When Nasty Breeds Nice: Threats of Violence Amplify Agreeableness at National, Individual, and Situational Levels

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Humans have perennially faced threats of violence from other humans and have developed functional strategies for surviving those threats. Five studies examined the relation between threats of violence and agreeableness at the level of nations, individuals, and situations. People living in countries with higher military spending (Study 1) and those who chronically perceive threats from others (Study 2) were more agreeable. However, this threat-linked agreeableness was selective (Studies 3–5). Participants primed with threat were more agreeable and willing to help familiar others but were less agreeable and willing to help unfamiliar others. Additionally, people from large families, for whom affiliation may be a salient response to threat, were more likely than people from small families to shift in agreeableness. Returning to the national level, military spending was associated with increased trust in ingroup members but decreased trust in outgroups. Together, these findings demonstrate that agreeableness is selectively modulated by threats of violence.

Keywords: threat, aggression, affiliation, personality, agreeableness

Threats have been linked to functional variation in personality and social behavior at both the national and local level. Citizens of nations with higher pathogen loads, for instance, tend to perceive themselves as more dispositionally introverted and closed to new experiences (Schaller & Murray, 2008)—inclinations that help limit contact with people or places that potentially carry pathogens. Experimental research yields parallel findings: Compared with people exposed to neutral pictures, those exposed to pictures of sick others subsequently report being more introverted and less open to new experiences (Mortensen, Becker, Ackerman, Neuberg, & Kenrick, 2010). Thus, people facing disease threats tend to have personality characteristics that facilitate social avoidance of potentially sick others. In the present research, we investigate responses to a very different type of threat posed by other humans—the threat of violence.

Common sense might suggest that chronic exposure to violence and hostility leads people to become more hostile themselves and, ultimately, less agreeable and trusting of others. Indeed, some research suggests that aggression and other responses related to disagreeableness follow from threatening situations (Berkowitz, 1990; Dunstley, 2005; Kenrick & Sheets, 1994). However, this might not always be the case. In fact, under certain circumstances, threats of violence may actually incline people to be more agreeable, helpful, and trusting.

In the current investigation, we explore how threats of violence are linked to personality characteristics and corresponding social behaviors in seemingly counterintuitive but ultimately functional ways. Our approach is grounded in two underlying premises: first, that humans have encountered aggression and hostility from other humans for many thousands of years and, as a consequence, evolved specific strategies for surviving threats of violence posed by others (Cosmides & Tooby, 1992; Öhman & Mineka, 2001; Plutchik, 1980; Van Vugt, De Cremer, & Janssen, 2007) and, second, that environmental cues of violence and danger, today, trigger functional psychological shifts in attitudes, cognitions, behaviors, and personality that can facilitate these survival strategies (Griskevicius, Goldstein, Mortensen, Cialdini, & Kenrick, 2006; Kenrick, Li, & Butner, 2003; Maner et al., 2005; Mortensen et al., 2010; Neuberg, Kenrick, & Schaller, 2011). In five studies, we explore responses to threats of violence at three levels—at the level of nations, of individuals, and of temporary situations (both in the lab and in the field).
Threats of Violence and Aggression

To understand how humans respond to threats of violence, it is useful to consider how humans respond to dangerous or negative circumstances more generally. According to theories of classical conditioning, any stimulus associated with an aversive state will automatically elicit negative responses (Berger, 1962). Indeed, some research suggests that other people associated with negative circumstances, such as a stranger encountered in an uncomfortably hot room, are liked less than those encountered under neutral circumstances (Griffitt, 1970). Along similar lines, it has been proposed that aggression is triggered by frustration (Dollard, Miller, Doob, Mowrer, & Sears, 1939), and Berkowitz (1990) reviewed evidence suggesting that when a negative feeling or thought occurs, it can activate a host of related, negative memories, feelings, and behaviors. For example, participants asked to think about negative experiences were, compared with those who thought about neutral experiences, less willing to help a research assistant (Berkowitz, 1987).

In addition to generally negative circumstances, other research has demonstrated that people respond in socially aversive ways to threats of violence from others (Duntley, 2005; MacLaren, Best, & Bigney, 2010). For example, homicidal fantasies most frequently occur after threats to the self or valued others (Kenrick & Sheets, 1993), and women are most often motivated to murder their husbands following a history in which the husband has abused and threatened them (Wilson, 1989). Feeling threatened is also one of the most common causes of aggression in young children (Dodge, Price, Bachorowski, & Newman, 1990; Hubbard, Dodge, Cillessen, Coie, & Schwartz, 2001), and children who view the world as hostile are more likely to initiate aggression (Dodge & Frame, 1982). Together, these findings suggest that people who feel threatened will be inclined to act in socially aversive ways.

Threats of Violence and Affiliation

Despite the link between threats of violence and social aversion reviewed above, several other lines of research suggest a more complicated story: People sometimes respond to threats of violence with social affiliation. Across a diverse range of animal species, aggregation, or diminished physical distance between group members, has been found to be a common strategy for surviving threats of violence (Crook, 1960; Darling, 1937; Kraus, 1994; Scott, 1945; Stankovich, 2003). While aggregation can create large groups that are easy targets for predators, increasing group size also reduces the likelihood of any one individual being attacked (Watt & Chapman, 1998). Moreover, aggregation has several other advantages—it gives individuals the opportunity to work together to fight off predators, it can serve to confuse and distract predators, and females and young animals can gain protection from larger males (Werner & Dyer, 1992). Given the apparent benefits of an aggregation strategy across a wide range of animal species, it is possible that humans are also compelled to aggregate in the presence of threats.

Indeed, some evidence suggests that humans are inclined to come together under threat. For example, the stress and anxiety produced by dangerous situations tends to increase the desire to be near others (Geary & Flinn, 2002; Schachter, 1959; Taylor et al., 2000), and people have an increased desire to affiliate when they consider the thought of their own death (Wisman & Koole, 2003). Moreover, people are more inclined to conform to others’ opinions when threatened, a functional shift in behavior that could enhance group cohesion and help prevent standing out from the crowd (Griskevicius et al., 2006). Together, these findings suggest that people who feel threatened sometimes act in socially affiliative ways.

