The Structure of Aggressive Personality

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David S. Chester[1]*, Michael L. Crowe[2,3], Courtland S. Hyatt[4], Joshua D. Miller[5]

[1]Department of Psychology, Virginia Commonwealth University

[2]VA Boston Healthcare System

[3]Boston University Chobanian & Avedisian School of Medicine

[4]Department of Psychiatry and Behavioral Sciences, Emory University School of Medicine

[5]Department of Psychology, University of Georgia

*Please address correspondence to David S. Chester, 806 West Franklin St., Richmond VA, 23284, USA; Phone: 1-804-828-7624; Fax: 1-804-828-2237; dschester@vcu.edu

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Abstract

Objective: Measures and models of trait aggression have multiplied to the point of incoherence. We sought to factor analyze a broad array of aggression measures to identify a comprehensive, coherent factor structure for this construct.

Method: In Study 1, a diverse sample of 922 undergraduates completed a battery of items acquired from 42 self-report aggression questionnaires. In Study 2, we administered a curated item pool to another diverse sample of 1,447 undergraduates, alongside criterion measures.

Results: We curated an initial item pool of 734 items down to 289 items that exhibited sufficient variability, were not redundant with other items, and possessed strong loadings onto a central ‘trait aggression’ factor. These remaining items were best characterized by a six-factor structure, which captured Relational, Angry, Violent, Retaliatory, Intimate Partner, and Alcohol forms of aggression. We estimated their hierarchical structure, correlations with their original aggression scales, Five Factor Model trait dimensions, impulsivity facets, and found them to be robust to gender composition and the inclusion of alcohol-naive and intimate-partner-naive participants.

Conclusions: This factor structure mostly supported widely-accepted models of aggressive personality that focus on its overt and relational forms and reactive functions, though proactive aggression only loosely emerged as a distinct entity. We retained the final items as the Comprehensive Aggression Scale (CAS).

Keywords: trait aggression, aggression measurement, bass-ackwards, factor analysis, Comprehensive Aggression Scale

Introduction

A key aspect of human personality is the dispositional tendency towards aggressive behavior. Trait aggression has been studied at length, yielding many insights into the manifestations and motivations of intentional harm. Aggression is a complex behavioral phenotype and so it should not be surprising that there would be myriad measures of the construct. This rich and burgeoning array of measures has grown quickly and across many disciplines, resulting in a tangled morass of measures and conceptual models of trait aggression that are often at odds with one another and may fall prey to jingle-jangle fallacies.

The measurement of aggression has become overgrown and this directly leads to several key problems. First, a lack of standardization of measurement renders it difficult to compare findings across studies. Given the tendency for certain measures to be adopted by specific sub-fields, it can create systematic issues in comparing the findings of one area of the literature to another. Second, from a practical standpoint, it creates confusion for researchers seeking to identify a measure to use. Such a proliferation also runs the risk of bloating the content domain of the aggression construct to the point of imprecision and envelopment of inappropriate constructs. Indeed, some aggression questionnaires correctly limit their items to aggressive behaviors, whereas others swell to include related emotional and cognitive constructs like anger and hostile social perceptions (e.g., Buss & Perry, 1992). Third, and perhaps most importantly, the existence of so many measures limits the construct validity of aggression science --- how can researchers know whether they accurately measured aggression when there are so many ways of conceptualizing and capturing this

construct? Without a strong foundation of construct validity, researchers cannot build a sound theoretical framework for aggression. To begin to address these growing issues, we sought to distill a clear conceptual and psychometric factor structure of trait aggression from a large battery of widely-used and accepted trait aggression questionnaires.

Trait Aggression

Human personality envelopes many enduring dispositions. A critically important aspect of personality is the tendency towards *aggression* --- any attempt to harm people against their will (Allen & Anderson, 2017). Aggression is thus a behavior, yet it can also be construed as a personality trait when tendencies towards aggressive behavior reliably occur. Indeed, some people tend to be more dispositionally aggressive than others, across situations and time. Aggressive children are more likely to develop into aggressive adolescents and aggressive adults (Huesmann et al., 1984) and people who are aggressive in their daily lives tend to be aggressive in the laboratory (Chester & Lasko, 2019). Trait aggression also exhibits the empirical properties of a lower-order facet of the broader, Big Five personality dimension of Agreeableness/Antagonism (Chester & West, 2020), and unsurprisingly, Agreeableness/Antagonism is the Big Five dimension most strongly linked to self-reported (Vize et al., 2019) and laboratory aggression (Hyatt et al., 2019). Taken together, this evidence suggests that aggression is a durable and important personality trait.

Models and Measures of Trait Aggression

Many debates have arisen surrounding the precise structure of trait aggression, its forms and functions, summarized neatly by Parrott and Giancola (2007) as “*direct*

versus indirect ... physical versus verbal ... active versus passive ... rational versus manipulative ... proactive versus reactive ... antisocial versus prosocial ... annoyance-motivated versus incentive-motivated ... overt versus covert ... targeted versus targetless ... overt versus relational ... and relational versus social" (p. 283). The result is a literature that is rife with competing conceptual and theoretical models of aggression, as well as a host of measures that reify these different models. Some models have risen to more prominence and frequent use than others, below we review two of these most popular approaches.

Buss-Perry Four Factor Model

Perhaps the most popular and widely-adopted approach to trait aggression is the four-factor model advanced by Buss and Perry (1992), in which trait aggression comprises tendencies towards physical aggression, verbal aggression, anger, and hostility. This approach divides aggression into behavioral (physical and verbal aggression), affective (anger), and cognitive (hostility) components. Given that aggression manifests as a dispositional behavior, a main focus of this model is differentiating the form that the harm is inflicted through (physical means or verbal means). The focus is on the perpetrator and the avenue through which they seek to harm others.

This four factor model arose from Buss and Perry's (1992) Aggression Questionnaire, which was created from the broader Buss-Durkee Hostility Inventory. This scale was subsequently administered to undergraduate student participants, yielding a four factor structure via factor analysis. Dozens of other studies have adopted this measure, often replicating the questionnaire's psychometric properties in clinical,

forensic, and cross-cultural samples (e.g., Ando et al., 1999; Diamond et al., 2005; Gallagher & Ashford, 2016; García-León et al., 2002; Gerevich et al., 2007). As evidenced by the fact that the seminal paper has been cited over 9,500 times (Google Scholar; as of March 31, 2023), the Buss-Perry model has risen to dominate the field of trait aggression.

Forms and Functions Model

Other approaches to aggression build upon the Buss and Perry (1992) model of physical versus verbal forms of aggression. Beyond these overt and relational manifestations, aggression can serve various functions. It can be an impulsive, hostile response to perceived provocations (i.e., reactive aggression) or it can serve broader goals as part of a premeditated, planned behavioral strategy (i.e., proactive aggression; Feshbach, 1964; c.f. Bushman & Anderson, 2001). Such 'forms and functions' approaches to trait aggression disambiguate such reactive and proactive functions among their overt and relational forms --- creating a 2 x 2 matrix that captures reactive-overt, reactive-relational, proactive-overt, and proactive-relational aggression sub-types (Marsee et al., 2011; Raine et al., 2006). This approach has garnered substantial empirical support and stands as one of the key theoretical bulwarks that articulates trait aggression. Whether key measures of this model, such as the Reactive-Proactive Aggression Questionnaire (RPQ; Raine et al., 2006), were intended to capture *trait* versus state aggression was initially unclear, but recent research demonstrated that they could be accurately construed as such (Babcock et al., 2014). Therefore, despite capturing the same underlying trait aggression construct, the RPQ and other form and function measures appear far different from the Buss-Perry Aggression Questionnaire in

both content and empirical structure.

This contrast between the two most frequently applied trait aggression measures is only one example of a literature rife with disagreement and disorder. A cursory review of the literature yields dozens of distinct trait aggression questionnaires and surveys, each with its own underlying dimensional structure, and each intended to capture aggression in its myriad forms, contexts, and motivations. While such a diverse toolkit can be useful, it can also become a hindrance when left unchecked. From this broad array of aggression measures, it is clear that more research is needed to address the inconsistencies and ambiguities inherent in the conceptualization and measurement of the aggressive personality.

The Present Research

Across two studies, we sought to examine the hierarchical factor structure of trait aggression. In line with the Buss-Perry (1992) four factor model of aggression and the Forms and Functions model (Marsee et al., 2011) of aggression, we predicted that the aggression factors would first differentiate themselves by form (i.e., physical and verbal aggression). We then expected these forms of aggression to differentiate themselves based on function (i.e., proactive and reactive aggression). The present research followed a series of two preregistration plans (Study 1: https://osf.io/jte7p; Study 2: https://osf.io/9pdwn). The de-identified data and analysis code and output that are necessary to replicate our results are publicly available: https://osf.io/c39vn/files.

Method

Participants

After removing respondents with > 75% missing aggression item data[1] (Study 1: 21 removed; Study 2: 27 removed), participants were 922 (Study 1) and 1,447 (Study 2) undergraduate students recruited through introductory psychology course subject pools. Table 1 summarizes the demographics of participants from each study that were entered into subsequent analyses.

