Comparison of Two Aggression Inventories

John Archer, Gwen Kilpatrick, and Rosalind Bramwell

Department of Psychology, University of Central Lancashire, Preston, Lancashire, United Kingdom

Two recently developed questionnaire measures of aggression, the Aggression Questionnaire [Buss and Perry (1992; Journal of Personality and Social Psychology 63:452–459)]; and the Aggression Inventory [Gladue (1991a); Psychological Reports 68:675–684], were administered to a British sample (N = 320) of men and women undergraduates. Both questionnaires contain subscales measuring physical and verbal aggression; the other scales of the Aggression Questionnaire measure anger and hostility, and those of the Aggression Inventory measure impulsiveness and avoidance of aggression. The factor structure of scales were assessed using confirmatory factor analysis. The interrelations of the subscales were calculated in both cases: anger was independently related to verbal and physical aggression and to hostility on the Aggression Questionnaire; impulsivity, and verbal and physical aggression were associated on the Aggression Inventory. Sex differences were largest on the two physical subscales, of lesser magnitude but still significantly different for the two verbal subscales, but absent for anger and hostility. This supports the hypothesis that sex differences in aggression are larger for more escalated forms of aggression. The physical and verbal subscales of the two questionnaires were each highly correlated with one another and the impulsive subscale of the Aggression Inventory highly correlated with the anger subscale of the Aggression Questionnaire. Thus, two aggression questionnaires developed in the US not only produce similar associations between subscales and sex differences among a British undergraduate sample, but also show high correlations between their respective scales.

Key words: physical aggression, verbal aggression, anger, hostility, impulsiveness, sex differences

INTRODUCTION

Two questionnaires designed to investigate self-reported aggression have been developed during the last few years. The first, the Aggression Inventory [Gladue, 1991a],
was based on a scale used by Olweus and his colleagues to study adolescent boys [Olweus et al., 1980]. This earlier scale was validated by peer nominations, and was also found to be correlated positively with testosterone levels. The second questionnaire, the Aggression Questionnaire [Buss and Perry, 1992], was based on an earlier widely used measure of aggressiveness, the Buss Durkee Hostility Inventory [Buss and Durkee, 1957].

In both cases, the samples used were North American college students. The scales were factor analyzed, and divided into subscales, whose internal consistencies were found to be high. Buss and Perry further examined test-retest reliability, and external validity (through peer nominations) for their scale: both of these were high.

Both papers contained data for sex differences on the subscales: males showed higher scores for physical aggression, and there was a smaller sex difference in verbal aggression in the same direction. Males showed higher scores than females on the impulsiveness subscale of the Aggression Inventory and the hostility subscale of the Aggression Questionnaire, but these differences were small. Women also showed higher scores than men on the two-item subscale, avoid, from the Aggression Inventory. The other subscale, anger, from the Aggression Questionnaire, showed no significant sex difference.

These sex differences supported general reviews of many earlier questionnaire and experimental studies of measures associated with aggression [e.g., Eagly and Steffen, 1986; Hyde, 1984] in that there were larger differences for physical than for verbal aggression. The lack of a sex difference for anger is consistent with earlier diary-based studies of anger [e.g., Averill, 1983]. Together with data from more severe acts of violence [Archer, 1994a; Campbell, in press; Daly and Wilson, 1988, 1990], they also suggest that the sex difference in aggressive behavior is located in the degree of escalation in the actions that follow anger rather than in the frequency with which men and women become angry. This view is derived from modern reformulations of Darwin's theory of sexual selection [Trivers, 1972], which predict greater competitiveness and risk taking among young males than females [Daly and Wilson, 1988; Wilson and Daly, 1993].

The two questionnaires are both a considerable improvement on earlier inventories for measuring aggression, and are beginning to be used to measure differences in other population subgroups (i.e., in addition to the two sexes): Archer et al. [1995] have used the Aggression Questionnaire to examine differences between male students and young unemployed men. The scales are also likely to be useful for examining the association of other variables, both biological and psychosocial, with aggressiveness: Gladue [1991b] has already shown that the Aggression Inventory shows positive correlations with testosterone levels in samples of young men, in line with the consensus from earlier studies involving measures which represent behavioral, rather than trait measures of aggressiveness [Archer, 1991, 1994b]. The Aggression Questionnaire has been used in a recent British study involving testosterone and aggression [Birring, 1994].