Functional Shifts in Personality Characteristics

If shifts toward social aversion or affiliation can be successful strategies for surviving threats of violence, then one component of enacting these strategies might involve functional shifts in personality characteristics and social behavior. Although past research has demonstrated that personality characteristics are heritable, arise early in development, are relatively consistent from situation to situation, and are relatively consistent across the life span (Asendorpf & van Aken, 2003; Carey, 2003; Goldberg, 1993; Jang, Livesley, & Vernon, 1996; John, Caspi, Robins, & Moffitt, 1994; Loehlin, McCrae, Costa, & John, 1998), it is also true that personality characteristics can shift as a function of subtle situational changes (Funder, 2006; Funder & Colvin, 1991; Furr & Funder, 2004; Sherman, Nave, & Funder, 2010).

Recent research has suggested that personality characteristics vary in functional ways with environmental circumstances. In a comprehensive analysis of the relation between infectious disease and personality around the world, Schaller and Murray (2008) found that as disease prevalence in a geographic region increased, there was a correspondent decrease in extroversion and openness. These changes are thought to be functional, as they can help limit contact with people or places that potentially carry disease. An experimental study found a similar pattern of results at the individual level. People who were exposed to pictures of sick others later reported lower levels of extroversion and openness to new experience than people exposed to neutral pictures (Mortensen et al., 2010). Given the relationship between disease threat and personality characteristics, there is reason to suspect that analogous shifts in personality characteristics might be found in response to threats of violence.

Functional Shifts in Agreeableness

As reviewed above, aggression and affiliation seem to be distinct strategies for overcoming threats of violence. To the extent that functional shifts in personality characteristics can promote these strategies, corresponding shifts in specific personality characteristics may occur following these threats.

The “Big Five” refers to a comprehensive and universal set of characteristics thought to represent the basic dimensions of personality (Costa & McCrae, 1992; John & Srivastava, 1999; Goldberg, 1993; McCrae & John, 1992). Of the Big Five personality characteristics, agreeableness is most closely associated with both aggression and affiliation—as it is connected to interpersonal cooperation and conflict (Gleason, Jensen-Campbell, & Richardson, 2004; Graziano, Habashi, Sheese, & Tobin, 2007; Jensen-Campbell & Graziano, 2001; John & Srivastava, 1999).

Past research has demonstrated that individuals low in agreeableness are more aggressive, have higher levels of trait anger, higher levels of revenge seeking, and greater interpersonal hostility (Gleason et al., 2004; Martin, Watson, & Wan, 2000; Nettle & Liddle, 2008; Olson & Weber, 2004). Moreover, individual dif-
ferences in agreeableness have been shown to influence responses to threatening or distressing situations. Graziano, Jensen-Campbell, and Hair (1996) found evidence that individuals low in agreeableness respond to conflict by using tactics that rely on asserting power over others, and Meier, Robinson, and Wilkowski (2006) reported that individuals low in agreeableness, but not those high in agreeableness, become more aggressive when primed with aggression words. Overall, these findings indicate that low agreeableness is related to a number of attitudes and behaviors that may facilitate aggression.

Conversely, high levels of agreeableness have been linked to many attitudes and behaviors that can promote affiliation. Individuals high in agreeableness prefer cooperation to competition, are willing to risk more to help others, are more prosocial, and have more harmonious relationships with others (Caprara, Alessandri, Di Giunta, Panerai, & Eisenberg, 2010; Graziano et al., 2007; Graziano, Hair, & Finch, 1997; Soldz & Vaillant, 1999). Agreeableness is also positively correlated with values related to social goals, such as fulfilling one’s social obligations, abiding by established norms, avoiding disruption of relationships with others, concern for the welfare of others, and the desire to care for others (Roccas, Sagiv, Schwartz, & Knafo, 2002).

The research reviewed thus far has linked threat to agreeableness in two seemingly contradictory ways. In the current investigation, we suggest that both are possible, depending on a combination of situational circumstances and individual differences. Moreover, we propose that agreeableness is not just an individual difference that moderates threat responding. Rather, we expect that agreeableness may actually shift in the face of threat.

Such a response would serve a functional purpose: Shifts toward lower agreeableness, accompanied by shifts in corresponding social behavior, would incline a person respond to threat with aggression or avoidance. Conversely, shifts toward greater agreeableness, and accompanying social behaviors, would help a person affiliate and aggregate with others.

Given that shifts toward lesser or greater agreeableness prepare a person to respond to threat in very different ways, it seems improbable that threat will be linked to just one response or the other. Instead, it makes more sense for shifts in agreeableness to be functionally tuned to unique combinations of situational circumstances and individual differences.

Here, we propose two factors that may critically moderate the relationship between threat and agreeableness: (a) the targets being considered as affiliation partners and (b) sociodevelopmental factors linked to the size of one’s social group.

In the face of threat, it would not be useful, or beneficial, for a person to become more or less agreeable with everyone. As we explore in Studies 3, 4, and 5, shifts toward greater agreeableness should occur primarily toward members of the ingroup, who may offer physical and social support, but not necessarily toward members of other groups, who may actually pose a treat.

In addition to the target of agreeableness, the size of one’s social group might also influence threat responding. According to animal research, as group size increases, the survival advantages accrued through affiliation and aggregation also increase (Watt & Chapman, 1998). Thus, at large group sizes, affiliation and aggregation are likely to be successful strategies for overcoming threat, but at small group sizes that advantage is reduced. As such, the size of one’s social group may influence whether a person responds to threat with affiliation. We explore this issue in Study 3.

Overview of Studies

In this article, we investigate (a) whether agreeableness shifts in response to threats of violence, (b) how psychological states and social behaviors associated with agreeableness—trust and prosociality—might also shift in response to threat, (c) if shifts in agreeableness are target-specific, and (d) if individual differences in the size of one’s social group moderate the relationship between threat and agreeableness.

Recent findings have linked disease threat to variations in the expression of personality characteristics both at the national level (Schaller & Murray, 2008) and in response to temporary, situational variation (Mortensen et al., 2010). To provide a similarly comprehensive understanding of the connection between threats of violence and agreeableness, we examined their relation at three levels of analysis—in mean national differences; in individual differences; and in response to temporary, situational conditions (both in the lab and in the field). Study 1 examined the correlation between threats of violence experienced at the national level and the agreeableness of individuals in those nations. Study 2 explored the correlation between individual differences in the perception of threats of violence and agreeableness. Study 3 experimentally manipulated threats of violence, examined changes in agreeableness toward familiar and unfamiliar social groups, and assessed the role of social group size in threat responding. Study 4 was a field study using a real-world manipulation of threat and a behavioral measure of agreeableness—help directed toward ingroup members or outgroups. Returning to the national level in Study 5, we examined the correlation between threats of violence and another indicator of agreeableness—trust in various social groups.

