetical	Achiev/Cog	Other	0.07
Ring & Reetz, 2000	35	35	12–14	Mix/unrep.	US Caucasian	Unreported	Within	Naturalistic	Achiev/Cog	Other	1.18
Rodriguez & Pehi, 1998	69	69	8–11	Mix/unrep.	Austral/NewZeal	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.63
Rotheram-Borus et al., 1990	23	23	12–14	Females	US mix/unrep.	None	Within	Hypothetical	Varied	CASQ/CASQ–R	1.12

Table 1 (*continued*)

Study	*N*		Age category	Gender	Culture	Psychopathology	Design	Method	Domain	Measure	*d*
	Positive events	Negative events									
Rotheram-Borus et al., 1990	77	77	12–14	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	0.50
Rotheram-Borus et al., 1990	39	39	12–14	Females	US mix/unrep.	Mix	Within	Hypothetical	Varied	CASQ/CASQ–R	−0.08
Russell & McAuley, 1986	79	80	19–24	Mix/unrep.	US mix/unrep.	Unreported	Between	Naturalistic	Achiev/Cog	Other	0.61
Ryckman & Peckham, 1986	177	177	12–14	Females	US mix/unrep.	Depressed	Within	Hypothetical	Varied	Adapted ASQ	−0.98
Ryckman & Peckham, 1986	376	376	12–14	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	−0.02
Ryckman & Rallo, 1986	145	145	8–11	Females	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	0.63
Ryckman & Rallo, 1986	122	122	8–11	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Content analysis	0.81
Sakamoto & Kambara, 1998	143	143	19–24	Mix/unrep.	Japan	Unreported	Within	Hypothetical	Varied	ASQ	−0.17
Sampson, 1990	30	30	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	0.84
Sampson, 1990	30	30	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.85
Scanlan & Passer, 1980a	72	78	8–11	Males	US mix/unrep.	Unreported	Between	Naturalistic	Athletic	Other	0.64
Scanlan & Passer, 1980b	54	46	8–11	Females	US mix/unrep.	Unreported	Between	Naturalistic	Athletic	Other	0.66
Scapinello, 1989	96	96	19–24	Males	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.75
Schmidt et al., 1998	27	27	12–14	Mix/unrep.	US mix/unrep.	Mix	Within	Hypothetical	Varied	CASQ/CASQ–R	1.00
Schmidt et al., 1998	14	14	12–14	Mix/unrep.	US mix/unrep.	ADHD/ext.	Within	Hypothetical	Varied	CASQ/CASQ–R	2.25
Schmitz & Skinner, 1993	152	152	8–11	Mix/unrep.	West Europe	Unreported	Within	Naturalistic	Achiev/Cog	Other	−0.80
Schneider & Leitenberg, 1989	14	14	8–11	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	Other	0.07
Schneider & Leitenberg, 1989	28	28	8–11	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	Other	0.15
Schneider & Leitenberg, 1989	22	22	8–11	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	Other	1.65
Schneider & Leitenberg, 1989	21	21	8–11	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	Other	1.71
Schulman, 1995	74	74	15–18	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	MMCS	1.22
Schulman et al., 1987	19	19	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.39
Schulman et al., 1989	169	169	19–24	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	Content analysis	1.35
Schulman et al., 1993	54	54	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.29
Schulman et al., 1993	130	130	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.04
Seligman et al., 1979	35	35	19–24	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	ASQ	2.17
Seligman et al., 1979	35	35	19–24	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.17
Seligman, Abramson, et al., 1984	35	35	19–24	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	ASQ	2.17
Seligman, Abramson, et al., 1984	35	35	19–24	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.17
Seligman, Peterson, et al., 1984	96	96	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	2.13
Seligman et al., 1990	26	26	19–24	Males	US Caucasian	Unreported	Within	Hypothetical	Varied	ASQ	2.01
Seligman et al., 1990	21	21	19–24	Males	US Caucasian	Unreported	Within	Hypothetical	Varied	ASQ	2.57
Seligman & Schulman, 1986	94	94	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.56
Semkow & McCarrey, 1982	45	45	19–24	Females	Canada	Unreported	Within	Experimental	Achiev/Cog	Other	0.44
Semkow & McCarrey, 1982	44	44	19–24	Females	Canada	Unreported	Within	Experimental	Achiev/Cog	Other	0.58
Sharpe et al., 1994	34	34	8–11	Mix/unrep.	African American	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.63
Silverman & Peterson, 1993	32	32	25–55	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	ASQ	2.99
Silverman & Peterson, 1993	30	30	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.19
Silverman & Peterson, 1993	30	30	25–55	Mix/unrep.	US mix/unrep.	Psychotic	Within	Hypothetical	Varied	ASQ	1.59
Silverman & Peterson, 1993	32	32	25–55	Mix/unrep.	US mix/unrep.	Psychotic	Within	Hypothetical	Varied	ASQ	2.29
Simon & Feather, 1973	130	56	19–24	Mix/unrep.	Austral/NewZeal	Unreported	Between	Experimental	Achiev/Cog	Other	1.13
Singh & Nathawat, 1989	40	40	15–18	Mix/unrep.	India	Unreported	Within	Hypothetical	Varied	ASQ	1.11
Singh & Nathawat, 1989	40	40	15–18	Mix/unrep.	India	Unreported	Within	Hypothetical	Varied	ASQ	1.77
Smith & Whitehead, 1993	176	176	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Experimental	Interpersonal	Other	0.46
Spirito et al., 1988	20	20	12–14	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Varied	CASQ/CASQ–R	0.75
Spirito et al., 1988	20	20	12–14	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	CASQ/CASQ–R	0.21
Spirito et al., 1991	69	69	15–18	Mix/unrep.	US Caucasian	Mix	Within	Hypothetical	Varied	CASQ/CASQ–R	0.84

(*table continues*)

Table 1 (*continued*)