Since it is likely that both scales will be used widely in the future, it would seem desirable to examine the two instruments together, to assess their comparability. In doing so, we also provide data from a British sample which can be compared with the original North American samples of Buss and Perry, and Gladue. Since these were restricted to student samples, we have used an equivalent group of respondents. As indicated above, the data can be used as a basis for comparing other population groups.

Thus the aim of the present study is to assess the interrelation between measures on the subscales of the two aggression questionnaires for a British sample of young male
and female undergraduates. In doing so, we compare some psychometric properties of the two questionnaires with those reported in the two papers describing their development. We also report data on sex differences in the various subscales, again to compare the findings with those of the two existing studies.

**METHODS**

**Subjects**

Three hundred twenty university undergraduates participated in the study. Half were female and half were male. Of these, the split was equal between undergraduates studying social science subjects and science subjects. The completion rate was 100%. Data were collected over a period of 1 month.

**Materials and Procedure**

Two questionnaires were administered, the Aggression Questionnaire [Buss and Perry, 1992] and the Aggression Inventory [Gladue, 1991a], as part of a wider study on computer games. Half the subjects completed the Aggression Questionnaire followed by the section on computer games, then the Aggression Inventory; the other half completed the computer section first followed by the Aggression Questionnaire and then the Aggression Inventory, counter-balanced across males and females.

**The Aggression Questionnaire**

This contains 29 questions concerning self-reports of behavior and feelings, with each item scored using a 5 point Likert scale (1: “very often applies to me” to 5: “never or hardly applies to me”). Item 4 (“I can think of no good reason for ever hitting a person”) and item 19 (“I am an even-tempered person”) are reversed. There are four subscales, physical (9 items), verbal (5 items), anger (7 items), and hostility (8 items). The aggression subscales tend to concentrate on behaviour (e.g., “I have threatened people I know,” and “I often find myself disagreeing with people”), and the other two scales on feelings (e.g., anger: “I have trouble controlling my temper;” hostility: “I am sometimes eaten up with jealousy”). Buss and Perry [1992] found that the four subscales were factorially distinct, with coefficient alphas from 0.72 (verbal) to 0.85 (physical) and test-retest reliabilities over 9 weeks of 0.72 to 0.80; they showed positive correlations with peer-ratings, the magnitudes of which were relatively high (from 0.20 for verbal aggression to 0.45 for physical aggression). In addition, confirmatory factor analysis on another sample indicated the robustness of the factors found in the original sample.

**The Aggression Inventory**

This contains 20 questions with each item scored on a 5 point Likert scale (1: “the statement does not apply to me at all” to 5: “the statement applies exactly to me”). It also consists of four subscales, physical (4 items), verbal (7 items), impulsive (7 items), and avoid (2 items) concerning aggression and aggression-inhibition. Factor analysis [Gladue, 1991a] of an original list of 28 items revealed four factors, physical confrontation, verbal criticisms and insults, impulsiveness, and the desire to avoid confrontation. Examples of each are as follows: “When another person hassles or shoves me, I give him/her a shove or punch” (physical); “If a person insults me, I insult him/her right
back" (verbal); “I often act before I think” (impulsive); “I prefer to get out of the way
and stay out of trouble whenever someone is hassling me” (avoid). Cronbach’s alphas
for the subscales were calculated separately for men and women by Gladue [1991a].
Those for the first three scales were between 0.80 and 0.82 for men, and 0.70 and 0.76 for
women. The two-item avoid subscale showed an alpha of 0.65 for men and 0.70 for women.

Data Analysis

The subscales of each questionnaire were analysed in terms of their internal consistencies
and intercorrelations with the other subscales. Partial correlations were undertaken to clarify some of these associations. Sex differences were also calculated, and
the effect sizes compared with those found in the original study describing the questionnaires. Then intercorrelations between the subscales from the two questionnaires are
presented, for the whole sample and for males and females separately. In addition, con-
firmatory factor analysis was undertaken for the Aggression Questionnaire data, to test the model used in Buss and Perry’s own confirmatory factor analysis, and for comple-
tion confirmatory factor analysis was carried out also on the Aggression Inventory.

