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Personality and Aggressive Behavior Under Provoking and Neutral Conditions: A Meta-Analytic Review

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The authors conducted a comprehensive review to understand the relation between personality and aggressive behavior, under provoking and nonprovoking conditions. The qualitative review revealed that some personality variables influenced aggressive behavior under both neutral and provocation conditions, whereas others influenced aggressive behavior only under provocation. Studies that assessed personality variables and that directly measured aggressive behavior were included in the quantitative review. Analyses revealed that trait aggressiveness and trait irritability influenced aggressive behavior under both provoking and neutral conditions but that other personality variables (e.g., trait anger, Type A personality, dissipation–rumination) influenced aggressive behavior only under provoking conditions. The authors discuss possible relations between these patterns of aggressive behavior and the personality dimensions of Agreeableness and Neuroticism and consider implications for theories of aggression.

Keywords: aggressive behavior, personality traits, Agreeableness, Neuroticism

With a few notable exceptions (e.g., Freud, 1929/1962), early theorizing and research on aggressive behavior focused on the effects of situational factors (e.g., Bandura, 1973; Dollard, Doob, Miller, Mowrer, & Sears, 1939). Empirical studies and meta-analytic reviews have shown that the presence of violent cues (e.g., Anderson, Benjamin, & Bartholow, 1998; Bettencourt & Kernahan, 1997; Carlson, Marcus-Newhall, & Miller, 1990), parental conflict and divorce (e.g., Kolvin, Miller, Scott, Gatzanis, & Fleeting, 1990; McCord, 1991), poverty (e.g., Guerra, Huesmann, Tolan, Van Acker, & Eron, 1995; Spencer, Dobbs, & Phillips, 1988), provocation (e.g., Bettencourt & Miller, 1996; Carlson & Miller, 1988), and the quality of parent–child relations (e.g., Booth, Rose-Krasnor, McKinnon, & Rubin, 1994; Parke & Deur, 1972) are a few of the many situational variables that reliably influence aggressive behavior.

Although research focusing on gender differences and aggressive behavior dates back to at least the 1950s (see Bettencourt & Miller, 1996; Eagly & Steffen, 1986, for a review), investigations of the influences of other individual-differences and personality variables were not prevalent until the late 1970s. The majority of these relatively recent studies have examined personality variables hypothesized to increase aggressive behavior, and most have investigated the influence of personality variables under both provoking and nonprovoking (neutral) situations. Our review of this literature suggests that whereas some findings have revealed that personality variables are positively associated with aggressive behavior under relatively neutral conditions as well as under provoking conditions (e.g., Bushman, 1995; Giancola & Zeichner, 1995b; Muntaner, Llorente, & Nagoshi, 1989; Parrott & Zeichner, 2002), other results have shown that personality variables predict greater levels of aggressive behavior only under provocation (e.g., Bushman & Baumeister, 1998; Caprara, Coluzzi, Mazzotti, Renzi, & Zelli, 1985; Carver & Glass, 1978; Netter, Hennig, Rohrmann, Wyhlidal, & Hain-Hermann, 1998; Pihl, Lau, & Assaad, 1997). That is, whereas particular personality variables predict greater aggressive behavior across situations, others interact with level of provocation in their effects on aggressive behavior.

Supporting the observation that particular personality variables seem to predict distinct patterns of aggressive behavior, Caprara, Perugini, and Barbaranelli (1994) revealed that a variety of aggression-related personality variables loaded on two separate factors. Caprara et al. stated, "The first factor represents the impulsive, affective dimension of aggression, and the second factor represents the social–cognitive and instrumental dimension of aggression" (p. 147). That is, it appears that the analysis might have uncovered a correspondence between the two factors that summarized the set of personality variables and at least two patterns of aggression. Despite the fact that certain personality variables may predict different patterns of aggressive behavior, theories of aggression (Anderson & Bushman, 2002; Berkowitz, 1989; Crick & Dodge, 1994; Huesmann, 1998) have yet to fully articulate why and which particular personality variables are associated with aggressive behavior. Nevertheless, researchers (Geen & Donnerstein, 1998; Miller, Lynam, & Leukefeld, 2003) have called for additional theorizing about the role that personality

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plays in aggressive behavior. To date, no qualitative or quantitative review of the literature has examined the relations between personality variables and aggressive behavior, especially under either neutral or provoking conditions. Such a review is of interest to a broad range of disciplines invested in understanding why and when individuals engage in aggressive behavior, including developmental, social–personality, clinical, and educational psychology as well as sociology, psychiatry, and forensics. In the present work, we provide qualitative and quantitative reviews of the literature on personality and aggressive behavior that may guide further theorizing and research in a variety of basic and applied domains.

To provide an integrated understanding of the ways personality variables may influence aggressive behavior, we conducted a meta-analysis of the relevant empirical literature. By doing so, we hoped to reveal which personality variables predict aggressive behavior only under provocation and which predict aggressive behavior even when situations are relatively neutral. In our analysis, we focused on direct measures of aggressive behavior because self-reports of aggression are likely to be influenced by social desirability. To sharpen our focus, we included only those personality variables theorized to increase aggressive behavior. Also, because we sought to examine possible associations between personality variables and aggressive behavior under conditions that were either provoking or neutral, the set of studies that could be included in the meta-analysis was limited in at least two important ways. First, we were unable to include studies for which it was unclear whether the situation preceding aggressive behavior was either provoking or neutral. This criterion resulted in the inclusion of experimental studies because these either controlled or manipulated level of provocation. Also, our criteria limited the number of childhood and adolescent studies of aggression that could be included because many of these did not include direct measures of aggressive behavior and most did not delineate between neutral and provoking situations.

Despite these limitations, the findings of our meta-analysis are likely to generalize to the larger literature on aggression. Anderson, Lindsay, and Bushman (1999) pointed out that the purpose of most experimental research is to uncover theoretical and causal relations among conceptual variables. Often, these relations are difficult to isolate in studies that use other designs, such as survey methods. Further, Anderson et al. argued that what is of importance is that demonstrated relations among variables generalize across study methods, not whether a given measure of behavior (e.g., aggressive behavior) appears, on the surface, to be similar to real world examples of that behavior. Anderson et al. pointed out that "researchers are interested in generalization of theoretical relations among independent and dependent variables, not specific instantiations of them" (p. 4). Anderson and Bushman (1997) conducted a meta-analysis of studies that used either experimental designs or other designs conducted in the field (i.e., survey, observational) to determine the generalizability of the relations among the study variables. Their results revealed a high correspondence between the directions and magnitudes of the effects of predictor variables on aggression across these methodologies. Also, across a broad range of psychological and behavioral domains, Anderson et al. revealed considerable consistency among effect sizes for different types of study methodologies.

In the following sections, first, we define some relevant terms and review contemporary theories of aggressive behavior. Next, we discuss a prominent theory of personality dimensions, the five-factor model, and describe how it might guide our understanding of the relations between personality and patterns of aggressive behavior. Third, we review the research on each of the personality variables included in the meta-analysis, thereby providing a qualitative review of this literature. Finally, we report the results of our meta-analysis, which examines the influence of personality variables on aggressive behavior under provoking and neutral conditions.

Definitions of *Personality, Aggressive Behavior,* and *Provocation*

Personality is defined as "a dynamic organization, inside the person, of psychophysical systems that create the person's characteristic patterns of behavior, thoughts, and feelings" (p. 48; Allport, 1961). We use the term *personality dimensions* when referring to the constructs identified by the five-factor model but the term *personality variables* when referring to the measured constructs available in the empirical literature on aggressive behavior. The personality variables that adhered to our inclusion criteria and thus were available for the meta-analysis were dissipation–rumination, emotional susceptibility, impulsivity, irritability, narcissism, trait aggressiveness, sensation seeking, trait anger, and Type A personality.

Although the term *aggression* refers to a wide spectrum of behaviors, in the psychological literature, it is defined as any behavior intended to harm another individual who is motivated to avoid being harmed (e.g., Baron & Richardson, 1994; Coie & Dodge, 2000; Geen, 1990, 1998a, 1998b). Aggressive behavior is distinguished from high levels of trait aggressiveness; the latter identifies people who are prone to hostile cognitions and angry affect as well as a readiness to engage in physical and verbal aggression (Buss & Perry, 1992). Trait aggressiveness is often measured with a self-report assessment, such as the Buss–Perry Aggression Questionnaire (Buss & Perry, 1992).

Researchers have operationalized aggressive behavior in a number of ways, including measuring the intensity of electric shocks administered to another individual (e.g., Bailey & Taylor, 1991; Bushman, 1995; Buss, 1963, 1966; Giancola & Zeichner, 1995a, 1995b; Taylor, 1967), pushing and hitting (e.g., Josephson, 1988), monetary or point penalties (e.g., Bjork, Dougherty, Moeller, & Swann, 2000; Check & Dyck, 1986; Netter et al., 1998; Strube, Turner, Cerro, Stevens, & Hinchey, 1984), verbal attack (e.g., Langerspetz & Engblom, 1979), and negative evaluations (e.g., Leibowitz, 1968; Rothaus & Worchel, 1960; Shemberg, Leventhal, & Allman, 1968; Wingrove & Bond, 1998).

Aggressive behavior is often engendered by provocations, which are actions or situations that are aversive or stressful (Berkowitz, 1984, 1989, 1990, 1993; Carlson & Miller, 1988; Dollard et al., 1939; Geen, 1990; Huesmann, 1998). Provocations have been operationalized as physical provocations, such as intensity of electric shock or noxious noise administered to the participant (i.e., by a confederate or experimenter; Bushman, 1995; Giancola & Zeichner, 1995b; Taylor, 1967); monetary or point penalties during a competitive task (e.g., Bjork, Dougherty, & Moeller, 1997; Bjork et al., 2000); verbal provocations, such as personal insults (e.g., Berkowitz, 1960; Caprara, Passerini, Pastorelli, Renzi, & Zelli, 1986; Caprara & Renzi, 1981); and frustration, such as failure to complete a task or inability to participate

in an activity (e.g., Geen, 1968; Josephson, 1988; Rule & Percival, 1971).

Researchers have operationalized *neutral* situations in a number of ways. Some conditions are fairly neutral, such as those that involve a confederate who silently observes a participant completing a puzzle (Carver & Glass, 1978) or a confederate who provides a relatively neutral evaluation of a participant (Caprara & Renzi, 1981). Other neutral conditions involve a participant receiving positive feedback from an experimenter (Caprara & Renzi, 1981) or a confederate (Bushman & Baumeister, 1998). Finally, in a few studies, *high-provocation* conditions are compared with *low-provocation* conditions. Participants in the latter conditions receive low levels of a noxious stimulus, and, as such, these conditions are meant to be comparatively neutral. Thus, the conditions that we were able to code as neutral were actually quite varied in valence. Nevertheless, because these conditions were meant to be compared with provoking conditions, we treated them as neutral conditions. Although we acknowledge that not all of the conditions in the studies are truly neutral, in the sections that follow we use the term *neutral* as a means for simplifying our terminology.[1]

Theories of Aggressive Behavior

A variety of contemporary theories are relevant for understanding associations between personality and aggressive behavior (e.g., Anderson, Anderson, & Deuser, 1996; Anderson & Bushman, 2002; Berkowitz, 1993; Caprara, Regalia, & Bandura, 2002; Coie & Dodge, 2000; Crick & Dodge, 1994; Geen, 1990; Huesmann, 1998). Prominent among these are Crick and Dodge's (1994) and Huesmann's (1998) developmental models of antisocial and aggressive behavior as well as Anderson and Bushman's (2002) general aggression model, all of which have been influenced by Berkowitiz's (1984) and Bandura's (1973) earlier theorizing. It is important to note that Anderson and Bushman's (2002) model includes *person factors* as predictors of aggression, with the acknowledgment that "certain traits predispose individuals to high levels of aggression" (p. 35). Nevertheless, none of these theories provides a framework for understanding how and why particular personality variables predict aggressive behavior. However, theorists suggest a set of underlying variables that are likely to be the mechanisms through which personality variables influence aggressive behavior. These variables include cognitive processing, negative affect, self-regulation, and social-information processing.

People who are particularly likely to engage in aggressive behavior have more elaborate and readily accessible aggression-related cognitions (Anderson & Bushman, 2002; Berkowitz, 1983, 1993; Huesmann, 1988). Dodge (2002) underscored that children acquire these aggressive cognitions through early experiences and socialization. Anderson and Bushman (2002) suggested that the development of aggression-related knowledge structures can shape an individual's personality and, thus, influence the likelihood that the individual will engage in aggressive behavior. One could argue that an individual's personality may further bias the ways he or she interprets information, which, in turn, may guide aggressive behavior.

Cognition and negative affect, or anger, are "inextricably linked," Huesmann (1998, p. 98) argued. In a similar vein, Anderson et al. (1996) suggested that individual differences and situational variables may interact by "traversing cognitive and affective pathways believed to influence the likelihood of aggression" (p. 367). Negative affect results from the cognitive evaluation that an external stimulus is provoking (Huesmann, 1998). It is likely that personality variables that are marked by the propensity to experience negative affect or to perceive situations as provoking will be associated with higher levels of aggressive behavior.

Most theories of aggression largely ignore the role that self-regulation plays in aggressive behavior. Recently, however, Caprara et al. (2002) pointed to the importance of self-regulation in understanding aggressive behavior; their research shows that a lack of self-regulatory efficacy is associated with increased violence. Regulation failure is characterized by the tendency to act impulsively or the tendency to react to situations without sufficient thought about future consequences (e.g., Barratt, 1994). Persons who have difficulty with self-regulation are unlikely to be able to inhibit urges to behave aggressively. As such, personality variables characterized by self-regulation failure are likely to be associated with greater levels of aggressive behavior.