Study	*N*		Age category	Gender	Culture	Psychopathology	Design	Method	Domain	Measure	*d*
	Positive events	Negative events									
Spirito et al., 1991	40	40	12–14	Mix/unrep.	US mix/unrep.	Mix	Within	Hypothetical	Varied	CASQ/CASQ–R	0.88
Stipek, 1984	20	20	8–11	Females	US mix/unrep.	Unreported	Within	Naturalistic	Achiev/Cog	Other	0.27
Stipek, 1984	21	21	8–11	Males	US mix/unrep.	Unreported	Within	Naturalistic	Achiev/Cog	Other	0.30
Stipek & Gralinski, 1991	136	101	8–11	Females	US mix/unrep.	Unreported	Between	Naturalistic	Achiev/Cog	Other	0.04
Stipek & Gralinski, 1991	155	81	8–11	Males	US mix/unrep.	Unreported	Between	Naturalistic	Achiev/Cog	Other	1.06
Stojanowska, 1998	101	101	25–55	Mix/unrep.	West Europe	Unreported	Within	Naturalistic	Achiev/Cog	Other	0.95
Strube, 1985	62	62	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	2.04
Summerville et al., 1994	28	28	15–18	Mix/unrep.	African American	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	0.42
Summerville et al., 1994	41	41	15–18	Mix/unrep.	African American	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.60
Summerville et al., 1994	52	52	15–18	Mix/unrep.	African American	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	3.70
Sweeney et al., 1982	47	31	19–24	Females	US mix/unrep.	Unreported	Between	Naturalistic	Achiev/Cog	Other	0.99
Sweeney et al., 1982	52	36	19–24	Males	US mix/unrep.	Unreported	Between	Naturalistic	Achiev/Cog	Other	1.15
Teglasi, 1977	18	18	19–24	Females	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.30
Teglasi, 1977	18	18	19–24	Females	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.76
Teglasi, 1977	18	18	19–24	Females	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.77
Teglasi, 1977	18	18	19–24	Females	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	1.27
Teglasi, 1977	18	18	19–24	Females	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	1.38
Teglasi, 1977	18	18	19–24	Females	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	1.48
Tems et al., 1993	23	23	12–14	Mix/unrep.	US Caucasian	None	Within	Hypothetical	Varied	CASQ/CASQ–R	1.42
Tems et al., 1993	23	23	12–14	Mix/unrep.	US Caucasian	Depressed	Within	Hypothetical	Varied	CASQ/CASQ–R	0.28
Tems et al., 1993	94	94	12–14	Mix/unrep.	US Caucasian	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.45
Tennen et al., 1987	55	55	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.90
Thompson et al., 1998	570	570	8–11	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	2.35
Thompson et al., 1998	515	515	8–11	Males	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	2.36
Vispoel & Austin, 1995	211	211	12–14	Mix/unrep.	US Caucasian	Unreported	Within	Naturalistic	Achiev/Cog	Other	1.51
Vlahovic-Stetic et al., 1999	31	31	8–11	Mix/unrep.	E. Europe/Russia	Unreported	Within	Hypothetical	Achiev/Cog	Other	2.67
Vlahovic-Stetic et al., 1999	31	31	8–11	Mix/unrep.	E. Europe/Russia	Unreported	Within	Hypothetical	Achiev/Cog	Other	2.86
Wagner et al., 1998	317	317	15–18	Females	US mix/unrep.	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.75
Wagner et al., 2000	64	64	12–14	Mix/unrep.	US Caucasian	Mix	Within	Hypothetical	Varied	CSQ	0.46
Wagner et al., 2000	24	24	12–14	Mix/unrep.	African American	Mix	Within	Hypothetical	Varied	CSQ	1.06
Wagner et al., 2000	10	10	12–14	Mix/unrep.	Native American	Mix	Within	Hypothetical	Varied	CSQ	1.15
Ward et al., 1987	41	41	8–11	Mix/unrep.	US mix/unrep.	None	Between	Experimental	Achiev/Cog	Other	2.03
Ward et al., 1987	41	41	8–11	Mix/unrep.	US mix/unrep.	Depressed	Between	Experimental	Achiev/Cog	Other	1.46
Watson et al., 1989	11	11	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	0.36
Watson et al., 1989	11	11	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	0.47
Watson et al., 1989	11	11	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	0.70
Watson et al., 1989	11	11	25–55	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	0.99
Whitehead et al., 1987	52	52	8–11	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	Other	1.77
Wofford et al., 1996	160	160	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	−0.14
Wolf & Savickas, 1985	87	87	15–18	Mix/unrep.	US mix/unrep.	None	Within	Hypothetical	Achiev/Cog	Other	0.71
Wolf & Savickas, 1985	67	67	15–18	Mix/unrep.	US mix/unrep.	Mix	Within	Hypothetical	Achiev/Cog	Other	0.65
Wolf & Savickas, 1985	58	58	15–18	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Achiev/Cog	Other	0.28
Wolf & Savickas, 1985	62	62	15–18	Mix/unrep.	US mix/unrep.	Mix	Within	Hypothetical	Achiev/Cog	Other	0.35
Wolleat, 1980	647	647	15–18	Females	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	IAR	−0.09
Wolleat, 1980	577	577	15–18	Males	US mix/unrep.	Unreported	Within	Hypothetical	Achiev/Cog	IAR	0.56
Wollert et al., 1983	15	15	19–24	Mix/unrep.	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.51
Wollert et al., 1983	15	15	19–24	Mix/unrep.	US mix/unrep.	Unreported	Between	Experimental	Achiev/Cog	Other	0.73
Wollert & Rowley, 1987	118	21	19–24	Mix/unrep.	Canada	Unreported	Between	Naturalistic	Achiev/Cog	Other	1.78

Table 1 (*continued*)

Study	*N* Positive events	*N* Negative events	Age category	Gender	Culture	Psychopathology	Design	Method	Domain	Measure	*d*
Wortman et al., 1973	18	18	15–18	Males	US mix/unrep.	Unreported	Between	Experimental	Interpersonal	Other	0.57
Xenikou et al., 1997	189	189	25–55	Mix/unrep.	UK	Unreported	Within	Hypothetical	Other	Adapted ASQ	0.11
Yamauchi, 1988	40	40	19–24	Females	Japan	Unreported	Between	Experimental	Achiev/Cog	Other	−1.44
Yamauchi, 1988	40	40	19–24	Males	Japan	Unreported	Between	Experimental	Achiev/Cog	Other	−0.94
Yamauchi, 1989	94	94	12–14	Females	Japan	Unreported	Within	Hypothetical	Achiev/Cog	Other	−0.47
Yamauchi, 1989	76	76	12–14	Males	Japan	Unreported	Within	Hypothetical	Achiev/Cog	Other	−0.18
Yates et al., 1995	82	82	8–11	Males	Austral/NewZeal	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	1.19
Yates et al., 1995	63	63	8–11	Females	Austral/NewZeal	Unreported	Within	Hypothetical	Varied	CASQ/CASQ–R	2.65
Yee et al., 1996	86	86	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	ASQ	1.44
Zaleski, 1988	331	331	19–24	Mix/unrep.	US mix/unrep.	Unreported	Within	Hypothetical	Varied	Other	0.99
Zimmerman et al., 1984	18	18	25–55	Mix/unrep.	US mix/unrep.	Depressed	Within	Hypothetical	Varied	ASQ	0.19

Note. Mix/unrep. = mixed or unreported; US = United States; ASQ = Attributional Style Questionnaire; Achiev/Cog = achievement or cognitive events; West Europe = Western Europe excluding the United Kingdom (UK); Sub. abuse = substance abuse; CASQ/CASQ–R = Children's Attributional Style Questionnaire or Children's Attributional Style Questionnaire—Revised; ADHD/ext. = attention-deficit/hyperactivity disorder or other externalizing disorder; Austral/NewZeal = Australia and New Zealand; E. Europe/Russia = Eastern Europe and Russia; IAR = Intellectual Achievement Responsibility Questionnaire; CSQ = Cognitive Style Questionnaire; MMCS = Multidimensional-Multiattributional Causality Scale.

Abramson, & Hyde, 2002). Still others have suggested that the gender difference in the magnitude of the self-serving attributional bias demonstrated above—namely that females display a smaller bias than males—may actually be reversed in childhood, with males demonstrating the smaller bias at this age (Nolen-Hoeksema et al., 1991). The results of the Age × Gender analysis are presented in Table 4 and Figure 2.

The magnitude of the self-serving attributional bias in males and females differed with age, although few comparisons reached statistical significance. The graph of this interaction is shown in Figure 2. Although it appears as though females have the larger bias in childhood, the contrast between males and females was not significant ($z^2 = 2.07$, $p > .10$). However, the sexes showed different trajectories for the magnitude of the bias with age. For males, although there appears to be a decline in the magnitude of the bias from childhood to adolescence, the effect sizes in the two age ranges were not significantly different ($z^2 = 2.78$, $p > .05$). In fact, at no age did males' effect size differ significantly from its childhood level. Females, however, demonstrated a marked decline in the self-serving bias with age. For females, the decline in magnitude of the self-serving bias from childhood to early adolescence was significant ($z^2 = 4.59$, $p < .05$). At every age thereafter, the effect size for females was significantly smaller than the childhood level (all *p*s < .01). However, although females demonstrated a smaller self-serving bias than males in early adolescence, middle adolescence, early adulthood, and adulthood, the gender difference was significant only in adulthood ($z^2 = 6.27$, $p < .05$). The gender difference in the magnitude of the self-serving bias was not examined in older adults (over age 55) because of insufficient numbers of effect sizes. The overall pattern is that males display a small, nonsignificant decline in the magnitude of the self-serving bias in early adolescence but recover by late adolescence and continue to display a large effect size in adulthood. For females, however, the decline in early adolescence is more marked than for males, and the bias remains smaller than that in males through adulthood.

