



Direct and indirect relations between the Big 5 personality traits and aggressive and violent behavior

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ABSTRACT

Relations between the Big 5 personality traits and aggressive behavior have been studied frequently. However, no work has tested whether that relation is direct or indirect through aggressive attitudes and aggressive emotions. Data from two large samples that used different Big 5 measures examined these effects. Overall, results showed that the paths from Big 5 traits to aggressive behavior depends on both the specific type of aggressive behavior and the Big 5 traits measured. For example, Openness and Agreeableness were both directly and indirectly related to physical aggression, but were only indirectly related (through aggressive attitudes) to violent behavior. Similarly, Neuroticism was both directly and indirectly (through aggressive emotions) related to physical aggression, but not to violent behavior. Theoretical implications and future work are discussed.

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1. Introduction

Aggression and personality theorists posit that personality variables are important predictors of aggressive behavior (see Anderson & Huesmann, 2003). Indeed, several personality traits are related to aggressive behavior, including, narcissism (Bushman & Baumeister, 1998), impulsivity (Campbell & Muncer, 2009), among others. The predominant overall model of personality has identified the “Big 5” personality factors, traits that repeatedly appear across culture and gender. The predominant social-cognitive models of aggression (e.g., General Aggression Model; GAM) include personality variables, and to some extent explicate psychological processes that link traits to aggression. For example, the GAM postulates that traits can influence aggression through their impact on aggressive emotions or on aggressive cognitions. The present research tested the direct and indirect effects of the Big 5 personality traits (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism) on aggressive behavior. We used multi-group path modeling from two samples that used different Big 5 measures to test the direct effects of personality on two types of aggression (physical, violent) as well as indirect effects (mediated effects) through aggressive emotions and aggressive attitudes.

1.1. Big 5 and aggression

The strongest Big 5 predictor of aggressive behavior is Agreeableness, which is characterized as good-natured, trustful, and

cooperative (John & Srivastava, 1999). It is negatively related to self-report and peer-report aggressive behavior (Gleason, Jensen-Campbell, & Richardson, 2004) and violence (Heaven, 1996). Conscientiousness is characterized by being responsible, orderly, and dependable (John & Srivastava, 1999), and tends to be negatively related to aggression (Sharpe & Desai, 2001). Neuroticism, characterized by being easily upset and emotionally unstable (John & Srivastava, 1999), is positively related to aggressive behavior (Sharpe & Desai, 2001). Openness, characterized by being intellectual, polished, and independent-minded (John & Srivastava, 1999), tends to be unrelated to aggressive behavior (e.g., Gleason et al., 2004). Finally, Extraversion is characterized as being talkative, assertive, and energetic (John & Srivastava, 1999) and its relations with aggression are mixed. Sharpe and Desai (2001) found that the correlation between self-reported physical aggression and Extraversion was negative, whereas Gallo and Smith (1998) found a positive relation between Extraversion and physical aggression.

1.2. Incorporating the Big 5 into larger aggression theories

It is unknown whether or not the relations between the Big 5 and aggression are direct, or indirect through some learned aggressive outcomes, such as aggressive emotions and aggressive attitudes. GAM (Anderson & Bushman, 2002) posits that repeated interaction with aggression-related stimuli (both real and fictitious) and situations, and subsequent positively reinforced aggressive behavior, is likely to increase one's aggressive personality through several learned outcomes (e.g., aggressive beliefs, attitudes, and related emotions). Furthermore, in all major social-cognitive models of aggression, momentary accessibility of

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aggressive emotion and cognitions are key proximal causes of aggressive behavior. Thus, depending on the specific Big 5 trait, GAM would suggest that the Big 5 are related to aggressive behavior because they may either enhance or inhibit the development and chronic accessibility of aggressive emotions and aggressive attitudes. For example, if Agreeableness is negatively associated with aggressive emotions or aggressive attitudes, then it should also be negatively related to aggression. There is strong support for how repeated exposure to aggression-related stimuli and situations is related to aggressive emotions and aggressive attitudes; and how those aggressive outcomes are related to the likelihood of aggressive behavior (Anderson & Bushman, 2002). However, there is a paucity of research on how Big 5 traits are related to these aggressive outcomes.

