International Journal of Psychology

International Journal of Psychology, 2014
Vol. 49, No. 5, 355–363, DOI: 10.1002/ijop.12052

Cross-cultural sex differences in situational triggers of aggressive responses

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This paper examines male and female individual differences in situational triggers of aggressive responses (STAR) in three countries as well as cross-cultural sex differences in trait aggression (aggression questionnaire, AQ). Convenience sampling was employed (university students) for the descriptive correlational study (Poland $N = 300$, 63% female, mean age 21.86, $SD = 2.12$; UK $N = 196$, 60% female, mean age 20.48, $SD = 3.79$; Greece $N = 299$, 57% female, mean age 20.71, $SD = 4.42$). The results showed that the STAR scale is an equivalent construct across all three countries. Overall, females were more sensitive to both provocation (SP) and frustration (SF) than males. When controlling for trait aggression, Polish and Greek females scored similarly in SP and higher than UK females. No sex differences in SP or SF were found in the UK sample. Additionally, Polish participants scored the highest in SP. Furthermore, when trait aggression was removed, the Greek participants were most sensitive to frustration, whereas Polish and English participants' SF did not differ. We discuss the results with regard to intercultural differences between investigated countries.

Keywords: Situational triggers of aggressive responses (STAR); Sensitivity to provocation/frustration; Poland; Greece; UK; Sex differences.

Sex differences in aggression are observed for both stereotypes of male and female behaviour and actual behaviour (Archer, 2004). However, there is ambiguity regarding understanding differences in the experience and expression of anger by men and women. Campbell, Muncer, and Coyle (1992) argued that sex differences in aggression were present when it comes to the reason for the aggression exhibited. Indeed, Lawrence (2006) pointed out that it is important to acknowledge individual differences in the type of events and antecedents that make people feel aggressive. The situational triggers of aggressive responses (STAR) scale is a self-report instrument measuring the extent to which different events make individuals feel aggressive. The scale consists of two factors—sensitivity to frustration (SF) and to provocation (SP). SF is a proneness to feel particularly aggressive in response to having one's goals blocked and in response to uncontrollable negative events. SP relates to feeling aggressive in reaction to goading and provocation from others. In general, the experience of feeling aggressive does increase the likelihood of aggressive behaviour; individuals high in SP do have an increased tendency to act aggressively towards those who provoke them, however not to those who do not provoke them (Lawrence & Hutchinson, 2013). Regardless of sex, those sensitive to frustration scored higher on anger and hostility and those sensitive to provocation scored higher on overt physical aggression (Lawrence, 2006). The extent to which male and female SP and SF is equivalent, however, has not been examined outside the UK context. The current paper examines male and female triggers of aggressive feelings in the cross-cultural setting alongside cross-cultural sex differences in trait aggression.

Sex differences in emotional and behavioural aspects of aggression

Typically, studies have focused either on the emotional (anger experience) or the behavioural aspect of

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aggression. Stereotypically, anger is associated with men, however, other research claims that women experience more severe and persistent anger than men do (Simon & Nath, 2004), but because of cultural restraints and socialisation processes, they suppress rather than express anger. Research revealed that men and women did not differ with respect to the frequency of experiencing anger (Simon & Nath, 2004). Although there were some differences in the ways in which men and women managed anger, self-reported anger did not differ (Archer, 2004). Because expressing anger was not exclusively related to people's experiences of anger (Archer, 2004), we believe that types of situations in which men and women experience angry feelings as well as cultural norms regarding anger expression should be taken into consideration.

Despite the similarities in anger experience between men and women, there were differences in aggressive behaviour, with men showing more escalated aggression. Sexual selection theory (SST; Trivers, 1972) and social role theory (SRT; Eagly & Steffen, 1986) are two main theories, which explain sex differences in aggression. SST is derived from unequal parental investment in the animal kingdom and its consequences determining the extent of sex differences in aggression (Trivers, 1972). Archer (2004) argues that sex difference in human aggression is to be expected as humans are a sexually selected species. In a social environment where both sexes are required to share taking care of a child, intermale competition is lower and therefore men would be less aggressive than in an environment with solely females responsible for child care (Archer, 2009). Alternatively to the sexual selection view focusing on male competition, Campbell (1999) explained the possible reason for lower engagement in aggressive behaviours by women. Their avoidance of risky behaviour might possibly be motivated by staying healthy and alive and rearing their offspring. Therefore considering SST and Campbell's complementary idea, the larger the prevailing threat of physical danger, the larger the sex differences in physical aggression than for direct verbal aggression that appears to be less risky. With regard to SST, costs and benefits are related mainly to aggressive behaviour and less to the emotional state which is why it does not predict sex differences for anger. SST implies that the mechanism underlying sex differences in aggression is not located in a general sex difference in response to frustration or in ease of arousal to anger (Archer, 2009). Archer (2004) claims that in an environment where men have access to resources enabling them to find a mate and take care of a family where they are socially and/or culturally obliged or willing to share the parental investment, sex differences in aggression would be expected to appear to a lesser degree than in societies where males have to fight when mating. To support this notion, Daly and Wilson (1988) recognised a much higher frequency of male than female same-sex homicides, especially among men with lower resources. Apart from resource availability, cross-cultural variations in women's relative emancipation would mediate sex differences in aggression (Archer, 2009).