Study 1: Nation-Level Threats of Violence and Agreeableness

Study 1 sought to test whether a relationship between threats of violence and agreeableness existed at the national level. Because past research has demonstrated that threats of violence can lead to both aggression and affiliation, there are two possible outcomes. If threats of violence trigger aggression strategies, then people in countries experiencing greater threat should report being less agreeable. However, if threats of violence trigger affiliation strategies, then people in countries experiencing greater threat should report being more agreeable.

To assess national threats of violence, we chose to examine military spending, a variable that has been linked to the type of intergroup hostility and conflict that fosters a national sense of threat of violence. Indeed, past research has found that military build-ups precede actual wars (Wallace, 1979) and that public support for higher military spending tends to increase as perceptions of international threat increase (Kriesberg & Klein, 1980).

Moreover, a comprehensive analysis of all interstate conflicts between 1950 and 2000 found that military spending was significantly correlated with probability of actual conflict (Nordhaus, Oneal, & Russert, 2009) and that this relation survives controlling for a number of political, geographic, and economic variables. Finally, military spending is an advantageous variable to examine
because it should be somewhat independent of other types of threats (e.g., disease threats or natural disasters).

Method

To assess military spending we used figures from the CIA World Factbook (2007), which listed the percentage of national gross domestic product (GDP) each country allocated to the military. This measure helps to control for national differences in GDP and serves as an indicator of how the military is prioritized in relation to other components of the national budget. To evaluate agreeableness at the national level, we used data reported from Schmidt et al. (2007), in which the Big Five inventory (John & Srivastava, 1999) was administered to 17,837 individuals in 56 different nations.

Combining the data on military spending with the data on agreeableness left a total sample of 54 nations representing seven major geopolitical regions: Europe (24 nations), Asia (nine nations), Africa (seven nations), South America (five nations), North America (three nations), Oceania (three nations), and the Middle East (three nations).

Results

Results revealed a significant, positive correlation between military spending and agreeableness, \( r(54) = .43, p < .001 \). As percent of GDP spent on the military increased, individuals’ agreeableness also increased. Exploring the relation between military spending and other Big Five dimensions, we found that there was also a significant, positive correlation between military spending and conscientiousness, \( r(54) = .35, p = .009 \), but that there was not a significant correlation between military spending and extroversion, openness, or neuroticism (\( rs < .10 \)).

To address plausible alternative explanations for the relation between military spending and agreeableness, we conducted a series of multiple regression analyses to test whether the observed relation held when statistically controlling for a number of potentially confounding variables. The link between military spending and agreeableness remained significant after individually controlling for national GDP, GDP per person, population density, poverty rate, economic disparity, disease prevalence, and other Big Five personality characteristics (\( \beta \)s between -.38 and -.46, \( ps < .01 \)). The observed relation also remained significant when controlling for the same variables in a single regression (\( \beta = .38, p = .04 \)).

Discussion

Study 1 demonstrated a relation between threats of violence and agreeableness at the national level. As military spending increased, individuals’ reported being more agreeable. This finding may seem counterintuitive at first, because it is possible that nations that spend a lot on the military would be characterized as hostile and aggressive—characteristics typically associated with low agreeableness. However, the finding is in line with the assumption that increased agreeableness can promote affiliation and aggregation. Furthermore, the relation between military spending and agreeableness appears to be quite robust, as it survives controlling for a number of potential confounds. Study 1 also found that military spending was related to conscientiousness but not extroversion, openness to experience, or neuroticism.

Although we suggest that the relation between military spending and increased agreeableness is indicative of a more fundamental link between threats of violence and increased agreeableness, it is possible that military spending is not actually related to threats of violence. Rather, military spending could be related to feelings of safety and security, as an increased military presence may reduce the perceived likelihood of attack from another country. However, there are several reasons to believe that military spending is positively related to threat, rather than safety and security. First, the empirical studies reviewed above indicate that military spending is associated with increases in actual interstate conflict and the perceived probability of conflict (Kriesberg & Klein, 1980; Nordhaus et al., 2009; Wallace, 1979). Second, in our data set, the countries with the greatest percentage of GDP dedicated to military spending are Jordan, Israel, and Turkey, countries that exist in a relatively unstable part of the globe and countries for which military conflict is of chronic concern. Finally, a longitudinal review of military spending and perceptions of security found that feelings of security decreased as military spending increased (Ward & Mahjan, 1984).

Study 2: Individual-Level Threats of Violence and Agreeableness

Study 1 suggested a positive relation between threats of violence and agreeableness at the national level. However, it is plausible that this relation is much different at the individual level within a country than at the national level. For example, studies of subjective well-being have found a strong relation between the wealth of nations and the well-being of citizens in those nations but a much weaker relation between individual wealth and well-being within nations (Diener, 2000). Thus, to examine whether the relation between threats of violence and agreeableness was similar at the national level and the individual level, Study 2 assessed the relation between individual differences in the perception of threat and agreeableness. Again, there are two possible outcomes. If people respond to threats of violence with aggression, individuals who perceive more threats of violence should see themselves as less agreeable than those who perceive fewer threats. However, if people respond to threats of violence by affiliating, individuals who perceive more threats of violence should see themselves as more agreeable than those who perceive fewer threats.

Method

Participants. Fifty-four participants (26 male, 28 female) were recruited from introductory psychology classes as partial fulfillment of their class requirement. Participants entered the lab in groups of three or fewer and were seated at individual computers.

Procedure. Participants were told they would be completing a study regarding attitudes and decision making. As part of a larger study, participants completed several questionnaires including the Big Five Inventory (John & Srivastava, 1999) and later the Belief in a Dangerous World (BDW) scale (Altemeyer, 1988).

The BDW scale consists of six items related to personal threats of violence (e.g., “There are many dangerous people in our society who will attack someone out of pure meanness, for no reason at
all”) and six items related to abstract societal threats (e.g., “If our society keeps degenerating the way it has been lately, it’s liable to collapse like a rotten log and everything will be in chaos”). Because we were primarily interested in threats of violence, we created a subscale of the six items of the BDW scale that deal with personal, threats of violence (α = .70) and analyzed the relation between this subscale, which we refer to as the Belief in a Dangerous World Personal Threat scale (BDW-PT), and agreeableness.