RESULTS

The Aggression Questionnaire [Buss and Perry, 1992]

Confirmatory factor analysis. Buss and Perry [1992] reported a confirmatory fac-
tor analysis on the four (correlated) factors of the aggression questionnaire. In assessing
goodness of fit, they followed a procedure suggested by Joreskog and Sorbom [1979]
of dividing the chi-square by the degrees of freedom, to avoid the problem of a poten-
tially misleading chi-square statistic with large samples. Using this method, they sug-
gest that ratios above 2.0 suggest a poor fit, whilst ratios below 2.0 suggest a reasonable
fit. Buss and Perry report that the four (correlated) factor model for the aggression
questionnaire gave a ratio of 1.94, i.e., a reasonably good fit. They did not, however,
give details of their model specification.

In performing a confirmatory factor analysis on this data a standard model was used
[see Bentler, 1989] in which factor variances were set at 1, and error variances were
free and uncorrelated. This produced a chi-square over df value of 2.43, that is, a poor
fit using the criteria outlined above. Following inspection of standardised residuals, a
number of errors were allowed to covary: This resulted in a chi-square over df ratio of
1.83, i.e., a reasonable fit using the above criteria. This result, rather than suggesting the
desirability of an alternative factor structure, may be taken to indicate the difficulties of
obtaining classically “pure” measures in this type of questionnaire.

Internal consistency of subscales. The internal consistencies of the four subscales
were evaluated by the alpha coefficient using all 320 subjects. The values were as follows: physical aggression, .80; verbal aggression, .72; anger, .79; and hostility, .77.
These were similar to the figures reported by Buss and Perry [1992] and indicate con-
siderable internal consistency.

Intercorrelations between subscales. Table I shows the intercorrelations between the subscales physical, verbal, anger, and hostility of the Aggression Questionnaire. These subscales were all significantly intercorrelated, the values ranging from 0.31 to 0.48.

The correlations of physical and verbal aggression with hostility were due mainly to
the connections of all three with anger: when anger was partialled out, these relation-
ships were severely attenuated (physical and hostility, \( r = 0.15, P < 0.05 \); verbal and hostility, \( r = 0.11, \) NS); the association between physical aggression and verbal aggression was also reduced, but remained statistically significant (\( r = 0.30; P < 0.001 \)). This pattern is suggested by the Pearson correlations found in Buss and Perry’s sample, where hostility was correlated with anger but not substantially with physical or verbal aggression.

The correlations between Buss and Perry’s subscales calculated separately for men and women (Table II) are similar to the overall correlations. The connections between anger and physical aggression, and between anger and hostility, were stronger for the males than for the females.

The intercorrelations between the subscales for the males were considerably reduced when anger was partialled out: the value for physical and verbal was 0.20 \( (P < 0.01) \), for verbal and hostility 0.21 \( (P < 0.01) \), and for physical and hostility 0.14 \( (\) NS), again indicating that anger is mediating a substantial proportion of the association between the other three subscales.

When anger was partialled out for the females, the previously low relationships between verbal and hostility and between physical and hostility become near to zero \( (r = -0.04 \) and \( r = 0.10 \), respectively, both NS). For physical and verbal aggression, however, the association remained significant, although reduced in magnitude \( (r = 0.29, P < 0.001) \).

**Sex differences for subscales.** Males showed significantly higher scores on the physical and verbal aggression subscales (Table IIIa). The sex difference was much larger for the physical subscale \( (d = 0.65) \) than for the verbal subscale \( (d = 0.35) \). These differences were slightly smaller than those found by Buss and Perry. In the present sample, females were found to be as hostile as males were, and they also showed similar scores for the anger subscale. This last finding is in line with that of Buss and Perry, but they found a small but significant sex difference for hostility.

### TABLE II. Correlations Between the Aggression Questionnaire Subscales for a) Male Participants \((n = 160)\), Above the Diagonal; and b) Female Participants \((n = 160)\), Below the Diagonal

<table>
<thead>
<tr>
<th></th>
<th>Physical</th>
<th>Anger</th>
<th>Verbal</th>
<th>Hostility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>—</td>
<td>.52**</td>
<td>.41**</td>
<td>.37**</td>
</tr>
<tr>
<td>Anger</td>
<td>.36**</td>
<td>—</td>
<td>.50**</td>
<td>.52**</td>
</tr>
<tr>
<td>Verbal</td>
<td>.42**</td>
<td>—</td>
<td>—</td>
<td>.42**</td>
</tr>
<tr>
<td>Hostility</td>
<td>.22*</td>
<td>.38**</td>
<td>.16</td>
<td>—</td>
</tr>
</tbody>
</table>

\* \( P < 0.01, \) 2 tailed.