Table 1

Participant Characteristics by Study

Demographics	Study 1 (*N* = 922)	Study 2 (*N* = 1,447)
Age: *M* (*SD*)	18.92 (2.43)	19.57 (2.91)
Gender: *N* (%)		
Cisgender Female	643 (69.7%)	1,073 (74.2%)
Transgender Female	1 (0.1%)	2 (0.1%)
Cisgender Male	256 (27.8%)	338 (23.4%)
Transgender Male	3 (0.3%)	11 (0.8%)
Non-Binary	4 (0.4%)	16 (1.1%)
+	2 (0.2%)	6 (0.4%)
Missing	13 (1.4%)	1 (0.1%)
Race/Ethnicity: *N* (%)		
White	437 (47.4%)	581 (40.2%)
Hispanic, Latina/o/x, or Spanish Origin	111 (12.0%)	203 (14.0%)
Black or African-American	259 (28.1%)	417 (28.8%)
Asian	191 (20.7%)	369 (25.5%)
American Indian or Alaskan Native	18 (2.0%)	26 (1.8%)
Middle Eastern or North African	40 (4.3%)	73 (5.0%)
Native Hawaiian or Pacific Islander	9 (1.0%)	3 (0.2%)
+	9 (1.0%)	23 (1.6%)
Missing	11 (1.2 %)	0 (0.0%)
Household Income: *N* (%)		
$0 – $19,050	103 (11.2%)	181 (12.5%)
$19,051 – $77,400	288 (31.2%)	466 (32.2%)
$77,401 – $165,000	298 (32.3%)	462 (31.9%)
$165,001 – $315,000	163 (17.7%)	233 (16.1%)
$315,001 – $400,000	35 (3.8%)	55 (3.8%)
$400,001 – $600,000	16 (1.7%)	38 (2.6%)
Missing	19 (2.1%)	12 (0.8%)

[1] This decision to remove respondents with > 75% missingness (planned missingness was 72.49%) was not preregistered and was chosen by the first author after the imputation procedure failed until these participants were removed from the dataset. We did not perform our analyses with any other missingness thresholds.

Note. Cisgender Female = assigned female at birth and identified as a woman at the time of data collection, Cisgender Male = assigned male at birth and identified as a man at the time of data collection, Transgender Female = assigned male at birth and identified as a woman at the time of data collection, Transgender Male = assigned female at birth and identified as a man at the time of data collection, + = an identity not listed. Race/ethnicity categories were not mutually exclusive. Household income brackets based on 2018 U.S. tax bracketing.

Materials

Aggression Questionnaires. The first author conducted a comprehensive search of the literature using the APA PsycInfo and Google Scholar databases in December 2020 for all aggression questionnaires that met several preregistered inclusion criteria. To be included, each scale was required to:

1. include at least one subscale that was explicitly and intentionally designed to measure some aspect of the perpetration of aggression.
2. be based on self-reports (other-report or interview-based measures excluded).
3. be published in a peer-reviewed outlet alongside empirical evidence for the scale's validity.
4. not require a fee to use.
5. be intended for use among adolescents and/or adults.
6. be available in the English language.

Using these criteria, the first author identified 42 aggression scales[2]. Of these 42 scales, 6 had no subscales, only a total score. The remaining 36 aggression scales were further decomposed into 88 aggression subscales (non-aggression subscales were excluded; Table 2).

[2] Unfortunately, the first author did not keep a record of the search terms he used, the number of search results he reviewed, nor the number or details of the manuscripts he rejected.

Table 2

Aggression Scales and Subscales Included in the Present Research

Scale Name	Included Subscale(s)	Citation
Abuse Within Intimate Relationships Scale (AWIRS)	Deception, Emotional Abuse, Overt Violence, Restrictive Violence, Verbal Abuse	Borjesson et al., 2003
Aggression Inventory (AI)	Physical Aggression, Verbal Aggression	Gladue, 1991
Aggression Scale (AS)	Total score only	Orpinas & Frankowski, 2001
Aggressive Acts Questionnaire (AAQ)	Impulsive Aggression, Aggressive Mood, Premeditated Aggression, Agitation	Barratt et al., 1999
Alcohol-Related Aggression Questionnaire (ARAQ)	Alcohol-Related Aggression, Trait Aggression	McMurran et al., 2006
Angry Aggression Scale (ANGAS)	Coercive Anger, Explosive Anger, Thrill-Seeking Anger, Vengeful/Ruminative Anger	Bjørnebekk & Howard, 2012
Appetitive Aggression Scale (APPAS)	Total score only	Weierstall & Elbert, 2011
Assessment of Sadistic Personality (ASP)	Pleasure-Seeking, Subjugation, Unempathic	Plouffe et al., 2017
Buss Durkee Hostility Inventory (BDHI)	Assault, Indirect Aggression, Verbal Aggression	Buss & Durkee, 1957
Buss Perry Aggression Questionnaire (BPAQ)	Physical Aggression, Verbal Aggression	Buss & Perry, 1992
Competitive Aggressiveness and Anger Scale (CAAS)	Aggressiveness	Maxwell & Moores, 2007
Comprehensive Assessment of Sadistic Tendencies (CAST)	Direct Physical, Direct Verbal	Buckels & Paulhus, 2013
Conflict in Adolescent Dating Relationships Inventory (CADRI)	Physical Abuse, Relational Abuse, Sexual Abuse, Threatening Behavior, Verbal Emotional Abuse	Wolfe et al., 2001
Crime and Analogous	Violent	Miller & Lynam, 2003

Scale Name	Included Subscale(s)	Citation
Behavior Scale (CAB)	Crime/Delinquency	
Dating-Peer Relational Aggression Scale (DPRAS)	Dating Relational Aggression Perpetration, Peer Relational Aggression Perpetration	Ellis et al., 2009
Displaced Aggression Questionnaire (DAQ)	Behavioral Displaced Aggression	Denson et al., 2006
Dogmatism Scale (DOG)	Aggression	Crowson, 2009
Expressive Aggression Questionnaire - Revised (EXPAGG)	Expressive Aggression, Instrumental Aggression	Archer & Haigh, 1997
Forms and Functions of Aggression Scale (FFA)	Pure Overt Aggression, Reactive Aggression, Instrumental Overt Aggression, Pure Relational Aggression, Reactive Relational Aggression, Instrumental Relational Aggression	Little et al., 2003
Illegal Behavior Checklist (IBC)	Violent Crimes Against People	McCoy et al., 2006
Impulsive/Premeditated Aggression Scale (IPAS)	Impulsive Aggression, Premeditated Aggression, Familiarity With Target/Remorse/Agitation	Stanford et al., 2003
Indirect Aggression Scale (IAS)	Guilt Induction Techniques, Social Exclusionary Behaviors, Use of Malicious Humor	Forrest et al., 2005
Intimate Partner Violence Attitude Scale (IPVAS)	Abuse, Violence	Smith et al., 2005
IPIP - Multidimensional Personality Questionnaire (IPIP-MPQ)	Aggression	Goldberg et al., 2006
Lifetime Assessment of Violent Acts (LAVA)	Alcohol Related Acts, Injury to Other, Intimate Partner Violence Acts, Lethal Risk Acts, Lifetime Aggressive Acts, Motivated Acts, Reactive Acts, Trouble From Violent Acts	King et al., 2017
MacArthur Community Violence Screening	Violence Perpetration	Steadman et al., 1998

Scale Name	Included Subscale(s)	Citation
Instrument (MCVSI)		
Modified Overt Aggression Scale (MOAS)	Physical Aggression, Verbal Aggression	Kay et al., 1988
Peer Conflict Scale (PCS)	Proactive Overt, Proactive Relational, Reactive Overt, Reactive Relational	Marsee & Frick, 2007
Peer Experiences Questionnaire – Revised (PEQ-R)	Overt Aggressor, Relational Aggressor	Prinstein et al., 2001
Problem Behavior Frequency Scale (PBFS)	Physical Aggression, Relational Aggression, Verbal Aggression	Farrell et al., 2016
Reactive Proactive Aggression Questionnaire (RPQ)	Reactive Aggression, Proactive Aggression	Raine et al., 2006
Richardson Conflict Response Questionnaire (RCRQ)	Direct Aggression, Indirect Aggression	Richardson & Green, 2003
Risky, Impulsive, Self-Destructive Questionnaire (RISQ)	Aggression	Sadeh & Baskin-Sommers, 2017
Sexual Experiences Survey (SES)	Sexual Aggression	Koss & Gidycz, 1985
Short Sadistic Impulse Scale (SSIS)	Total score only	O'Meara et al., 2011
Spitefulness Scale (SS)	Total score only	Marcus et al., 2014
Sub-Types of Antisocial Behavior Questionnaire (STAB)	Physical Aggression, Social Aggression	Burt & Donnellan, 2009
Vengeance Scale (VS)	Total score only	Stuckless & Goranson, 1992
Verbal Aggressiveness Scale (VAS)	Total score only	Infante & Wigley III, 1986
Zuckerman–Kuhlman-Aluja Personality Questionnaire (ZKA-PQ)	Aggression-Hostility	Aluja et al., 2010

Note. Two scales (and their three associated subscales) are not listed because we later determined that they were proprietary scales that did not meet our inclusion criteria.

From these 6 total aggression scales and 88 aggression subscales, we extracted an initial item pool of 734 aggression questionnaire items. Of these 734 aggression

questionnaire items, 7 pairs of items were redundant with each other (i.e., two items had identical or near-identical semantic content). One item from each pair was then excluded, resulting in an initial item pool of 727 items. To eliminate method variance, the first author then modified many of the questionnaire items to ensure that they each took the form of self-descriptive statements that referred to the present tense (original and modified items are presented in Supplemental Table 1). The first author also modified items to improve grammar, use more inclusive non-binary pronouns ‘they or them’ instead of binary pronouns (e.g., ‘he or she’) when the item referred to a second party, and to ensure that each item was a full stand-alone self-descriptive statement that did not require additional text from other instructions or headings or prompts. The first author made other modifications to use similarly broad terminology that captured wide ranges of potential interactions across items (e.g., ‘other people’ instead of ‘another person’) and to eliminate hypothetical language. For each item, participants rated their agreement with each self-descriptive statements using a 1 (Strongly Disagree) to 7 (Strongly Agree) response scale.