Results

There was a significant, positive correlation between the BDW-PT scale and agreeableness, $r(55) = .36, p = .007$. As chronic perceptions of threats of violence increased, people also reported being more agreeable. Additionally, there was a significant, positive correlation between the BDW-PT scale and extroversion, $r(55) = .27, p = .041$. There was not a significant correlation between the BDW-PT scale and openness, conscientiousness, or neuroticism ($r < .20$). The relationship between BDW-PT and agreeableness also survived controlling for the other Big Five personality characteristics ($β = .24, p = .036$). Finally, there was a marginally significant correlation between the BDW scale, as a whole, and agreeableness, $r(55) = .25, p = .064$.

Discussion

Study 2 demonstrates a positive correlation between individual differences in the perception of threat and agreeableness. At first blush, it might seem as though people who chronically perceive threats of violence are disagreeable, hostile, and untrusting of others. However, the individual level finding from Study 2 fits with the results of Study 1 and the notion that people respond to threats of violence in socially affiliative ways. Additionally, Study 2 found that the relation between perceptions of threat and agreeableness was relatively unique, as perceptions of threat were related to agreeableness and extroversion but not conscientiousness, openness to experience, or neuroticism.

Together, Studies 1 and 2 found a positive relation between threats of violence and agreeableness. As national threats of violence or chronic individual perceptions of threat increased, agreeableness also increased. We propose that this increase in agreeableness is a functional strategy for overcoming and surviving threats of violence, because agreeableness can facilitate affiliation. However, we have not yet demonstrated that threats of violence are creating these shifts in agreeableness. There may be an unknown variable causing both increases in threats of violence and increases in agreeableness. Although unlikely, another alternative explanation may be that the relation between threats of violence and agreeableness occurs in the opposite direction—that agreeable people encourage their governments to spend a greater percentage of their GDP on the military and chronically see more threats of violence in the world.

Study 3: Situation-Level Threats of Violence and Agreeableness

To more directly examine the causal relation between threats of violence and agreeableness, Study 3 experimentally manipulated threats of violence and later measured agreeableness. Additionally, we sought to deepen our understanding of this relation by examining two potential moderators.

First, we examined whether the relation between threats of violence and agreeableness was target-specific, focusing particularly on whether agreeableness is directed toward ingroup versus outgroup members. One possibility is that threat-induced increases in agreement reduce threats by leading individuals to act in a nonthreatening and pacifying manner toward those who pose threats of violence. If so, threats of violence should lead to general and noncontingent increases in social affiliation and agreeableness. However, because past research has found that threats of violence can lead to both affiliation and aggression, we suspected that changes in agreeableness would not be universal across targets. From a functional perspective, increases in agreeableness might only occur to the extent that they enhance one’s ability to affiliate with close others. Therefore, we hypothesized that threats of violence would lead people to become more agreeable toward people to whom they are close but not toward people outside of this select group. In fact, it is possible that people may become less agreeable toward people outside of their protective coalition, because there would be little benefit in trying to affiliate with strangers given that outgroup others might actually be the source of threat.

In addition to being target-specific, it is also possible that there are individual differences in the extent to which people adopt affiliative strategies under threat. Indeed, one such difference might be the size of one’s social group. Research across a range of animal species has suggested that, as group size increases, the survival advantages accrued through affiliation and aggregation also increase (Watt & Chapman, 1998). Thus, affiliation and aggregation are likely to be more successful threat-response strategies for members of large groups than members of small groups. As a consequence, one might expect individuals who belong to larger groups to be especially likely to shift in agreeableness under threat.

Although the current availability of a social group during threat may be important, research from a wide range of animal species has found that threat responding is heavily influenced by early developmental experiences (Gunnar, 2007; Nelson et al., 2009; Wiedenmayer, 2009). Therefore, the size of a person’s predominant childhood social group—his or her family—may be particularly important in determining whether a person attempts to affiliate under threat. Specifically, people who grew up in large (as opposed to small) families may be more likely to adopt affiliation strategies and, as a consequence, shift in agreeableness, under threat. Consistent with this line of reasoning, larger family size is associated with a range of psychological variables that likely play a role in affiliation and aggregation, such as increased prosociality, increased theory of mind abilities, and greater perceived likelihood of cooperation (Jiao, Ji, & Jing, 1986; Perner, Ruffman, & Leekam, 1994; Van Lange, Otten, De Bruin, & Joireman, 1997). In Study 3 we measured both current social group size and childhood family size to determine whether one, or both, of these factors moderate the effect of threat on agreeableness.

Thus, Study 3 had three major goals: (a) to experimentally test whether threats of violence influence agreeableness, (b) to examine whether this relation is target-specific, and (c) to examine whether social group size moderates the threat–agreeableness link.
Method

Participants. Ninety-three participants (47 male, 56 female, 11 not reported; M age = 35.34, SD = 14.9) were recruited from the Amazon Mechanical Turk website and paid $0.50 to participate in a survey about attitudes and perceptions.

Procedure. The study was a between-subjects 2 (motive prime: threat of violence vs. control) × 2 (target group: familiar vs. unfamiliar) design. Upon starting the survey, participants were instructed to read a short story and imagine themselves in the situation described. Participants were randomly assigned to either read a story about a threat of violence or a control story. The threat-of-violence story described being alone in one’s house at night, hearing unusual noises from another room, and becoming increasingly convinced that there is an intruder; it ended with the door of one’s bedroom being opened from the outside. This manipulation has been used in past research and has been shown to increase feelings of threat and the need to protect oneself (Griskevicius et al., 2006). The control story described being alone in one’s house searching for a lost set of keys.

Following the story, participants were randomly assigned to fill out one of two modified versions of the Big Five Inventory (John & Srivastava, 1999). Half of the participants were instructed to consider a familiar target as they completed the Big Five Inventory. Specifically, they were told, “For the next set of questions, please think about how you act when you’re around people you know very well.” The other half was instructed to consider an unfamiliar target as they completed the Big Five Inventory. Specifically, they were told, “For the next set of questions, please think about how you act when you’re around people you have never met before.”