Research has shown that Agreeableness and Conscientiousness are both negatively related to vengefulness (an aggressive emotion), whereas Neuroticism is positively related to vengefulness (McCullough, Bellah, Kilpatrick, & Johnson, 2001). Sharpe and Desai (2001) found that Neuroticism is positively related to anger and hostility (aggressive emotions), whereas Extraversion, Agreeableness, and Conscientiousness are negatively related to these emotions. Anderson et al. (2004) found that Agreeableness and Conscientiousness were negatively related to attitudes towards violence (an aggressive attitude). Thus, this literature suggests that the Big 5 personality traits may be related to aggressive behavior directly and/or indirectly through aggressive emotions and aggressive attitudes.

1.3. Overview of the current research

Despite the wealth of literature examining the relations between Big 5 traits and aggressive behavior, it is unknown whether these effects are direct, indirect through aggressive attitudes and aggressive emotions, or some combination of direct and indirect effects. Furthermore, it is unclear whether various routes to aggressive behavior are similar or different across all five personality traits. For instance, some personality traits may be only directly related to aggressive behavior, others may be indirectly related to aggressive behavior, some may be both directly and indirectly related to aggressive behavior, while some may not be related to aggressive behavior. Finally, it is unclear whether these effects differ as a function of different types of aggressive behavior. For instance, the effects of Agreeableness may be stronger for physical aggression than violence, in part because violence in general is harder to predict.

1.4. Primary study

Conger, Patterson, and Ge (1995) argued that if one can replicate an effect using different samples and different measures to assess the same theoretical construct(s), then the theoretical underpinnings for such relations are robust to measurement. We tested the relations between Big 5 traits, aggressive emotions, aggressive attitudes, and aggressive/violent behavior with two independent samples using a different measure of the Big 5 for each sample. We chose to focus on aggressive and violent behavior for this study. On the aggression continuum (see Anderson & Huesmann, 2003), physical aggression (e.g., hitting) lies before violent behavior (e.g., hitting with a weapon). Because the potential consequences may be more severe for violent offenders compared to aggressive offenders, the specific relations between the Big 5 and these behaviors may differ.

2. Method

2.1. Description of the two samples¹

Both samples consisted of undergraduate students from the same large Midwestern University. Partial course credit for their psychology course requirements was given to all participants. Sample 1 consisted of 347 (56% male) participants. Sample 2 consisted of 873 (40% male) participants.

2.2. Materials

The two samples completed the following three scales:

2.2.1. Violent behavior

The modified National Youth Survey (NYS; Anderson & Dill, 2000) was used to assess violent behavior. This is a 10-item questionnaire that asks participants to indicate how often they did a variety of aggressive acts from 1 (*0 times*) to 11 (*more than 27 times*) in the past year. A sample item is, "Hit or threatened to hit other students." Prior to summing up the items, all of the NYS items were converted to Z-scores (Anderson & Dill, 2000). These standardized items are summed.

2.2.2. Attitudes towards violence

To assess aggressive attitudes, the Revised Attitude towards Violence Scale (RATVS; Anderson, Benjamin, Wood, & Bonacci, 2006) was used. This 39-item questionnaire has participants rate their level of agreement with the items on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale. Items are summed.

2.2.3. Aggressive personality

The Buss–Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992) was used to assess trait aggression. This 29-item questionnaire has participants indicate how much they believe items are characteristic of them on a 1 (*not at all characteristic of me*) to 7 (*extremely characteristic of me*) rating scale. Certain items are reverse scored then summed. This questionnaire has four subscales. The first is the physical aggression subscale, which consists of nine items. A sample item is, "If somebody hits me, I hit back." This subscale is conceptualized as self-report estimates of aggressive behavior. The second is the trait anger subscale, consisting of seven items. A sample item is, "I am sometimes eaten up by jealousy." The third subscale is the trait hostility subscale, which consists of eight items. A sample item is, "When people are especially nice, I wonder what they want." The trait anger and hostility indices were summed for an index of aggressive emotions. The final subscale is the verbal aggression subscale, which was not used in this study.