In their theoretical model, Dodge and colleagues (e.g., Coie & Dodge, 2000; Crick & Dodge, 1994) have articulated the role that ongoing social-information processing plays in directing aggressive behavior. According to Dodge (2002), social-information processing not only includes cognitive processing (e.g., attention, perception, and mental representation) and affective experiences but also involves "the setting of goals for responding within the social situation, accessing of one or more possible behavioral responses, evaluating the accessed behavioral responses, and selecting one for enactment, and then translating a desire to perform an action into behavior" (p. 225). For example, Dodge and Coie (1987; Dodge, Lochman, Harnish, Bates, & Pettit, 1997) have shown that hostile attribution bias is one social-information processing mechanism that is particularly predictive of some types of aggression.[2]

Dodge and Coie (1987; Dodge et al., 1997) theorized that distinct ways people process social information and differences in people's salient social goals mutually influence the likelihood that they will engage in one of two types of aggression. The authors drew a distinction between reactive and proactive aggression styles, which are essentially synonymous with hostile and instrumental aggression subclassifications (Berkowitz, 1993; Hartup, 1974). Dodge and Coie defined reactive aggression as hostile responses to perceived threat or provocation. They explained that "perceptions of threat and experiences of anger *push* the reactively

[1] For the neutral conditions, we examined the mean personality-difference effect sizes according to the type of "relatively neutral" condition used as a comparison for a provocation condition (truly neutral, low provocation, or positive comparison with a provoking condition). The results of this analysis showed that the magnitudes of the mean personality-difference effect sizes were unaffected by the type of neutral comparison condition.

[2] Although Zelli and Dodge (1999) conceptualized hostile attributions as a personality-like characteristic, no studies examining the relation between hostile attribution bias and aggressive behavior were included in the current meta-analysis because these typically use self-report or scenario and role-playing measures of aggressive behavior. Also, the individual differences of hostile masculinity, hypermasculinity, and gender role masculinity (Anderson, 1997; Datlow, 1999; Kogut, Langley, & O'Neal, 1992; Lohr, 1996; LoPresto & Deluty, 1988; Malamuth, 1988; Norris, 1999) were excluded from analysis because these constructs only focus on male-on-female aggression.

aggressive individual to retaliate" (p. 1147). Therefore, the goal of reactive aggression is to redress a threatening or anger-producing act by another person. By contrast, proactive aggression is perpetrated to gain resources or control over others and need not be in response to provocation; it is a relatively nonemotional display of coercion and power initiated to gain resources or to intimidate and dominate others (Dodge et al., 1997). According to Dodge and Coie (1987), the anticipated outcome "pulls" aggressive behavior.

We speculate that personality variables that appear to predict greater aggressive behavior only in response to provocation may be those that are positively associated with reactive aggression. Because proactive aggression need not be in response to provocation, aggressive behavior under neutral conditions may include some instances of proactive aggression. Nevertheless, the studies included in the current meta-analysis neglected to consider the motives (i.e., gain resources or control over others) of the perpetrator. If no instrumental goal is present or even reasonably inferable in the situation involving aggressive behavior, then there is no way to identify such aggressive actions as being proactive. Therefore, we do not equate personality variables that predict aggressive behavior under both neutral and provoking conditions with proactive aggression. It is important to note that some people exhibit both reactive and proactive aggression (Dodge & Coie, 1987), and some aggressive behaviors are directed by multiple motives or goals (Bushman & Anderson, 2001). Therefore, individuals who engage in high levels of aggressive behavior under neutral and provoking conditions might manifest both styles of aggression, have multiple motives, or both.

The Five-Factor Model of Personality and Personality Dimensions Related to Aggression

The five-factor model (Costa & McCrae, 1992), a prominent theory of personality dimensions, is useful for understanding the link between personality and aggressive behavior (Jensen-Campbell & Graziano, 2001; Miller et al., 2003). The major personality dimensions in the five-factor model are Neuroticism, Extraversion, Conscientiousness, Agreeableness, and Openness to Experience; each dimension is represented by six facets. Research on aggressive behavior has examined the influences of a variety of specific personality variables (e.g., trait aggressiveness, trait anger, Type A personality) without reference to these major dimensions. More recently, however, a few researchers (Gleason, Jensen-Campbell, & Richardson, 2004; Graziano, Jensen-Campbell, & Hair, 1996; Suls, Martin, & David, 1998) have sought to understand the relation between aggression and dimensions of personality using the five-factor model. The Neuroticism and Agreeableness dimensions appear to be particularly associated with aggression (Costa, McCrae, & Dembroski, 1989; Gleason et al., 2004; Graziano et al., 1996; Miller et al., 2003; Suls et al., 1998).

The Agreeableness dimension describes people who are directed toward interpersonal relationships and the needs of others. The facets of Agreeableness include trust, straightforwardness, altruism, compliance, modesty, and tender-mindedness. The opposite pole of Agreeableness is Antagonism. According to Costa et al. (1989), antagonistic people tend to be hostile and irritable—"they need to oppose, to attack, or to punish others" (p. 45) Moreover, those high in Antagonism tend to mistrust and have a low regard for others, and, in turn, they act in ways designed to exclude or snub those who are perceived as disliked or inferior. Finally, antagonistic people may lack emotional expression and be unattached interpersonally—"they are cool or cold, contemptuous, callous, unfeeling" (p. 45).

The Neuroticism dimension is characterized by those who have a tendency to experience negative affectivity and psychological distress. The facets of Neuroticism include anxiety, angry hostility, depression, self-consciousness, and impulsiveness. Neurotic individuals are ineffective in their attempts to cope with stress and are prone to engage in irrational thought. By contrast, those who are low in Neuroticism are more emotionally stable and calm and adapt well to stressful situations.

Theorizing and research suggest that these two personality dimensions may predict different propensities for hostility and aggression. Costa et al. (1998) distinguished between neurotic hostility (i.e., "hot-blooded" hostility) and antagonistic hostility (i.e., "cold-blooded" hostility) and stated that "whereas neurotic hostility is exemplified by frequent and strong experiences of anger . . . , antagonistic hostility is exemplified by cynicism, callousness, and lack of cooperation" (p. 53). Accordingly, Costa et al. linked these two personality dimensions to particular patterns of aggressive behavior. Somewhat consistent with these distinctions, Hennig, Reuter, Netter, Burk, and Landt (2005) labeled the two factors of aggression identified in their analysis as Neurotic Hostility and Aggressive Hostility.

Research by Jensen-Campbell and Graziano (2001; see also Graziano et al., 1996; Jensen-Campbell, Gleason, Adams, & Malcolm, 2003) showed that persons low in Agreeableness were more likely to report that destructive conflict resolution tactics (i.e., physical action, threats, and undermining others' self-esteem) were appropriate in response to interpersonal conflict scenarios, compared with those high in Agreeableness. Likewise, Gleason et al. (2004) found that participants' level of Agreeableness was negatively related to the number of peers who nominated the participant as likely to engage in aggressive behavior.

Sharpe and Desai (2001) revealed that, compared with other dimensions, Agreeableness and Neuroticism were the most predictive of trait aggressiveness, as measured by the Buss and Perry (1992) Aggression Questionnaire. Their results showed that the Agreeableness dimension was highly and negatively related to all of the subscales in the Buss and Perry Aggression Questionnaire but that the Neuroticism dimension was more highly and positively related to the Anger and Hostility subscales than to the Physical and Verbal Aggression subscales. Like Sharpe and Desai (2001), R. Martin, Watson, and Wan (2000) examined the associations between the five personality dimensions and a variety of anger and trait aggressiveness measures. Their results showed that an angry affect factor of the trait measures (e.g., Aggression Questionnaire, State–Trait Anger Scale; Spielberger, Jacobs, Russell, & Crane, 1983) was most strongly and positively related to Neuroticism and that a behavioral aggression factor was most strongly and positively related to low Agreeableness (i.e., Antagonism). Finally, Hennig et al.'s (2005) factor analysis of the Buss–Durkee Hostility Inventory (Buss & Durkee, 1957) also revealed two factors, labeled Neurotic Hostility and Aggressive Hostility. The authors reported a strong positive correlation between Neuroticism and the Neurotic Hostility factor (Agreeableness was not measured). Furthermore, Hennig et al. revealed that the physiological underpinnings (e.g., changes in hormone levels) of Aggressive Hostility were distinct from those of Neurotic Hostility, suggesting that

participants who endorsed more Aggressive Hostility factors were characterized by low serotonin activity.

Taken together, this evidence suggests that aggression-related constructs may be divided into two main factors. The angry factor of aggression appears to be positively related to Neuroticism; this type of aggression may be similar to reactive aggression. As such, Neuroticism may be particularly likely to be positively related to aggressive behavior only under provocation. Because it has been linked to cold-blooded aggression, which is not necessarily precipitated by provocation, Antagonism (i.e., low Agreeableness) may be positively associated with aggressive behavior under neutral conditions as well as provocation conditions.

Despite the suggestive findings from this research on personality dimensions, the studies are limited in a couple of ways. First, none has examined whether these personality dimensions predict different patterns of actual aggressive behavior. Instead, the studies have primarily relied on self-reports of aggression. Indeed, a few studies have reported correlations between participants' responses to assessments of the dimensions of personality and their responses to the Buss and Perry (1992) Aggression Questionnaire, the latter of which is considered an assessment of a personality variable, namely, trait aggressiveness. One interpretation of these correlational findings is that, at best, they demonstrate construct validity for the Agreeableness and Neuroticism dimensions. Also, in these studies, researchers have failed to compare aggressive behavior under provoking situations and neutral situations. In doing so, they have neglected to take into account the ways personality dimensions may interact with provocation to predict aggressive behavior.

Personality Variables in the Current Meta-Analysis

Research on the five-factor model suggests that the Agreeableness and Neuroticism dimensions may predict different patterns of aggressive behavior under neutral and provoking conditions. As we have noted, however, little, if any, empirical literature confirms relations between personality dimensions and patterns of aggressive behavior. Because studies in our meta-analysis have assessed personality variables, manipulated provocation levels, and measured aggressive behavior, the meta-analysis has the potential to isolate patterns of relations between personality variables and aggressive behavior. As mentioned previously, the personality variables available for the meta-analysis were dissipation–rumination, emotional susceptibility, impulsivity, narcissism, trait aggressiveness, trait anger, trait irritability, and Type A personality.[3] As we describe in the following subsections, empirical research reveals that most of these personality variables are related to the Agreeableness and Neuroticism dimensions. Table 1 includes the measures of the personality variables used in the studies included in the current meta-analysis, the authors of the measures, the number of items, and the type of scale used as well as an example item from one of the measures. Table 2 displays the variables and their correlations, which we derived from the published literature. Unfortunately, we were unable to obtain every possible correlation—in particular, many for dissipation–rumination and Type A personality were unavailable. In general, these correlations reveal high and positive associations among some of the variables. Other correlations, however, reveal low and sometimes negative interrelations. Acknowledging the overlap among some of these variables, in our primary analyses, we analyze and explain the results for each personality variable separately. We adopted this approach because we wanted to determine whether each variable was associated with aggressive behavior only in response to provocation or across conditions.

Trait Aggressiveness

Buss and Perry (1992; also see Anderson & Bushman, 2001; Berkowitz, 1993) defined trait aggressiveness as a propensity to engage in physical and verbal aggression, to hold hostile cognitions, and to express anger. Tiedens (2001) theorized that the tendency for those high in trait aggressiveness to make hostile attributions may increase anger and create a vicious cycle of hostility and negative affect. A few studies (Caprara, Barbaranelli, & Zimbardo, 1996; R. Martin et al., 2000; Ruiz, Smith, & Rhodewalt, 2001) revealed negative correlations between trait aggressiveness and the Agreeableness dimension. Caprara et al. (1996) and Ruiz et al. (2001) reported positive correlations between Neuroticism and trait aggressiveness, but Martin et al. reported a small yet significant negative relation between the two constructs.

Empirical research shows that, compared with individuals who are low in trait aggressiveness, those high in trait aggressiveness engage in higher levels of aggressive behavior under both neutral and provoking conditions (e.g., Bushman, 1995; Giancola & Zeichner, 1995a, 1995b; Hammock & Richardson, 1992; Knott, 1970; Larsen, Coleman, Forbes, & Johnson, 1972; Scheier, Buss, & Buss, 1978; Wingrove & Bond, 1998; Zeichner, Frey, Parrott, & Butryn, 1999). For example, in one study (Bushman, 1995), participants played a competitive reaction time game with a fictitious opponent; participants received noxious noise after losing a trial and were able to administer noxious noise after winning a trial. The results showed that, regardless of provocation level, participants who were high in trait aggressiveness administered higher levels of noxious noise than those who were low in trait aggressiveness. Despite this general pattern, a few studies have not revealed a reliable relation between trait aggressiveness and aggressive behavior under either provoking or nonprovoking conditions (Bailey & Taylor, 1991; Shondrick, 1996). Nevertheless, the majority of the findings suggest that people who are high in trait aggressiveness behave more aggressively than those who are low in trait aggressiveness and that this difference is observed even when conditions are relatively neutral.