Additional moderators. We also assessed the size of our participants’ childhood family and the size of their current social network. To assess childhood family size, we asked questions about both objective and subjective family size. Participants responded to a question about objective family size, “How many siblings do you have?” on an 11-point scale that ranged from “0” to “10 or more” in increments of 1. Additionally, participants responded to a question about subjective childhood family size, “Compared to those around you, how would you describe the size of your family that you grew up with?” on a 7-point scale ranging from 1 (extremely small) to 7 (extremely large).

Two questions were used to assess the size of participants’ current social networks. One question asked “How many children do you have?” Participants responded to this question on an 11-point scale that ranged from “0” to “10 or more” in increments of 1. Another question aimed to assess the size of participants’ nonfamilial social network by asking an open-ended question about their number of close friends: “How many close friends would you say that you have?”

Results

Threat of violence and target group. First we tested for the main effects of motive prime, target group, and the Motive Prime × Target Group interaction on agreeableness. There were no main effects of motive prime or target group (ps > .6). However, a two-way analysis of variance (ANOVA) revealed a significant Motive Prime × Target Group interaction, F(1, 89) = 6.81, p = .011, η² = .071 (see Figure 1). Consistent with our hypothesis, the threat prime (relative to control) led participants to rate themselves as more agreeable with familiar others, F(1, 89) = 4.27, p = .04, η² = .046, and less agreeable with unfamiliar others, F(1, 89) = 2.67, p = .10, η² = .029. There were no significant interactions between motive prime and target group for openness, conscientiousness, extraversion, or neuroticism (all ps > .3). Moreover, the Motive Prime × Target Group interaction on agreeableness survived controlling for the other Big Five personality characteristics (β = .33, p = .038).

Additional moderators. Past research suggests early childhood experiences are highly influential in determining how people respond to threats. Moreover, past studies have found that people from larger families display many qualities, such as prosociality and cooperation, that may enhance one’s ability to affiliate and aggregate with others. Therefore, we examined whether the two-way interaction between motive prime and target described above was moderated by various measures of family size and social network size.

We first examined the three-way interaction between motive prime, target group, and two measures of childhood family size—number of siblings and subjective family size. Regression analyses showed a significant three-way Motive Prime × Target Group × Number of Siblings interaction on agreeableness, β = .73, t(84) = 2.64, p = .01, η² = .076. Following Aiken and West (1991), we next examined the two-way Motive Prime × Target Group interactions at one standard deviation above and below the mean number of siblings. For participants with a large number of siblings (one standard deviation above the mean), there was a significant Motive Prime × Target Group interaction, β = 1.66, t(84) = 3.38, p = .001, η² = .12. For participants with a small number of siblings (one standard deviation below the mean), there was not a significant Motive Prime × Target Group interaction, β = .21, t(84) = 0.43, p = .67 (see Figure 2).

We probed each of the two-way interactions between motive prime and target group by calculating the mean difference in agreeableness, comparing participants in the threat of violence condition and control condition at both levels of the target variable—familiar versus unfamiliar others. This analysis suggested that when people with a large number of siblings (one standard deviation above the mean) were thinking about familiar others, a self-protection prime led to a significant increase in agreeableness relative to the control condition, β = .62, t(84) = 2.50, p = .015, η² = .068. When they were thinking about unfamiliar others,
however, the same self-protection prime led to a significant decrease in agreeableness relative to the control condition, $\beta = .47$, $t(84) = 2.29$, $p = .025$, $\eta^2 = .058$. In contrast, for people with a small number of siblings (one standard deviation below the mean), the self-protection prime (relative to control) did not change agreeableness either when thinking about familiar or unfamiliar others (both $ps > .70$). Together these findings suggest that the Motive Prime $\times$ Target Group interaction observed in our initial analysis is strongest for people with a large number of siblings and nonsignificant for people with a small number of siblings.

In addition to number of siblings, we also asked participants about the subjective perception of the size of their family when they were growing up. The three-way Motive Prime $\times$ Target Group $\times$ Subjective Family Size interaction on agreeableness was marginally significant, $\beta = .62$, $t(84) = 1.8$, $p = .059$, and showed a similar pattern of results as the three-way interaction with motive prime, target group, and number of siblings.

Whereas past research has suggested that there may be something unique about the size of one’s family growing up, we also measured the current size of participants’ family by asking participants about their number of children and the size of their nonfamilial social network by asking about their number of close friends. The three-way interactions between motive prime, target group, and each of these variables on agreeableness was nonsignificant ($ps > .3$).

### Discussion

Study 3 accomplished three major goals. First, it provided experimental evidence that threats of violence lead to shifts in agreeableness. Second, it demonstrated that these shifts are selective. Threats of violence do not always lead to increases in agreeableness. Rather, changes in agreeableness occurred in functionally different ways depending on whether participants were instructed to think of familiar versus unfamiliar others. When participants primed with threat thought about familiar others, they rated themselves as more agreeable than participants in the control condition. However, when participants primed with threat thought about unfamiliar others, they rated themselves as less agreeable than participants in the control condition. Moreover, the interaction between threats of violence and target was unique to agreeableness, and there were no Motive Prime $\times$ Target interactions for conscientiousness, extroversion, openness to experience, or neuroticism. Finally, Study 3 demonstrated that individual differences can moderate the extent to which people change their agreeableness in the face of threat. We found that people with large numbers of siblings are especially likely to change agreeableness when threatened, by becoming more agreeable around familiar others and less agreeable around unfamiliar others. People with few siblings did not display shifts in agreeableness in response to threat. Importantly, the Motive Prime $\times$ Target Group interaction was only moderated by measures of participants’ childhood family size and was not moderated by current family size or the size of participants’ nonfamilial social network. Thus, these findings suggest that affiliation with close others may be a particularly salient strategy for people from large families.

The results of Study 3 supported our hypotheses that, relative to the control condition, participants in the threat condition would report being more agreeable with familiar others and less agreeable with unfamiliar others. It is also interesting that participants in the control condition reported being more agreeable with unfamiliar others than familiar others (see Figure 1). This finding might seem counterintuitive at first, but it is in line with past research that has found that people are strategically motivated to appear warm and likeable around unknown others (Jones & Wortman, 1973), perhaps in an attempt to avoid difficult interactions, and that people understand that occasional deficits in agreeableness toward close others are both natural and generally nonthreatening to the relationship (Mills & Clark, 1994).