IPIP-NEO-60. We administered the 60-item version (Maples-Keller et al., 2019) of the International Personality Item Pool representation of the NEO Personality Inventory (IPIP-NEO; Goldberg, 1999; Goldberg et al., 2006). This measure captured each Five Factor Model factor with a 12-item subscale: Agreeableness, Conscientiousness, Extraversion, Neuroticism, and Openness to Experience. Each of the five factor subscales can be further divided into six facet-level subscales (two items per facet subscale). For each item, participants rated their agreement with various self-descriptive statements using a 1 (Strongly Disagree) to 5 (Strongly Agree) response

scale.

UPPS+P Impulsivity Scale. The UPPS+P Impulsivity Scale (Lynam et al., 2006; Whiteside & Lynam, 2001) includes 59 items that assess five facets of impulsive behavior: negative urgency, lack of premeditation, lack of perseverance, sensation seeking, and positive urgency. For each item, participants rated their agreement with various self-descriptive statements using a 1 (Disagree Strongly) to 4 (Agree Strongly) response scale.

Procedure

In both studies, participants completed all procedures online from a location of their choosing. After providing informed consent, participants completed a battery of demographic measures. Then, participants read a brief prompt that informed them that the following questions would ask them about their aggressive behavior: ”*The following questions will ask you about your aggressive behavior, which is defined as any attempt to hurt someone else who doesn't want to be hurt. For the following questions, please indicate the extent to which you agree or disagree with how accurately each statement describes how you typically are as a person and how you typically behave. Please do NOT reply based on how you are feeling right now, in this moment.*”

Based on participants’ qualitative feedback from Study 1, we added the following text to the prompt in Study 2 to add some clarity about a recurring term in the aggression items (i.e., ‘fights’): “*Some questions will ask you about your experiences with 'physical fights'. These don't have to be fistfights or brawls, but can include any time you and someone else tried to physically hurt each other (and neither of you wanted to be hurt). For example, you and your friend could have become mad at each*

other and you shoved each other. Even if you've never been in a fight, just imagine how you think you would behave if you did find yourself in that situation. Some questions will just refer to 'fights' without the word 'physical' attached to it. These can include physical altercations and verbal arguments."

After reading this prompt, participants completed 200 aggression questionnaire items that were randomly selected from each study's broader aggression item pool. Given that many of the questions asked participants about their aggression after alcohol consumption or in the context of an intimate partnership, we included two questions in our demographics questionnaire that asked participants if they had "ever consumed alcohol" or had "ever had a romantic partner". If participants indicated they had never consumed alcohol, the item pool that their 200 items were randomly selected from was modified to exclude all questions about alcohol-related aggression. If participants indicated they had never had a romantic partner, the item pool that their 200 items were randomly selected from was modified to exclude all questions about intimate partner aggression.

Participants then completed criterion measures (Study 1: the 12-item Agreeableness subscale of the IPIP-NEO-60; Study 2: the full IPIP-NEO-60 and the UPPS+P Impulsivity Scale), were debriefed, were given an opportunity to give us written feedback about the study, and then exited the study.

Data Analyses

Data analyses were set out in a two-stage process. An initial study (i.e., Study 1) was conducted to prune the massive initial itemset of 727 items down to a more manageable item pool. A second study (i.e., Study 2) was then conducted to factor

analyze this curated item pool.

Pruning redundant items with inter-item correlations (Study 1). After excluding items on which more than 90% of participants selected either the lowest or highest response option, we identified items with redundant levels of correlations with other items (i.e., item pairs with *correlations of* |*.65*| *and above*). Within each pair of redundantly-correlated items, we removed the item with the greatest amount of redundant pairings with other items. If the two items within the item pair had the same number of redundant correlations with other items, a random number generator determined which item to eliminate. This process sequentially removed items in a step-wise fashion until no redundant items remained. Doing so maximized the conceptual breadth and reduced the content overlap of the final item pool.

Multiple imputation. Given the massively missing-at-random design, we used multiple imputation to impute all missing datapoints using the *mice* package (version 3.13.0; van Buuren & Groothuis-Oudshoorn, 2011) in R statistical software (version 3.6.2; R Core Team, 2019). The imputation procedure used predictive mean matching to conduct 100 imputations of each original dataset, allowing a maximum of 50 iterations of the imputation procedure for each imputation to converge. This process created 100 imputed datasets that we then combined into a single imputed dataset for each study using the *sjmisc* package (version 2.8.6; Lüdecke, 2018), which replaced each missing datapoint from each original dataset with the mean value of all 100 imputed values, rounded upwards or downwards to the next whole integer (as in other psychological and personality factor analytic work: e.g., Burger, in press; Harzer et al., 2021). We did not preregister this approach to combining imputed datasets, but we

chose to do so because it proved too computationally and practically burdensome to perform all of our intended analyses with these 100 separate imputed datasets and would undermine the ease with which we were able to share and communicate our data and analyses with the public.

Parallel analyses (Study 2). To identify the optimal number of factors to extract from the Study 2 dataset, we conducted a parallel analysis using the *psych* package (version 1.9.12; Revelle, 2016). This parallel analysis compared the eigenvalues of each factor that was extracted from the real Study 2 data against resampled data, identifying the ideal number of factors by isolating the last factor (obtained from the real data) to exhibit an eigenvalue that was larger than the eigenvalue derived from the resampled data.

'Bass-ackwards' exploratory factor analyses (Study 2). A sequential series of exploratory factor analyses was used to identify a hierarchical factor structure from the top down, a variant of the method described in Goldberg's (2006) 'bass-ackwards' factor analyses. Analyses started by extracting a single factor, and then sequentially extracting one more factor until the optimal factor solution (identified by parallel analyses) was reached. Inter-factor correlations both *within* and *between* each level of the factor analysis were then calculated. This analytic approach allows investigators to examine the hierarchical factor structure of an itemset, as well as how each factor is decomposed into more specific factors. These analyses were conducted via the *psych* package, which employed a principal axis factoring method with promax rotation (at all levels excepting the initial one-factor level, in which no rotation was performed). Items from the initial, unrotated one-factor level that did not load onto this single factor at |.30|

or higher were eliminated from subsequent analyses. Items were assigned to a factor if they exhibited a factor loading of at least |.35| and did not exhibit cross-factor loadings within |.20|. All factor loadings were derived from factor pattern matrices.

Factor correlations (Studies 1 then 2). To help characterize the factors we extract from the hierarchical factor analyses, we computed and correlated the factor scores of the final factor solution with the full battery of original aggression scales from which they were made (in Study 1) and the two criterion scales (i.e., the measures of Five Factor Model personality and UPPS+P impulsivity) we included in Study 2. Doing so allowed us to identify the aggression measures that most closely corresponded to each factor, as well as the broader nomological network of each factor.

Results

Item Curation

Study 1. The initial pool of 727 items was administered in Study 1. Item responses were examined to identify those with insufficient variability (i.e., 90% of participants or more selected the same response option). This resulted in the removal of 111 items (e.g., “I attack other people with weapons”, “I have fights to be cool”, “I attack others, causing serious injuries”). Among the remaining 616 items, our iterative correlation process that identified redundant items removed 251 items. After conducting this redundancy analysis, we realized that 28 items from the original item pool had been accidentally acquired from two proprietary scales (and their three corresponding subscales) that should not have been included in the original item pool, five items of which remained in the curated item pool. Removal of these five remaining proprietary items created an abbreviated item pool of 360 items that we used in Study 2. See

Supplemental Table 1 for a list of all original and modified items, whether they were curated in this process, and the reasons that they were or were not removed from the item pool.

Study 2. The preliminary, unrotated, single factor analysis on the remaining 360 items found 71 items that did not load onto the central ‘aggression’ factor at |.30| or greater (e.g., “When other people try to ‘cut ahead’ of me in lines, I firmly tell them not to do so”, “I tell my friends openly when I disagree with them”, “I demand that people respect my rights”), and these items were removed from subsequent analyses (factor loadings provided in Supplemental Table 2, removed items highlighted in red). A final item pool of 289 items were entered into all subsequent factor analyses.

Parallel and MAP Analyses

Parallel analyses (Horn, 1965) suggested a 42 factor, 21 component solution, which was deemed excessive (true and resampled eigenvalues provided in Supplemental Table 3). Subsequently, we conducted a non-preregistered minimum average partial (MAP) analysis (Velicer, 1976) via the *psych* package that employed promax rotation and principal axis factoring. The MAP analysis suggested the default maximum of an eight factor solution (full MAP analysis output available in Supplemental Table 4), which was initially adopted.