2.2.4. The Big 5 personality traits

Participants in Sample 1 completed the Five Factor Inventory (FFI; Costa & McCrae, 1992). This scale consists of 60-items that asks participants to rate their level of agreement for each item on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale. Each of the five personality traits was assessed using 12-items. A sample item from the Extraversion factor is, "I like to have a lot of people around me." A sample item from the Agreeableness factor is, "I try to be courteous to everyone I meet." A sample item from the Openness factor is, "I don't like to waste my time daydreaming (reverse coded)." A sample item from the conscientiousness factor is, "I keep my belongings clean and neat." Finally, a sample item from the Neuroticism factor is, "I often feel inferior to others." Certain items

¹ No additional demographic information was provided for Sample 2. Additional ethnic information was gathered for Sample 1, which showed that 83% reported that they were Caucasian.

Table 1
Correlations between relevant observed variables in Full model for Sample 1.

		1	2	3	4	5	6	7	8	9
1	Neuroticism	–	–.12	–.004	–.16	–.18	.49	.05	.12	.03
2	Extraversion	–.34	–	.34	.29	.15	–.17	–.07	.01	.004
3	Openness	–.07	.03	–	.49	.37	–.18	–.22	–.05	–.11
4	Agreeableness	–.35	.33	.01	–	.58	–.36	–.27	–.31	–.20
5	Conscientiousness	–.35	.36	–.04	.27	–	–.25	–.15	–.20	–.13
6	Aggressive emotions	.63	–.22	–.03	.53	–.24	–	.31	.49	.18
7	Aggressive attitudes	.06	.01	–.23	–.43	–.002	.27	–	.47	.26
8	Physical aggression	.22	–.05	–.02	–.49	–.17	.53	.44	–	.30
9	Violent behavior	.09	–.02	.01	–.24	–.07	.22	.27	.30	–

Correlation coefficients for Sample 1 ($N = 347$) are below the diagonal and correlation coefficients for Sample 2 ($N = 873$) are above the diagonal.

For Sample 1: values greater than .14 or less than –.14 are statistically significant ($p < .05$).

For Sample 2: values greater than .08 or less than –.08 are statistically significant ($p < .05$).

are reverse scored. Higher scores indicate higher levels of that particular personality trait. The reliability for the entire scale ($\alpha = .70$) and subscales (α s $> .68$) were adequate.

Participants in Sample 2 used the Big 5 scale (Goldberg, 1992). This 100-item questionnaire asks participants to rate how true each adjective is of them on a 1 (*not at all like me*) to 9 (*extremely like me*) scale. The five subscales represent the Big 5 dimensions, each consisting of 20 adjectives. A sample Intellect item ($\alpha = .86$) is “Intellectual.” A sample Emotional Instability (e.g., Neuroticism) item ($\alpha = .83$) is “Unobvious.” A sample Conscientiousness item ($\alpha = .83$) is “Disorganized (reverse coded).” A sample Agreeableness item ($\alpha = .90$) is “Cold (reverse coded).” A sample Surgency (e.g., Extraversion) item ($\alpha = .88$) is “Introverted (reverse coded).” Certain items were reverse scored. Higher scores indicate more of that personality characteristic.

3. Results

Two correlation matrices were created and can be seen in Table 1. All variables were standardized prior to analysis.

3.1. Data analysis plan

Path analysis using MPLUS on multiple input matrices tested the relations in the models. We first pitted three broad models against each other to determine the best fit for the data. The Direct model had the Big 5 variables, aggressive emotions, and aggressive attitudes directly predicting aggressive behavior. The Indirect model had the Big 5 variables predict aggressive emotions and aggressive attitudes, which, in turn, predicted physical aggression. Finally, the Full model had the Big 5 variables predict aggressive emotions, aggressive attitudes, and physical aggression. Aggressive emotions and aggressive attitudes also predicted physical aggression. In all models, the Big 5 were correlated with one another, as was the relation between aggressive emotions and aggressive attitudes. Also, these models constrained all correlations and paths to be equal across the two sample groups. Once the best fitting model was identified (Full, Indirect, or Direct), we allowed the Big 5 variables to be freely estimated between the two samples. Finally, certain additional parameters were allowed to be freely estimated based on modification indices. This method was repeated for violent behavior. When the best fitting model was identified, standardized regression coefficients were examined to determine the relations between the Big 5, aggressive emotions, aggressive attitudes, and aggressive behavior. Because we are using two different samples that completed different versions of the Big 5, we do not expect the path coefficients between the two groups to be identical even if the paths are constrained to be equal. However, the magnitude and direction of the estimates should be similar. Finally, because of the number of parameters being estimated

simultaneously, only relations that are statistically significant at $p < .001$ will be considered sufficiently strong to warrant further discussion.