\** \( P < 0.001, \) 2 tailed.
TABLE III. Means, Standard Deviations, and Effect Sizes for a) the Aggression Questionnaire (n = 320), and b) the Aggression Inventory (n = 320)*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Male</th>
<th>Female</th>
<th></th>
<th></th>
<th></th>
<th>Effect size (d)</th>
<th>Original d value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a) Aggression questionaire</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>20.38 6.65</td>
<td>16.61 4.90</td>
<td>.001</td>
<td>0.65</td>
<td>0.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
<td>14.63 4.07</td>
<td>13.36 3.11</td>
<td>.002</td>
<td>0.35</td>
<td>0.44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anger</td>
<td>16.62 5.54</td>
<td>17.27 4.73</td>
<td>NS</td>
<td>0.13</td>
<td>0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hostility</td>
<td>17.89 5.48</td>
<td>17.47 5.11</td>
<td>NS</td>
<td>0.08</td>
<td>0.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>b) Aggression inventory</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>8.98 3.32</td>
<td>7.22 3.20</td>
<td>.001</td>
<td>0.54</td>
<td>0.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
<td>20.44 4.77</td>
<td>18.70 3.79</td>
<td>.001</td>
<td>0.41</td>
<td>0.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impulsive</td>
<td>19.30 5.23</td>
<td>18.15 4.82</td>
<td>.042</td>
<td>0.23</td>
<td>0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance</td>
<td>6.00 1.70</td>
<td>6.11 1.71</td>
<td>NS</td>
<td>0.06</td>
<td>0.23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Also shown are the effect sizes found in the original papers, a) by Buss and Perry [1992], and b) by Gladue [1991a].

The Aggression Inventory [Gladue, 1991a]

**Confirmatory factor analysis.** Confirmatory factor analysis of the Gladue Aggression Inventory, again specifying correlated factors, with factor variances set at one and error variances free and uncorrelated, resulted in a chi-square over df ratio of 2.23, consistent with the possibility that similar measurement problems exist for this scale as for the Aggression Questionnaire.

**Internal consistency of subscales.** The internal consistency of the four subscales were evaluated by the alpha coefficient using all 320 participants. The values were as follows: physical, .74; verbal, .71; avoidance, .28; and impulsive, .75. The low value for avoidance was expected because this scale was only composed of two questions.

**Intercorrelations between subscales.** Table IV shows the intercorrelations between the subscales physical, verbal, impulsive, and avoid of the Aggression Inventory [Gladue, 1991a]. The physical, verbal, and impulsive subscales were significantly intercorrelated, the values ranging from 0.35 to 0.51. The avoidance subscale showed a low but significant negative correlation with the verbal subscale (−0.16), but lower correlations with the other two subscales. Table V shows the same intercorrelations for the males and females separately. The patterns found were very similar to those for the whole sample.

**Sex differences for subscales.** Males showed significantly higher scores for the physical, verbal, and, to a lesser extent, the impulsive subscales, but not for avoidance (Table IIIb). The sex difference was larger for the physical than for the verbal subscale. This was consistent with the findings of Gladue [1991a], although in both cases the sex

**TABLE IV. Correlations Between the Aggression Inventory [Gladue, 1991a] Subscales for All Participants (n = 320)**

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Avoidance</th>
<th>Verbal</th>
<th>Impulsive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>−.10</td>
<td>.51**</td>
<td>.35**</td>
</tr>
<tr>
<td>Avoidance</td>
<td>—</td>
<td>−.16*</td>
<td>−.04</td>
</tr>
<tr>
<td>Verbal</td>
<td>—</td>
<td>—</td>
<td>.48**</td>
</tr>
</tbody>
</table>

**P < 0.001, 2 tailed.

**P < 0.01, 2 tailed.
TABLE V. Correlations Between the Aggression Inventory [Gladue, 1991a] Subscales for a) Male Participants (n = 160), Above the Diagonal; and b) Female Participants (n = 160), Below the Diagonal

<table>
<thead>
<tr>
<th></th>
<th>Physical</th>
<th>Avoidance</th>
<th>Verbal</th>
<th>Impulsive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>—</td>
<td>-.07</td>
<td>.50**</td>
<td>.34**</td>
</tr>
<tr>
<td>Avoidance</td>
<td>-.12</td>
<td>—</td>
<td>-.11</td>
<td>-.13</td>
</tr>
<tr>
<td>Verbal</td>
<td>.46**</td>
<td>-.21*</td>
<td>—</td>
<td>.48**</td>
</tr>
<tr>
<td>Impulsive</td>
<td>.33**</td>
<td>.07</td>
<td>.45**</td>
<td>—</td>
</tr>
</tbody>
</table>

*P < 0.01, 2 tailed. 
**P < 0.001, 2 tailed.

differences were larger in his sample (Table IIIb). The sex difference for impulsiveness was slightly larger in the present study than that found by Gladue. There were no significant differences between the sexes for the avoidant subscale. In Gladue’s study, females were found to be more avoidant of aggression than males.