Cultural differences. To address the question of whether the magnitude of the self-serving attributional bias is larger in U.S. and Western samples than in other cultural groups, we first examined the magnitude of the bias in five broadly defined cultural groups: U.S. samples, other Western samples (United Kingdom, Canada, Australia, New Zealand, and Western Europe), Asian samples (India, Japan, China, Korea, Pacific Islanders), Eastern

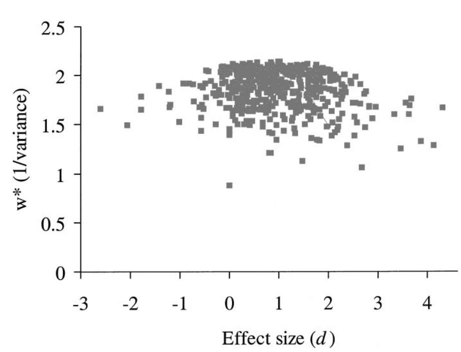

Figure 1. Funnel plot of effect sizes as a function of random-effects weights (w*). $N = 503$.

Table 2
Number of Effect Sizes by Moderator Variable

		Gender			Psychopathology				Culture					Method		Measure								
Variable	Total *k*	M	F	Mix	None	Any	Mix	Comm	U.S.	West	Asian	EE/Rus	Africa	Dim	Cat	ASQ	ASQ (ad)	CASQ	CSQ	CAVE	MAS	IAR	MMCS	Other
Total *k*		87	73	343	35	98	24	346	379	91	22	7	4	279	224	189	14	62	4	3	11	19	19	182
Age group																								
8–11	111	27	14	70	6	15	1	89	99	9	0	3	0	27	84	0	0	27	1	1	0	12	0	70
12–14	64	8	8	48	5	6	10	43	49	12	3	0	0	25	39	4	0	18	3	1	0	7	3	29
15–18	68	16	12	40	3	6	4	55	58	7	3	0	0	39	29	22	0	17	0	0	5	0	4	20
19–24	121	16	21	84	7	10	0	104	85	19	13	1	3	56	65	47	2	0	0	1	6	0	12	53
25–55	129	17	15	97	14	59	7	49	78	44	3	3	1	122	7	108	11	0	0	0	0	0	0	9
Over 55	10	3	3	4	0	2	2	6	10	0	0	0	0	10	0	8	1	0	0	0	0	0	0	1
Gender																								
M					3	12	1	71	66	13	6	0	2	31	56	26	0	6	0	0	4	4	1	46
F					2	11	4	56	55	14	4	0	0	36	37	20	3	11	0	0	1	2	3	33
Mix					30	75	19	219	258	64	12	7	2	212	131	143	11	45	4	3	6	13	15	103
Psychopathology																								
None									28	6	0	1	0	28	7	20	1	7	0	0	0	2	0	5
Any									76	19	2	1	0	88	10	68	3	16	0	0	0	1	0	10
Mix									20	4	0	0	0	22	2	7	2	10	3	0	0	1	0	1
Comm									255	62	20	5	4	141	205	94	8	29	1	3	11	15	19	166
Culture																								
U.S.														212	167	138	6	59	4	3	8	16	12	133
West														55	36	42	7	3	0	0	0	3	3	33
Asian														8	14	6	0	0	0	0	3	0	2	11
EE/Rus														3	4	3	0	0	0	0	0	0	1	3
Africa														1	3	0	1	0	0	0	0	0	1	2
Method																								
Dim																1	0	0	0	2	11	19	19	171
Cat																188	14	62	4	1	0	0	0	11

Note. M = all male; F = all female; Comm = community sample that did not select for or report psychopathology); West = western culture other than the United States; Asian = Japanese, Chinese, Korean, Pacific Islander, Indian; EE/Rus = Eastern Europe and Russia; Dim = dimensional; Cat = categorical; ASQ = Attributional Style Questionnaire; ad = adapted; CASQ = Children's Attributional Style Questionnaire or Children's Attributional Style Questionnaire—Revised; CSQ = Cognitive Style Questionnaire; CAVE = content analysis of verbal extractions; MAS = Math Attribution Scale; IAR = Intellectual Achievement Responsibility Questionnaire; MMCS = Multidimensional-Multiattributional Causality Scale.

Table 3
Magnitude of the Self-Serving Attributional Bias as a Function of Age

Age group	*k*	*d*	95% CI for *d*
8–11	111	1.27	1.13, 1.41
12–14	64	0.78	0.60, 0.96
15–18	68	1.02	0.85, 1.19
19–24	121	0.97	0.84, 1.10
25–55	129	0.70	0.58, 0.83
Over 55	10	1.38	0.90, 1.86

Note. *k* = number of effect sizes; CI = confidence interval.

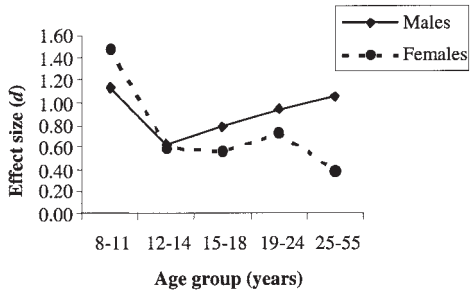

Figure 2. Magnitude of the self-serving attributional bias as a function of age and gender.

European/Russian samples, and African samples. Homogeneity analyses indicated that there were significant differences in the magnitude of the self-serving attributional bias as a function of cultural groups ($H_B = 37.93$) compared with a critical value, $\chi^2(4, N = 5) = 13.28$, $p < .01$. As predicted, the magnitude of the self-serving attributional bias was large in U.S. and other Western samples (*d*s = 1.05 and 0.70, respectively) and significantly smaller in Asian samples ($d = 0.30$; $z^2 = 13.43$) compared with a critical value, $\chi^2(1, N = 2) = 6.63$, $p < .01$. It is important to note that across all cultural groups the direction of the self-serving attributional bias was positive. Within-groups homogeneity analyses indicated that all five cultural groups displayed significant within-groups heterogeneity ($p < .01$). Thus, we further examined the magnitude of the self-serving attributional bias in more homogeneous cultural subgroupings.

We examined the self-serving bias in 16 specific cultural groups. U.S. samples were divided into U.S. White, African American, Asian American, Hispanic American, Native American, and U.S. samples of mixed or unreported ethnicity. Non-U.S. Western samples were divided into the following groups: United Kingdom, Canada, Australia and New Zealand, and Western Europe (non-United Kingdom). Asian samples were divided into the following groups: India, Japan, Pacific Islander, and China and Korea. Eastern Europe and Russia and Africa remained as cultural groups. The selection of these groups represented those unique ethnic groups or nations for which we had four or more independent samples to examine mean effect sizes.

The results for this analysis are shown in Table 5. The magnitude of the self-serving attributional bias was large in all U.S. samples. No ethnic group within the United States (African Americans, Asian Americans, Hispanic Americans, or Native Americans) displayed a self-serving bias that was significantly different than that found in White U.S. samples or U.S. samples of mixed or unreported ethnicity.