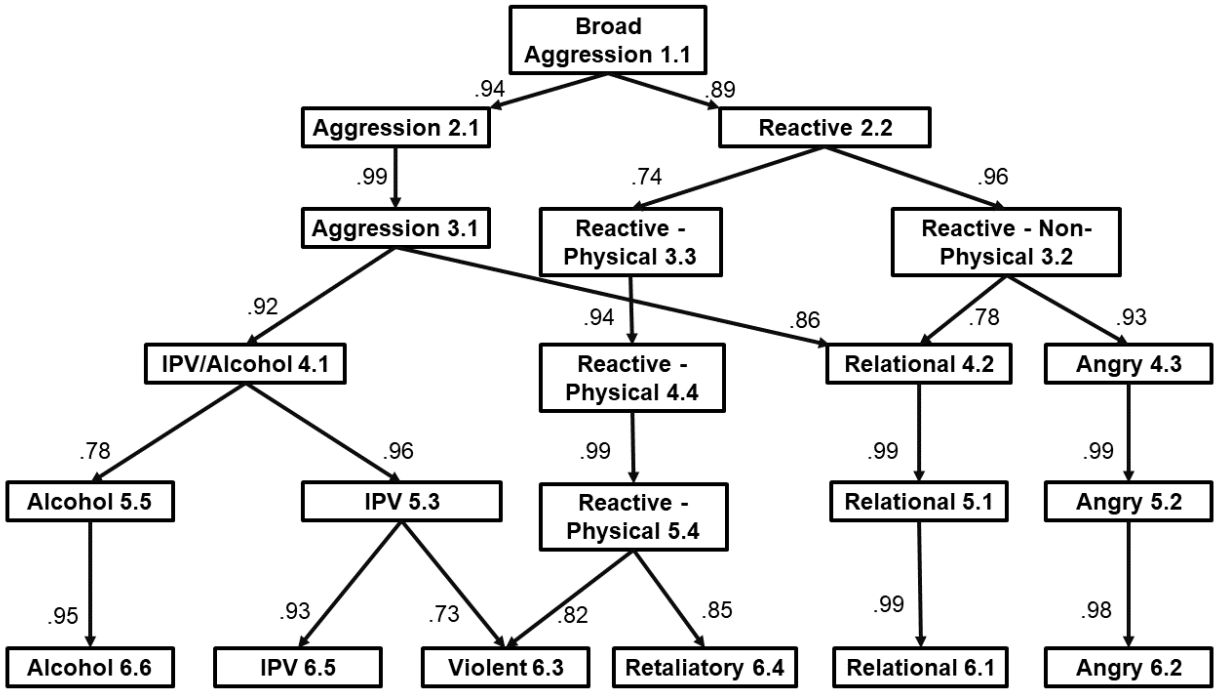
Hierarchical Structure of Aggression

We then examined the factor pattern matrix to assess the content of each of the eight initial factors. Of the eight factors we extracted from the bass-ackwards analysis, factor eight had no items that loaded at or above |.35| and was subsequently discarded. Factor seven included eight items that loaded at or above |.35|, yet every one of these

eight items had problematic cross-loadings (i.e., loadings within |.20| of the factor seven loading) with at least one of the preceding factors. As such, factor seven was also discarded, resulting in a six factor structure. The final six factor structure is depicted in Figure 1. Factor loadings, communalities, and uniqueness values for each item are provided at each level of the bass-ackwards analysis in Supplemental Table 5. Factor score correlations *within* and *across* each level of the bass-ackwards analysis are provided in Supplemental Table 6.

Factor 1

Hierarchical Factor Structure of Trait Aggression Items



Note. Only inter-factor correlations larger than |.70| are depicted.

First level. At the first level, a single 'Broad Aggression' factor (F1.1) emerged that explained 30% of the variance and was comprised of 278 items, factor score: *M* = 2.43, *SD* = 0.73. This factor's highest-loading items contained content that captured

relational forms of aggression (e.g., “I do things to try and make other people look stupid”, “If others make me upset or hurt me, I often put them down”, “To get what I want, I often say mean things to others”).

Second level. The first-level aggression factor subsequently split into two factors. This first undifferentiated ‘Aggression’ factor (F2.1; 19% variance explained, 123 items, *M* = 1.82, *SD* = 0.67) that described severe violence (e.g., “I use weapons against people”), unprovoked harm-doing (e.g., “I am deliberately cruel to others, even if they haven’t done anything to me”), intimate partner aggression (e.g., “I betray my romantic partners”), and relational aggression (e.g., “I spread false rumors about other people”). The second ‘Reactive’ factor (F2.2; 15% variance explained, 97 items, *M* = 3.24, *SD* = 0.92) comprised items describing angry, retaliatory acts against perceived provocations that were mostly verbal in nature (e.g., “When people yell at me, I yell back”). These two factors were strongly correlated, *r* = .70.

Third level. At the next level, the broad ‘Aggression’ factor (F3.1; 17% variance explained, 86 items, *M* = 1.76, *SD* = 0.67) remained largely unchanged. Conversely, the previous level’s ‘Reactive Aggression’ factor now split into a ‘Reactive - Non-Physical’ factor (F3.2; 13% variance explained, 64 items, *M* = 3.30, *SD* = 0.94), which captured angry acts of verbal aggression (e.g., “When I get mad, I say nasty things”). The other new entity from this split was a ‘Reactive - Physical’ factor (F3.3; 7% variance explained, 14 items, *M* = 2.85, *SD* = 1.01), which referred to vengeful acts of violence in response to perceived provocations (e.g., “I hit back when hit by others”) factors. These three factors were strongly correlated, *r*s = .56 to .60 (individual inter-factor correlations available in Supplemental Table 6).

Fourth level. The previous level's broad 'Aggression' factor now split into a combined 'IPV and Alcohol' factor (F4.1; 11% variance explained, 45 items, *M* = 1.77, *SD* = 0.70), which characterized by acts of violence directed at intimate partners (e.g., "I scream at my romantic partners") and others (e.g., "I use weapons to threaten people."), which were sometimes related to alcohol intoxication (e.g., "Drinking alcohol makes me aggressive"). The second factor from this split was a 'Relational' factor (F4.2; 12% variance explained, 46 items, *M* = 2.10, *SD* = 0.84), which was also constructed from the previous level's 'Reactive Non-Physical' factor. This factor reflected verbal and social forms of reputational and exclusionary aggression (e.g., "I enjoy making fun of others"). The previous level's 'Reactive Non-Physical' factor also contributed to a new 'Angry' factor (F4.3; 10% variance explained, 40 items, *M* = 3.45, *SD* = 0.99). This new factor reflected the tendency to experience heightened anger and for that anger to express itself in the form of impulsive aggression (e.g., "When I am angry, I react without thinking"). The 'Reactive - Physical' factor from the previous level re-emerged here as well (F4.4; 7% variance explained, 18 items, *M* = 2.86, *SD* = 0.98), largely unchanged. These four factors were strongly correlated, *r*s = .44 to .62 (individual inter-factor correlations available in Supplemental Table 6).

Fifth level. At this next level, the 'Relational' (F5.1; 13% variance explained, 54 items, *M* = 2.02, *SD* = 0.76) and 'Angry' factors (F5.2; 10% variance explained, 41 items, *M* = 3.50, *SD* = 0.98) re-emerged, alongside the 'Reactive - Physical' factor (F5.4; 8% variance explained, 26 items, *M* = 2.55, *SD* = 0.88). However, the previous level's 'IPV and Alcohol' factor split into a broad 'IPV' factor (F5.3; 8% variance explained, 24 items, *M* = 1.98, *SD* = 0.86), which was characterized by violent acts

toward intimate partners (e.g., “I threaten to break up with my romantic partners to get them to do what I want”) and others (e.g., “During conflicts with other people, I throw things at them”). The other factor that emerged from this split was an ‘Alcohol’ factor (F5.5; 3% variance explained, 13 items, *M* = 2.13, *SD* = 0.92), which captured the tendency to aggress during alcohol consumption and intoxication (e.g., “The more alcohol I drink, the more argumentative I get.”). These five factors were strongly correlated, *r*s = .31 to .63 (individual inter-factor correlations available in Supplemental Table 6).

Sixth level. At the final level, the ‘Relational’ (F6.1; 13% variance explained, 62 items, *M* = 2.04, *SD* = 0.80), ‘Angry’ (F6.2; 9% variance explained, 32 items, *M* = 3.29, *SD* = 1.01), and ‘Alcohol’ (F6.6; 3% variance explained, 11 items, *M* = 2.20, *SD* = 0.98) factors re-emerged. A new ‘Violent’ factor emerged (F6.3; 7% variance explained, 18 items, *M* = 1.65, *SD* = 0.72) from the previous level’s broad ‘IPV’ and ‘Reactive - Physical’ factors, which captured severe acts of overt, physical harm-doing (e.g., “I get in physical fights with other people”). The previous level’s ‘Reactive - Physical’ factor also contributed to a new ‘Retaliatory’ factor (F6.4; 6% variance explained, 20 items, *M* = 3.12, *SD* = 0.96), which referred to retaliatory acts of physical and verbal aggression in response to perceived provocation (e.g., “I fight back when other people hit me first”). The previous level’s broad ‘IPV’ factor also contributed to a new factor that was specific to intimate partner aggression, creating a specific ‘IPV’ factor (F6.5; 5% variance explained, 23 items, *M* = 1.95, *SD* = 0.85; e.g., “I say things just to make my romantic partners angry”).

These six factors were strongly positively correlated, though the Alcohol factor

was more weakly correlated across the other factors (Table 3). The final 166 items from the six-factor solution are presented in Supplemental Document 1 as the Comprehensive Aggression Scale (CAS).

Table 3

Zero-Order Correlations Between Each of the Sixth-Level Aggression Factors from Study 2

Aggression Factor	6.1	6.2	6.3	6.4	6.5
6.1 - Relational					
6.2 - Angry	.54				
6.3 - Violent	.56	.32			
6.4 - Retaliatory	.59	.59	.42		
6.5 - Intimate	.61	.39	.47	.37	
6.6 - Alcohol	.52	.35	.52	.41	.45

Note. All correlations are significant at $p < .001$.