Discrepancies in the social context may accentuate, neutralise or even reverse the typical sex differences in aggressive behaviour (Archer, 2009) and women may become more aggressive. SRT suggests that sex differences in physical aggression would be larger (although modestly so) than differences for verbal aggression (Archer, 2009).

In a meta-analysis, Archer (2004) confirmed higher male physical but also verbal aggression. Nevertheless, the extent to which these patterns are observed cross-culturally must be taken into consideration when examining sex differences in different types of aggression.

Cross-cultural sex differences in aggression

Archer (2004) described that in general when overall direct aggressive behaviour but not anger was the target of cross-cultural studies, the results (self-reports) revealed sex differences with males exhibiting higher aggression. In some cases (e.g. India and Russia) such differences were not observed. In European studies, the differences were larger than in North American or Asian studies.

Moreover, in the case of self-reported physical aggression, males again scored higher. In the case of physical aggression among Asian studies, the sex discrepancy was greater than in the case of North American or European studies. As such, results are consistent with previous reviews (Eagly & Steffen, 1986).

OVERVIEW OF PRESENT STUDY

The STAR scale allows us to examine male and female triggers of aggressive feelings within a cross-cultural setting. Sex differences on STAR were not observed in a study conducted among students in UK but were present in a Polish student sample (Zajenkowska, Jankowski, Lawrence, & Zajenkowski, 2013). Females exhibited higher levels of aggression in response to frustration and provocation. If an event triggers an individual's aggressive emotion and cognition, it is more likely that this individual will behave aggressively in response (Anderson & Bushman, 2002). The majority of current studies show, however, that men more often behave aggressively, and women because of cultural socialisation and mostly fear, hold back and do not express anger (Cross & Campbell, 2011).

From the current literature, typically women and men did not differ in terms of feeling angry, but differ with regard to the expression of physical and verbal aggression. However, different reaction patterns to anger among men and women varied by culture. We also expect to find variability in situations that trigger aggressive

feelings in men and women. Sexes might differ in terms of proneness to frustration and provocation within the same culture and between countries. Moreover, situations that trigger aggressive feelings and SF and SP may be culturally specific.

The current study focuses on sex differences for provocation and frustration sensitivity through the use of the STAR questionnaire across different cultural contexts, controlling for trait aggression. Three European countries were selected for the study, as Archer (2004) stresses the importance to redress the geographic imbalance of most previous reviews and to include English-speaking populations from outside the United States as well as other non-English native countries. Poland, Greece and the UK were chosen because they differ in terms of egalitarianism related to sex inequality (Schwartz, 2006). UK, in comparison with Poland and Greece, has the most egalitarian culture and Poland the least (Schwartz & Rubel, 2005). In the case of Poland and Greece, the data is more ambiguous. According to Schwartz (2006), Poland is less egalitarian than Greece, but because of the global gender gap index (Hausmann et al., 2012) that indicates the magnitude of sex-based disparities on economic, political, educational and health criteria, Greece was lower than Poland in this respect. It is possible that such vagueness arises because of the differences in variables included in the egalitarianism estimation. Schwartz and Rubel (2005) believed that the economic situation of the country does matter as the richer the countries, the sex differences in self-direction values were smaller. Those values related to enjoying being independent, outside the control of others and indulging oneself. In poorer countries, with more embedded and collectivist cultures (e.g. Greece), men attributed more importance to self-direction values than women did. On the other hand, in richer countries with more autonomous and individualist cultures, for example the UK, sex differences were smaller (Schwartz & Rubel, 2005).