### Study 4: Situation-Level Threats of Violence and Interest in Helping Others

We have examined the relation between threats of violence and agreeableness through correlations at the national level, correlations between individual differences, and a laboratory experiment. In Study 4 we expanded upon our multimethod approach by conducting a field experiment, in which we sought to replicate and extend our previous findings using a real-world manipulation of threat and a behavioral measure of agreeableness.

In Studies 1–3, we linked threats of violence to variation in agreeableness and found that people shift in agreeableness in response to threat. Because agreeableness was assessed via self-report, however, it is possible that threats of violence merely shift self-perceptions of agreeableness without changing a person’s actual expression of agreeableness. Therefore, in Study 4 we measured how threats of violence affected a behavior associated with agreeableness—people’s willingness to help others. Helping is a useful behavioral index of agreeableness because, as described earlier, agreeableness has been linked to prosociality, willingness to help others, concern for others’ welfare, and the desire to care for others (Caprara et al., 2010; Graziano et al., 2007; Graziano et al., 1997; Rocca et al., 2002; Soldz & Vaillant, 1999). As in Study 3, however, we do not predict that threats of violence should lead people to become generally helpful with everyone. Instead, helpfulness should be target-specific—directed primarily at members of the ingroup.

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**Figure 2.** Mean agreeableness of participants based on motive prime (threat vs. control) and target group (familiar vs. unfamiliar) at one standard deviation above and below mean number of siblings (Study 3). Error bars represent the standard error of the mean.
Method

Our field experiment had a 2 (prime condition: threat of violence vs. control) × 2 (target group: ingroup vs. outgroup) design. We placed posters around our university’s campus that either reminded students of a real-world threat of violence or a neutral topic. Next to these posters were smaller flyers that advertised an opportunity to help an ingroup or outgroup campus organization. At the bottom of each flyer, the organization advertised its e-mail address on several tabs that students could pull off and take with them. The flyer encouraged students to take a tab so that they could contact the student organization about the volunteer opportunity. These tabbed flyers are common around our university’s campus and are used to advertise many different types of campus events and opportunities. Our dependent variable was the number of tabs taken from each combination of poster and flyer—a behavioral indication of students’ interest in helping.

Threat manipulation. At the time of this experiment, our local community was engaged in a debate over a proposed new law that would allow guns on college campuses. This law received much coverage in both the campus newspaper and in local news outlets. Additionally, the potential consequences of the law’s passage were the topic of several e-mails sent out to all students enrolled at our university. As our threat manipulation, we created posters that reminded students about the proposed law. Each poster read, “Guns on campus. Know the pros and cons.” In the center of the poster was a picture of a real gun, pointed forward at the person reading the poster.

For our control condition, we created a similar poster about construction on campus—another frequent topic of discussion at the time of this experiment. Because of several major ongoing construction projects, this topic was also discussed in student newspapers and media outlets. The construction posters read, “Construction on campus. Know the pros and cons.” In the center of the poster was a picture of campus construction site with a crane and a partially constructed building. Aside from the wording and picture, all posters were identical.

Target-group manipulation. For our target group manipulation, we created flyers advertising opportunities to volunteer with two campus organizations. Both flyers advertised an event to create welcome packages for incoming students and indicated a need for student volunteers. The campus organization hosting the event constituted our experimental manipulation.

In one case, the flyer described the event as being hosted by the “Arizona Student Association” (ingroup) and had a picture of an ethnically diverse group of students that represented the general demographic composition of our university’s student population. Our outgroup flyers were identical except they described the event as being hosted by the “Ethiopian Student Association” and had a picture of Ethiopian students. This manipulation allowed us to keep constant the volunteer activity being advertised while varying who students would expect to interact with during the event.

Because we had no control over which student-participants would walk past these flyers, we chose an outgroup (Ethiopian students) not well represented on our university campus. This was done to greatly decrease the likelihood that students taking tabs from the “outgroup” flyers would be members of that group.

Procedure. Data collection took place over 2 weeks. Because students moving across campus could potentially encounter multiple combinations of posters and flyers, and thereby become suspicious of their purpose, we identified four distinct areas of campus in which popular classes are offered. For the first week of data collection, one of the four Prime × Target Group conditions was randomly assigned to each of the four areas. Within each area, six specific locations were selected to hang the posters and flyers. These specific locations were judged by undergraduate research assistants to be public, noticeable, and where students frequently waited before or in between classes.

After the first week of data collection, we swapped locations of the gun and construction posters. The volunteer flyers, manipulating target group, remained in place. Because we did not change the location of the flyers, target group and location were confounded, which would render any main effect of target group impossible to interpret. However, because the content of the posters next to these flyers was counterbalanced, location would not provide plausible explanations for any observed Prime × Target Group interaction (our main hypothesis).

Undergraduate research assistants counted the number of tabs remaining on each flyer three times each day over the course of the study. Because our flyers, and the number of tabs remaining on each one, were public, they were susceptible to the influence of social proof (e.g., flyers with fewer tabs remaining being judged to be popular and this popularity leading people to take tabs). Therefore, each time our undergraduate assistants counted the number of tabs remaining on the flyers, they were instructed to replace flyers with missing tabs. This helped to minimize any potential effect of social proof on our results.

Results

There was a significant Prime Condition × Target Group interaction on intentions to help, ($\chi^2 = 5.6, p = .018$; see Figure 3). In line with our predictions, students were more likely to take tabs from the ingroup (Arizona) flyers when they were hanging next to gun posters ($n = 17$) than when they were hanging next to construction posters ($n = 8$; $\chi^2 = 3.24, p = .072$). Conversely, students were less likely to take tabs from the outgroup (Ethiopian) flyers when they were hanging next to gun posters ($n = 4$) than when they were hanging next to construction posters ($n = 12$; $\chi^2 = 4.00, p = .045$). Because we counterbalanced the location of

Figure 3. For Study 4, number of tabs taken as a function of type of poster (construction vs. gun) and flyer (Arizona vs. Ethiopian).
the posters after the first week, we also checked to see if there was 
an effect of time on our results. There was not. A similar number 
of tabs were taken during Week 1 (n = 22) and Week 2 (n = 19), 
and the overall pattern of results was consistent across weeks.

Discussion

The results of Study 4 replicate those of Study 3 with a real-
world manipulation of threat and a behavioral assessment of agree-
ableness. Relative to a control condition, those primed with a 
threat of violence were more willing to help ingroup members and 
less willing to help outgroup members.