Correlations with Original Scales

We returned to the Study 1 dataset, as it had the full item pool from the 42 scales that we could use to compute the 6 total scale scores and 88 subscale scores to examine how the factors extracted from the bass-ackwards analysis mapped onto these original measures. The large amount of planned missing data required us to use latent correlations within a structural equation modeling framework, which allowed us handle the missingness via full information maximum likelihood (FIML) estimation. FIML exhibits excellent estimation performance with planned missingness levels at and below those used in Study 1 (Zhang & Yu, 2022). We deviated from our preregistered imputation approach because multiple imputation with the previously-used parameters proved computationally impossible for the level of missingness inherent in Study 1. As such, we used the *lavaan* package (version 0.6-13) for R statistical software (version 4.2) to estimate these latent correlations, the strongest of which are summarized in

Table 4 (full results in Supplemental Table 7).

Table 4

The Five Measures with Strongest Latent Associations with Each Sixth-Level Factor from Study 1

6.1 Relational	6.2 Angry	6.3 Violent	6.4 Retaliatory	6.5 Intimate	6.6 Alcohol
PBFS - Verbal Aggression (β = 1.08)	AAQ - Agitation (β = 1.00)	RISQ - Aggression (β = 1.05)	AI - Physical Aggression (β = 1.03)	LAVA - Intimate Partner Violence (β = 1.05)	ARAQ - Alcohol Aggression (β = 1.00)
PCS - Proactive Relational (β = 1.04)	RPQ - Reactive Aggression (β = 0.94)	AAQ - Premeditated Aggression (β = 1.04)	FFA - Reactive (β = 1.00)	DPRAS - Dating Relational (β = 1.00)	LAVA - Alcohol Related Acts (β = 0.98)
FFA - Pure Relational (β = 1.00)	LAVA - Intimate Partner Violence (β = 0.94)	APPAS (β = 1.02)	BDHI - Assault (β = 1.00)	AWIRS - Verbal Abuse (β = 1.00)	SES - Sexual Aggression (β = 0.83)
IAS - Social Exclusion (β = 1.00)	DAQ - Displaced Aggression (β = 0.94)	PCS - Reactive Overt (β = 1.02)	EXPAGG - Instrumental Aggression (β = 0.99)	IPVAS - Abuse (β = 0.91)	ARAQ - Trait Aggression (β = 0.67)
IAS - Guilt Induction (β = 1.00)	ANGAS - Explosive Anger (β = 0.92)	MCVSI - Violence Perpetration (β = 1.01)	BPAQ - Physical Aggression (β = 0.98)	AWIRS - Emotional Abuse (β = 0.89)	LAVA - Lethal Risk Acts (β = 0.64)

Note. Latent factor associations, acquired from the std.all estimates of the lmer output, are loosely ordered within each column from top (strongest association) to bottom (weakest association). Abuse Within Intimate Relationships Scale = AWIRS, Aggression Inventory = AI, Aggressive Acts Questionnaire = AAQ, Alcohol-Related Aggression Questionnaire = ARAQ, Angry Aggression Scale = ANGAS, Appetitive Aggression Scale = APPAS, Buss Durkee Hostility Inventory = BDHI, Buss Perry Aggression Questionnaire = BPAQ, Dating-Peer Relational Aggression Scale = DPRAS, Displaced Aggression Questionnaire = DAQ, Expressive Aggression Questionnaire - Revised = EXPAGG, Forms and Functions of Aggression Scale = FFA, Indirect Aggression Scale = IAS, Intimate Partner Violence Attitude Scale = IPVAS, Lifetime Assessment of Violent Acts = LAVA, MacArthur Community Violence Screening Instrument = MCVSI, Peer Conflict Scale = PCS, Problem Behavior Frequency Scale = PBFS, Reactive Proactive Aggression Questionnaire = RPQ, Sexual Experiences Survey = SES.

Correlations with Criterion Scales

Descriptive statistics, including internal consistency estimates, for Study 2's criterion measures are provided in Supplemental Table 8. Each aggression factor's associations with all five FFM personality factors are available in Table 5. Higher scores across the aggression factors we extracted were most robustly associated with low agreeableness, *r*s = -.28 to -.61. These aggression factors were strongly positively correlated with neuroticism, negatively correlated with conscientiousness, weakly and inconsistently linked to openness, and unassociated with extraversion. At the six factor level, antagonism was most positively associated with higher levels of the Relational aggression factor and least associated with the sixth Alcohol aggression factor. The Retaliatory aggression factor was relatively less negatively associated with conscientiousness. The Angry aggression factor was uniquely positively associated with neuroticism.

Table 5

Zero-Order Correlations Between Each Aggression Factor and the FFM Personality Factors from Study 2

Factor	A	C	E	N	O
1.1	-.55	-.35	-.03	.35	.00
2.1	-.59	-.36	-.04	.23	-.11
2.2	-.42	-.29	-.01	.41	.10
R^2	.35	.13	.00	.18	.07
3.1	-.58	-.35	-.04	.22	-.12
3.2	-.40	-.30	-.04	.46	.11
3.3	-.38	-.16	.07	.14	.04
R^2	.34	.15	.02	.26	.08
4.1	-.49	-.33	-.06	.21	-.16
4.2	-.60	-.36	-.05	.27	-.02
4.3	-.33	-.30	-.05	.50	.12
4.4	-.43	-.16	.07	.11	.04

Factor	A	C	E	N	O
R^2	.39	.16	.02	.32	.08
5.1	-.60	-.36	-.04	.26	-.04
5.2	-.33	-.29	-.04	.49	.13
5.3	-.46	-.30	-.07	.22	-.16
5.4	-.46	-.20	.05	.14	.01
5.5	-.29	-.25	-.01	.20	-.06
R^2	.38	.15	.02	.30	.09
6.1 - Relational	-.61	-.36	-.04	.27	-.03
6.2 - Angry	-.33	-.33	-.06	.52	.12
6.3 - Violent	-.49	-.30	-.03	.22	-.07
6.4 - Retaliatory	-.44	-.14	.08	.12	.03
6.5 - Intimate	-.46	-.30	-.07	.21	-.16
6.6 - Alcohol	-.28	-.24	.00	.19	-.05
R^2	.40	.18	.04	.36	.09

Note. FFM = Five Factor Model; A = agreeableness, C = conscientiousness, E = extraversion, N = neuroticism, O = openness. Unshaded cells: $p < .001$; Light gray shaded cells: $p < .05$; dark gray shaded cells: $p > .05$. R^2 reflects variance explained in the given FFM factor by all aggression factors within each level, as estimated via multiple linear regression.

We then conducted exploratory bivariate correlations between each of the six factors and the 30 FFM facets to examine finer details about their nomological network (Table 6; agreeableness, conscientiousness, and neuroticism facet correlations with all aggression factors from all levels are available in Supplemental Table 9).

Table 6

Zero-Order Correlations Between Each of the Sixth-Level Aggression Factors and the FFM Personality Facets from Study 2

FFM Facet	6.1	6.2	6.3	6.4	6.5	6.6	R^2
A - Altruism	-.23	-.07	-.21	-.13	-.18	-.09	.08
A - Cooperation	-.69	-.48	-.52	-.55	-.46	-.31	.50
A - Modesty	-.27	-.14	-.19	-.29	-.18	-.16	.11
A - Morality	-.54	-.29	-.39	-.30	-.43	-.24	.31
A - Sympathy	-.16	.06	-.15	-.03	-.16	-.06	.09
A - Trust	-.13	-.14	-.18	-.15	-.13	-.05	.04
C - Achievement	-.16	-.03	-.17	-.03	-.16	-.11	.06
C - Cautiousness	-.34	-.42	-.32	-.20	-.26	-.25	.21
C - Dutifulness	-.34	-.21	-.26	-.10	-.31	-.19	.15
C - Orderliness	-.20	-.17	-.17	-.10	-.17	-.14	.05
C - Self-Discipline	-.23	-.26	-.16	-.11	-.16	-.14	.09
C - Self-Efficacy	-.13	-.13	-.09	.02	-.11	-.09	.06
E - Activity	.00	.03	.03	.05	.01	-.01	.01
E - Assertiveness	.08	.08	.08	.17	.01	.06	.04
E - Cheerfulness	-.12	-.18	-.11	-.02	-.10	-.07	.05
E - Excitement-Seeking	-.02	.05	-.04	.11	-.06	-.01	.04
E - Friendliness	-.13	-.14	-.11	-.01	-.15	-.05	.05
E - Gregariousness	.03	-.06	.01	.04	.02	.04	.02
N - Anger	.37	.61	.44	.36	.36	.29	.41
N - Anxiety	.02	.30	-.04	.01	-.02	.01	.19
N - Depression	.21	.35	.13	.10	.10	.09	.17
N - Immoderation	.17	.18	.12	.04	.08	.11	.06
N - Self-Conscious	.13	.28	.05	-.03	.11	.08	.16
N - Vulnerability	.08	.22	.10	-.04	.12	.11	.11
O - Adventurousness	-.13	-.19	-.05	-.04	-.10	-.05	.06
O - Artistic	-.06	.04	-.11	-.01	-.14	-.07	.04
O - Emotionality	.03	.28	.03	.03	-.01	.04	.15
O - Imagination	.02	.09	-.01	.07	-.06	-.04	.03
O - Intellect	-.05	.00	-.06	.04	-.16	-.06	.04
O - Liberalism	.08	.15	-.04	.02	-.08	-.01	.09

Note. FFM = Five Factor Model; A = agreeableness, C = conscientiousness, E = extraversion, N = neuroticism, O = openness. Unshaded cells: $p < .001$; Light gray shaded cells: $p < .05$; dark gray shaded cells: $p > .05$. R^2 reflects variance explained in the given FFM facet by all six aggression factors within the sixth level, as estimated via multiple linear regression.