When examining individual's SP and SF cross-culturally, the current study aims to examine the extent to which the STAR scale is valid outside the UK context. Moreover, it explores general country-based differences in aggressive feelings after provocation and frustration and the interactive impact of country and sex on such feelings. Based on the SST assumptions, it could be expected that in cultures where men share parental investment with woman and where resources are sufficient, one can find smaller sex differences in overt aggression. Provocation-related aggression (but not aggression after frustration) correlated with overt aggression in previous studies. As Poland and Greece are more embedded, collectivist, poorer and less egalitarian than the UK, we expect that there will be sex differences observed in aggressive feelings following provocation. We expect that aggressive feelings after frustration will be similar across countries as well as in males and females because SF is more closely related to anger, and there is more evidence that the experience of anger differs less by sex and country (Archer, 2004; Lawrence, 2006). Controlling for trait aggression is crucial in order to distinguish the effects of sensitivity to aggressive triggers and trait aggression *per se*. As sex and country differences in trait aggression were not the main focus in this study, only the general assumption was made, according to many studies (Archer, 2004), that males will declare more aggressive behaviour in general (measured by aggression questionnaire, AQ) than females. In accordance with SST, we might expect more overt aggression for less economically developed countries, however, such expectations should be of exploratory nature only at this stage.

METHOD

Materials and procedure

The STAR scale (Lawrence, 2006) was used to measure aggression-related sensitivities. The questionnaire consists of 22 situations (10—SF and 12—SP). Participants rate how each aggressive situation makes them typically feel on a 5-point scale (with 5 meaning "*very accurate*"). The instrument has high internal consistency (αs = .82 and .80 for SF and SP, respectively) and its validity has been examined and supported previously (Lawrence, 2006; Lawrence & Hodgkins, 2009). In both Poland and Greece, the questionnaire was translated for the current study into Polish and Greek, back-translated into English by two experts and also by a bilingual translator and was approved by the author of the original scale. The internal consistency of the STAR dimensions in the present research was high (Table 1).

The aggression questionnaire (AQ; Buss & Perry, 1992) comprises 29 items relating to behaviours and feelings concerning different aggressive responses. There are four subscales, two of which relate to overt expressions of aggression: physical aggression (9) and verbal aggression (5) whereas the other two subscales relate to aggressive emotions: anger (7) and cognitions: hostility (8). The Greek adaptation used in this study consisted of 22 items in which the factor structure has not yet been explored. The AQ uses a 5-item Likert-type scale to score the items ranging from 1 (*very untrue*) to 5 (*very true*). The instrument has high internal consistency (αs = .85, .72, .83 and .77, for physical aggression (PA), verbal aggression (VA), anger (A) and hostility (H) dimensions, respectively; Buss & Perry, 1992). The internal consistency of the AQ subscales in the present research was high (Table 1). It should be noted that the AQ dimensions were not available in the Greek data as we found a unifactorial structure and no other evidence on the factor structure was available. Thus, only the total AQ scores were compatible across all three countries and these were employed in the analysis

TABLE 1
Internal consistency estimates for the aggression questionnaire (AQ; Buss & Perry, 1992) and the situational triggers of aggressive responses STAR scale (Lawrence, 2006)

Cronbach alpha	*Poland*	*UK*	*Greece*[a]
Physical aggression (AQ)	.81	.85	—
Verbal aggression (AQ)	.59	.77	—
Anger (AQ)	.76	.82	—
Hostility (AQ)	.72	.75	—
Total scale (AQtot)	.85	.90	.88
SP (overall sample $\alpha = .80$)	.78	.83	.82
SF (overall sample $\alpha = .78$)	.77	.78	.80

Note: SP = sensitivity to provocation; SF = sensitivity to frustration; AQtot = AQ total score.
[a]For the Greek data, no factor structure is available, so only the total score is meaningful and internal consistency was computed for the whole scale only. The UK and Polish versions of the scale were also different from each other; however, internal consistency estimates were calculated for each of the dimensions as suggested by the existing literature for each version.

of covariance designs in the final stages of our analysis; wherever applicable, the AQ dimension information was used in the analysis, excluding the Greek data.

Participants

The overall sample consisted of 795 university students (40% males and 60% females) with a mean age of 21.10 and a standard deviation of 3.59. Convenience sampling was employed.