Trait Irritability

The definition of *irritability* includes being angrier, in general, and taking offense to the slightest provocation as well as the

[3] For sensation seeking, there were only two available effect sizes (Cheong & Nagoshi, 1999; Giancola & Zeichner, 1995b), and each was derived from a provocation condition (none for neutral conditions). The average effect sizes derived from the fixed and the random analyses for sensation seeking were positive ($k = 2$; fixed mean $d = 0.37$; random mean $d = 0.33$), but the confidence intervals (CIs; fixed CI = −0.06, 0.79; random CI = −0.69, 1.35) suggested that neither was greater than zero. These findings suggest that the association between sensation seeking and aggressive behavior may be weak. Because we were interested in comparing the personality-difference effect size for neutral and provoking conditions in the following analysis sections, we did not include sensation seeking in any further analyses.

Table 1
Measures Used to Assess Personality Variables in the Studies Included in the Meta-Analysis

Measures	Authors of measures	No. of items and scale	Example item
		Trait aggression	
BDHI	Buss & Durkee (1957)	75; true–false; Likert-type adaptations	"If somebody hits me, I hit back."
Aggression Questionnaire	Buss & Perry (1992)	29; 5-point Likert-type	
Aggression Scale	Larsen et al. (1972)	37; Thurstone scaling	
Aggressive behavior pattern	Pitkanen (1973)	33; teacher- and peer-rated behaviors	
Rip Van Winkle Peer-Rated Index of Aggression	Lefkowitz et al. (1977)	9; checklist	
		Irritability	
Irritability Scale	Caprara & Renzi (1981)	30; 6-point Likert-type	"I don't think I am a very tolerant person."
BDHI—Irritability subscale	Buss & Durkee (1957)	11; true–false	
		Trait anger	
Spielberger Anger Expression Scale[a]	Spielberger et al. (1985)	8; 4-point Likert-type	"I lose my temper."
Trait Anger Scale	Spielberger, Jacobs, et al. (1983)	10; 4-point Likert-type	
Anger Situation Questionnaire	van Goozen, Frijda, & van de Poll (1994)	17; vignettes	
Overt Anger	Pihl et al. (1997)	10; two-part interview	
		Type A personality	
Jenkins Activity Form[b]	Jenkins et al. (1979)	21; mixed-response format	"Has your spouse or some friend ever told you that you eat too fast?"
High School Personality Questionnaire	Cattell et al. (1958)	Subscales similar to Type A characteristics	
Matthews Youth Test for Health	Matthews & Angulo (1980)	19; 5-point Likert-type	
		Dissipation–rumination	
Dissipation–Rumination Scale	Caprara (1986)	20; 6-point Likert-type	"The more time passes, the more satisfaction I get from revenge."
		Emotional susceptibility	
Emotion Susceptibility Scale	Caprara, Cinanni, et al. (1985)	40; 6-point Likert-type	"Sometimes I feel I am about to explode."
Word association test	Fraczek & Macaulay (1971)	40; word stems	
		Impulsivity	
Impulsivity Scale	Grush et al. (1986)	18; mixed-response format	"Do you do things on the spur of the moment?"
Eysenck 1.7 Scale	Eysenck et al. (1985)	54; yes–no	
Emotionality, Activity, Sociability, Impulsivity Temperament subscale	Buss & Plomin (1975)	20; 5-point Likert-type	
		Narcissism	
Narcissistic Personality Inventory	Raskin & Terry (1988)	40; true–false	"If I ruled the world it would be a much better place."

Note. BDHI = Buss–Durkee Hostility Inventory.
[a] In the aggression literature, the Anger-Out subscale of Spielberger, Jacobs, et al.'s (1983; e.g., Bushman, Baumeister, & Phillips, 2001) Anger Expression Inventory is used most often, and it is used exclusively in the studies included in the meta-analysis. [b] Although the validity of the Jenkins Activity Form has been questioned by a number of researchers (e.g., Booth-Kewley & Friedman, 1987; Matthews, 1988; but see Pearson, 1987), studies that measured Type A personality using this scale were retained in the analysis if they met all inclusion criteria.

Table 2
Correlations Among the Personality Variables Included in the Meta-Analysis

Variable	1	2	3	4	5	6	7	8
1. Agg	—							
2. Irr	.30*–.77*	—						
3. Anger	.16*–.48*	.57*	—					
4. Type A	.01–.52*	−.02–.48*	.08*–.42*	—				
5. DisRum	.25*–.38*[a]	.63*	.30*[b]		—			
6. EmoSus	.42*–.68*[c]	.59*	.43*		.30*	—		
7. Imp	.07*–.39*	.32*–.38*	−.01–.22*	.16*–.52*		−.20*	—	
8. Narc	.09*–.50*	.16*[d]	.13*–.37*	.48*–.50*	−.19*[b]–.23*[d]	.07*		—

Note. The following studies are included in this correlation table: Bartholow et al. (2005); Berman et al. (1998); Booth-Kewley and Friedman (1987); Buss and Durkee (1957); Buss and Perry (1992); Byrne (1996); Caprara, Barbaranelli, and Comrey (1992); Caprara et al. (1996); Caprara, Manzi, and Perugini (1992); Caprara and Pastorelli (1993); Caprara et al. (1994); de Flores and Valdes (1986); Dill (1999); Emmons (1981); Frantz (1986); Fukunishi et al. (1996); Furnham (1984); Garcia-Leon et al. (2002); Hart and Joubert (1996); Heaven (1989); Joireman et al. (2003); Kokkonen and Pulkkinen (1999); McCann et al. (1987); Myrtek (1995); Netter et al. (1998); Raskin and Terry (1988); Rhodewalt and Morf (1995); Smith (1984); Stanford et al. (1995); Watkins et al. (1992); Wills et al. (1994); Wood (1996); Yuen and Kuiper (1991). Agg = trait aggression; Irr = irritability; Anger = trait anger; Type A = Type A personality; DisRum = dissipation–rumination; EmoSus = emotion susceptibility; Imp = impulsivity; Narc = narcissism.
[a] Tolerance toward violence was used as a proxy for trait aggressiveness. [b] Self-rumination was used as a proxy for dissipation–rumination. [c] Emotional instability was used as a proxy for emotion susceptibility. [d] Egocentrism was used as a proxy for narcissism.
* $p < .05$.

propensity to be offensive in the use of aggressive behavior (Caprara, 1982; Caprara, Renzi, et al., 1986; Caprara, Renzi, Alcini, D'Imperio, & Travaglia, 1983). Conceptually (Caprara & Renzi, 1981) and empirically (M. D. Wood, 1996), trait irritability is related to trait aggressiveness. In Buss and Durkee's (1957) initial assessment of trait aggressiveness (i.e., Buss–Durkee Hostility Inventory), they included an irritability subscale in the measure. Buss and Perry's (1992) updated measure of trait aggressiveness (Aggression Questionnaire) omits the irritability subscale, but it nevertheless retains some of the items from the subscale. In their research on aggressive behavior, Caprara and Renzi (1981; Caprara et al., 1983, 1987) examined trait irritability separately from trait aggressiveness. Because Buss and Durkee (1957; Buss & Perry, 1992) treated trait irritability as a construct within trait aggression but Caprara et al. distinguished the two, it was unclear whether the results for trait aggressiveness and trait irritability should be combined. In our analysis, we first examined them separately but found that their respective results were essentially the same; therefore, we combine them in subsequent analyses. At least one study (Caprara, Barbaranelli, & Zimbardo, 1996) has examined the relation between trait irritability and a revised, brief measure of the five personality dimensions. Correlational analyses suggest that irritability is negatively related to Agreeableness and positively related to Neuroticism.

Consistent with the findings for trait aggressiveness, study results (Anderson et al., 2004; Lindsay, 1999; Renzi, Caprara, Crudele, Galante, & Giannone, 1984) for trait irritability show that, even when situations are relatively neutral, individuals who are high in trait irritability engage in higher levels of aggressive behavior than those who are low in trait irritability. For example, in Renzi et al.'s (1984) study, participants were selected on the basis of their irritability scores, and the experimenter provided either positive or disparaging feedback. Next, participants interacted on a cooperative task with a confederate. The participant indicated the confederate's incorrect answers with what was ostensibly electric shock. A main effect of trait irritability was found on levels of shock, but no interaction between trait irritability and provocation was revealed. Nevertheless, several studies have shown an interaction between irritability and level of provocation on aggressive behavior (Caprara & Renzi, 1981; Caprara et al., 1983; Caprara, Renzi, Amolini, D'Imperio, & Travaglia, 1984; Caprara, Barbaranelli, & Comrey, 1992). In these studies, high levels of irritability were associated with greater levels of aggressive behavior under both neutral and provoking conditions, but the magnitude of this association was larger under the provoking conditions. In summary, the literature reveals a positive relation between trait irritability and aggressive behavior under both neutral and provoking conditions.

Trait Anger

Trait anger has been defined as the tendency for some individuals to feel anger more intensely, more often, and for a longer period of time than others (Deffenbacher et al., 1996). Also, people who are high in trait anger are predisposed toward responding angrily when they are unfairly criticized, treated unjustly, or treated badly (van Goozen, Frijda, & van de Poll, 1994; Spielberger, Jacobs, et al., 1983). van Goozen, Frijda, and van de Poll (1994) noted that people who are high in trait anger focus on a target that they see as blameworthy and act to correct the provoking action; they can do this in either constructive (e.g., assertive) or destructive (e.g., aggressive) ways. Trait anger is positively correlated with Neuroticism and Antagonism (i.e., low Agreeableness), but the correlation with Neuroticism appears to be larger (Caprara et al., 1996; R. Martin et al., 2000).

As is true with the construct of irritability, the construct of trait anger overlaps with trait aggressiveness. In particular, Buss and Perry's (1992) Aggression Questionnaire includes an Anger subscale as one of its components. Thus, there is likely to be conceptual as well as content overlap between trait aggressiveness and trait anger. For our current purposes, we treated these albeit correlated constructs as separate indexes. We believed that, whereas trait aggressiveness may include a propensity to experience anger, trait anger itself is not synonymous with trait aggressiveness.

Moreover, although only a few studies of aggressive behavior have examined trait anger in particular, the results suggest a different pattern than the main effect pattern revealed in our review of the studies of trait aggressiveness. That is, research shows that trait anger and provocation interact in their effects on aggressive behavior. The majority of studies on trait anger (Bushman, Baumeister, & Phillips, 2001; Pihl et al., 1997; van Goozen, 1994; van Goozen, Frijda, Kindt, & van de Poll, 1994; van Goozen, Frijda, & van de Poll, 1994) have revealed that, compared with those who score low on anger expression inventories, individuals who score high behave more aggressively under provoking conditions than under neutral conditions. Thus, trait anger seems to predict aggressive behavior primarily in response to provocation.

Emotional Susceptibility

Emotional susceptibility is defined as a stable tendency to feel distressed, inadequate, and vulnerable to perceived threats (Caprara, 1982; Caprara et al., 1983; Caprara, Renzi, et al., 1986). Caprara (1982) hypothesized that emotional susceptibility reflects a propensity to experience negative affect and a tendency to become upset and defensive when confronted with personal attacks and insults. We could find only one study (Caprara, Barbaranelli, & Comrey, 1992) that examined the relations between emotional susceptibility and a few personality dimensions from the five-factor model. This study showed a high positive correlation between emotional susceptibility and a measure of Neuroticism ($r = .70$; there was no measure of Agreeableness in this study).

In general, research shows that, under provoking conditions, people high in emotional susceptibility tend to respond with higher levels of aggressive behavior than those low in emotional susceptibility (Caprara et al., 1983, 1987; Caprara, Renzi, et al., 1986; Fraczek & Macaulay, 1971; Renzi et al., 1984). In one investigation, Caprara et al. (1983) manipulated provocation by providing participants with either positive or negative feedback regarding their performance on an intelligence test and then gave participants an opportunity to administer electric shocks to a confederate during a learning task. Caprara et al. found that emotional susceptibility interacted with the provoking feedback; the magnitude of the difference in aggressive behavior between participants who scored high versus low in emotional susceptibility was greater under provoking than under neutral conditions. Similarly, Caprara (1982) showed that the effect of provocation on aggressive behavior was stronger for men high in emotional susceptibility than for those low in emotional susceptibility. One study (Caprara, Renzi, et al., 1986), however, revealed no interaction and instead showed that, compared with their counterparts, highly emotionally susceptible participants exhibited more aggressive behavior, regardless of whether they had been provoked. Despite the findings of this study, the preponderance of evidence suggests that emotional susceptibility interacts with provocation in its influence on aggressive behavior.

Narcissism

Narcissists have an inflated sense of self-worth and self-love without a strong set of beliefs that support this sense of superiority (e.g., Kernberg, 1975; see also Freud, 1917/1966). Because narcissists have unstable self-esteem, they are extremely sensitive to personal slights, such as insults and criticism. That is, narcissism is characterized by a vulnerability to threats to the self-concept, and thus, when ego-threatening situations occur, narcissistic individuals tend to behave aggressively (Baumeister, Bushman, & Campbell, 2000; Baumeister, Smart, & Boden, 1996; Bushman & Baumeister, 1998). Emmons (1987) linked narcissism to extreme emotional lability and strong reactions, which could include anger and rage (see also Kernis, Grannemann, & Barclay, 1989; Rhodewalt & Morf, 1995). He noted that factors that restrain aggressive behavior seem to be deficient in narcissists (Emmons, 1984).