Each aggression factor's associations with UPPS-P impulsivity factors are available in Table 7 (FFM and UPPS-P correlations are available in Supplemental Table

10). Both negative and positive urgency exhibited the most consistent and robust associations with the aggression factors we extracted. At the six factor level, negative urgency exhibited a particularly strong, positive association with the Angry aggression factor.

Table 7

Zero-Order Correlations Between Each Aggression Factor and the UPPSP Impulsivity Factors from Study 2

Factor	NU	PE	PR	SS	PU
1.1	.54	.21	.20	.15	.48
2.1	.45	.21	.24	.13	.50
2.2	.55	.17	.13	.14	.38
R^2	.31	.05	.06	.02	.25
3.1	.43	.21	.24	.11	.49
3.2	.56	.20	.12	.10	.37
3.3	.33	.06	.10	.20	.28
R^2	.33	.07	.06	.04	.25
4.1	.40	.18	.20	.07	.44
4.2	.47	.25	.22	.11	.46
4.3	.58	.19	.12	.09	.36
4.4	.30	.05	.08	.22	.27
R^2	.37	.09	.06	.05	.24
5.1	.46	.24	.22	.12	.47
5.2	.57	.18	.11	.09	.34
5.3	.37	.17	.14	.04	.38
5.4	.34	.08	.13	.21	.33
5.5	.37	.14	.19	.11	.37
R^2	.36	.08	.06	.06	.25
6.1 - Relational	.47	.25	.23	.12	.47
6.2 - Angry	.61	.21	.16	.09	.37
6.3 - Violent	.40	.17	.23	.13	.44
6.4 - Retaliatory	.32	.05	.06	.22	.27
6.5 - Intimate	.36	.17	.14	.04	.38
6.6 - Alcohol	.35	.13	.18	.10	.35
R^2	.41	.10	.10	.06	.27

Note. NU = Negative urgency, PE = Lack of Perseverance, PR = Lack of Premeditation, SS = Sensation Seeking, PU = Positive Urgency. Unshaded cells: $p < .001$; Light gray shaded cells: $p < .05$; dark gray shaded cells: $p > .05$. R^2 reflects variance explained in the given UPPSP factor by all aggression factors within each level, as estimated via multiple linear regression.

Exploratory Robustness Checks

Gender. The gender composition of Study 2's sample was heavily biased towards cisgender women. As a practical exercise to estimate the extent to which this over-representation of cisgender women affected our factor solution, we conducted a series of robustness analyses. We did not perform specific comparisons of different gender identity or sex assignment groups as this would have been outside the scope of these robustness checks. Welch's independent *t*-tests (selected because they do not assume equality of variances across groups) on the final six aggression factor scores revealed that cisgender women scored lower than men and other gender identities on Relational, Violent, Retaliatory, and Alcohol aggression factors, but did not differ on Angry and Intimate Partner aggression factors (Table 8).

Table 8

Comparing Cisgender Women to Men and Other Gender Identities on Aggression Factor Scores

	Cisgender Women		Men+					95% CI	
Factor	*M*	*SD*	*M*	*SD*	*t*	*p*	*d*	*Lower*	*Upper*
6.1 - Relational	1.97	0.78	2.25	0.83	-5.85	< .001	-.36	-.48	-.24
6.2 - Angry	3.31	1.04	3.22	0.91	1.61	.109	.09	-.03	.21
6.3 - Violent	1.60	0.70	1.78	0.74	-4.11	< .001	-.25	-.37	-.14
6.4 - Retaliatory	2.98	0.95	3.39	0.93	-7.21	< .001	-.43	-.55	-.31
6.5 - Intimate	1.94	0.82	1.96	0.91	-0.48	.630	-.03	-.15	.09
6.6 - Alcohol	2.13	0.96	2.37	1.02	-3.98	< .001	-.25	-.37	-.13

Note. Men+ = Cisgender men, transgender men, non-binary, and other gender identities.

To estimate whether our findings would change if we imposed parity between cisgender women and cisgender men, we excluded a random subset of 735 cisgender women participants (such that there were now equal numbers of cisgender men and

women) and re-ran the bass-ackwards analysis on the same pool of 360 aggression items we administered in Study 2. We observed a similar six factor solution onto which 285 of these 360 items loaded. Of those 285 items, 284 items were the same items identified from the full sample's factor analysis and captured only one additional item that was not identified in the full sample's factor analysis (Supplemental Tables 11-15). The hierarchy of these six factors was articulated in a similar manner, though there were several notable differences (Supplemental Figure 1; Supplemental Table 15). Relational aggression now emerged as a distinct factor at the second level, as opposed to the fourth level in the full sample. Conversely, reactive - physical aggression now emerged at the lower, fourth level. Alcohol aggression now emerged at the fifth level where it was no longer lumped together with violence, as opposed to the sixth level in the full sample.

Alcohol consumption. Participants who had never consumed alcohol did not respond to alcohol-related aggression items, yet our imputation procedure imputed these intentionally missing datapoints. To estimate whether our findings would change if we constrained our analyses to participants who were not alcohol naive, we excluded 332 participants who had never consumed alcohol from our dataset and re-ran the bass-ackwards analysis. We observed a similar six factor solution that captured 287 out of the original 289 items from the full Study 2 sample's factor analysis and captured six additional items (Supplemental Tables 16-20). The hierarchy of these six factors was articulated in a similar manner and most crucially, the Alcohol aggression factor emerged in an identical manner at the fifth level (Supplemental Figure 2; Supplemental Table 20).

Relationship status. Participants who had never had a romantic partner did not respond to intimate partner aggression items, yet our imputation procedure imputed these intentionally missing datapoints. To estimate whether our findings would change if we constrained our analyses to participants who had had a romantic partner, we excluded 399 participants who had never had a romantic partner from our dataset and re-ran the bass-ackwards analysis. We now observed a five factor solution (due to the sixth factor now consisting of only six items that all had problematic cross-factor loadings) that captured 287 out of the original 289 items from the full Study 2 sample's factor analysis and captured four additional items (Supplemental Tables 21-25). The hierarchy of these five factors was articulated in a similar manner to the full sample --- at the fifth level, Intimate Partner Violence remained combined with general Violence (Supplemental Figure 3; Supplemental Table 25).

Response style. Given that all reverse-scored items were eliminated from the final item pool, we sought to examine in an exploratory manner whether response styles such as acquiescence bias (instead of true trait variance) might have artificially eliminated these items. To do so, we followed the procedures of Ashton and colleagues (2017) by first identifying one of the original aggression scales administered in Study 1 that contained a balanced amount of reverse-scored and non-reverse-scored items with similar construct coverage. This took the form of the Vengeance Scale (VS; Stuckless & Goranson, 1992), which contained 10 reverse-scored items and 10 non-reverse-scored items. We then re-ran latent association analyses to separately examine associations between each of the sixth-level aggression factors and the (A) non-reverse-scored items and (B) reverse-scored VS items. To ensure similarity in direction of the

associations, we reverse-scored the reverse-scored items prior to entering them into the latent association analyses. Strongly suggesting the presence of a robust response bias, we found considerable differences between the size of the correlations between each of the aggression factors and the two response-style subscales of the VS (Table 9).

Table 9

Latent Associations Between Non-Reverse-Scored and Reverse-Scored Vengeance Scale Subscales and Aggression Factor Scores

VS Subscale	6.1 - Relational	6.2 - Angry	6.3 - Violent	6.4 - Retaliatory	6.5 - Intimate	6.6 - Alcohol
Non-Reverse-Scored	.78***	.60***	.73***	.82***	.42***	.43***
Reverse-Scored	.22***	.01	.38***	.22**	.06	.11

Note. Latent factor associations were acquired from the std.all estimates of the lmer output. **p < .01, ***p < .001. VS = Vengeance Scale.

Discussion

Aggression is a core topic of study throughout sub-disciplines of psychology including personality, social, clinical, developmental, and industrial-organizational. Scholarly and practical interest in this costly and complex behavior have resulted in the proliferation of aggression measures and models. Most of the growth has taken the form of self-report questionnaires that assess broad-scale, dispositional tendencies towards different forms and facets of aggression. We identified 42 scales with 88 subscales, comprised of 734 items, which we distilled down to 166 items that loaded onto six factors using hierarchical exploratory factor analyses (as in Crowe et al., 2018; Sleep et al., 2021). In doing so, we sought to bring consensus and clarity to this area while informing theoretical models of aggression.

The Structure of Aggressive Personality

We extracted an initial Broad Aggression factor from the item pool that was best characterized by items capturing relational aggression, defined as non-physical forms of harm perpetrated with the intent of social injury (Parrott & Giancola, 2007), and angry aggression, defined as aggressive acts performed in the psychological context of felt anger (Buss & Perry, 1992). Yet even these angry acts were more verbal than physical in their description. Though aggression is prototypically construed as an overt physical act that entails bodily harm, it appears that the primary theme of the available measures focused on more social and relational forms of harm-doing. This prevalence of relational aggression may reflect the aggressive tendencies of our undergraduate sample. Samples that include people who are more prone to physical and severe aggression (e.g., prisoners convicted of violent crimes) may yield less primacy of relational aggression, though this remains to be tested.