Study 5: Nation-Level Threats of Violence and Trust

The results of Studies 3 and 4 demonstrated that the relation 
between threats of violence and agreeableness is target-specific. In 
Study 5, we returned to the national level to further assess the 
target-specific nature of this relation. Specifically, we examined 
the link between military spending and people’s trust in family and 
neighbors, on the one hand, and people from other religions or 
nationalities, on the other. Agreeableness and trust are closely 
related, as trust is one of the primary components of agreeableness, 
and measures of trust are centrally incorporated in the assessment 
of agreeableness (John & Srivastava, 1999). Several lines of re-
search also suggest a relation between agreeableness and trust: 
Assessments of trust are strongly correlated with Big Five mea-
sures of agreeableness in both adults and children (Evans & 
Revelle, 2008; Hahn & Comrey, 1994; Kausel & Slaughter, 2011; 
Sneed, 2002); within organizations, employees are more likely to 
trust agreeable leaders (Quinlan, 2009); and, in one study, among 
multiple measures of demographic and personality characteristics, 
trait-level agreeableness was the best predictor of trust in an economic 
game (Ben-Ner & Halldorsson, 2010). Finally, trust should facilitate 
the type of affiliation that would be beneficial under threat, because 
pople consider it the most important characteristic in interdependent 
relationships (Cottrell, Neuberg, & Li, 2007).

If people respond to threats of violence by becoming more socially 
affiliative with familiar others, then people who experience threats 
of violence on the national level should especially show increased levels 
of trust toward family and neighbors and, mirroring the results of 
Studies 3 and 4, they should show decreased levels of trust in people 
from other religions and nationalities.

Method

As in Study 1, we used figures from the CIA World Factbook 
(2007) to assess military spending. To evaluate people’s trust in 
various social groups we used data reported in the World Values 
Survey (2009) on trust in four social groups: family, neighbors, 
members of other religions, and members of other nationalities. Com-
bining the data on military spending with the data on trust left a total 
sample of 50 nations representing seven major geopolitical regions: 
Europe (19 nations), Africa (eight nations), Asia (eight nations), South 
America (seven nations), North America (three nations), the Middle 
East (three nations), and Oceania (two nations).

Results and Discussion

Results indicated that military spending was significantly, pos-
itively correlated with trusting family, $r(48) = .34, p = .02$; 
marginaly positively correlated with trusting neighbors, $r(50) =$ 
.24, $p = .09$; and significantly negatively correlated with trusting 
members of other religions, $r(50) = -.32, p = .023$, and other 
nationalities, $r(49) = -.29, p = .045$ (see Figure 4). Moreover, 
comparing each of these correlations with one another—both of 
the positive correlations (trust in family and trust in neighbors) 
were significantly different from both of the negative correlations 
(trust in members of other religions and members of other nation-
alities; $ps < .01$).

To capture the extent to which participants trusted ingroup 
members more than outgroup members, we also created a measure 
of ingroup trust bias. Following Edwards’s (1994) residualized 
difference score approach, we predicted trust in ingroup members 
from trust in outgroup members and saved the residual scores. 
These residuals, our ingroup trust index, represent the variance in 
trust in ingroup members that is distinct from trust in members of 
other groups. Military spending was significantly related to our 
ingroup trust index, $\hat{\beta} = .39$, $R(49) = 2.97$, $p = .005$.

As in Study 1, we conducted a series of multiple regression anal-
yses to see whether the observed relation held when statistically 
controlling for a number of potentially confounding variables. Indeed, 
the link between military spending and ingroup trust bias remained 
significant after individually controlling for national GDP, GDP per 
person, population density, poverty rate, economic disparity, and 
disease prevalence ($\hat{\beta}$ between .41 and .54, $ps < .010$). The observed 
relation also remained significant when controlling for the same 
variables in a single regression ($\hat{\beta} = .34$, $p = .022$).

In sum, Study 5 demonstrated a relation between threats of 
violence and trust at the national level. However, this relation was 
dependent on whether trust was assessed toward familiar others or 
unfamiliar others. Furthermore, the relation between military 
spending and trust appears to be quite robust, as it survives 
controlling for a number of potential confounds.

General Discussion

The current investigation examined how threats of violence 
fluence personality characteristics and social behaviors at three
different levels of analysis—in nations that differentially experience threats of violence, in individual differences in the perception of threats, and in temporarily threatening situations. In Study 1, as threats of violence experienced at the national level increased, agreeableness increased. In Study 2, individuals who chronically perceived threats of violence rated themselves as more agreeable than those who did not chronically perceive such threats. In Study 3, a temporary manipulation of threat led to selective, target-specific shifts in agreeableness. Compared with the control condition, participants in the threat condition reported being more agreeable toward familiar others but less agreeable toward unfamiliar others. Moreover, this relation was moderated by the participants’ number of siblings: Participants with a large number of siblings were especially likely to show shifts in agreeableness in the threat condition, but participants with relatively few siblings did not change in agreeableness. Study 4 was a field study in which a threat of violence was found to influence a behavior associated with agreeableness—willingness to help others. Relative to a control condition, those primed with a threat of violence were more willing to help ingroup members and less willing to help outgroup members. Returning to the national level in Study 5, a similar selective pattern was found: As threats of violence experienced at the national level increased, trust in members of one’s ingroup increased, but trust in members of outgroups decreased.

**Functional Specificity in Threat Responding**

Together, these studies help to develop a deeper understanding of variation in responding to threats of violence. In the past, distinct lines of research have proposed associations between threats of violence and either aggression or affiliation, without a clear distinction about the circumstances under which each response would be expected. The present findings suggest that these varied responses are functionally tuned to the perceived availability of affiliative resources. People seem to prepare themselves to act in socially avoidant ways when dealing with members of unfamiliar outgroups—who are relatively unlikely to provide instrumentally protective resources and, indeed, might pose threats of danger themselves—but they appear to act in socially affiliative ways when they have a familiar group with which to aggregate. Additionally, there seem to be important individual differences in the extent to which people seek out affiliation following threat. People from large families, for whom affiliation with close others may be a particularly salient or practiced response to threat, appear more likely to modulate their agreeableness toward both familiar and unfamiliar others. Thus, these studies indicate that aggregation and affiliation are not general responses to threats of violence but, rather, are specific to both current social conditions (e.g., familiar vs. unfamiliar others) and to the particular individual in the situation (e.g., a person from a large vs. small family).