Correlations Between Subscales of the Two Aggression Questionnaires

As expected, both the respective physical and the verbal subscales of the two questionnaires were highly correlated. The anger subscale on the Aggression Questionnaire was also found to correlate highly with the Impulsive subscale of the Aggression Inventory. In fact, impulsiveness was highly correlated with all four of Buss and Perry’s Aggression Questionnaire subscales. These results, from all the participants, are shown in Table VIa.

Examining the two sexes separately (Table VIb and c) indicated that males showed a higher correlation between the two physical subscales, and higher correlations than females on some other scales, notably that impulsiveness was more strongly associated with all four of the Aggression Questionnaire subscales.

TABLE VI. Correlations Between the Subscales of the Aggression Questionnaire (top) and Those of the Aggression Inventory (side) for a) All Participants (n = 320); b) Male Participants (n = 160), and c) Female Participants (n = 160)

<table>
<thead>
<tr>
<th></th>
<th>Physical</th>
<th>Anger</th>
<th>Verbal</th>
<th>Hostility</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) All participants</td>
<td>Physical</td>
<td>.64**</td>
<td>.23**</td>
<td>.25**</td>
</tr>
<tr>
<td></td>
<td>Avoidance</td>
<td>-.29**</td>
<td>-.20**</td>
<td>-.12</td>
</tr>
<tr>
<td></td>
<td>Verbal</td>
<td>.46**</td>
<td>.41**</td>
<td>.51**</td>
</tr>
<tr>
<td></td>
<td>Impulsive</td>
<td>.45**</td>
<td>.62**</td>
<td>.44**</td>
</tr>
<tr>
<td>b) Male participants</td>
<td>Physical</td>
<td>.69**</td>
<td>.31**</td>
<td>.18</td>
</tr>
<tr>
<td></td>
<td>Avoidance</td>
<td>-.23*</td>
<td>-.24*</td>
<td>-.03</td>
</tr>
<tr>
<td></td>
<td>Verbal</td>
<td>.48**</td>
<td>.48**</td>
<td>.48**</td>
</tr>
<tr>
<td></td>
<td>Impulsive</td>
<td>.53**</td>
<td>.70**</td>
<td>.46**</td>
</tr>
<tr>
<td>c) Female participants</td>
<td>Physical</td>
<td>.51**</td>
<td>.20</td>
<td>.27**</td>
</tr>
<tr>
<td></td>
<td>Avoidance</td>
<td>-.19</td>
<td>-.17</td>
<td>-.22*</td>
</tr>
<tr>
<td></td>
<td>Verbal</td>
<td>.35**</td>
<td>.35**</td>
<td>.53**</td>
</tr>
<tr>
<td></td>
<td>Impulsive</td>
<td>.30**</td>
<td>.55**</td>
<td>.40**</td>
</tr>
</tbody>
</table>

*P < 0.01, 2 tailed. 
**P < 0.001, 2 tailed.
DISCUSSION

Overall, the present findings confirm the applicability of both questionnaires to undergraduate samples outside North America where they were developed. Cronbach’s alphas for the subscales were, with the exception of the two-item avoidant scale of the Aggression Inventory (Gladue), comparable with the previously reported acceptable values. The results of confirmatory factor analysis for the Aggression Questionnaire showed a reasonable fit with previous findings for a North American sample by Buss and Perry [1992]. In the present study, student samples were used for the purpose of comparability with the original studies, but this of course restricts the generality of the findings. Other data suggest that the Aggression Questionnaire is suitable for samples of young men who are not students, and can be used to compare them with student samples [Archer et al., in press]. However, further research is required to assess the extent to which the scales are applicable to samples of different ages, and from different subcultures and nationalities.