As discussed above, there was notable variability in the magnitude of the self-serving attributional bias among non-Western cultures. Consistent with the premise of smaller self-serving biases in Asian cultures (Crittenden & Bae, 1994; Heine et al., 1999; Salili, 1996), some Asian cultures displayed a markedly attenuated or even absent self-serving attributional bias. Samples in Japan and the Pacific Islands both displayed significantly smaller self-serving attributional biases than those observed in the United States (Ja-

Table 4
Magnitude of the Self-Serving Attributional Bias as a Function of Age and Gender

	d (95% CI)	
Age group	Males	Females
8–11	1.13 (0.85, 1.41) *k* = 27	1.48 (1.09, 1.86) *k* = 14
12–14	0.63 (0.12, 1.15) *k* = 8	0.59 (0.09, 1.09) *k* = 8
15–18	0.78 (0.42, 1.14) *k* = 16	0.56 (0.15, 0.97) *k* = 12
19–24	0.95 (0.60, 1.31) *k* = 16	0.72 (0.41, 1.04) *k* = 21
25–55	1.05 (0.71, 1.40) *k* = 17	0.38 (−0.01, 0.78) *k* = 15
Over 55	—	—
H	160.16*	165.93*

Note. Parentheses contain 95% confidence interval (CI) for the effect size *d*. A dash indicates that a mean could not be computed because there were four or fewer effect sizes. *k* = number of effect sizes on which the computation of the mean was based; *H* = within-groups homogeneity statistic (Hedges & Becker, 1986).
* $p < .05$.

Table 5
Magnitude of the Self-Serving Attributional Bias as a Function of Culture

Culture	*k*	*d*	95% CI for *d*	*H*
United States White	74	1.07	0.91, 1.24	131.28*
United States mixed/unreported	282	1.05	0.96, 1.13	423.74*
African American	11	1.29	0.86, 1.73	16.63
Asian American	4	0.84	0.15, 1.53	2.69
Hispanic American	3	0.75	−0.13, 1.62	0.61
Native American	5	1.08	0.43, 1.72	1.14
United Kingdom (UK)	33	0.64	0.39, 0.88	44.11
Canada	8	0.99	0.48, 1.50	6.78
Australia and New Zealand	30	0.96	0.70, 1.22	38.59
Western Europe (non-UK)	20	0.31	0.02, 0.63	13.59
Eastern Europe and Russia	7	1.25	0.70, 1.81	11.64
India	7	0.53	0.00, 1.07	9.37
Japan	7	−0.30	−0.82, 0.22	5.93
China and Korea	4	1.04	0.36, 1.72	2.37
Pacific Islander	4	0.18	−0.50, 0.86	0.21
Africa	4	1.21	0.51, 1.90	2.13

Note. *k* = number of effect sizes; CI = confidence interval; *H* = within-groups homogeneity statistic (Hedges & Becker, 1986).
* $p < .05$, according to chi-square test.

pan: $z^2 = 8.33$, $p < .05$; Pacific Islands: $z^2 = 6.34$, $p < .05$). In fact, in both Japanese and Pacific Islander samples, the 95% confidence interval for the mean effect size included zero, indicating the probable absence of a self-serving attributional bias in this cultural group. Although samples from India appeared to display a smaller self-serving bias ($d = 0.53$) than U.S. samples, this effect size was not significantly different than that found in U.S. samples ($p > .05$). However, the 95% confidence interval for Indian samples included zero, indicating the possible absence of a self-serving bias in this group. Only samples from China and Korea displayed a self-serving attributional bias that was comparable with that observed in U.S. samples ($d = 1.04$).

Psychopathology. To address the question of whether psychopathological groups display an attenuated or absent self-serving attributional bias compared with psychologically healthy nonpsychopathological groups, the magnitude of the self-serving attributional bias was first compared for samples that were (a) selected for the absence of psychopathology, (b) selected for any psychopathology, (c) included a mix of participants with and without psychopathology, and (d) community samples that did not select for or report psychopathology. Homogeneity analyses indicated that there were significant differences in the magnitude of the self-serving attributional bias as a function of psychopathology ($H_B = 62.97$) compared with a critical value, $\chi^2(3, N = 4) = 11.34$, $p < .01$.

The mean effect size for samples selected for the absence of any psychopathology was very large ($d = 1.28$). The mean effect size for community samples unselected for psychopathology was also very large ($d = 1.08$) and comparable to the mean effect size across all samples ($d = 0.96$). By contrast, the mean effect size for samples that selected for the presence of any psychopathology was only in the moderate range ($d = 0.48$). Samples with any psychopathology displayed a significantly smaller self-serving attributional bias than samples with no psychopathology and community samples ($z^2 = 47.92$) compared with a critical value, $\chi^2(1, N = 2) = 6.63$, $p < .01$. Similarly, the mean effect size for mixed samples including participants with and without psychopathology was in the moderate range ($d = 0.54$).

Within-groups homogeneity analyses indicated that there was significant heterogeneity within the sample with psychopathology ($H_W = 126.26$) compared with a critical value, $\chi^2(97, N = 98) = 120.99$, $p < .05$. Thus, we conducted further analyses examining the mean effect sizes for specific psychopathological groups, in comparison with each other and with the nonpsychopathological, mixed, and unreported groups examined above. The results of this analysis are presented in Table 6.

The mean effect size for the self-serving attributional bias in groups with depressive disorder was small ($d = 0.21$). This was the smallest effect size for any psychopathology group and suggests a substantial attenuation of the self-serving bias in this population. In fact, the 95% confidence interval for samples with depressive disorder included zero, suggesting no self-serving bias in this group. Samples with depressive disorder displayed a significantly smaller self-serving attributional bias than either the samples with no psychopathology or the community samples of unreported psychopathology ($z^2 = 60.61$, $p < .01$).

Several other psychopathological groups also demonstrated an attenuated self-serving attributional bias in comparison with that observed in community samples or nonpsychopathological samples. Individuals with anxiety disorders displayed a moderate self-serving attributional bias ($d = 0.46$) that was significantly smaller than that in samples with no psychopathology ($z^2 = 7.61$, $p < .01$) but not significantly greater than that in samples with depressive disorder ($z^2 < 1.00$, $p > .10$). Contrary to expectations, individuals with psychotic disorders displayed not an exaggerated self-serving attributional bias but a bias comparable with that found in community samples. An attenuation of the self-serving attributional bias was also found for samples with ADHD or externalizing disorders ($d = 0.55$); this was significantly lower than the bias in nonpsychopathological and community samples ($z^2 = 6.01$, $p < .05$).

Samples with bipolar disorder displayed a very large self-serving attributional bias ($d = 1.12$). However, a test of the contrast between samples with bipolar disorder compared with nonpsychopathological samples and community samples indicated there were no significant differences among the three groups in the magnitude of the bias ($z^2 = 0.49$, $p > .10$).

Methodological factors. We examined the magnitude of the self-serving attributional bias as a function of several methodological characteristics of studies: type of outcome for which attributions were made, domain of outcome, dimensional versus categorical assessment of attributions, and measurement instrument.

First we examined the magnitude of the self-serving attributional bias as a function of whether attributions were measured dimensionally (internality, stability, and globality assessed separately) or categorically (using the attribution of ability). In the current study, the magnitude of the self-serving attributional bias was significantly larger when measured dimensionally ($d = 1.06$) than when measured categorically ($d = 0.84$; $z^2 = 11.00$) compared with a critical value, $\chi^2(1, N = 2) = 6.63$, $p < .01$.