One study (Schroeder, Wormworth, & Livesley, 1994) has shown that narcissism is highly positively correlated with Neuroticism and Antagonism (e.g., low Agreeableness). Other studies have corroborated a positive association between narcissism and Antagonism but have shown either no relation with Neuroticism (Ruiz et al., 2001) or a negative relation with Neuroticism (Wiggins & Pincus, 1994).[4] What can account for these disparate findings for narcissism and Neuroticism? Widiger, Trull, Clarkin, Sanderson, and Costa (1994) suggested that "excessively low scores on self-report measures of neuroticism may . . . be indicative of narcissism, particularly when these scores are not confirmed by ratings provided by a peer or spouse" (p. 51). That is, it seems that narcissists downplay their neurotic tendencies on self-report measures. By conducting a structured interview of the five-factor model, Trull and Widiger (1997) revealed positive correlations between narcissism and all of the facets of Neuroticism. In addition, when personality disorder experts were asked to rate narcissists on the facets of the five personality dimensions, they indicated that narcissists were high on the angry hostility facet of the Neuroticism dimension (Lynman & Widiger, 2001). These latter observations suggest that narcissism is positively related to Neuroticism.

Several studies (Bushman & Baumeister, 2002; Haskell, 2002; Twenge & Campbell, 2003) have revealed that narcissism predicts aggressive behavior in situations involving provocation. In one experiment, Bushman and Baumeister (1998, Study 1) included participants who were either high or low in narcissism and who were either insulted or praised by a confederate. Subsequently, participants were given the opportunity to administer noise blasts to this confederate in a competitive reaction time task. The results showed that participants high in narcissism administered more intense noise blasts than those low in narcissism, and the positive relation between narcissism and aggressive behavior was much stronger in the insult condition than in the praise condition. A second study (Bushman & Baumeister, 1998, Study 2) corroborated this finding. Although the number of experiments that focus on narcissism and aggressive behavior is relatively low, the available findings suggest that narcissism and level of provocation interact in their influences on aggressive behavior.

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[4] Several studies have examined the relation between narcissism and the five-factor model. However, these studies have measured narcissism as a personality disorder, whereas the measure of narcissism (Narcissistic Personality Inventory; Raskin & Terry, 1988) used in the aggression studies that we included are meant to measure narcissism in typical populations (Twenge & Campbell, 2003). Nevertheless, we can use the data for the personality disorder as a marker to understand the relation between narcissism and five-factor personality dimensions on the basis of a conceptual analysis.

Type A Personality

Similar to narcissism, the Type A personality profile is characterized by feelings of inadequacy with regard to self-worth (i.e., self-esteem; Price, 1982). These fears of inadequacy often result in the need for Type A individuals to prove themselves through personal accomplishments (Glass, 1977; Mutaner et al., 1989; Price, 1982). When confronted with a threat or challenge to either their control or their competence, Type A individuals become angry, irritated, and impatient (Brunson & Matthews, 1981; Glass, Snyder, & Hollis, 1974; R. A. Martin, Kuiper, & Westra, 1989; Rosenman, 1978). Thus, higher levels of Type A personality appear to be associated with a greater vulnerability to threats to self-competence and a propensity to experience anger in the presence of threat (Strube et al., 1984). Using a five-factor inventory, Morrison (1997) found that a Type A measure was negatively correlated with Agreeableness but found no correlation with Neuroticism. However, Byrne (1996) as well as Sibilia, Picozzi, and Nardi (1995) reported that Type A personality was positively correlated with Neuroticism.

In the literature, individuals who do not manifest the Type A behavioral pattern are referred to as *Type B* individuals (Booth-Kewley & Friedman, 1987; Mutaner et al., 1989). Although, conceptually, Type A individuals who are provoked should engage in more aggressive behavior than Type B individuals, the available empirical findings are mixed. Two studies have found that Type A individuals were no more aggressive in their behavior than Type B individuals under provoking conditions (Baron, Russell, & Arms, 1985; Holmes & Will, 1985). Another study showed that Type A individuals behaved more aggressively than Type B individuals under both neutral and provoking conditions (Check & Dyck, 1986). However, most studies (Carver & Glass, 1978; Llorente, Bernardo, de Flores, & Valdes, 1985; Muntaner et al., 1989; Strube et al., 1984) have revealed that Type A individuals engage in higher levels of aggressive behavior than Type B individuals under provoking conditions but not under neutral conditions.

Dissipation–Rumination

Dissipation and rumination are considered opposite ends of a continuum; dissipators tend to get over feelings of anger and hostility rapidly following provocation, but ruminators tend to maintain and exacerbate their feelings of anger and hostility for prolonged periods of time (Caprara, 1986). The tendency to ruminate refers to the rehearsing of experiences of provocation and thoughts of retaliation. Because of their tendency to perseverate over provoking incidents, high ruminators (low dissipators) should be more likely than high dissipators (low ruminators) to behave aggressively following provocation. Caprara et al. (1996) reported a negative correlation between rumination (hostile rumination) and Agreeableness and a positive correlation between rumination and Neuroticism (also see Caprara, Barbaranelli, & Comrey, 1992).

Consistent with the definition of dissipation–rumination, Caprara, Coluzzi, et al. (1985) revealed that, in response to insult, high ruminators (low dissipators) administered significantly higher levels of shock to a confederate than did high dissipators (low ruminators). However, in the absence of provocation, the authors found little difference in the levels of shock administered by both types of individuals. Similarly, Collins and Bell (1997) showed an interaction of dissipation–rumination and levels of provocation. That is, high ruminators in the provocation condition administered a greater number of shocks to an opponent than did high dissipators, and the authors found the reverse in the neutral condition. In contrast, one study (Caprara et al., 1987) has shown that high ruminators (low dissipators) generally behaved more aggressively than high dissipators, regardless of provocation level. Although these results are not entirely consistent, theoretically, the dissipation–rumination variable should interact with provocation to induce aggressive behavior.

Impulsivity

In the literature (e.g., Barratt, 1994; Eysenck, Pearson, Easting, & Allsop, 1985; Parker & Bagby, 1997), *impulsivity* is defined as the extent to which individuals are unable to control their thoughts and behaviors. The relative inability to control one's behavior is thought to stem from deficits in the self-regulation of affect, motivation, and arousal as well as in working memory and higher order cognitive functions that ordinarily give rise to hindsight, forethought, anticipatory behavior, and goal-directed action (Barkley, 1997). Barratt (1994) suggested that highly impulsive individuals are characterized by a "hair-trigger temper" (p. 71) and by the lack of self-control that they need to refrain from aggressive behavior after being provoked. McCrae and Costa (1985) reported that impulsivity is positively correlated with Neuroticism but uncorrelated with Agreeableness. Shafer (2001) and Netter et al. (1998) corroborated the positive correlation between impulsivity and Neuroticism (but see Aluja, Garcia, & Garcia, 2002).

Studies (e.g., Hynan & Grush, 1986; Netter et al., 1998) have revealed a relation between impulsivity and aggressive behavior, particularly under conditions of provocation. Netter et al. (1998), for example, had participants perform a joint task with a confederate and either provoked participants with frustration and insults or did not. The results showed that in the provocation condition, individuals who were high in impulsivity administered more intense electrical shocks to the confederate than did individuals who were low in impulsivity. However, under neutral conditions, the results showed that level of impulsivity did not reliably influence aggressive behavior. It appears that, in the face of provocation, emotional volatility and poor self-regulation may induce greater levels of aggressive behavior among highly impulsive individuals.

The Present Study

In the present study, we meta-analytically examine the associations between personality variables and aggressive behavior, separately under provoking and relatively neutral conditions. Our meta-analysis has the capacity to refine theories of aggression in several ways. First, because at least some personality variables are likely predictors of aggressive behavior, a comprehensive quantitative review will document the need for theories of aggression to articulate how and why personality variables influence observable behavior. Second, the meta-analysis is likely to suggest that theories must consider whether personality variables are likely to interact with levels of provocation in their influences on aggressive behavior. Third, the meta-analytic findings may point to additional variables that moderate the link between personality antecedents and aggressive behavior.

For our quantitative review, we calculated an effect-size estimate that compares the aggressive behavior of individuals who

scored high on a particular personality variable with the behavior of those who scored low. Our term for this comparison is *personality-difference effect size.* Our theoretical and empirical review of the literature on aggression and personality suggests that two patterns of aggressive behavior should be revealed by the meta-analysis. As such, we predicted that some personality variables available for the meta-analysis would be positively associated with aggressive behavior under both relatively neutral and provoking conditions. By contrast, other variables would be positively associated with aggressive behavior only under provocation conditions.

Method

Sample of Studies

Up to the end of the year 2004, we conducted database searches, including a PsycINFO search of psychological abstracts, an ERIC search, and a Dissertation Abstracts International search of the abstracts of master's theses and doctoral dissertations. We used the keywords *aggression, aggressive behavior, aggress, hostility, individual differences, personality traits, personality,* and *trait.* Also, we contacted researchers for whom we had included at least two research reports in the meta-analysis and requested any relevant published and unpublished studies. Finally, we examined the reference sections of relevant meta-analyses (Anderson & Bushman, 1997, 2002; Bettencourt & Kernahan, 1997; Bettencourt & Miller, 1996; Bushman & Anderson, 1998; Carlson, Marcus-Newhall, & Miller, 1989, 1990; Ito, Miller, & Pollock, 1996) for additional citations. We copied all potentially qualifying articles and checked their reference sections for additional citations.

Inclusion Criteria for Studies

Studies were included in analyses if it was possible to calculate an effect size estimate of the difference between the aggressive behavior of individuals who scored high and those who scored low on a personality measure hypothesized to increase aggression, separately under a neutral condition, a provocation condition, or both.[5] An effect size estimate could be calculated if the results included a correlation between a personality variable and a measure of aggressive behavior or if the results included a mean score of aggressive behavior for participants who scored high on a personality variable and one for those who scored low on the same variable (viz. median or tertiary splits).[6] Whenever possible, we derived an effect size from a correlation between a personality variable and a measure of aggressive behavior, but when no other data were available, we derived the effect size from means and an estimate of the pooled standard deviations. In both instances, we estimated the effect size metric, *d,* using DSTAT software (Johnson, 1989) and corrected for small-sample bias (Hedges & Olkin, 1985).

Specific conditions known to further moderate aggressive behavior, such as alcohol (e.g., Ito et al., 1996; Taylor & Hulsizer, 1998) and violent cues (e.g., Carlson et al., 1990; Paik & Comstock, 1994; W. Wood, Wong, & Chachere, 1991), were excluded from the present meta-analysis. Studies that used self-reports of aggression or that used only clinical or deviant samples were not included. In addition, studies in which the personality measure was administered after the measure of aggressive behavior were excluded from the analysis.[7] This latter exclusion criterion was adopted to eliminate the possibility that the differences in aggressive behavior might have influenced the subsequent self-report on the personality variable measure.

In total, 63 studies yielded 109 personality-difference effect sizes. For those studies that reported the age range of participants, across studies, ages ranged from 7 years old to 48 years old, and for those studies that reported the mean age of participants, across studies, the mean age was 21.85 years (also see Table 3 for the age category of participants per report). Six studies had only a neutral condition, 20 studies had only a provocation condition, and 37 studies had both a neutral and a provocation condition. Several studies yielded more than one effect size per neutral condition, provocation condition, or both. In such cases, we followed the established practice of preserving relevant between-conditions effect sizes (Johnson & Eagly, 2000).[8]

Variables Coded From Each Research Report

The following information was coded for each study: (a) type of personality variable (dissipation–rumination, emotional susceptibility, irritability, impulsivity, narcissism, trait anger, trait aggressiveness, Type A personality), (b) type of provocation (physical [shock, noise], verbal [insulted by another, evaluated poorly, or yelled at], frustration [difficult puzzle, preventing the achievement of a desired goal], and monetary or point penalty), (c) type of aggression (physical [hitting or shoving, intensity of noxious noise, intensity of electric shock, duration of noxious noise, duration of electric shock, number of noxious noise blasts, number of electric shocks], verbal [negative feedback or disparaging comments directed at the confederate], and monetary or point penalty), (d) option to aggress (participant forced to aggress or participant free to aggress), (e) target of aggressive behavior (same as provocateur or different from provocateur), (f) gender of participants (female only, male only, both). The coders of the variables were one graduate student and one undergraduate student. The coding sheet was explained to the coders, and each independently coded a small test set of studies. Then the coders and B. Ann

[5] Studies that looked at personality variables hypothesized to decrease aggressive behavior were excluded from the present analysis. These included anxiety (Bjork et al., 1997; Dengerink, 1971; Dorsky & Taylor, 1972; Wilkinson, 1985), depression (Bjork et al., 1997), empathy and perspective taking (Giancola, 2003; Perugini & Gallucci, 2001; Richardson, Hammock, Smith, Gardner, & Signo, 1984; Strayer & Roberts, 2004), executive functioning (Hoaken, Shaughnessy, & Pihl, 2003; Santor, Ingram, & Kusumakar, 2003), intelligence (Giancola & Zeichner, 1994), nonviolence (Sen, 1986), reflection (Irwin & Gross, 1995), self-consciousness (Spivey & Prentice-Dunn, 1990), and social integration and ascendancy (Boyatzis, 1975). Also, studies that looked at individual differences hypothesized to increase aggressive behavior but that yielded only one effect size were excluded from analyses. These included aggression–guilt (Knott, Lasater, & Shuman, 1974), authoritarianism (Altemeyer, 1981), dominance (Leyens, Herman, & Dunand, 1982), introversion (Garcia, 1985), locus of control (Dengerink, O'Leary, & Kasner, 1975), Machiavellianism (Murphy, 1974), and personal norm of reciprocity (Perugini & Gallucci, 2001).