3.2. Physical aggression

Table 2 presents the model fit for the Direct, Indirect, Full, and modified full models along with the difference in chi-square tests between models. Results showed that the Direct model did not fit the data well; however, it did fit significantly better than the Baseline model, in which all variables were unrelated to each other. The Indirect model fit significantly better than the Direct model, but the model fit was still inadequate. Finally, the Full model fit the data best. This model fit significantly better than the Indirect model. Using the Full model as the new Baseline model for comparison, we first allowed the correlations between the Big 5 variables to be estimated freely across groups. This improved the model fit considerably. Modification indices suggested we allow the path between agreeableness to aggressive attitudes and agreeableness to aggressive emotions to be freely estimated across groups, as well as the correlation between aggressive attitudes and aggressive emotions. Results showed that this model fit the data best. This model fit better than the previous model.

Figure 1 present the results of the final Full model. Examination of the path coefficients showed that the paths from aggressive emotions ($\beta = .42, p < .001$; $\beta = .44, p < .001$ for Samples 1 and 2, respectively) and aggressive attitudes ($\beta = .31, p < .001$; $\beta = .32, p < .001$ for Samples 1 and 2, respectively) to physical aggression were significant. Neuroticism (β s = $-.13, p < .001$ for both samples), Extraversion (β s = $.09, p < .001$ for both samples), Openness (β s = $.14, p < .001$ for both samples), and Agreeableness (β s = $-.16, p < .001$ for both samples) all directly predicted physical aggression. Openness (β s = $-.18, p < .001$ for both samples) and Agreeableness ($\beta = -.48, p < .001$; $\beta = -.24, p < .001$ for Samples 1 and 2, respectively) both predicted aggressive attitudes, whereas Agreeableness ($\beta = -.38, p < .001$; $\beta = -.27, p < .001$ for Samples 1 and 2, respectively) and Neuroticism ($\beta = .48, p < .001$; $\beta = .47, p < .001$ for Samples 1 and 2, respectively) both predicted aggressive emotions. No other paths were significant at the $p < .001$ level.

Mediation tests yielded significant indirect paths from agreeableness to physical aggression through aggressive emotions ($B = -.16, p < .001$; $B = -.12, p < .001$ for Samples 1 and 2, respectively) and aggressive attitudes ($B = -.15, p < .001$; $B = -.08, p < .001$ for Samples 1 and 2, respectively). In other words, part of the negative association between Agreeableness and physical aggression is mediated by the fact that disagreeable people have aggressive attitudes and emotions that increase physical aggression.

Similarly, the indirect path from Openness to physical aggression through aggressive attitudes was significant (B s = $-.06, p < .001$ for

Table 2
Model fit statistics for physical aggression and violent behavior.

DV	Model	χ^2	df	$\Delta\chi^2$	Δdf	CFI	TLI	RMSEA	SRMR
Physical aggression	Baseline	1489.09***	36						
	Direct	863.79***	38	625.30	2	0.43	0.46	0.19	0.16
	Indirect	267.04***	33	596.75	5	0.84	0.82	0.11	0.08
	Full	172.20***	28	94.84	5	0.90	0.87	0.09	0.08
	Free correlations	47.60***	18	124.60	10	0.98	0.96	0.05	0.03
	Modification indices	20.98	15	26.26	3	1.00	0.99	0.03	0.02
Violent behavior	Baseline	976.46***	36						
	Direct	857.99***	38	116.47	2	0.13	0.17	0.19	0.15
	Indirect	187.52***	33	670.47	5	0.84	0.82	0.09	0.08
	Full	166.40***	28	21.12	5	0.85	0.81	0.09	0.08
	Free correlations	41.80***	18	124.60	10	0.98	0.95	0.05	0.02
	Modification indices	19.76	16	22.04	3	1.00	0.99	0.02	0.02

* $p < .05$,
** $p < .01$,
*** $p < .001$.