There was a strong overlap between assessing attributions dimensionally and the use of the ASQ and its associated family of measurement instruments, including adaptations of the ASQ, the CASQ, and the CSQ. Fully 95% of studies assessing attributions dimensionally utilized the ASQ, CASQ, CASQ–R, or CSQ. We next examined variability in the magnitude of the self-serving attributional bias as a function of measurement instrument. The

Table 6
Magnitude of the Self-Serving Attributional Bias as a Function of Psychopathology

Psychopathology	*k*	*d*	95% CI for *d*	*H*
No psychopathology	35	1.28	1.04, 1.53	32.79
Depressive disorder	50	0.21	0.00, 0.41	57.11
Bipolar disorder	5	1.10	0.41, 1.79	5.79
Psychotic disorders	11	0.92	0.48, 1.37	10.45
Anxiety disorders	8	0.46	0.06, 0.99	3.99
ADHD/externalizing disorders	9	0.55	0.07, 1.04	7.08
Substance abuse disorders	7	0.88	0.31, 1.44	5.01
Abused	8	0.85	0.33, 1.38	19.29
Mix of psychopathology and no psychopathology	24	0.54	0.23, 0.84	22.73
Unreported	346	1.08	1.00, 1.16	527.32*

Note. *k* = number of effect sizes; CI = confidence interval; *H* = within-groups homogeneity statistic (Hedges & Becker, 1986); ADHD = attention-deficit/hyperactivity disorder.
* $p < .05$, according to chi-square test.

Table 7
Magnitude of the Self-Serving Attributional Bias as a Function of Measurement Instrument

Measure	*k*	*d*	95% CI for *d*	*H*
Attributional Style Questionnaire (ASQ)	189	1.05	0.95, 1.16	299.02*
Adaptations of ASQ	14	0.63	0.25, 1.00	24.53
Children's Attributional Style Questionnaire (CASQ) or CASQ—Revised	62	1.14	0.96, 1.32	88.92*
Cognitive Style Questionnaire	4	1.13	0.41, 1.86	2.14
Content analysis of verbal or written attributions	3	0.83	0.02, 1.68	1.14
Intellectual Achievement Responsibility Questionnaire	19	0.49	0.16, 0.82	5.37
Math Attribution Scale	11	0.43	0.02, 0.84	3.91
Multi-Dimensional Multi-Attribution Causality Scale	19	0.71	0.40, 1.03	5.70
Other/developed specifically for study	182	0.94	0.83, 1.04	315.56*

Note. k = number of effect sizes; CI = confidence interval; H = within-groups homogeneity statistic (Hedges & Becker, 1986).
* $p < .05$, according to chi-square test.

results of this analysis are presented in Table 7. The ASQ family of questionnaires (ASQ, CASQ, CASQ–R, and CSQ) all revealed large self-serving attributional biases ($d > 1.00$) that were comparable to those found across all samples. By contrast, both the Intellectual Achievement Responsibility Questionnaire and Math Attribution Scale displayed biases that were significantly smaller than the overall weighted mean effect size (both ps $< .05$).

Homogeneity analyses indicated that there were significant differences in the magnitude of the self-serving attributional bias as a function of whether the outcome assessed was hypothetical, experimental, or naturalistic ($H_B = 9.95$) compared with a critical value, $\chi^2(2, N = 3) = 9.21$, $p < .01$. The mean effect size for the self-serving attributional bias was largest when measured in response to hypothetical positive and negative events ($d = 1.01$), compared with when it was measured in response to experimental ($d = 0.78$) or naturalistic ($d = 0.71$) outcomes.

Homogeneity analyses indicated that there were significant differences in the magnitude of the self-serving attributional bias as a function of whether the study assessed outcomes across a variety of domains or the specific domain categories of achievement or cognitive events, social or interpersonal events, or athletic events ($H_B = 10.52$), compared with a critical value, $\chi^2(2, N = 3) = 9.21$, $p < .05$. The mean effect size for the self-serving attributional bias was largest when measured in response to multiple event types ($d = 1.04$), compared with when measured in response to achievement or cognitive events ($d = 0.87$), social or interpersonal events ($d = 0.81$), or athletic events ($d = 0.49$) alone. This likely represents the widespread use of the ASQ family of questionnaires, all of which assess attributions in a variety of domains (typically both achievement and interpersonal) and together account for 269 (91%) of the 296 samples assessing attributions across multiple event domains.

We also examined the magnitude of the self-serving attributional bias as a function of the reliability of the measure. Of 503 samples, reliability statistics unique to that sample were reported for 92 samples; 410 samples did not report internal consistency for the measure they administered in the sample. Studies were grouped into those using attributional measures with low internal consistency (less than 0.50), moderate internal consistency (0.50 to 0.74), and high internal consistency (0.75 or above). As expected, the magnitude of the self-serving attributional bias was smaller in samples with low internal consistency measures ($d = 0.41$) and larger in samples with moderate or high internal consistency measures (ds = 1.14 and 1.06, respectively) compared with studies with unreported internal consistencies ($d = 0.93$).

Regression Analysis

In view of the fact that the initial homogeneity analysis indicated that the set of 503 effect sizes was nonhomogenous, and given the large number of moderator analyses conducted, multiple regression analysis was used as an omnibus test of the sources of variation in effect sizes. The regression analyses were conducted and interpreted according to the procedure outlined by Hedges and Becker (1986) and using weights for a random-effects model as specified by Hedges and Vevea (1998). Effect size was the criterion variable, weighted by the inverse of the variance, corrected by the between-studies variance component, for each effect size. On the basis of the results of the categorical analyses reported previously, we performed an initial regression analysis using the following predictors: age of participants, gender (male, female, and mixed), psychopathology (no psychopathology, any psychopathology, and community samples), culture (U.S., non-U.S. Western, Asian, and other), and attribution measurement (dimensional and categorical). Age was entered as a continuous variable, and both linear and quadratic trends were examined. Gender, psychopathology, and culture were entered as sets of contrast codes. Finally, the Age × Gender interaction was examined, with age as a linear variable interacting with the contrast code contrasting male-only with female-only samples.

Entered simultaneously, these variables predicted 27% of the variance in effect size. Using the procedure described by Hedges and Becker (1986), we examined each predictor variable for significance by calculating the corrected standard error for each beta weight, using this corrected standard error to compute the test statistic z for each regression coefficient, and comparing each test statistic z to the critical value ($p < .01$) of the standard normal distribution (2.58). Age entered as a linear variable was a significant predictor ($z = 3.35$); however, the quadratic trend for age was not significant. The contrast comparing samples with any

psychopathology to samples with no psychopathology and community samples was significant ($z = 3.64$). Culture remained a significant predictor of effect size; specifically, the contrast code comparing Asian cultures with U.S. and Western cultures was significant ($z = 2.67$). The contrast comparing all-male samples with all-female samples was not significant. The method by which attributions were measured (dimensionally vs. categorically) was a significant predictor ($z = 8.87$). The Age × Gender interaction failed to reach significance ($z = 1.25$).

We further tested the model specification. The weighted error sum of squares, 437.42, did not exceed the approximate 95% critical value according to W. Beyer (1966), $\chi^2(487, N = 503) = 553.00$, leading us to accept the specified model. This suggests that the current set of predictor variables produces a model that adequately fits the data.

Discussion

We conducted a meta-analysis to investigate the magnitude, ubiquity, and adaptiveness of the self-serving attributional bias. Our meta-analysis included a large number of studies identified by a computerized literature search across personality, social, clinical, cross-cultural, developmental, and educational psychology.

Is There a Self-Serving Attributional Bias?

A meta-analysis of 503 independent effect sizes, using a random-effects model, yielded an overall weighted mean effect size of 0.96, a very large effect indicating that in general, people make more internal, stable, and global attributions for positive or success events than they do for negative or failure events. The effect size demonstrated in the current meta-analysis is somewhat larger than those reported in prior meta-analyses of the self-serving attributional bias. Arkin et al. (1980), W. K. Campbell and Sedikides (1999), and Mullen and Riordan (1988) all reported effect sizes in the range of 0.38 to 0.67.