[6] Studies for which effect sizes could not be calculated included Bjork et al. (2000); Pihl, Zacchia, and Zeichner (1982); and Stephens, Nelson, and Hudgens (1974).

[7] The identified studies that measured the personality variable after the aggression measure was taken included Cherek, Schnapp, Moeller, and Dougherty (1996); Dougherty, Bjork, Huckabee, Moeller, and Swann (1999); Lieberman, Solomon, Greenberg, and McGregor (1999); South, Oltmanns, and Turkheimer (2003); and Verona, Patrick and Lang (2002).

[8] The independent sample was the unit of analysis. However, a few studies allowed us to calculate a number of different effect sizes relevant to the personality variables we included in the analyses. That is, three studies reported statistics for more than one personality variable. However, these separately reported statistics stemmed from the same independent sample. To retain the distinctions between the personality variables in our analysis, rather than collapsing across them or selecting only one of them, we used Cooper's (1989) "shifting unit of analysis" (p. 78). For example, for analyses that examined each of the personality variables separately, these three studies contributed an effect size for each personality variable for which we had data. However, in the other analyses, the studies contributed one effect size by virtue of averaging of the multiple effect sizes.

Bettencourt discussed coding discrepancies for this test set to further clarify the variable definitions and coding methods. After this initial training, the two coders separately coded each of the variables for all of the studies. When a discrepancy was found, both coders independently reviewed the study again and made a decision about whether they would retain their code or modify it. Finally, interrater reliabilities (percentage of agreement) were calculated; they ranged from .87 to 1.00. Remaining discrepancies were discussed and resolved in conference with B. Ann Bettencourt.

Results

A positive mean personality-difference effect size indicated that participants who scored high on a given personality variable were more behaviorally aggressive than those who scored low on the same variable. These personality-difference effect sizes are reported in Table 3. In addition, Table 3 contains the coded values for the level of provocation (neutral or provocation), type of personality variable, type of provocation, gender of participant, target of aggression, type of aggression, option to aggress, study design, and source of effect size.

Because the presence of extreme values in a data set can seriously distort the outcomes of analyses (Tabachnick & Fidell, 1989; Wilcox, 1995), including meta-analyses (see Bettencourt & Miller, 1996, and Cooper, Charlton, Valentine, & Muhlenbruck, 2000, for a discussion of the issue), the distributions of the effect size estimates were examined. Two effect sizes (ds = 6.04 and 5.06) in the distribution were identified as extreme outliers (through the interquartile range procedure; SAS Institute, 1985). Extreme values in a distribution may be either excluded or modified (Tabachnick & Fidell, 1989). To retain all of the studies in the analyses, we changed the values of these two extreme effect sizes to equal the value of the respective next closest effect size in the distribution (Tabachnick & Fidell, 1989; Wilcox, 1995). As shown in the top panel of Table 4, the mean effect size and the CI for the modified data were essentially identical to those for the unmodified data. We used the modified data in all subsequent analyses.

Weighting the effect size of each study by its sample size is recommended (e.g., Hedges & Olkin, 1985). The mean-weighted effect size assigns greater weight to studies with larger sample sizes on the assumption that their effects are more reliable. Ninety-five percent CIs were computed for each mean-weighted effect size within each class of a coded variable. Between-class statistics (Q_b) and within-class homogeneity statistics (Q_w) were used to analyze the effect size estimates (Hedges & Olkin, 1985). The between-class statistic is analogous to an F statistic and indicates the magnitude of the variance among the average effect sizes. The within-class homogeneity statistics in the weighted analyses indicate significant heterogeneity among the effect sizes in the sample.

We conducted both fixed-effects analyses and random-effects analyses (see Cooper & Hedges, 1994). In fixed-effects models, meta-analysts are able to make inferences about the effect sizes only in regard to the set of reviewed studies (Hedges & Vevea, 1998). For this type of analysis, the effect size estimates the population effect with the error calculated from the random sampling of participants within the studies. In random-effects models, meta-analysts are able to make inferences that generalize beyond the set of reviewed studies to a broader population of studies. For this type of analysis, it is assumed that the variability among effect sizes emerges from both participant-level sampling error and random differences among studies (Hedges & Vevea, 1998). The random-effects model assumes that studies have been randomly sampled from a population of studies that could have been conducted. Cooper et al. (2000) pointed out that it is often unclear whether a fixed-effects analysis or a random-effects analysis is most appropriate for a given meta-analysis. It is often best to perform both types of analyses because, as Overton (1998) has shown, random-effects models can overestimate error variance. Similarly, Wang and Bushman (1999) pointed out that the risk of Type II error is greater with random-effects models and recommended conducting both fixed-effects and random-effects analyses.

In the present study, we conducted both types of analyses. Nevertheless, because of the relatively small number of studies available in the literature, we focus on the results from the fixed-effects analysis. That is, given that the small number of effect sizes rendered relatively low power and that random-effects analyses can be overly conservative in such cases, we focus on the fixed-effects analyses to interpret the effect sizes available in the literature. Therefore, the conclusions we draw may not be generalizable to a broader population of studies.

Summary of Effect Size Estimates

As shown in the first two rows of Table 4, an overall analysis of the mean personality-difference effect size, which ignored level of provocation (i.e., neutral vs. provocation), revealed the expected influence of personality variables on aggressive behavior. In general, those who scored high on the personality measures included in the meta-analysis behaved more aggressively than those who scored low on these measures. The analysis also indicated significant within-class heterogeneity for this mean effect size, revealing a substantial amount of unexplained variance in the overall mean effect size, fixed $Q_w(101) = 377.16$, $p < .001$; random $Q_w(101) = 50.22$, $p < .001$.

Effect of Provocation on Personality Differences in Aggressive Behavior

One goal of the current meta-analysis was to determine whether the magnitudes of personality-difference effect sizes were different under neutral and provoking conditions. As shown in the lower panel of Table 4, analyses that ignored the specific type of personality variable but compared neutral with provocation conditions revealed that the mean personality-difference effect size under neutral conditions was reliably smaller than that under provocation conditions, fixed $Q_b(1) = 17.78$, $p < .01$; random $Q_b(1) = 6.73$, $p < .05$. This finding suggests that personality variables and the level of provocation (neutral vs. provoking) interact to influence aggressive behavior. Nevertheless, the respective 95% CIs showed that the mean effect sizes associated with both the neutral and the provoking conditions were greater than zero. This latter result suggests that, compared with participants who scored low, those who scored high on the personality variables behaved more aggressively under both neutral and provoking conditions.

Type of Personality Variable

On the basis of our qualitative review of the literature, we predicted that some personality variables would be positively associated with aggressive behavior only under provocation con-

Table 3
Effect Sizes and Study Characteristics

Author	*N*	*d*	Level of provo	Personality variable	Type of provo	Gender of participant	Source of provo	Type of aggression	Option to aggress	Study design	Source of effect size	Age category
Bailey & Taylor (1991)	20	0.0568	1	1	1	2	1	2	1	2	1	2
Bailey & Taylor (1991)	20	0.1186	2	1	1	2	1	2	1	2	1	2
Baron et al. (1985)	23	0.6244	1	3	2	2	1	2	1	1	1	2
Baron et al. (1985)	24	0.0553	2	3	2	2	1	2	1	1	1	2
Ben-Porath & Taylor (2002)	20	−0.0422	2	1	1	2	1	2	1	2	1	2
Berman et al. (1993)	38	−0.2211	1	3	1	2	1	2	2	2	1	2
Berman et al. (1993)	38	−0.1307	2	3	1	2	1	2	1	2	1	2
Bond et al. (2001)	12	0.9710	1	1	1	1	1	2	1	2	2	3
Bond et al. (2001)	12	0.9395	2	1	1	1	1	2	1	2	2	3
Bushman (1995)	148	0.2435	1	1	1	3	1	2	2	2	2	2
Bushman (1995)	148	0.1834	2	1	1	3	1	2	2	2	2	2
Bushman et al. (2001)	200	−0.0294	1	6	1	3	1	2	2	2	1	2
Bushman et al. (2001)	200	0.3168	2	6	1	3	1	2	2	2	1	2
Bushman & Baumeister (1998)[a]	130	0.3005	1	7	2	3	1	2	2	3	2	2
Bushman & Baumeister (1998)[a]	130	0.6385	2	7	2	3	1	2	2	3	2	2
Bushman & Baumeister (1998)[b]	70	−0.1196	1	7	2	3	1	2	2	3	2	2
Bushman & Baumeister (1998)[b]	70	0.3119	2	7	2	3	1	2	2	3	2	2
Bushman & Baumeister (1998)[b]	70	0.0514	1	7	2	3	2	2	2	3	2	2
Bushman & Baumeister (1998)[b]	70	0.0764	2	7	2	3	2	2	2	3	2	2
Caprara & Renzi (1981)	100	2.2142	1	2	2	3	2	2	1	1	1	2
Caprara & Renzi (1981)	100	5.0547	2	2	2	3	2	2	1	1	1	2
Caprara et al. (1984)	40	0.4406	1	2	2	3	2	2	1	1	1	2
Caprara et al. (1984)	40	1.1651	2	2	2	3	2	2	1	1	1	2
Caprara (1982)	100	0.2139	1	5	2	3	2	2	1	1	1	2
Caprara (1982)	100	0.6744	2	5	2	3	2	2	1	1	1	2
Caprara et al. (1985)	20	0.0170	1	4	2	2	1	2	1	1	1	2
Caprara et al. (1985)	20	1.4540	2	4	2	2	1	2	1	1	1	2
Caprara et al. (1983)[a]	60	0.4504	1	2	2	3	2	2	1	1	1	2
Caprara et al. (1983)[a]	60	3.0292	2	2	2	3	2	2	1	1	1	2
Caprara, Renzi, et al. (1986)[a]	40	0.6994	1	2	2	3	2	2	1	1	1	2
Caprara, Renzi, et al. (1986)[a]	40	1.6140	2	2	2	3	2	2	1	1	1	2
Caprara et al. (1983)[b]	60	0.5016	1	5	2	3	2	2	1	1	1	2
Caprara et al. (1983)[b]	60	1.1195	2	5	2	3	2	2	1	1	1	2
Caprara, Renzi, et al. (1986)[b]	40	0.3864	1	5	2	3	2	2	1	1	1	2
Caprara, Renzi, et al. (1986)[b]	40	0.4293	2	5	2	3	2	2	1	1	1	2
Carver & Glass (1978)[a]	24	0.0300	1	3	2	2	1	2	1	1	1	2
Carver & Glass (1978)[b]	24	0.8619	2	3	2	2	1	2	1	1	1	2
Carver & Glass (1978)[b]	24	−0.0922	1	3	4	2	1	2	1	4	1	2
Carver & Glass (1978)[b]	24	0.9714	2	3	3	2	1	2	1	4	1	2
Carver & Glass (1978)[b]	24	0.6164	2	3	2	2	1	2	1	4	1	2
Check & Dyck (1986)	63	0.7660	2	3	2	2	1	3	1	4	1	2
Cheong & Nagoshi (1999)	8	1.1384	2	8	1	2	1	2	2	4	2	2
Collins & Bell (1997)	20	−1.0902	1	4	2	2	2	2	2	1	1	2
Collins & Bell (1997)	20	0.7347	2	4	2	2	2	2	2	1	1	2
Edguer & Janisse (1994)	49	−0.3393	1	3	2	2	1	2	1	1	1	2
Edguer & Janisse (1994)	48	0.0338	2	3	2	2	1	2	1	1	1	2
Fraczek & Macaulay (1971)	18	0.8681	2	5	1	2	1	2	2	4	1	2
Frey & Zeichner (2006)	60	0.2607	2	8	1	2	1	2	2	2	1	2
Gerra et al. (2001)[a]	20	2.3813	2	1	4	2	1	3	2	4	2	3
Gerra et al. (2001)[b]	20	1.5913	2	2	4	2	1	3	2	4	2	3
Giancola (2002)	103	1.0861	2	1	1	3	1	2	1	4	2	3

Table 3 (*continued*)