This initial factor was broken down into a final, six-factor solution that largely failed to support our preregistered predictions as to how neatly the factors would articulate themselves. However, the final six factor structure did *roughly* support our predictions that we would observe factors that differentiated physical versus verbal forms of aggression, as in the dominant Buss and Perry (1992) model. We further witnessed physical and verbal aggression further subdivide into reactive and (to a much lesser degree) proactive functional forms, as in Raine and colleagues (2006). Though this four-factor 'forms and functions' model of aggression (Marsee et al., 2011) --- comprised of proactive-physical, proactive-relational, reactive-physical, and reactive-relational aggression --- never clearly appeared in earlier factor solutions, the final factor solution did approximate this articulation by-and-large. Indeed, the Angry aggression

factor largely corresponded to reactive-relational aggression, as the items almost always referenced provocation and acts of aggression that were largely non-physical. The Retaliatory factor clearly mapped onto reactive-overt aggression as provocation was most frequently mentioned and the aggressive acts were physical. Proactive aggression factors were less clearly represented. The Relational aggression factor largely mapped onto proactive-relational aggression as the items did not often include mentions of being provoked or subsequent retaliation, this factor correlated strongly with the original proactive aggression (and not the original reactive aggression) scales, and the aggression was almost always non-physical in nature. The Violent aggression factor roughly reflected proactive-overt aggression given the lack of provocation mentioned in the items, strong links to the original proactive aggression (and weaker links to the original reactive aggression) scales, and the physical and severe nature of the aggressive acts. Further in line with our predictions, these four factors were supplemented by Intimate Partner and Alcohol aggression factors, suggesting that these two additional forms of aggression are not mere manifestations of the broader four-factor structure, but are meaningfully different and should be assessed as such.

This six-factor solution was inevitably a product of the scale content that we extracted from the existing aggression literature. Additional factors would certainly arise if we included novel or additional items from measures of different forms of aggression. For example, none of the measures or items we included sought to measure aggression perpetrated by or on behalf of authority figures --- an important and neglected facet of aggression. If our initial item pool had included a substantial amount of such authoritarian aggression content, this may have arisen in a separate factor reflecting

that construct. As such, it is critical to acknowledge that the six-factor structure we observed is merely a reflection of what the psychometric literature has prioritized and not a purely veridical representation of the true diversity of the phenotype of aggressive personality.

The Comprehensive Aggression Scale (CAS)

We assembled the 166 items that comprised the final six factor structure into the Comprehensive Aggression Scale (CAS), with subscales for each of the six factors. Though preliminary, these items hold promise for serving as an initial pool of content that appears to capture the primary forms and functions of trait aggression. Further research using item-response theory, longitudinal and experimental designs, and other validation techniques are needed to hone this initial manifestation of the CAS into a reliable and accurate approach to measuring these six factors of aggression in a more efficient manner. Until then, the CAS should not be adopted as a new gold-standard measure of trait aggression.

Many of these CAS items were developed decades ago (e.g., eight items from the Buss Durkee Hostility Inventory that was published in 1957) and the modernization or generation of entirely new item content that reflects current vernacular and society is likely warranted. Further, none of the 166 CAS items were reverse-scored, which our findings suggest is not due to true trait variance and is instead largely due to variance in participants' response styles. Specifically, a meaningful proportion of the observed between-participant variance in CAS scores is likely due to method variance that arises from the tendency for some individuals to agree or disagree with statements about themselves, independent of item content. This method variance issue likely inflated the

correlations among CAS subscales and between CAS subscales and other measures. Further, this variance issue likely differed between items with socially-undesirable (versus socially-desirable) wording. The lack of reverse-scored CAS items resulted in an item pool biased towards socially-undesirable content and this may complicate the interpretation of CAS scores. Future validation efforts exerted upon the CAS and other aggression self-report measures will likely benefit from eliminating such method variance issues from the item pool by crafting items that do not evoke biased responding. Whether these initial CAS items are ultimately used or not, we hope that the future of trait aggression psychometrics will be characterized by a search for consensus and standardization and not an ongoing proliferation of new measures.

We included 14 of the core items of the premiere trait aggression measure, the Buss-Perry Aggression Questionnaire (1992), three of which were initially culled from our item pool because they were redundant with other items, two more items did not sufficiently load upon the initial aggression factor, and seven more items exhibited problematic cross-loadings. Ultimately, only two of the Buss-Perry items were retained in the CAS, which loaded onto the Violent aggression factor. This poor performance of the Buss-Perry items is troubling given the widespread use of this measure. It may be that items from this measure simply capture trait aggression in general and not any of the six specific factors we identified. Yet of the initial 360 items we entered into the unrotated single-factor analysis, none of the Buss-Perry items were ranked in the top 100 strongest loading items (most were ranked 117-204 in positive loading strength). Thus, it is unlikely that Buss-Perry items are ideal exemplars of the trait aggression item pool. Future research is needed to determine if these critiques of this measure are

warranted, and if they are, what steps need to be taken to identify a superior measure.

Relations to the Five Factor Model of Personality and Impulsivity

In line with our preregistered predictions and previous meta-analyses (e.g., Hyatt et al., 2019; Vize et al., 2019), low agreeableness (i.e., antagonism) was the most robust predictor of aggression across the six factors. This fits with calls to couch aggression as a facet that lies primarily within the broader personality domain of antagonism (Chester & West, 2020). Yet this antagonism-aggression link was not the strongest for all of the six factors. The Angry aggression factor's strongest FFM link was with neuroticism, which was not merely due to the presence of an angry hostility facet on this broader negative affectivity domain (the Angry aggression factor's correlation with neuroticism minus both angry hostility items, $r = .41$, $p < .001$). Conscientiousness was often a robust FFM correlate of aggression factor scores as well, consistent with the core role this domain plays in both aggression specifically and externalizing behavior more generally. Together, these results provide ample support for the primary role of antagonism, secondary roles for neuroticism and conscientiousness, and a weak role for extraversion and openness.

The facet-level FFM analyses supported the broader conclusions we reached from the factor-level FFM analyses. Across all factors, the two-item Cooperation facet of the IPIP-NEO-60's Agreeableness scale (Maples-Keller et al., 2019) was the most robust positive correlate of aggression. Given the content of this subscale's items, (i.e., "I insult people", "I get back at others"), it is likely that this measure could be more accurately construed as a measure of trait aggression instead of cooperation. Other key facets were heightened anger, a lack of morality, and a lack of cautiousness, which fit

well with past survey research (Chester & West, 2020), but not with findings from behavioral laboratory measures of aggression (Hyatt et al., 2020). More work is needed to address this gap but is likely due to the nature of lab measures of aggression that measure the construct via regimented, repeated trials and thus may inadvertently downplay the role of disinhibition.

Across aggression factors, the strongest correlates with impulsivity were negative and positive forms of urgency. This replicates past work and highlights the crucial role of emotion-driven impulsivity in predicting aggression (Bresin, 2019). The Retaliatory factor was conspicuously unassociated with a lack of both perseverance and premeditation, suggesting that many revenge-minded individuals do not exhibit deficits in self-control, but may actually have surfeits thereof (West et al., 2022). What is clear is that impulsivity is a critical variable for understanding aggression in its many forms.

Gender

Our factor analytic results were largely robust to the gender composition of our sample. Yet we did not examine gender and sex in substantive ways, instead focusing on the practical purpose of ensuring the reliability of our factor solutions to the sample's gender composition. Future research is needed with samples that afford researchers to examine gender and sex and their impact on the factor structure, item functioning, and psychometrics of trait aggression scales. Yet our limited examination of gender comparisons did yield some interesting findings the deserve further exploration. As seen in much of the literature (Björkqvist, 2018; Denson et al., 2018), cisgender women were less prone to violent, retaliatory, and alcohol-related aggression than men and those with other gender identities. Curiously, women also reported lower tendencies towards

relational aggression than men and those with other gender identities. This finding does not fit with conventional approaches to gender differences in aggression, which emphasize that men are prone to overt, physical, and violent aggression whereas women are prone to indirect, social, verbal, and relational forms of aggression. Instead, our findings lend support to a growing movement to recognize that men may be more prone to *both* overt and relational forms of aggression (e.g., Loudin et al., 2003).

Limitations and Future Directions

We did not include any measures or conduct any analyses to ensure valid responding, which means that some of the responses to our items may not be valid. We obtained two samples with remarkable ethnic, racial, and socioeconomic diversity, yet despite their diversity, the students we sampled were from a constrained cultural setting that must be expanded with more diverse samples in the future.

The six factor solution we observed was largely robust to the gender identity composition of the sample, as well as the exclusion of participants who had never consumed alcohol, but a five factor solution was preferred when we removed participants who had never had an intimate partner. It is unclear if this change was due to statistical power issues or something more content-related, but future research should examine why the six factor structure was not robust to this aspect of participants.

The factor solutions that the analysis identified only explained between 30% (at the first level) and 43% (at the sixth level) of the overall variance in participants' responses. This is very similar to other such hierarchical factor analyses of broad personality item pools (e.g., Sleep et al., 2021), highlighting the limited ability of factor analyses to capture the majority of variance in such complex constructs that are varied

with such a wide array of item content. Yet even these limited levels of explained variance may have been inflated by the shared method of self-report questionnaire items. Other sources of reports and behavioral measures are needed to examine if the factor structure we observed holds true in other psychometric domains, such as behavioral laboratory-based measures of aggression. Further, combining the imputed datasets, as we were forced to do, likely inflated the inter-item and inter-factor correlations we observed. Future analyses should be able to be performed on an array of imputed datasets, obviating this issue.

Conclusions

The development and validation of new measures is a valuable wellspring for psychological science. Yet unchecked, such growth can create confusion and disorder that undermines sound conclusions and interferes with the cumulative growth of research findings. From the existing array of aggression personality questionnaires, we identified a six-factor solution that reifies the critical role of forms (relational and overt) and functions (reactive and proactive) of aggression, as well as aggression that occurs in the context of intimate partnerships and alcohol consumption. We hope that these findings provide some consensus and coherence for the conception and measurement of aggressive personality.