Large effect sizes are relatively uncommon in psychological research (Cohen, 1969; see Lipsey & Wilson, 1993, for a review of meta-analyses in psychology). In the specific field of cognition, the well-documented effect of depression on memory impairment displayed only a moderate effect size (0.56) in one meta-analysis (Burt, Zembar, & Niederehe, 1995). The self-reference effect on memory recall similarly displayed a moderate effect size (0.50; Symons & Johnson, 1997). Effect sizes for the well-known decline in performance on cognitive tasks with age ranged from small to moderate (0.27 to 0.52; Verhaeghen & Salthouse, 1997). Thus, in comparison with other effect sizes in the field of cognition, the magnitude of the self-serving attributional bias found in the current study represents an unusually large effect. Attributional positivity is a highly robust phenomenon.

One of the primary questions this study sought to address was whether the self-serving attributional bias is in fact a widespread feature of human cognition. Our results unambiguously support the conclusion that the self-serving attributional bias is nearly ubiquitous across a diverse representation of samples varying in age, gender, psychopathology, and culture. The consistency of the self-serving attributional bias was remarkable. Fully 89% of the 503 independent samples yielded a positive value for the effect size. The vast majority of the 503 effect sizes (72%) were of moderate ($d = 0.40$) size or greater according to Cohen's (1969) classification. Only five subgroups (depressed, adult women, Japanese, Indian, and Pacific Islander samples) displayed virtually no self-serving attributional bias; for each of these groups, the 95% confidence interval for the effect size included zero. No subgroup displayed a negativity bias, which would have been demonstrated by a negative effect size for which the 95% confidence interval excluded zero.

What Is the Developmental Trajectory of the Self-Serving Attributional Bias?

One of the most interesting findings from the current meta-analysis was the significant trend in the self-serving attributional bias from childhood into old age. Effect sizes for the attributional bias were found to be largest in childhood (ages 8–11) and late adulthood (after age 55). The magnitude of the bias was smallest in early adolescence. These results suggest a developmental pattern in which the positivity bias in attributions is very large in childhood, significantly declines in early adolescence, remains at this relatively attenuated level throughout adolescence and adulthood, and then shows a dramatic increase again in late adulthood. At all developmental stages, however, the magnitude of the bias is 0.70 or greater, suggesting a persistently large self-serving bias across the life span.

These results are consistent with the presence of what some researchers have identified as an exaggerated positivity bias in childhood (Plumert, 1995; Ruble et al., 1994; Stipek, 1984; Stipek & MacIver, 1989). Because there are few studies of attributions in children younger than 8 years, we were not able to examine the self-serving bias in early childhood. This is likely related to cognitive development limitations on assessment. Although children may be able to self-report on some aspects of perceived competence as early as age 6 (Eccles et al., 1993), it has been argued that children do not conceptualize ability or other personal characteristics as stable traits until the middle childhood period, making it difficult to assess attributions in children under age 8 (Stipek & MacIver, 1989). Thus, it is impossible to know whether the large positivity bias in attributions we observed in middle childhood is comparable to or is itself a decline from that in younger children. However, it is clear in the current study that attenuation in children's positivity in attributions occurs in adolescence.

There are several possible pathways for a decline in the magnitude of the self-serving bias from childhood to adolescence: Attributions for positive events become less internal, stable, and global; attributions for negative events become more internal, stable, and global; or both. Research on life events, cognitive development, and self-esteem in adolescence suggests that attributions for negative events likely become less positive (i.e., more internal, stable, and global) in adolescence than they were in childhood. During this developmental period, children begin to understand that ability is a stable trait and to infer that repeated failure at an endeavor signals a lack of ability (Stipek & MacIver, 1989). Thus, although young children are remarkably resilient to failure and make few negative attributions about it, adolescents have the cognitive ability to infer that negative events may be caused by internal, stable, and global causes such as a lack of ability. Both boys and girls report more negative life events as they transition to adolescence, particularly associated with the transition

to middle school (Ge, Lorenz, Conger, Elder, & Simons, 1994; Wigfield & Eccles, 1994).

It is interesting to note that despite the appearance of an increase in the bias in late adolescence, the self-serving attributional bias does not recover much of its childhood magnitude until later adulthood, after age 55. The parallel with the trend for depression is striking. The rise in depression prevalence begins in early adolescence, is complete by late adolescence, and remains relatively stable into adulthood (Hankin et al., 1998). Some studies have suggested that rates of depression in older adults may be lower than those found in midlife (Gatz & Fiske, 2003).

The dramatic increase in the magnitude of the effect size for older adults is striking and merits attention. Some researchers have suggested that later adulthood may be a period marked by an attenuated self-serving bias (Lachman & McArthur, 1986), but we found instead an exaggerated bias in this age group ($d = 1.38$). It is unlikely that this large effect size is a spurious observation, as there were 10 samples with participants over age 55. All of the effect sizes for these 10 studies were positive, ranging in magnitude from 0.53 to 2.68, with 6 of the 10 effect sizes exceeding 1.00. What may account for the unusually large self-serving attributional bias in older adults? One explanation may be that the majority of studies we examined were conducted with community-dwelling adults. Community-dwelling adults may have a more positive outlook on their own situation when they compare themselves with their contemporaries who are ill, confined to nursing homes or other care facilities, or even deceased. Moreover, some studies have concluded that optimism actually increases with age (Lennings, 2000). Of particular interest, one study included in the current meta-analysis examined the stability of attributions for positive and negative events over a 52-year span and concluded that although attributions for negative events are relatively stable from early to late adulthood, attributions for positive events actually became more internal, stable, and global with time (Burns & Seligman, 1989). The very pronounced self-serving attributional bias among older adults is also consistent with characterizations of the "paradox of happiness" and the "invulnerable self" in later life: Most older adults report good functioning and high life satisfaction despite increasing age-associated losses and declines in functioning (Baltes & Baltes, 1990; Costa & McCrae, 1984).

Our results suggest an intriguing gender difference in the developmental trajectory for the self-serving attributional bias. Although both males and females demonstrated a large self-serving bias in childhood, the genders diverge after childhood, demonstrating different trajectories for the magnitude of the bias with age. For males, there was no statistically significant decline in the bias from childhood to adolescence. In fact, at no age did males' effect size differ significantly from its childhood level. Females, however, demonstrated a marked decline in the self-serving bias with age. For females, the decline in magnitude of the self-serving bias from childhood to early adolescence was significant, and at every age thereafter, females' effect size was significantly lower than its childhood level. However, although females demonstrated a tendency toward a lower self-serving bias than did males in early adolescence, middle adolescence, early adulthood, and adulthood, the gender difference was significant only in adulthood. The overall pattern is that males show a relatively stable self-serving bias from childhood into adulthood, with only statistically insignificant variability. For females, however, the decline in early adolescence is more marked than for males, and the bias remains smaller than that in males through adulthood.

Finally, one particular finding may shed light on the developmental trajectory of attributional processes more generally. We predicted that abused samples would display an attenuated self-serving attributional bias because of the association of abuse history with more negative attributional patterns in adults and the high comorbidity of abuse and depression (Rose et al., 1994). There were only eight studies examining attributions in abused samples, and effect sizes ranged from –1.21 to 2.08. Of those eight samples, five were child samples (ages 8–11) and three were adult samples (ages 25–55). The effect sizes clustered by age; the three adult abused samples had the three smallest effect sizes (ds = –1.21, –0.57, and 0.17), and the five child abused samples had the larger effect sizes, all in the moderate to large range. The three adult abused samples were all selected for childhood abuse yet displayed negativity biases or very small biases in adulthood. Rose and Abramson (1992) suggested that childhood abuse would be associated with negative attributional patterns in adulthood in part because the repeated experience of abuse would, over time, contribute to the victim interpreting negative events as being caused by stable and global factors. As Mezulis, Hyde, and Abramson (2003) have argued elsewhere, if attributional styles are not fully developed until after childhood, adverse childhood experiences may not be represented in attributional processes until adolescence or adulthood.