Author	*N*	*d*	Level of provo	Personality variable	Type of provo	Gender of participant	Source of provo	Type of aggression	Option to aggress	Study design	Source of effect size	Age category
Giancola (2002)	103	0.7126	2	6	1	3	1	2	1	4	2	3
Giancola & Zeichner (1995a)	30	0.5658	1	1	1	3	1	2	1	2	2	3
Giancola & Zeichner (1995a)	30	0.6054	2	1	1	3	1	2	1	2	2	3
Giancola & Zeichner (1995b)	79	0.4042	2	6	1	2	1	2	1	4	2	3
Giancola & Zeichner (1995b)	79	0.9164	2	1	1	2	1	2	1	4	2	3
Giancola & Zeichner (1995b)	79	0.2596	2	2	1	2	1	2	1	4	2	3
Hammock & Richardson (1992)	194	6.0370	1	1	1	3	1	2	1	1	2	2
Hammock & Richardson (1992)	194	0.5586	2	1	1	3	1	2	1	1	2	2
Haskell (2002)	48	0.1956	1	7	2	2	1	2	2	1	2	2
Haskell (2002)	48	0.6049	2	7	2	2	1	2	2	1	2	2
Holmes & Will (1985)	17	0.8470	1	3	2	2	1	2	2	1	1	2
Holmes & Will (1985)	20	0.3431	2	3	2	2	1	2	2	1	1	2
Hynan & Grush (1986)	20	−0.4499	1	8	2	2	1	2	1	1	1	2
Hynan & Grush (1986)	20	0.0660	2	8	2	2	1	2	1	1	1	2
Josephson (1988)	396	0.8712	2	1	4	2	2	2	2	4	2	1
Knott (1970)	18	1.0558	2	1	1	2	1	2	2	4	1	2
Lagerspetz & Engblom (1979)	57	0.5100	1	1	0	3	0	2	2	5	1	1
Lagerspetz & Engblom (1979)	57	1.2060	1	1	0	3	0	1	2	5	1	1
Larsen et al. (1972)	58	0.4237	1	1	0	3	0	2	1	5	2	2
Leibowitz (1968)	38	0.6154	1	1	0	2	0	2	1	5	2	2
Lindsay (1999)	97	0.6023	1	2	2	3	2	2	2	1	2	2
Lindsay (1999)	88	0.4637	2	2	2	3	2	2	2	1	2	2
Llorente et al. (1985)	60	−0.3350	1	3	3	2	1	2	1	1	1	2
Llorente et al. (1985)	60	0.6633	2	3	3	2	1	2	1	1	1	2
Matthews & Angulo (1980)	60	0.5211	2	3	4	3	2	2	2	4	1	1
Muntaner et al. (1989)	61	−0.2491	1	3	0	2	0	2	1	1	1	2
Muntaner et al. (1989)	60	0.4150	2	3	3	2	1	2	1	1	1	2
Netter et al. (1998)	10	0.9818	1	8	1	2	1	2	1	1	1	2
Netter et al. (1998)	10	0.8938	2	8	1	2	1	2	1	1	1	2
Parrott & Zeichner (2001)	17	0.8229	2	2	1	2	1	2	1	4	1	2
Parrott & Zeichner (2002)	25	0.6452	1	6	1	2	1	2	2	2	1	2,3
Parrott & Zeichner (2002)	25	0.2591	2	6	1	2	1	2	2	2	1	2,3
Pihl et al. (1997)	29	0.2966	1	6	1	2	1	2	1	2	1	3
Pihl et al. (1997)	29	1.2432	2	6	1	2	1	2	1	2	1	3
Renzi et al. (1984)[a]	50	0.1283	1	2	2	3	2	2	1	1	1	2
Renzi et al. (1984)[a]	50	−0.0964	2	2	2	3	2	2	1	1	1	2
Renzi et al. (1984)[b]	50	0.1255	1	5	2	3	2	2	1	1	1	2
Renzi et al. (1984)[b]	50	0.1480	2	5	2	3	2	2	1	1	1	2
Scheier et al. (1978)	63	0.7140	1	1	0	3	0	2	1	5	2	2
Shemberg et al. (1968)	45	1.3513	1	1	0	3	0	2	1	5	1	1
Shondrick (1996)	20	0.3861	1	1	1	2	1	2	1	2	1	2
Shondrick (1996)	20	0.0298	2	1	1	2	1	2	1	2	1	2
Strube et al. (1984)	21	0.5392	1	3	3	2	2	3	2	1	1	2
Strube et al. (1984)	22	0.8161	2	3	3	2	2	3	2	1	1	2
Twenge & Campbell (2003)[c]	31	1.1847	2	7	2	3	1	2	2	4	2	2
Twenge & Campbell (2003)[d]	22	−0.3312	1	7	2	3	2	2	2	1	2	2
Twenge & Campbell (2003)[d]	39	0.9062	2	7	2	3	2	2	2	1	2	2

(*table continues*)

Table 3 (*continued*)

Author	*N*	*d*	Level of provo	Personality variable	Type of provo	Gender of participant	Source of provo	Type of aggression	Option to aggress	Study design	Source of effect size	Age category
van Goozen, Frijda, Kindt, & van de Poll (1994)	25	0.7403	2	6	2	1	1	1	2	4	2	2
van Goozen, Frijda, & van de Poll (1994)	30	0.4750	2	6	2	1	1	1	2	4	2	2
Wingrove & Bond (1998)	23	0.3731	2	1	2	3	1	1	2	4	2	2
Wingrove & Bond (1998)	23	1.2344	2	8	3	3	1	1	2	4	2	2
Winkel et al. (1987)	28	−0.1016	1	3	0	3	0	3	2	5	2	1
Zeichner et al. (1999)	43	1.2583	2	1	1	3	1	2	2	4	2	2
Zeichner, Parrot, & Frey (2003)	84	0.8907	2	1	1	3	1	2	2	4	2	2
Zeichner, Frey, & Parrot (2003)	80	0.9433	2	1	1	3	1	2	2	4	2	2
Zeichner, Frey, & Parrot (2003)	80	0.4466	2	6	1	3	1	2	2	4	2	2
Zeichner, Frey, & Parrot (2003)	80	0.5776	2	2	1	3	1	2	2	4	2	2
Zeichner, Frey, & Parrot (2003)	80	0.6558	2	1	1	3	1	2	1	4	2	2

Note. k = number of effect sizes in the category; provo = provocation. Effect sizes that are positive indicate higher levels of aggressive behavior. Level of provo: 1 = neutral, 2 = provocation. Personality variable: 1 = trait aggression, 2 = irritability, 3 = Type A personality, 4 = dissipation–rumination, 5 = emotional susceptibility, 6 = trait anger, 7 = narcissism, 8 = impulsivity. Type of provo: 0 = none, 1 = physical, 2 = verbal, 3 = frustration, 4 = other. Gender of participant: 1 = female, 2 = male, 3 = both male and female. Source of provo: 0 = not applicable, 1 = same as provocateur, 2 = different from provocateur. Type of aggression: 1 = verbal, 2 = physical, 3 = other. Option to aggress: 1 = forced to aggress, 2 = free to aggress. Study design: 1 = between subjects, 2 = within subject, 3 = both, 4 = provocation only, 5 = neutral only. Source of effect size: 1 = group statistic, 2 = continuous statistic. Age statistics were not available from many reports in the meta-analysis, but categories of participants' ages were determined as 1 = children, under the age of 18, 2 = college students, 3 = adults from a community sample.
[a] Study 1. [b] Study 2. [c] Study 3. [d] Study 4.

ditions, whereas other personality variables would be associated with aggressive behavior under both neutral and provoking conditions. For our analyses, we categorized the personality-difference effect sizes by the eight personality variables included in the meta-analysis (i.e., trait aggressiveness, trait irritability, trait anger, Type A personality, dissipation–rumination, emotional susceptibility, narcissism, and impulsivity). Furthermore, for each personality variable, we calculated the average effect sizes associated with the neutral conditions separately from those associated with the provocation conditions. As expected, the analyses revealed two patterns of relations (see Table 5); one pattern revealed associations between the personality variables and aggressive behavior under both neutral and provoking conditions, whereas the other showed associations only in response to provocation.

In particular, as shown in the upper panel of Table 5, the mean effect sizes for trait aggressiveness and their respective CIs showed that individuals who were high in trait aggressiveness behaved more aggressively than those who were low in trait aggressiveness under both neutral and provoking conditions. The analysis revealed that the mean effect sizes associated with the neutral and the provocation conditions were the same, fixed $Q_b(1) = 1.66$, *ns;* random $Q_b(1) = 0.18$, *ns.*

A similar pattern of outcomes was revealed for the mean effect sizes associated with trait irritability, fixed $Q_b(1) = 1.31$, *ns;* random $Q_b(1) = 1.72$, *ns.* The results revealed that whether conditions were neutral or provoking, individuals high in trait irritability behaved more aggressively than those low in trait irritability (see upper panel of Table 5). Moreover, the respective CIs revealed that these mean effect sizes were statistically reliable. It is not surprising that the results for trait aggressiveness and trait irritability are similar because for some measures trait irritability is a part of the trait aggressiveness construct, the items in the measures of the two constructs are similar, and they are highly and positively correlated.

By contrast to the pattern of results that emerged for trait aggressiveness and trait irritability, the personality-difference effect sizes associated with the remaining personality variables were positive and reliable under provocation conditions but, for the most part, small and unreliable under neutral conditions. As shown in the lower panel of Table 5, the results for trait anger revealed that the effect size for the neutral condition was small and equivalent to zero, suggesting that when the situation was neutral, individuals who were high in trait anger were no more likely to behave aggressively than those low in trait anger. Conversely, when provoked, those high in trait anger showed reliably greater levels of aggressive behavior than those low in trait anger. Accordingly, the results show that the effect size associated with the neutral category was smaller than that for the provocation category, fixed $Q_b(1) = 5.76$, $p < .05$; random $Q_b(1) = 0.47$, *ns.*

Similarly, the mean effect size and CI revealed that under neutral conditions, Type A and Type B individuals engaged in equivalent levels of aggressive behavior. Under provocation, however, the mean effect size indicated that Type A individuals behaved more aggressively than did Type B individuals. For Type A personality, the analysis revealed that the mean effect size was smaller under neutral conditions than under provocation condi-

Table 4
Mean Personality-Difference Effect Sizes

Category of effect sizes	*k*	Fixed		Random	
		Mean *d*	95% CI	Mean *d*	95% CI
Nonmodified	102	0.54	0.48, 0.60	0.66	0.57, 0.75
Modified	102	0.50	0.45, 0.55	0.57	0.44, 0.69
Neutral conditions	43	0.37	0.29, 0.45	0.38	0.19, 0.57
Provoking conditions	59	0.60	0.53, 0.67	0.72	0.55, 0.89

Note. Personality-difference effect sizes that are positive indicate that high scores on the personality variables were associated with higher levels of aggressive behavior. Confidence intervals (CIs) that do not include zero indicate that the effect size is of significant magnitude. *k* = number of effect sizes in the category.

tions, fixed $Q_b(1) = 14.66$, $p < .001$; random $Q_b(1) = 2.66$, $p < .10$.

Also, as shown in the lower panel of Table 5, for dissipation–rumination, the mean personality-difference effect size in the neutral category was small and equivalent to zero. In contrast, high ruminators behaved more aggressively than did low ruminators (i.e., high dissipators) under provocation. The analysis that compared the personality-difference effect sizes in the neutral and provocation conditions revealed that these mean effect sizes were different, fixed $Q_b(1) = 10.96$, $p < .001$; random $Q_b(1) = 4.84$, $p < .05$.

The results for emotional susceptibility were similar to those for trait anger, Type A personality, and dissipation–rumination, but the effects were weaker. The results for emotional susceptibility revealed that the mean effect size under provoking conditions was marginally larger than that under neutral conditions, fixed $Q_b(1) = 3.71$, $p < .10$; random $Q_b(1) = 0.62$, *ns.* The analysis showed that the mean effect size for the neutral condition was small, but the CI suggested it was somewhat larger than zero. The respective effect size for the provocation condition was relatively large and different from zero.

With a few exceptions, the findings for narcissism and impulsivity were consistent with the interaction pattern between the personality variables and level of provocation. As shown at the bottom of Table 5, for the neutral categories, the mean effect sizes

Table 5
Mean Personality-Difference Effect Sizes as a Function of Personality Variable

Category and condition	*k*	Fixed		Random	
		Mean *d*	95% CI	Mean *d*	95% CI
Trait aggressiveness					
Neutral	11	0.85	0.68, 1.02	0.85	0.47, 1.23
Provoking	16	0.71	0.57, 0.84	0.74	0.42, 1.06
Trait irritability					
Neutral	6	0.64	0.46, 0.83	0.75	0.26, 1.24
Provoking	10	0.79	0.62, 0.96	1.17	0.77, 1.57
Trait anger					
Neutral	3	0.09	−0.17, 0.37	0.06	−0.46, 0.99
Provoking	8	0.50	0.32, 0.67	0.56	0.12, 0.99
Type A personality					
Neutral	10	−0.08	−0.29, 0.14	0.02	−0.39, 0.44
Provoking	12	0.47	0.29, 0.66	0.48	0.11, 0.86
Dissipation–rumination					
Neutral	2	−0.50	−1.14, 0.14	−0.52	−1.52, 0.48
Provoking	2	1.06	0.40, 1.73	1.08	0.06, 2.10
Emotional susceptibility					
Neutral	4	0.24	0.03, 0.46	0.30	−0.29, 0.89
Provoking	5	0.50	0.29, 0.71	0.62	0.07, 1.17
Narcissism					
Neutral	5	0.11	−0.11, 0.32	0.04	−0.50, 0.58
Provoking	6	0.53	0.33, 0.74	0.59	−0.10, 1.09
Impulsivity					
Neutral	2	0.00	−0.74, 0.73	0.13	−0.95, 1.21
Provoking	5	0.49	0.13, 0.86	0.63	−0.02, 1.28

Note. Personality-difference effect sizes that are positive indicate that high scores on the personality variables were associated with higher levels of aggressive behavior. Confidence intervals (CIs) that do not include zero indicate that the effect size is of significant magnitude. *k* = number of effect sizes in the category.

and CIs revealed that individuals scoring high on narcissism, as well as those scoring high on impulsivity, were similar to their low-scoring counterparts in levels of aggressive behavior. By contrast, for the provocation categories, the mean effect sizes for these personality variables were positive, suggesting that higher levels of both narcissism and impulsivity were associated with greater levels of aggressive behavior under provoking situations. The analyses revealed that for narcissism, the mean effect size was smaller under neutral conditions, compared with provocation conditions, fixed $Q_b(1) = 7.98$, $p < .001$; random $Q_b(1) = 2.17$, *ns,* but for impulsivity, this difference was not reliable, fixed $Q_b(1) = 1.39$, *ns;* random $Q_b(1) = 0.60$, *ns.* It should be noted that relatively few studies contributed effect sizes to the analysis of the impulsivity variable, and therefore it is unlikely that there was enough statistical power to test differences between the mean effect sizes. Although these latter results are somewhat mixed, the pattern of the results for narcissism and impulsivity appear to be similar to those for trait anger, Type A personality, dissipation–rumination, and emotional susceptibility, and they are notably distinct from the main effect pattern revealed for trait aggressiveness and trait irritability.