For the Aggression Questionnaire (Buss and Perry), there were significant intercorrelations between all four subscales, but those between hostility and the two aggression subscales (verbal and physical) were greatly reduced when anger was partialled out. This suggests that anger is independently related to verbal and physical aggression on the one hand and to hostility on the other, that is, that they are alternative ways of expressing anger. To a lesser extent, physical and verbal aggression provide alternatives, although in this case their association with one another was not so greatly attenuated when anger was partialled out. These findings are consistent with the pattern of correlations found for the US sample by Buss and Perry [1992] where physical and verbal aggression were strongly associated with anger and so was hostility, but hostility was only moderately related to the aggression subscales. Partial correlations with anger controlled led to very low correlations between hostility and the two aggression scales.

For the Aggression Inventory (Gladue), three of the scales (physical, verbal, and impulsive) showed significant correlations whereas the two-item avoidant scale showed correlations nearer to zero with the other three scales. Thus, impulsivity—which we should expect to be related to anger (see below)—was associated with verbal and physical aggression on this questionnaire. In this case, Gladue [1991a] did not report comparable correlations between the subscales.

The pattern of little or no sex difference for anger, a slight difference for verbal aggression, and a larger difference for physical aggression is consistent with that reported for the US samples, but the effect sizes for the sex differences in verbal and physical aggression are slightly smaller in the present case (Table III). The overall pattern is consistent with the suggestion that there will be larger sex differences for the more escalated forms of aggression (see Introduction), at least in young adults. This is derived from modern Darwinian sexual selection theory [Trivers, 1972; Daly and Wilson, 1988; Wilson and Daly, 1993], and is based on the greater variance in reproductive success for males than females, which generates more risky forms of competition among males than among females of reproductive age. Modern sexual selection theory also predicts that this pattern will decline with age, and that it will be young men with few resources and prospects, who will be most likely to engage in escalated physical aggression. Archer et al. [1995] found that unemployed men showed higher scores for physical aggression.
on the Aggression Questionnaire than male students did, but they also showed higher verbal aggression and anger.

Men also showed significantly higher scores on the impulsive subscale of the Aggression Inventory in the present study, although the effect size was small in this case (Table IIIb). Impulsivity has been found to show an association with testosterone levels [Gladue, 1991b], and we should expect it to be related to risk-taking which, as again predicted by sexual selection theory, is more pronounced among young males than other age and sex categories [Wilson and Daly, 1993].

The verbal and physical subscales of the two questionnaires were highly correlated, indicating that in both cases they were measuring similar dispositions and behavior. The anger subscale from the Aggression Questionnaire was highly correlated with Impulsiveness from the Aggression Inventory. The impulsive subscale also showed correlations of around 0.44 with the other three scales from the Aggression Questionnaire.

One general finding for both questionnaires, and for their cross-correlations, was that the males showed closer associations between the subscales than did females, indicating that the different aspects of aggression measured in these questionnaires are more closely associated for males than females. One possible explanation is that the different types of aggression converge more at higher levels of aggressiveness: the finding that there were higher correlations between the subscales of the Aggression Questionnaire for unemployed than for undergraduate men [Archer et al., 1995] is consistent with this (the former showing higher levels of aggression than the latter). An alternative possibility is that women show indirect forms of aggression not measured by the present questionnaires but which are linked to anger and hostility, thus diluting the associations with verbal and physical aggression. The finding that anger and hostility were at similar levels among men and women, and yet both physical and verbal aggression were lower for women, would be consistent with this suggestion. Several studies have found that there are higher frequencies of indirect aggression by girls than boys, and that these extend into young adulthood age [e.g., Lagerspetz et al., 1988; Bjorkqvist et al., 1992a,b, 1994]. Further studies which measure both direct and indirect forms of aggression are necessary to investigate this possibility [see also Bjorkqvist, 1994; Bjorkqvist et al., 1994].

In summary, this study showed that two aggression questionnaires developed in the US not only produce similar associations between subscales and sex differences among a British undergraduate sample, but also show high correlations between their respective scales. Nevertheless, the results of the confirmatory factor analysis did indicate the difficulties of obtaining classically "pure" measures with this type of questionnaire. Perhaps a multi-method approach similar to that used to construct measures of adult attachment [Griffin and Bartholomew, 1994] is advisable in future to control for errors and biases associated with any one method, in the present case those concerned with self-report questionnaires. Thus a combination of peer-reports [Buss and Perry, 1992], responses to hypothetical scenarios [e.g., van Goozen et al., 1994] together with the present self-report questionnaire measures could be used in future studies, to generate data which could be used to assess more specific models of the association between different forms of aggression.
REFERENCES