Is the Self-Serving Attributional Bias Ubiquitous Across Cultures or Specific to Western Cultures?

As expected, the magnitude of the self-serving attributional bias was very large in the U.S. and other Western cultures but significantly smaller in Asian cultures overall. Within the U.S. samples, there was remarkable consistency in the magnitude of the self-serving attributional bias across diverse ethnic groups. Effect sizes in the large to very large range ($d = 0.75$ to $d = 1.29$) were obtained for U.S. White, Asian American, African American, Hispanic American, and Native American samples, as well as for U.S. samples of mixed or unreported ethnicity. By contrast, the weighted mean effect size in Asian samples was small ($d = 0.30$) by Cohen's standards. The small magnitude of the self-serving bias in Asian cultures is consistent with several previous findings that the bias is greater in Western cultures than in Eastern cultures (Crittenden & Bae, 1994; Heine et al., 1999; Salili, 1996).

Although across all Asian samples the magnitude of the self-serving attributional bias was significantly smaller than in U.S. or Western samples, there was significant variability in the magnitude of the bias among individual Asian cultures. Japanese and Pacific Islander samples displayed no self-serving bias. India displayed a moderate bias ($d = 0.53$) that was also not significantly different from zero. China and Korea combined, by contrast, displayed a large bias ($d = 1.04$). This variability in effect sizes reflects vast heterogeneity across individual Asian cultures. Our results are consistent with those of Chandler, Shama, Wolf, and Planchard (1981), who compared the internality of attributions for students in India, Japan, and the United States and found that students in India made attributions that were more internal than those made by Japanese students but less internal than those made by American students.

Is the Self-Serving Attributional Bias Adaptive?

One of the reasons that the self-serving attributional bias has attracted so much empirical attention is its purported contribution to mental health. Social and clinical psychologists have long argued that positivity biases such as this one are crucial for the maintenance of a positive self-image and mental well-being and that the absence or attenuation of this bias could be associated with poor mental health (Abramson & Alloy, 1981; Alloy et al., 1990; Heider, 1958, Taylor & Brown, 1988).

Does the current meta-analysis shed any light on the question of the psychological adaptiveness of the self-serving attributional bias? Certainly our results support the premise that psychological dysfunction is associated with an attenuated bias. Individuals with psychopathology displayed a significantly smaller self-serving attributional bias ($d = 0.48$) than individuals with no psychopathology ($d = 1.28$) or community samples ($d = 1.08$). Although still positive and significantly greater than zero, the magnitude of the self-serving attributional bias in psychopathological samples was in the moderate range, which is in marked contrast to the large to very large effect sizes found across most other populations.

We further examined the heterogeneity in the magnitude of the self-serving attributional bias across specific psychopathologies. As expected, the magnitude of the bias was smallest ($d = 0.21$) in samples with depressive disorder; the 95% confidence interval for depressed samples included zero, suggesting the absence of a self-serving bias in this population. Despite the high frequency of negative effect sizes in depressed samples (36%, compared with 11% overall), we conclude that depressed samples display a significantly attenuated bias but not a negativity bias, which would have been indicated by an effect size significantly smaller than zero. Thus, Beck's (1967, 1987) hypothesis that individuals with depressive disorder would display a negativity bias in attributions is not supported by our results. However, among psychopathological groups, individuals with depressive disorder stand out as having the most significantly attenuated bias. Also as expected, the magnitude of the self-serving attributional bias was significantly attenuated in samples with anxiety disorder. Our results disconfirm the hypothesis that some anxiety populations have a "reversal" of the self-serving attributional bias (Hope et al., 1989).

Contrary to expectations, we found no evidence of an exaggerated self-serving attributional bias in any psychopathological group. In fact, samples selected for the presence of ADHD or other externalizing disorders actually displayed attenuated self-serving attributional biases in comparison to nonpsychopathological samples. The attenuation in ADHD samples is all the more striking because the majority (78%) of studies with participants with ADHD used child samples, which typically demonstrated an exaggerated bias. One explanation for the attenuation of the bias in these two samples may be the high comorbidity of ADHD with depression (Biederman, Faraone, Mick, & Moore, 1996). In addition, although some researchers have found that children with ADHD display exaggerated self-perceptions (Hoza et al., 2000), this may not apply to attributions. One reason may be that parents of children with ADHD make more internal and stable attributions for negative events in their children's lives, such as blaming children's negative behaviors on their disorder, than do parents of children without ADHD (Johnston & Freeman, 1997). Children with ADHD may internalize this negative attribution pattern as their own.

Our results clearly suggest that a wide variety of psychopathologies—depression, anxiety, and ADHD—are associated with an attenuated self-serving attributional bias. This raises an important question. Several demographic groups displayed significantly attenuated self-serving attributional biases. Is the conclusion, then, that these broad groups of individuals are all displaying poor adaptation? Obviously, our study is not capable of fully addressing this important question. However, we highlight two salient issues that should inform this debate.

First, there is the question of how and why the self-serving bias is associated with psychopathology. Is an attenuated self-serving attributional bias associated with psychopathology because having such an attenuation results in poor mental health, or is an attenuated bias a result of psychopathological problems? Most researchers have argued that the presence of positivity biases such as the self-serving attributional bias contributes significantly to mental health and that the attenuation or absence of such a bias is a risk factor for mental health problems (see Abramson et al., 1989; Taylor & Brown, 1988). The empirical evidence appears to support this claim. Several studies have supported the hypothesis that a depressogenic attributional style, or an attenuated self-serving bias, prospectively predicts depression in children, adolescents, and adults (see Abramson et al., 2002). The picture is less clear for anxiety disorders, with some studies finding that a more negative attributional style predicts anxiety symptoms (Hope et al., 1989; Luten, Ralph, & Mineka, 1997) but other studies (e.g., Metalsky & Joiner, 1992) failing to obtain such a result. Very little research has been conducted on attributions as a risk factor for other psychological disorders.

Second, although one can identify attenuations in the self-serving attributional bias that are statistically significant, it is a far more complicated task to identify attenuations that are clinically significant. How great a positivity bias is "sufficient" for mental health? For example, Asian samples displayed a significantly smaller bias ($d = 0.30$) than White U.S. samples ($d = 1.07$). However, the self-serving bias is still positive, albeit small, for Asians. That Asian samples display a significantly attenuated self-serving attributional bias (and in the case of Japanese and Pacific Islanders, no bias at all) raises an important challenge to the purported adaptiveness of the bias, particularly because there is little evidence to suggest that Asian cultures have a greater prevalence of psychopathology than non-Asian cultures. Several studies have found that rates of depression are comparable, or even somewhat lower, in Asian cultures compared with Western cultures (Doi, Roberts, Takeuchi, & Suzuki, 2001; Nakane, Ohta, Radford, & Yan, 1991).

Positive beliefs about the self may be maintained by attributional patterns other than the one defined here as a self-serving bias in attributions. Cross-cultural researchers such as Heine et al. (1999) and Crittenden and Bae (1994) have argued that the self-serving attributional bias may not be present in Asian cultures for the very reason that such a pattern of attributions is not self-serving to individuals in these cultures. If the self is perceived as interdependent in Asian cultures, sharing responsibility for success and assuming responsibility for failure may be the most adaptive way to maintain self-esteem. Several studies have confirmed that individuals in Asian cultures who make more self-effacing attributions

are actually more well-liked by others than those who make self-serving attributions, and they are not viewed as any less competent (Bond, Leung, & Wan, 1982; Crittenden & Bae, 1994). Thus, individuals in Asian cultures may be as likely to engage in positive illusions about the self as are individuals in Western cultures, but their positive illusions may be expressed in different ways than the self-serving attributional bias.