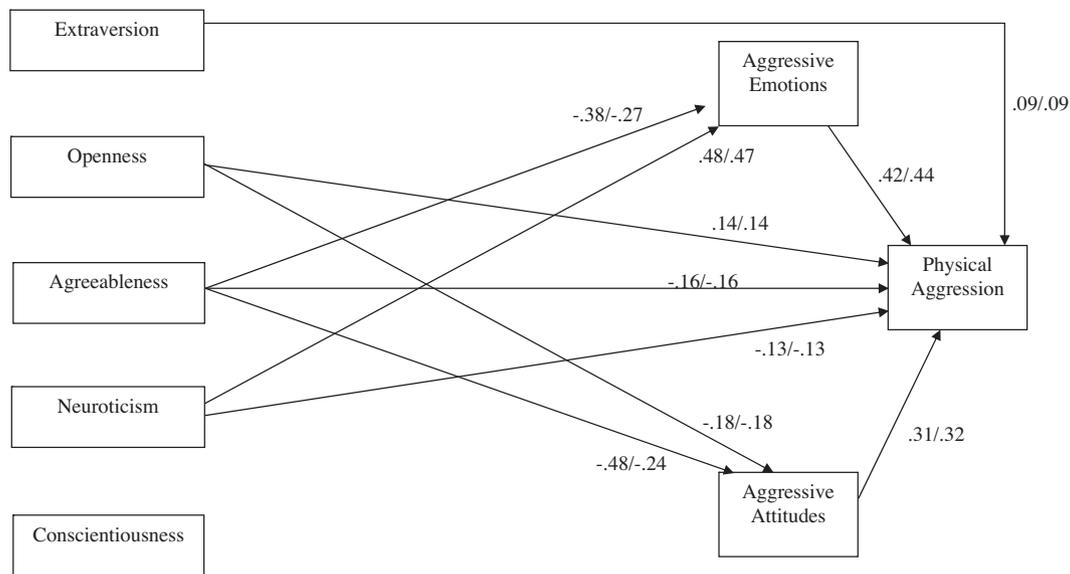


Fig. 1. Best model for physical aggression. For readability, correlations between Big 5 variables were not included in this figure. All coefficients are significant at the $p < .001$ level. Numbers on the left of the diagonal line are path coefficients for Sample 1 and numbers on the right are path coefficients for Sample 2.

both samples). Finally, the indirect path from Neuroticism to physical aggression through aggressive emotions was significant ($B_s = .20$, $p_s < .001$ for both samples).

3.3. Violent behavior

Table 2 presents the model fit for the Direct, Indirect, Full, and modified full models along with the difference in chi-square tests between models. As was true for physical aggression, the Direct model for violent behavior did not fit the data well, even though it fit better than the Baseline model. Again, the Indirect model fit significantly better than the Direct model, but the model fit was still inadequate. The Full model fit the data best, but still was poor. This model fit significantly better than the Indirect model. Using the Full model as the new Baseline model for comparison, we first allowed the correlations between the Big 5 variables to vary freely across groups. This improved the model fit considerably. Finally, modification indices suggested we allow the path between agreeableness to aggressive attitudes as well as the correlation between aggressive attitudes and aggressive emotions to be freely estimated across groups. Results showed that this model fit the data.

Examination of the path coefficients in Fig. 2 reveals that the path from aggressive attitudes ($\beta = .19$, $p < .001$; $\beta = .20$, $p < .001$

for Samples 1 and 2, respectively) to violent behavior was significant. No other variable significantly predicted violent behavior. Openness ($\beta = -.18$, $p < .001$; $\beta = -.17$, $p < .001$ for Samples 1 and 2, respectively) and Agreeableness ($\beta = -.47$, $p < .001$; $\beta = -.25$, $p < .001$ for Samples 1 and 2, respectively) both predicted aggressive attitudes, whereas Agreeableness ($\beta = -.33$, $p < .001$; $\beta = -.30$, $p < .001$ for Samples 1 and 2, respectively) and Neuroticism ($\beta = .50$, $p < .001$; $\beta = .46$, $p < .001$ for Samples 1 and 2, respectively) both predicted aggressive emotions.