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Comprehensive Aggression Scale

The following statements refer to your aggressive behavior, which is defined as any attempt to hurt someone else who doesn't want to be hurt. Please indicate the extent to which you agree or disagree with how accurately each statement describes how you typically are as a person and how you typically behave. Please do NOT reply based purely on how you are feeling right now, in this moment.

Please use a 1 (Strongly Disagree) to 3 (Neither) to 5 (Strongly Agree) response scale.

----------Relational Aggression----------

1. I'm the kind of person who gossips or spreads rumors.
2. I intentionally damage other people's reputations.
3. When I am angry at other people, I try to damage their reputation by gossiping about them or passing on negative information about them to other people.
4. I do things to try and make other people look stupid.
5. Perhaps I shouldn't, but I never get tired of mocking certain people.
6. I intentionally embarrass people around others.
7. I gossip about others to become popular.
8. I enjoy making fun of others.
9. When other people do things that make me angry, I try to embarrass them or make them look stupid in front of their friends.
10. I pick on other people.
11. I exclude other people from groups.
12. I deliberately exclude others from my groups, even if they haven't done anything to me.
13. I make negative comments about others' appearances.
14. When I am angry at others, I try to make them look bad.
15. I am purposely mean to some people.
16. Part of me enjoys seeing the people that I do not like fail, even if their failure hurts me in some way.
17. I don't invite other people to parties or other social events even though I know that they want to go to them.
18. During conflicts with other people, I gossip about them behind their back.
19. I make negative comments about the physical appearance of other people.
20. When I get annoyed, tormenting people makes me feel better.
21. I reveal other people's secrets when I am angry with them.
22. I tease other people to make them angry.
23. I tell others' secrets for things they did to me a while back.
24. I call other people names behind their back.
25. I think it is OK to make trouble for annoying people.
26. I taunt other people to make them lose concentration.
27. I make other people feel that they don't fit in.

28. I spread false rumors about other people.
29. I purposefully leave other people out of activities.
30. I accuse other people of things while making it appear like I said those things in fun.
31. I try to influence other people by making them feel guilty.
32. I'd lie to other people to make them upset.
33. To get what I want, I often say mean things to others.
34. When I am not able to refute others' positions, I try to make them feel defensive in order to weaken their positions.
35. I call other people names.
36. I am rude towards others.
37. I use other people's feelings to coerce them.
38. When others upset me, I tell my friends to stop liking those people.
39. I'm the kind of person who takes things from others.
40. If individuals I am trying to influence really deserve it, I attack their character.
41. I criticize other people in public.
42. I never get tired of pushing people around.
43. I enjoy inciting other people to fight.
44. During conflicts with other people, I make negative comments about their appearance to others.
45. When I make fun of other people, it is especially amusing if they realize what I'm doing.
46. I cheat to get ahead.
47. When I want things from friends of mine, I act ‘cold’ or indifferent towards them until I get what I want.
48. I make new friends to get back at people who have made me angry.
49. I dominate others using fear.
50. If others make me upset or hurt me, I often put them down.
51. I use my relationship with other people to try and get them to change decisions.
52. I use private in-jokes to exclude other people.
53. I ignore or stop talking to others in order to get them to do what I want.
54. I sometimes pretend I’m angry to make others afraid of me.
55. I will gladly pay a small sum of money to see classmates who I do not like fail their final exams.
56. I withhold information from other people that the rest of the group is let in on.
57. If I oppose the election of an official, then I am glad to see them fail, even if their failure hurts my community.
58. I pretend to be hurt by and/or angry with other people to make them feel bad about themselves.
59. During conflicts with other people, I tell others not to associate with them.
60. I obtain sex from other people by saying things I don't really mean.
61. I am willing to pay more for some goods and services if other people I do not like have to pay even more.

62. When I tell my friends about fights I was in, I tend to make them sound more exciting that they probably were.

----------Angry Aggression----------

1. When I am angry, I react without thinking.
2. Sometimes I get so upset by work or school that I become hostile toward family or friends.
3. When arguing, I tend to raise my voice.
4. Sometimes I get upset with friends or family members even though they are not the cause of my anger or frustration.
5. When I am mad, I sometimes slam doors.
6. I get angry when frustrated.
7. Most of the times that I get into arguments or physical fights, I act without thinking.
8. I consider my aggressive acts to be impulsive.
9. When I am angry, I take it out on people close to me.
10. I feel like I lose control of my temper during my aggressive acts.
11. I shout angrily.
12. If I get really irritated about things, it can take a long time before I am able to concentrate on other things.
13. When I get mad, I say nasty things.
14. I have temper tantrums.
15. My aggressive acts are spontaneous (not planned against the given targets).
16. I sometimes pout when I don't get my own way.
17. When I am angry, I sometimes sulk.
18. I become agitated or emotionally upset prior to my aggressive acts.
19. When I get angry I easily lose my self-control
20. I become angry or mad when I don't get my way.
21. If people make me angry, I am likely to vent my anger on others.
22. When people or things makes me angry, I am likely to take it out on others.
23. When people yell at me, I yell back.
24. If other people oppose me, I can get so angry that I say and do things I later regret.
25. During conflicts with other people, I curse at them.
26. Feeling personally insulted makes me act aggressively.
27. When people simply will not budge on matters of importance, I lose my temper and say rather strong things to them.
28. I am in a bad mood on days where I act aggressively.
29. I am confused during my aggressive acts.
30. I know most of the people involved in my aggressive acts.

31. I tend to become argumentative towards people who express views that challenge my deeply held beliefs and values no matter how nicely those views are expressed.
32. I hold grudges.

----------Violent Aggression----------

1. If others anger me, I often hit, kick, or punch them.
2. I get in physical fights with other people.
3. I get into fights more than the average person.
4. During conflicts with other people, I throw things at them.
5. I hit or slap other people.
6. I slap or kick other people.
7. During conflicts with other people, I hit (or try to hit) them but not with any objects.
8. Once in a while, I can't control the urge to strike other people.
9. I get into fights a little more than the average person.
10. When I'm violent I sometimes find myself getting so ‘turned on’ that I lose all self-control.
11. I feel like hitting other people.
12. I get so mad that I break things.
13. I threaten to kill people.
14. When I get angry, I will hurt other people.
15. I am more likely to hit other people physically when I am alone with the people who are annoying me.
16. If no one is there to see arguments that I'm involved in, I'm more likely to hit other people physically.
17. I feel better after hitting or yelling at other people.
18. I am in a good mood on days where I act aggressively.

----------Retaliatory Aggression----------

1. I fight back when other people hit me first.
2. I hit back when hit by others.
3. If I have to resort to physical violence to defend my rights, I will.
4. Whoever insults me or my family is asking for a fight.
5. I feel that my aggressive acts are justified.
6. During physical fights, I feel as if I know exactly what I am doing.
7. When other people hassle or shove me, I give them shoves or punches.
8. There is nothing wrong with getting back at other people who have hurt you.
9. Other people who provoke me deserve the punishment that I give them.
10. I believe in the motto "An eye for an eye, a tooth for a tooth".
11. When I'm hurt by other people, I often fight back.

12. When other people try to boss me around, I resist strongly.
13. After I lash out physically at other people, I would like them to make sure they never annoy me again.
14. When other people are mean to me, I get even with them.
15. Prior to my aggressive acts, I know they are going to occur.
16. The best thing about acting aggressively is that it makes other people get into line.
17. When I tell people what to do, they know to do it.
18. The day after physical fights, I remember every move I made.
19. When other people annoy me, I am apt to tell them what I think of them.
20. People who never behave aggressively get trodden on by others.

----------Intimate Partner Violence----------

1. I threaten to end my relationships with my romantic partners.
2. I threaten to break up with my romantic partners to get them to do what I want.
3. I say things just to make my romantic partners angry.
4. During heated arguments, it is okay for me to say things to hurt my romantic partners on purpose.
5. I purposely insult my romantic partners.
6. I scream at my romantic partners.
7. I blame my romantic partners for problems.
8. As long as I don't hurt my romantic partners, my threats are excused.
9. I bring up bad things that my romantic partners have done in the past.
10. I insult my romantic partners with put downs.
11. I accuse my romantic partners of flirting with others.
12. I do things to make my romantic partners feel jealous.
13. I think it helps our relationship for me to make my romantic partners jealous.
14. I mock my romantic partners.
15. I sneer at my romantic partners.
16. Threatening my romantic partners is okay as long as I don't hurt them.
17. I ridicule or make fun of my romantic partners in front of others.
18. I ignore my romantic partners.
19. I don't mind doing things just to make my romantic partners jealous.
20. When my romantic partners make me mad, I flirt with other people in front of them.
21. It is no big deal if I insult my romantic partners in front of others.
22. I kiss my romantic partners when they don't want me to.
23. I have pushing matches with my romantic partners.

----------Alcohol Aggression----------

1. Drinking alcohol makes me aggressive.

2. Being under the influence of alcohol (definitely over the legal limit) makes me act aggressively.
3. The more alcohol I drink, the more argumentative I get.
4. Being under the influence of alcohol (probably under the legal limit) makes me act aggressively.
5. I am aggressive only when I drink alcohol.
6. The more alcohol I drink, the more upset I get when I do not get what I want.
7. The more alcohol I drink, the more likely I am to jump to conclusions.
8. The more alcohol I drink, the less that I am able to reason with people.
9. I am under the influence of alcohol or other drugs during my aggressive acts.
10. The more I drink alcohol, the more I insult people.
11. The more I drink alcohol, the more impulsive I get.