Exploratory Analyses

We coded the effect sizes by additional variables, such as type of provocation (i.e., verbal, physical, frustration), source of provocation (i.e., same as provocateur, different from provocateur), and type of aggressive behavior (i.e., verbal, physical), but there were too few effect sizes within each category of the eight personality variables to examine the ways these additional variables moderated the magnitudes of the personality-difference effect sizes. Because the results suggested that the personality variables were associated with aggressive behavior either only under provocation or under both provocation and neutral conditions, we subdivided the personality-difference effect sizes into two categories that corresponded to the two patterns of results. That is, we combined the effect sizes for trait anger, Type A personality, dissipation–rumination, emotional susceptibility, narcissism, and impulsivity and labeled this category *provocation sensitive.* Likewise, we combined the effect sizes for trait aggressiveness and trait irritability and labeled this category *aggression prone.* Creating the provocation-sensitive and aggression-prone categories enabled the examination of the influences of the other coded moderator variables.

It is not surprising that an analysis that compared the provocation-sensitive category with the aggression-prone category under neutral versus provoking conditions was completely consistent with the pattern of results seen for the separate personality variables. For the provocation-sensitive category, the mean effect size for the neutral condition was small and equivalent to zero (mean $d = 0.07$, CI $= -0.04, 0.18$; random: mean $d = 0.08$, CI $= -0.17, 0.33$), but the mean effect size for the provocation condition was positive and greater than zero (mean $d = 0.51$, CI $= 0.42, 0.60$; random: mean $d = 0.58$, CI $= 0.37, 0.79$). The mean effect sizes were reliably different, fixed $Q_b(1) = 35.86$, $p < .001$; random $Q_b(1) = 9.16$, $p < .05$. By contrast, for the aggression-prone category, the mean effect sizes for both the neutral and the provocation conditions were positive and reliable (mean $d = 0.76$, CI $= 0.63, 0.88$, and mean $d = 0.74$, CI $= 0.64, 0.84$, respectively; random: mean $d = 0.81$, CI $= 0.51, 1.11$; and mean $d = 0.91$, CI $= 0.66, 1.16$, respectively) and were similar in magnitude, fixed $Q_b(1) = 0.04$, *ns;* random $Q_b(1) = 0.01$, *ns.*

We attempted to analyze the results by whether the type of aggressive behavior available to the study participants was either physical or verbal. Effect sizes derived from dependent measures such as hitting or shoving, intensity of noxious noise, intensity of electric shock, duration of noxious noise, duration of electric shock, or number of noxious noise blasts were included in the physical aggression category. Effect sizes derived from dependent measures such as negative evaluative feedback or disparaging comments directed toward the confederate were included in the verbal aggression category. As can be seen in the upper panel of Table 6, there were only a few studies ($k = 4$) that included measures of verbal aggression. That is, the vast majority of studies included in the analyses used measures of physical aggression (see the bottom panel of Table 6). Given that most of the effect sizes were associated with the physical aggression category, the results comparing neutral with provoking conditions in the provocation-sensitive, fixed $Q_b(1) = 32.67$, $p < .001$; random $Q_b(1) = 7.99$, $p < .05$, and the aggression-prone categories were very similar to the previously reported analyses, fixed $Q_b(1) = 0.08$, *ns;* random $Q_b(1) = 0.11$, *ns.*

Next, we divided the effect sizes by whether the participants were only female, only male, or both female and male. As can be seen in Table 7, most studies included both male and female participants, and some included only male participants; only two included female participants exclusively. The results suggest that the general pattern observed in the previous analyses was revealed regardless of whether the participants were only male or both female and male (and in one category, when participants were only female). For the neutral conditions, analyses comparing the male-only category with the other gender categories revealed no differences between the mean personality-difference effect sizes for both the provocation-sensitive category, fixed $Q_b(1) = 0.21$, *ns;* random $Q_b(1) = 0.05$, *ns,* and the aggression-prone category, fixed $Q_b(1) = 0.18$, *ns;* random $Q_b(1) = 0.16$, *ns.* This was also true for the provocation conditions: provocation sensitive, fixed $Q_b(1) = 0.00$, *ns;* random $Q_b(1) = 0.01$, *ns;* aggression prone, fixed $Q_b(1) = 0.17$, *ns;* random $Q_b(1) = 0.25$, *ns.* One unexpected finding was observed for the neutral, aggression-prone, male-only category. For this category, although the mean effect sizes were positive, suggesting an association between personality variables and aggressive behavior, the CIs suggested that the mean effect size was not reliable. It should be noted that the mean effect sizes associated with this latter category and the provocation-sensitive, female-only category were derived from a small number of study reports.

The source of provocation could be either the same as the eventual object of the participants' aggressive behavior (i.e., same as provocateur) or different from the object of the participant's aggressive behavior (i.e., different from provocateur). The results of the analyses for the source of provocation categories are reported in Table 8. The analysis for the provocation-sensitive category suggested that the association between the related personality variables and aggressive behavior after provocation was similar regardless of whether the object of the aggressive behavior was the same as or different from the provocateur, fixed $Q_b(1) = 0.14$, *ns;* random $Q_b(1) = 0.01$, *ns.* However, for the aggression-prone category, the level of aggressive behavior directed at the object of the aggression was greater when the provocateur was

Table 6
Mean Personality-Difference Effect Sizes by Type of Aggression

Category	*k*	Fixed		Random	
		Mean *d*	95% CI	Mean *d*	95% CI
Verbal					
Provocation sensitive					
Neutral					
Provoking	3	0.77	0.30, 1.23	0.66	0.01, 1.32
Aggression prone					
Neutral					
Provoking	1	0.37	−0.45, 1.20	0.37	−1.05, 1.79
Physical					
Provocation sensitive					
Neutral	24	0.07	−0.04, 0.18	0.03	−0.27, 0.32
Provoking	34	0.50	0.40, 0.59	0.51	0.26, 0.75
Aggression prone					
Neutral	17	0.75	0.62, 0.87	0.80	0.50, 1.10
Provoking	23	0.72	0.62, 0.83	0.87	0.61, 1.13

Note. The physical aggression category included measures such as hitting or shoving, intensity of noxious noise, intensity of electric shock, duration of noxious noise, duration of electric shock, number of noxious noise blasts, and number of electric shocks, and the verbal aggression category included measures of negative evaluative feedback or disparaging comments directed at the confederate. *k* = number of effect sizes in the category; CI = confidence interval.

different from the object, as opposed to when the provocateur and the object of aggression were the same person, fixed $Q_b(1) = 5.09$, $p < .001$; random $Q_b(1) = 1.07$, *ns.* These outcomes may suggest that individuals who scored low on the aggression-prone variables behaved less aggressively when the object of the aggression was not the source of provocation but that those who scored high on these variables behaved more aggressively regardless of whether the individual was the source of provocation.

Also, we analyzed the results according to the type of provocation to which the participants were exposed. The three types included physical provocation, verbal provocation, and frustration. The respective mean personality-difference effect sizes for the provocation conditions are shown in Table 9. For all three types of provocation, the results indicated that higher scores on the personality variables were associated with higher levels of aggressive behavior in both the provocation-sensitive and the aggression-

Table 7
Mean Personality-Difference Effect Sizes by Gender of Participant

Category of aggression type	*k*	Fixed		Random	
		Mean *d*	95% CI	Mean *d*	95% CI
Neutral conditions					
Provocation sensitive					
Male	16	−0.02	−0.20, 0.16	0.04	−0.28, 0.38
Both female and male	6	0.04	−0.14, 0.22	−0.01	−0.51, 0.47
Aggression prone					
Male	3	0.41	−0.04, 0.85	0.37	0.41, 1.15
Both female and male	17	0.63	0.52, 0.74	0.74	0.45, 1.03
Provoking conditions					
Provocation sensitive					
Female	2	0.59	0.05, 1.13	0.60	−0.33, 1.54
Male	21	0.50	0.35, 0.65	0.55	0.26, 0.84
Both female and male	10	0.52	0.37, 0.66	0.60	0.22, 0.98
Aggression prone					
Male	11	0.72	0.53, 0.91	0.75	0.35, 1.16
Both female and male	19	0.68	0.58, 0.79	0.90	0.63, 1.18

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

Table 8
Mean Personality-Difference Effect Sizes for Source of Provocation

		Fixed		Random	
Category and condition	*k*	Mean *d*	95% CI	Mean *d*	95% CI
Provocation sensitive					
Same as provocateur	29	0.52	0.41, 0.63	0.66	0.13, 1.20
Different provocateur	9	0.48	0.31, 0.65	0.63	−0.40, 1.65
Aggression prone					
Same as provocateur	19	0.65	0.53, 0.78	0.81	0.15, 1.48
Different provocateur	7	0.90	0.73, 1.08	1.53	0.34, 2.72

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

prone categories. There were no differences in the effect sizes for the provocation-sensitive category according to the type of provocation, fixed $Q_b(1) = 1.78$, *ns;* random $Q_b(1) = 0.43$, *ns.* For the aggression-prone category, however, the analysis showed that the type of provocation influenced the effect sizes, fixed $Q_b(1) = 14.00$, $p < .001$; random $Q_b(1) = 8.41$, $p < .05$. This analysis showed that the personality-difference effect size was largest when participants were frustrated and smallest when they were physically provoked. Although the number of effect sizes available for the aggression-prone, frustration category was small, the findings may suggest that individuals who score low on the aggression-prone variables are not particularly inclined toward aggressive behavior when the situation is merely frustrating. This pattern of responding would render a comparatively large personality-difference effect size.

Finally, we subdivided the mean effect sizes by whether the participants had another response option besides an aggressive behavior or had only an aggressive behavior as a possible response. As seen in Table 10, the results reveal that, in the provocation-sensitive category, personality variables were associated with aggressive behavior only when conditions included provocation, regardless of whether there was another response option besides aggressive behavior. For the provocation-sensitive category, the personality-difference effect size under the neutral condition was smaller than that under the provocation condition both when aggressive behavior was the only response option, fixed $Q_b(1) = 19.64$, $p < .001$; random $Q_b(1) = 4.77$, $p < .05$, and when there was an alternative option, fixed $Q_b(1) = 16.28$, $p < .01$; random $Q_b(1) = 4.36$, $p < .05$. By comparison, for the aggression-prone category, the personality-difference effect sizes were essentially the same in the neutral and the provocation conditions when participants were forced to aggress, fixed $Q_b(1) = 1.31$, *ns;* random $Q_b(1) = 0.04$, *ns,* as well as when participants were free to choose a response option other than aggressive behavior, fixed $Q_b(1) = 3.50$, $p < .10$; random $Q_b(1) = 0.19$, *ns.* It should be noted that, for the conditions in which participants were free to aggress, there were only a few effect-size estimates available for the aggressive-prone, neutral category.

Discussion

On the basis of our qualitative review of the aggression literature, we proposed that the meta-analytic findings would uncover two distinct patterns of relations between the personality variables and aggressive behavior. We hypothesized that some personality variables would be positively associated with aggressive behavior only under provocation conditions but that other personality variables would be positively associated with aggressive behavior under both neutral and provocation conditions. This hypothesis is consistent with factor analytic studies (e.g., Caprara et al., 1996; Hennig et al., 2005; R. Martin et al., 2000) that have revealed two distinct factors of aggression-related personality variables. In our meta-analysis, studies were included if they measured aggressive behavior directly (rather than through self-report) and included a personality variable as well as either controlled or manipulated situational provocation. The personality variables available in this literature were trait aggressiveness, trait irritability, trait anger, Type A personality, dissipation–rumination, emotional suscepti-

Table 9
Mean Personality-Difference Effect Sizes for Type of Provocation

		Fixed		Random	
Category and condition	*k*	Mean *d*	95% CI	Mean *d*	95% CI
Provocation sensitive					
Physical provocation	11	0.45	0.29, 0.61	0.52	0.13, 0.91
Verbal provocation	22	0.51	0.39, 0.63	0.56	0.29, 0.83
Frustration provocation	5	0.70	0.40, 0.99	0.79	0.20, 1.37
Aggression prone					
Physical provocation	16	0.62	0.49, 0.75	0.64	0.32, 0.96
Verbal provocation	8	0.88	0.71, 1.05	1.25	0.81, 1.68
Frustration provocation	2	1.94	1.18, 2.69	1.96	0.88, 3.04

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

Table 10
Mean Personality-Difference Effect Sizes by Option to Aggress

Category and condition	*k*	Fixed		Random	
		Mean *d*	95% CI	Mean *d*	95% CI
Forced to aggress					
Provocation sensitive					
Neutral	15	0.07	−0.07, 0.22	0.08	−0.25, 0.41
Provoking	19	0.52	0.39, 0.65	0.57	0.28, 0.87
Aggression prone					
Neutral	14	0.89	0.74, 1.04	0.88	0.55, 1.22
Provoking	15	0.77	0.63, 0.91	0.94	0.61, 1.27
Free to aggress					
Provocation sensitive					
Neutral	11	0.07	−0.09, 0.23	0.07	−0.32, 0.45
Provoking	19	0.50	0.37, 0.63	0.58	0.29, 0.88
Aggression prone					
Neutral	3	0.44	0.21, 0.67	0.51	−0.17, 1.18
Provoking	11	0.70	0.55, 0.85	0.87	0.49, 1.25

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

bility, narcissism, and impulsivity. For the meta-analysis, we calculated effect sizes of the associations between these personality variables and aggressive behavior (i.e., personality-difference effect sizes), separately under provocation and neutral conditions.