Indirect path tests showed that the path from agreeableness to violent behavior through aggressive attitudes ($B = -.09$, $p < .001$; $B = -.05$, $p < .001$ for Samples 1 and 2, respectively) was significant. The indirect path from Openness to violent behavior through aggressive attitudes was significant ($B = -.04$, $p < .001$; $\beta = -.03$, $p < .001$ for Samples 1 and 2, respectively). Again, the final model for violent behavior was quite different from the models for physical aggression.

3.4. Results summary

For physical aggression, results showed that Agreeableness was indirectly negatively related to aggressive behavior via both aggressive emotions and aggressive attitudes. Neuroticism was

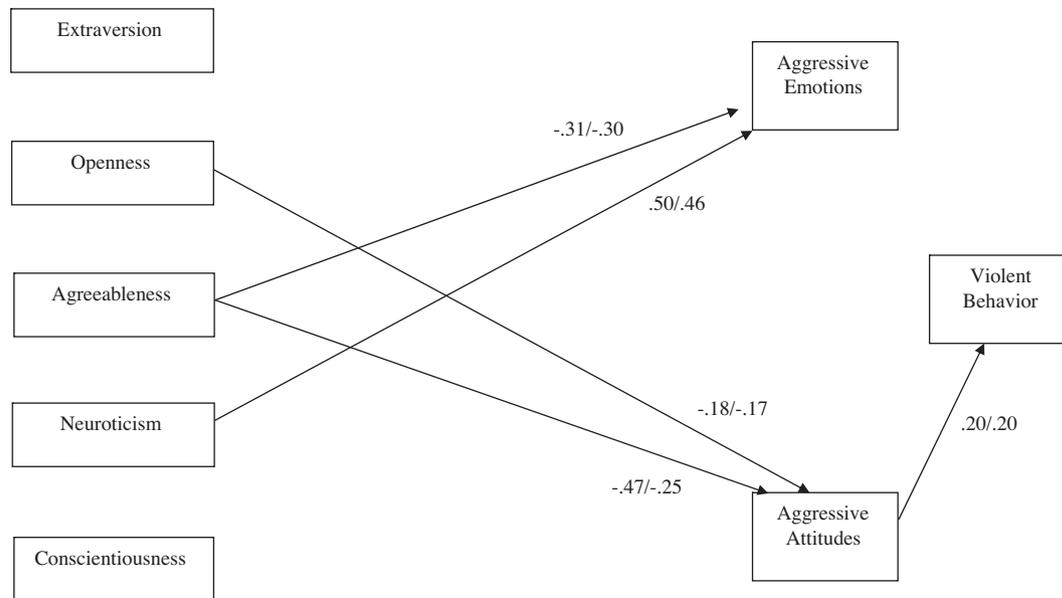


Fig. 2. Best model for violent behavior. For readability, correlations between Big 5 variables were not included in this figure. All coefficients are significant at the $p < .001$ level. Numbers on the left of the diagonal line are path coefficients for Sample 1 and numbers on the right are path coefficients for Sample 2.

indirectly related to aggressive behavior through aggressive emotions. Openness was indirectly related to aggressive behavior through aggressive attitudes. For violent behavior, Agreeableness and Openness were indirectly related to violent behavior through aggressive attitudes. Figure 1 also shows significant direct relations between the Big 5 variables and physical aggression. Openness, Agreeableness, and Neuroticism all predicted physical aggression. No direct relations were found between the Big 5 and violent behavior.