The current findings also add to an emerging literature on the distinctiveness of different threat-management systems. In a recent review of human responding to threats of disease and violence, researchers found that these two threats were functionally engaged by different environmental cues, had different emotional components, led to different inferences about others, and were associated with different behavioral inclinations (Neuberg et al., 2011). The present investigation builds on this research by highlighting the distinction between disease threats and threats of violence in biasing personality characteristics. Whereas earlier research demonstrated that threats of disease can lead to general social avoidance, we show that responses to threats of violence are more specific—that they lead to can lead to avoidance or affiliation, depending on the social conditions of the situation.

**Biasing Personality Characteristics**

In Studies 1–3, threats of violence were consistently related to agreeableness but not other personality characteristics. Conscientiousness was correlated with threats of violence experienced at the national level but was not related to chronic perceptions of threat or temporary exposure to threats. Extroversion was related to chronic perceptions of threat but not to national experiences of threat or temporary experiences of threat. Finally, openness to experience and neuroticism were not associated with threat of violence in any of the studies. Together, these results highlight the unique relation between agreeableness and threats of violence—a relation that is conceptually coherent given the close connections between agreeableness and both interpersonal cooperation and conflict.

Traditional approaches to personality have often focused on the stability of personality characteristics over time—demonstrating that personality characteristics are heritable, arise early in development, are consistent from situation to situation, and are consistent over the course of the life span (Asendorpf & van Aken, 2003; Carey, 2003; Goldberg, 1993; Jang et al., 1996; John et al., 1994; Loehlin et al., 1998). However, other researchers have advocated that personality characteristics can shift in their expression as a function of developmental experiences and in response to subtle situational variation (Funder, 2006; Mischel, Shoda, & Mendoza-Denton, 2002; Mortensen et al., 2010; Schaller & Murray, 2008). Indeed, incorporating situational factors into the investigation of personality characteristics is useful, because people can be characterized by both stable individual differences in their personality characteristics and by distinctive and stable patterns of situation–behavior interactions (Mischel & Shoda, 1995; Mischel et al., 2002).

These findings contribute to a growing body of literature examining those situation–behavior interactions (Funder, 2006; Mortensen et al., 2010). Here, we show that some of the variation in personality characteristics can be linked to threats of violence. In doing so, we underscore the possibility that variation in personality characteristics and their behavioral manifestations can be functional, rather than random, and that a range of factors, from the conditions of the local environment, such as temporally threatening situations, to national-level conditions, such as military spending, can influence one’s personality.

The results of Study 3 suggest different effects on agreeableness depending on the potential targets of that agreeableness. Given that, one might wonder why we observed main effects of threat on agreeableness in the first two studies. One possibility is that when people rate their agreeableness, they think by default about their agreeableness toward familiar others. To examine this possibility, we asked a separate group of participants to rate themselves on the Big Five dimensions, and then to rate, on a 7-point scale, whether they had been thinking about how they acted around strangers (a) versus how they acted around friends and family (7). For agreeableness, there was a tendency to be significantly above the midpoint of the scale (M = 4.95, p < .001), indicating that when people typically respond to Big Five agreeableness items they are
likely to be thinking about interacting with people they know. This is not a general bias, however. For instance, people’s self-ratings of extraversion were significantly below the scale midpoint (3.56, \( p < .001 \)), indicating that when people typically respond to Big Five extraversion items they are likely to be thinking about interacting with people they do not know. We suspect that the findings observed in Studies 1 and 2 show a main effect of threat on agreeableness because people infer, in the absence of information to the contrary, that agreeableness is essentially about one’s orientation toward familiar others.

**Interactions Between Threat and Sociodevelopmental Experiences**

In the current investigation we propose and find evidence for the influence of a sociodevelopmental factor, family size, on responses to threat. This finding complements recent research that has shown how another sociodevelopmental factor, childhood socioeconomic (SES) status, interacts with current experiences of threat to affect a range of variables, from preferences for reproductive timing to economic risk-taking and diversification (Griskevicius, Delton, et al., 2011; Griskevicius, Tybur, et al., 2011; White, Li, Griskevicius, Neuberg, & Kenrick, 2012). Importantly, however, these lines of research do not suggest that family size and childhood socioeconomic status measure the same construct or are interchangeable. When it comes to affiliation and threat responding, it appears from the current data that family size has more direct implications for whether affiliation is a strategically effective threat response. In contrast, work on childhood SES has drawn upon life history theory to suggest that childhood SES is an index of the unpredictability and harshness experienced growing up. In empirical studies, childhood SES moderates responses to later unpredictable and harsh events, such as random violence or a turbulent economy. Thus, the roles of family size and childhood SES in threat responding seem to be functionally linked to (a) the type of threat being experienced and (b) the possible responses to that threat.

Indeed, we reanalyzed our results from Study 3 using measures of subjective childhood SES, taken from previous work (Griskevicius, Delton, et al., 2011; Griskevicius, Tybur, et al., 2011; White et al., 2012), that were nonfocally included in our demographic questions. Recall that, in Study 3, we observed a three-way interaction between prime condition, target-group, and family size, such that family size moderated the relationship between threat and agreeableness toward familiar versus unfamiliar others. When we examined the relationship between prime condition, target-group, and childhood SES (replacing family size), there was not a significant three-way interaction (\( p = .98 \)). In fact, childhood SES did not interact with any of our experimental manipulations, nor was there a main effect of childhood SES (\( ps > .7 \)).

Our findings regarding family size, in conjunction with work on childhood SES, demonstrate that sociodevelopmental factors can play an important role in psychological processes directed at managing threat. Further research might well probe more deeply into the possible interactions between socioeconomic status, family size, and responses to different types of threats.

**Conclusion**

The current research demonstrates a functional relation between threats of violence, social behaviors, and personality characteristics. These findings suggest the far-reaching impact of violence and hostility on a diverse set of outcomes—from cultural differences in agreeableness and trust, to stable individual differences in agreeableness, to temporary fluctuations in agreeableness. Moreover, the findings highlight the functional, target-specific nature of the relation between threats of violence and agreeableness and demonstrate how this relation is moderated by sociodevelopmental experiences. Together, these findings help develop a deeper understanding of one of the ways in which humans respond to threats and violence form others. Although disagreeableness and mistrust may often seem to arise from violence, it is not always the case. Sometimes nasty breeds nice.

**References**


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