Overall, our meta-analytic findings are consistent with the findings from our qualitative review. The mean personality-difference effect sizes revealed that a few of the personality variables were positively associated with aggressive behavior under both provocation and neutral conditions but that other personality variables were positively associated with aggressive behavior only when the aggressor had been provoked. In particular, trait aggressiveness and trait irritability (which were highly and positively correlated) were associated with greater aggressive behavior across conditions. That persons who score high on trait aggressiveness direct greater levels of aggressive behavior toward others even when situations are relatively neutral may suggest that they have the capacity to engage in a cold-blooded style of aggressive behavior. By contrast, trait anger, Type A personality, dissipation–rumination, emotional susceptibility, narcissism, and, for the most part, impulsivity were associated with greater aggressive behavior only under provocation conditions. This finding may suggest that those who score high on these latter personality variables have a particular propensity to exhibit a hot-blooded style of aggressive behavior.

On the basis of the two patterns of aggressive behavior revealed in the meta-analysis, we conducted a series of additional exploratory analyses. To do so, we divided the effect sizes into two categories; the first category included the personality variables that seemed to be indicative of individuals prone to aggressive behavior across situations (i.e., aggression prone), and the second category included those who seemed to react aggressively only under conditions of provocation (i.e., provocation sensitive). Using these categories, we were able to further analyze the personality-difference effect sizes by the type of aggressive behavior, participants' gender, the type of provocation, the source of provocation, and the available options for responding other than aggressive behavior.

The meta-analytic findings show that both the provocation-sensitive and the aggression-prone categories were positively associated with aggressive behavior, regardless of the type of provocation (i.e., physical provocation, verbal provocation, and frustration). An unanticipated finding was that, for the aggressive-prone category, this association between the personality variables and aggressive behavior was larger under frustration than under physical provocation. It may be that the magnitude of the personality-difference effect size was larger because those who scored low on these personality variables (i.e., trait aggressiveness) were unlikely to engage in aggressive behavior when the situation was merely frustrating, which thereby yielded a larger personality-difference effect size for this type of provocation. Nevertheless, these findings should be considered tentative, because only two effect sizes were available in this category.

Also, we categorized the mean effect sizes in terms of the source of provocation vis-à-vis the object of the aggressive behavior. For the provocation-sensitive category, the results showed that whether the recipient of the aggressive behavior had been the source of provocation or someone else had been the source had little influence on the association between the personality variables and aggressive behavior. By comparison, for the aggression-prone category, the magnitude of the personality-difference effect size was larger when the recipient was not the source of provocation. It may be that those who scored low on the personality variables in the aggression-prone category were not particularly likely to be aggressive toward another person who had not provoked them but that those who scored high on personality variables in the aggression-prone category were highly aggressive, regardless of who provoked them.

In addition, we examined whether the magnitudes of the personality-difference effect sizes were moderated by whether the participants were provided a response option other than that of aggressive behavior (i.e., a nonaggressive response). When an option other than aggressive behavior was available to participants, aggressive behavior was least appropriate in neutral conditions. Although the mean effect size was derived from only three reports,

the results seem to suggest that, for the aggression-prone category, the positive association between personality variables and aggressive behavior remained reliable even when conditions were neutral and a nonaggressive option was available. Again, these results may point to a tendency for those who scored high on the personality variables in the aggression-prone category to be less responsive to variations in situational cues that signal that aggressive behavior is inappropriate.

Implications

The current work fills a void in the literature because, to date, there have been no comprehensive qualitative or quantitative reviews of the literature on personality and aggressive behavior. In doing so, it brings this literature under the rubric of the five-factor model of personality as a means for understanding individuals' proclivities toward aggression. Moreover, our qualitative and quantitative reviews suggest that particular personality dimensions (i.e., Neuroticism or Antagonism) may predict differences in the tendency to engage in aggressive behavior only in response to provocation or in proneness to engage in aggressive behavior across situations.

Although none of the studies in the meta-analysis directly measured the personality dimensions of either Neuroticism or Agreeableness, as reported in our qualitative review of the studies, all of the personality variables included in the meta-analysis were correlated with one or both dimensions. In addition, the meta-analytic findings that some personality variables appeared to predict one of two patterns of aggressive behavior are in consonance with previous findings (e.g., Graziano et al., 1996; Jensen-Campbell et al., 2003; R. Martin et al., 2000) that have shown positive correlations between these personality dimensions and self-reported aggression.

Survey studies (e.g., Hennig et al., 2005; R. Martin et al., 2000) have shown relations between Neuroticism and an angry type of aggression. Like Neuroticism, the personality variables of trait anger, Type A personality, dissipation–rumination, emotional susceptibility, and impulsivity are marked by a propensity toward negative affect, vulnerability to threats to the self, and impulsiveness. The meta-analytic findings show that these personality variables were predictive of aggressive behavior only under provoking conditions. Theoretical interpretations (Costa et al., 1989) have suggested that those who are high in Antagonism (i.e., low Agreeableness) are likely to engage in cold-blooded aggression. Noteworthy is the fact that studies have revealed that Antagonism is positively correlated with measures of trait aggressiveness, the latter of which was positively associated with aggressive behavior in the meta-analytic findings even when situations were relatively neutral and unprovoked. Taken together, our meta-analytic results along with theory (Costa et al., 1989) and research (e.g., Graziano et al., 1996; Jensen-Campbell et al., 2003; R. Martin et al., 2000; Sharpe & Desai, 2001) provide compelling evidence that Neuroticism may be more likely to be positively associated with aggressive behavior only in response to provocation and that Antagonism may be more likely to be positively associated with a proneness to engage in aggressive behavior across a variety of situations.

The pattern of aggressive behavior only in response to provocation revealed in the current meta-analysis can be interpreted as consistent with the reactive aggression style (Dodge & Coie, 1987), which is defined as hostile responses to perceived threat or provocation. Our results may suggest that the personality variables that are predictive of greater aggressive behavior only in response to provocation (i.e., provocation sensitive) may be positively associated with reactive aggression. Because proactive aggression, as defined by Dodge et al. (1997), need not be in response to provocation, aggressive behavior under neutral conditions might have included some instances of proactive aggression. Personality variables that are predictive of aggressive behavior under neutral conditions may be associated with some instances of proactive aggression. Nevertheless, our findings show that these same personality variables are also associated with greater aggressive behavior under conditions of provocation. Therefore, the personality variables that we categorized as aggression prone are likely to characterize people who exhibit both styles of aggression (i.e., proactive and reactive). Unfortunately, studies of personality and aggression included in the meta-analysis tended not to consider the motives (e.g., gain resources or control over others) of the perpetrator of aggressive behavior, and therefore it is impossible to confirm any relations between the personality variables included in our meta-analysis and the styles of aggression identified by Dodge et al. Indeed, although we attempt to draw connections between the categories we adopted for our meta-analysis and reactive and proactive styles of aggression, the studies available for our analysis and studies in the developmental literature have adopted different approaches toward understanding aggressive behavior. The former, which examined the relation between personality variables and aggressive behavior, adopted a variable-centered approach. By contrast, Dodge et al.'s studies of behavioral patterns of aggression are more consistent with a person-centered approach. Furr and Funder (2004) explained that the variable-centered approach examines "consistency of individual differences across situations," whereas the person-centered approach examines the "consistency of [behavioral] response profiles across situations" (p. 427). Because the personality and developmental literatures tend to adopt different approaches to understanding proclivities toward aggressive behavior, the connections we attempt to draw between them can be only tentative.

Limitations

The results of the current meta-analysis are limited in a number of ways. First, our inclusion criteria generated relatively few studies examining the relation between personality variables and aggressive behavior. Although we were able to calculate over 100 effect sizes, when we categorized the effect sizes by type of personality variable and by the level of provocation, we found that a number of constructs have gone relatively unexamined in the experimental literature. For example, the small number of available effect sizes was a problem for understanding the influence of impulsivity. Also, for some personality variables (e.g., authoritarianism, Machiavellianism) that have been shown to be related to aggressive behavior, there were too few studies for inclusion in the meta-analysis. Moreover, although our inclusion criteria allowed studies that used samples of a variety of ages (e.g., childhood, adolescence), most of the studies in the child developmental literature could not be included because we were unable to verify whether the conditions preceding the aggressive behavior were only neutral or only provoking.

Additionally, the reliable differences among mean effect sizes that were revealed by the fixed-effects analyses were not always

replicated in the random-effects analyses. Theoretically, this lack of correspondence may suggest that the outcomes of the meta-analysis are true for the specific sample of studies we included but not true for the potential population of studies that could be conducted. Practically, however, this problem may point to the fact that random-effects models overestimate error variance (Overton, 1998; Wang & Bushman, 1999).

Also, there was some variability in the quality of the included studies. Although some meta-analysts exclude studies on the basis of judgments that the studies are of lesser scientific quality, we were unable to do this because of the relative few studies available for the analysis. To assess the quality of studies in our data set, we derived the journal impact factors from the science citation criteria for journal quality. We found that the range in impact factors for the journals that published the studies we included in the meta-analysis ranged between 0.277 and 3.862; however, the mean of these impact factors was 1.96, and only three of the publications had impact factors lower than 1.00. Thus, although some of the studies were unpublished or were published in lower quality journals, the impact factors suggest that the majority of the studies included in our meta-analytic review were of relatively high quality.

It is important to note, however, that findings of the meta-analysis may be generalizable only to instances of physical aggression. The meta-analysis uncovered the fact that the vast majority of studies in the available sample of studies had measured physical aggression, largely ignoring other types of aggressive behavior (e.g., verbal aggression, indirect aggression). It should be noted that these aggressive behaviors are typically directed at confederates and include a relatively limited set of operationalizations of physical aggression, such as ostensible shocks or noise blasts. Clearly, future research should explore whether the positive associations revealed in the meta-analysis generalize to other types of aggressive behavior.

Because we wanted to avoid biases associated with self-reports of aggressive behavior, we limited the included studies to those that measured actual aggressive behavior. However, some features of studies that measure aggressive behavior may limit the generalizability of the findings. For example, these studies typically include only a limited set of operationalizations of aggression (e.g., ostensible shock, intensity of noise blasts), aggressive behavior between relative strangers, limited opportunities to retaliate against the aggressor, and few opportunities for responses other than aggressive behavior. Nevertheless, researchers (Anderson et al., 1999; Berkowitz & Donnerstein, 1982) have revealed that the findings of experimental studies of aggressive behavior have external validity and are comparable to the findings of studies using other methodologies.

Conclusion

Given the confluence of evidence, it seems likely that specific personality variables predict the tendency either to engage in aggressive behavior across a variety of situations (i.e., aggressive prone) or to engage in aggressive behavior primarily in response to provocation (i.e., provocation sensitive). Nevertheless, the connections we draw among the personality dimensions specified by the five-factor model, the personality variables included in our meta-analysis, and different patterns of aggression largely remain theoretical. Thus, our review points to the need for further research that examines the relations between personality dimensions and aggressive behavior. Within the developmental literature on aggression, it might be useful to study children's levels of Agreeableness and Neuroticism. Also, any research using dimensions from the five-factor model should include direct measures of aggressive behavior as well as determine the associations between the personality dimensions and aggressive behavior, separately under nonprovoking and provoking conditions. Moreover, researchers who study specific personality variables may need to provide an understanding of the ways these variables are fitted into the rubric of the five-factor model. Using this model of personality may bring more conceptual clarity to the plethora of personality variables that have been considered in the literature on aggressive behavior.

Perhaps most important, general theories should include personality as a central variable in models of aggression for a number of reasons. Our meta-analysis documents that personality variables are positively associated with aggressive behavior, at least under some circumstances. Moreover, the meta-analysis shows that some of the personality variables interacted with situational provocation in their influences on aggressive behavior. Given these findings, theoretical models of aggression are likely to have more explanatory power if they articulate the ways personality should be associated with aggressive behavior. Indeed, theoretical models of aggression that consider the role of personality may be able to more clearly articulate which variables underlie links between personality and aggressive behavior. On the basis of our review of contemporary theories on aggression, we speculate that differences in cognitive processes, social-information processing, levels of negative affect, and difficulties with self-regulation might be mechanisms that explain associations between personality and aggression. It remains unclear, however, whether all or only some of these process variables explain relations between specific personality variables or dimensions and aggressive behavior.

Although a growing body of literature suggests that, to understand aggressive behavior, researchers must study the distinct influences of personality, much research on these issues is needed. Because problems with aggression and violence continue to plague people's interpersonal lives, their intergroup interactions, and society in general, it is incumbent on social scientists to develop a better understanding of the complex dynamics among personality variables, situational variables, and aggressive behavior. Doing so not only will enrich the field's theoretical understanding of human aggression but also promises to refine therapeutic and policy interventions aimed at reducing aggression and violence.

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