4. Discussion

Research has focused on: (a) how aggressive attitudes and emotions are related to aggressive behavior (see Anderson & Bushman, 2002), (b) how the Big 5 are related to aggressive behavior (e.g., Sharpe & Desai, 2001), and (c) how the Big 5 are related to aggressive emotions (e.g., McCullough et al., 2001) and aggressive attitudes (e.g., Anderson et al., 2004). We are unaware of any published research which has attempted to integrate these three research areas by testing whether or not the Big 5 are directly related to aggressive behavior, or if that relationship is indirect through aggressive emotions and/or aggressive attitudes. Our results suggest that certain Big 5 personality variables are directly related to aggressive behavior, others are related to aggressive behavior through aggressive thoughts and/or aggressive emotions, while others are unrelated to all aggression-related outcomes. Table 3 summarizes our results. It is important to keep in mind,

of course, that our procedures were quite conservative statistically (e.g., reporting only $p < .001$ effects, controlling for scale intercorrelations). This means that the significant direct and indirect effects summarized in Table 3 represent replicable associations, but that any specific “nonsignificant” direct or indirect path may be the result of the conservative procedures rather than the true absence of an association.

4.1. The Big 5 and aggression theory

Whether direct or indirect, results showed that Big 5 traits are related to aggressive behavior. GAM views such individual difference variables as risk factors that combine either additively or interactively with situational cues through one’s internal state and decision and appraisal processes (see Anderson & Bushman, 2002). Within the context of the learning processes in GAM, this suggests that the personality dispositions of individuals will be related to developing an aggressive personality depending on the specific Big 5 trait. For instance, when confronted with a hostile situation (e.g., a provocation), disagreeable individuals are more likely to notice, attend to, and process antisocial or hostile cues, increasing the likelihood of hostile attributions, and interactions, and thereby reinforcing a range of aggressive schema and scripts. These findings have implications for understanding aggression. The more risk factors that can be elucidated, the better informed interventions efforts can be at reducing aggression. For example, the extent to which teaching an individual to be more agreeable changes one’s levels

Table 3
Summary of Big 5 trait direct and indirect effects on physical aggression and violent behavior.

DV	Big 5 trait	Direct effect direction	Indirect via aggressive emotions	Indirect via aggressive attitudes	Net Big 5 trait effect
Physical aggression	Extraversion	Positive	Ns	Ns	Slightly positive
	Openness	Positive	Ns	Negative	Negligible
	Agreeableness	Negative	Negative	Negative	Strongly negative
	Neuroticism	Negative	Positive	Ns	Slightly positive
	Conscientiousness	Ns	Ns	Ns	Negligible
Violent behavior	Extraversion	Ns	Ns	Ns	Negligible
	Openness	Ns	Ns	Negative	Negligible
	Agreeableness	Ns	Ns	Negative	Strongly negative
	Neuroticism	Ns	Ns	Ns	Negligible
	Conscientiousness	Ns	Ns	Ns	Negligible

of trait agreeableness, should reduce subsequent aggressive behavior. More research and intervention work is needed to further explore these claims and relations.

5. Limitations and future work

Our results suggest that some variables are directly related to aggressive behavior, while others are indirect. However, one limitation of the current study is the focus on only the main effects of the Big 5 on aggressive attitudes, aggressive emotions, and aggressive behavior. Other work has highlighted the importance of looking at interactions between certain Big 5 traits, as such interactions may influence aggressive behavior and anger (e.g., Agreeableness and Neuroticism; Ode, Robinson, & Wilkowski, 2008). However, there is no theoretical reason to expect any complex 5-way or 4-way statistical interactions, although this may be an interesting area for future research.

A second limitation is the reliance on correlational data. It is more likely that emotions, attitudes, and personality variables predict behavior, but a bi-directional relation between any of these variables is possible. We derived our models based on aggression and personality theories.

Third, any such study is limited by the measures used. The indirect effects through aggressive emotions and cognitions would likely be larger when a larger sample of each type is used. For example, aggressive attitudes are just one subset of aggressive cognitions that have been linked to increased aggressive behavior. Others include hostile attribution bias, hostile expectation bias, accessibility of aggression scripts, and normative beliefs about aggression (e.g., Anderson & Huesmann, 2003). Nonetheless, the present data tested and confirmed the prediction that much of the variance in aggression that is accounted for by general personality traits appears to operate through aggressive emotion and cognition.

However, additional work is needed to further test these complex relations. Longitudinal studies and studies with additional proximal predictors of aggression would seem most useful.

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