Anderson et al. (1996) suggested that non-Western cultural groups may not conceive of the independent self as the unit of analysis in the cognitive process of making attributions. Asking participants to make attributions for events using self-focused options such as ability may force them to make attributions in ways unnatural to their typical cognitive processes. Thus, the magnitude of the self-serving attributional bias may be difficult to compare cross-culturally because of the possible nonequivalence of measures (Poortinga, 1989).

How Do Methodological Factors Affect Researchers' Ability to Detect and Assess the Self-Serving Bias?

The self-serving bias was generally detectable as a large effect regardless of the methodological characteristics of the study. Across several different measures, the magnitude of the bias ranged from 0.43 to 1.14, with only two measures (representing a small minority, 4%, of all studies) displaying a self-serving bias significantly lower than that found across all studies combined. Similarly, the magnitude of the effect size was comparably large regardless of whether the study assessed attributions for achievement, social, athletic, or multiple domains and whether participants made attributions for hypothetical, experimental, or naturalistic events. Thus, we can conclude that the self-serving attributional bias is a robust finding that is readily detectable regardless of the methodological characteristics of specific studies.

Of interest was the significant difference in the magnitude of the effect size when attributions were measured dimensionally as opposed to categorically. When attributions were measured categorically, the magnitude of the self-serving bias was significantly smaller than when attributions were measured dimensionally (however, it is important to note that the self-serving bias estimated from studies measuring attributions categorically was still greater than 0.80). What factors may contribute to the finding that the effect size is smaller when attributions are measured categorically? Of the four attributions typically given in categorical studies (ability, effort, task difficulty, luck), ability is the most internal, stable, and global attribution and thus was chosen in the current study as the categorical attribution of choice in examining the self-serving attributional bias. However, as Abramson et al. (1978) pointed out, the ability attribution does not map perfectly onto the dimensions of internality, stability, and globality. Some individuals may intend the attribution of ability to have a nonglobal meaning, for example, not having ability in the specific domain or task being assessed. Moreover, ability does not exhaust possible internal, stable, and global attributions. Other personality or individual-difference characteristics, such as gender, ethnicity, or appearance, also may be considered internal, stable, and global attributions. Thus, measuring attributions dimensionally may provide a more accurate assessment of the internality, stability, and globality of the inferred cause of the event and thus better assess the self-serving attributional bias than measuring attributions categorically using the attribution of ability (Abramson et al., 1978).

Implications for Future Research

The relationship between the self-serving attributional bias and mental health bears further examination. The current study raised some important questions. First, is there variability in the relationship between the self-serving attributional bias and mental health across populations? If the attributional bias examined here may be less self-serving for some populations than others, we would expect that the association between the magnitude of the bias and mental health to be weaker in these populations. For example, it would be interesting to compare the correlation between the magnitude of the self-serving bias and depression for White U.S. male samples with that for female samples and Asian samples.

Second, future research should examine whether there are conditions under which the self-serving attributional bias may be maladaptive. A pervasive tendency to attribute successes to enduring personal characteristics and dismiss failures as caused by external, unstable, and specific causes may undermine an individual's ability to adaptively alter his or her behavior to achieve different outcomes when faced with failures or negative events. In addition, the extent to which the self-serving attributional bias represents a distortion of reality is unknown. As Abramson and Alloy (1981) pointed out, it may be objectively true that people do cause the good events but not the bad events in their own lives. But to the extent that this bias is in fact a bias and represents—as Heider (1958, 1976), Taylor and Brown (1988), and others have argued—an attempt to manipulate reality in a way that protects self-esteem, an exaggerated bias may reflect a break from reality that is no longer adaptive. We expected, for example, that psychotic disorders such as mania, paranoia, and schizophrenia would be associated with such a maladaptive break from reality that would be represented in an exaggerated self-serving attributional bias.

The current study does not support the conclusion that such populations are notably more self-serving than the general population. However, several important limitations to the current meta-analysis prevent us from drawing strong conclusions about this issue. First, the number of studies in which participants suffered from mania or psychotic disorders was relatively small—only 16 in total. Thus, although samples with bipolar disorder did display a larger bias than the general population, the variance of this estimate was so large that strong conclusions about the magnitude of the bias in this group compared with the general population can not be drawn. Second, there is a high comorbidity of psychotic disorders, especially schizophrenia, with depression (Craig & Hwang, 2000). In addition, individuals with bipolar disorder do experience major depression as well as, not infrequently, mixed episodes of mania and depression simultaneously. Few of the studies included in the current meta-analysis specified that participants were currently in an active manic or psychotic phase, or exhibited predominantly hypomanic or manic symptoms as opposed to depressive symptoms, at the time attributions were assessed. Future research should continue to examine these populations during active mania or psychosis to determine whether the psychological break from reality is in fact associated with an exaggerated self-serving bias.

An alternative explanation may be that if a self-serving attributional bias is an adaptive way to maintain psychological health, and particularly to avoid hopelessness, pessimism, and depression when faced with negative or stressful events, then it may be adaptive that the bias does increase in magnitude when stressors increase in frequency or severity. From this perspective, an unusually large self-serving attributional bias may reflect an adaptive reaction to unusual stress. These are important questions to which we eagerly await empirical answers.

Third, an intriguing topic for future research is the neurobiology of the positivity bias in attributions. Is the presence of a self-serving attributional bias associated with particular patterns of brain activity? Research on this important topic has only just begun. Drake reported that activation of the left hemisphere by behavioral methods (e.g., by directing attention to the right hemispace) led to more self-serving attributions (Drake & Seligman, 1989) and greater optimism for the future (Drake, 1984). Complementing these findings, Davidson, Abramson, Tomarken, and Wheeler (1991) found that individuals with a nondepressive attributional style (i.e., individuals who typically attribute negative events to external, unstable, and specific causes) exhibited greater relative left-sided anterior hemispheric activation than individuals with a depressive attributional style. The association between the self-serving attributional bias and activation of the left frontal cortex is interesting given that diverse work has converged on the conclusion that activation of this brain region is a key component of the neural circuitry implementing the behavioral approach system (e.g., Depue & Iacono, 1989; Gray, 1975), which is hypothesized to regulate approach behavior to attain rewards and goals (see Davidson, Jackson, & Kalin, 2000, for a review). It is tempting to speculate that the self-serving attributional bias may be an important cognitive component of an integrated behavioral approach system (see also Abramson et al., 2002; Tomarken & Keener, 1998). Integration of advances in the neuroscience of emotion (e.g., Davidson et al., 2000) with work on positivity biases in human cognition should be a high priority.

Conclusion

Repeated assertions that positive illusions about the self, such as the self-serving attributional bias, are normal, adaptive, and widespread features of human cognition prompted extensive debate about the universality of this phenomenon. The current meta-analysis represents the first comprehensive quantitative review of the literature on the self-serving attributional bias. We found strong support for the existence of a robust self-serving bias in attributions. The overall effect size for the self-serving attributional bias was large ($d = 0.96$) and may represent one of the largest effect sizes demonstrated in psychological research on cognition to date. Although the magnitude of the self-serving bias in attributions varied significantly, the presence of a positive self-serving bias was remarkably consistent across a variety of individual-difference factors, including age, gender, culture, and psychopathology. As expected, some groups displayed an attenuated self-serving attributional bias and some displayed no self-serving bias at all. Of particular interest was the finding that no group examined in the current study displayed a negativity bias. The variability in magnitude of the self-serving attributional bias raises important questions about the sources of influence on the bias that future research may untangle. In the end, however, our results strongly suggest that most people, most of the time, do attribute their successes to enduring, pervasive characteristics about themselves and discount their failures as unrelated to any enduring, pervasive personal characteristics.

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