Poland

The sample comprised 300 (189 females, 111 males) undergraduate students from three universities in Warsaw: University of Warsaw ($n = 82$), Academy of Special Education ($n = 127$) and Warsaw University of Technology ($n = 91$). Their mean age was 21.86 ($SD = 2.12$), ranging from 19 to 34, with males (21.58 ± 1.06) being older than females (22.36 ± 2.15; $t(298) = 3.093$, $p < .01$). There was no missing data.

UK

The sample comprised 196 (116 females, 79 males) undergraduate students from a large university in central England. One participant did not disclose his or her sex. Their mean age was 20.48 ($SD = 3.79$), ranging from 17 to 42, with males ($M = 212.65$, $SD = 4.24$) being older than females ($M = 19.70$, $SD = 3.25$; $t(193) = 3.62$, $p < .01$).

Greece

The sample comprised 299 (170 females, 129 males) university students from several schools of the National Technical University of Athens and from the National and Kapodistrian University of Athens. Their mean age was 20.71 ($SD = 4.42$) with males ($M = 20.08$, $SD = 2.09$) being slightly younger than females ($M = 21.08$, $SD = 5.52$; $t(293) = -2.42$, $p < .05$, corrected for non-homogeneity).

Groups of students were tested in classrooms and dormitories. All participants were informed of the nature, purpose and anonymity of the study.

RESULTS

The statistical analysis followed two main goals. The first was psychometric in terms of factor analysis and validity checks and the second examined sex differences across country groups with respect to SP and SF.

We first applied exploratory factor analysis (EFA; maximum likelihood with orthogonal rotation methods) on the 22 STAR items for the overall sample (regardless of country). To safely employ the Pearson correlation indices for this analysis, we first compared them to the respective Spearman Rho coefficients in an attempt to verify that small normality irregularities did not have an effect on the coefficients to be analysed. We transformed the coefficients with a Fisher z transformation and then employed Equation 1 to compare each pair of coefficients. We found no statistically significant differences across the two coefficient tables, therefore employing Pearson r indices in our factor analysis was justified.

$$z_{i\,.05/2} = \frac{z_{i(r)} - z_{i(Rho)}}{\sqrt{\frac{1}{n_{(r)}-3} + \frac{1}{n_{(Rho)}-3}}} \quad (1)$$

The determinant for this EFA model was acceptable (.0004) and the Kaiser-Meyer-Olkin measure of sampling adequacy reached .90. Two factors emerged and the percentage of variance explained was 28%. The two factors were identical to those in Lawrence (2006) (Tucker's φ indices were .96 and .97 for the first and second factors, respectively) although some minor discrepancies involving some cross-loadings suggested some further exploration. We analysed the STAR data for each country separately (maximum likelihood with orthogonal rotation of the axes) and arrived at separate common factor solutions, comparable to each other with regard to Tucker's φ indices. In all three solutions, two factors emerged and explained variance reached about 30%. The limited amount of variance explained is mainly because of the maximum likelihood factor extraction method employed, as EFA, through its estimation algorithm, is placing emphasis on the structure *per se* and not on simple data reduction, which aims at explaining as much variance as possible through principal component analysis. Factor congruence levels (Tucker's φ) were nearly perfect ($|\varphi| > .95$) across all solutions but for one exception. For Poland and UK, the two factors

were identical and for Poland and Greece also, the two factors were identical, however, UK and Greece shared just one identical factor with the other factor reaching only similarity levels. These outcomes and especially the similarity-only "handicap" called for further testing by employing more sophisticated methods—which would be applied anyhow as factor invariance should be present and indisputable for us to decide on the final factor structure and proceed with the computation of factor average-composite scores.

To satisfy the aim above, we employed Muthén's method (covariance structure analysis). Intraclass correlation coefficients were computed for the estimated between-groups correlation matrix and the pooled-within groups correlation matrix. Their average was .041 indicating very good levels of factor invariance across the three countries. Through maximum likelihood estimation and by target-rotating the separate solutions for the two correlation matrices, we reached a final target-rotated common factor solution for all three countries, which was slightly different from the initial factor structure found for the overall sample but was closer to Lawrence's (2006) original structure (average φ was .96, whereas for the comparison of the original theoretical structure and the initial overall factor solution, average φ was .94).

Through our analysis, it became evident (a) that STAR presented an invariant factor structure across the three countries and (b) that this invariant structure closely resembled the original (Lawrence, 2006). These outcomes indirectly supported STAR's structure across three European countries. Thus, the aggregate (mean) scores for each of the two STAR factors (SP and SF) were calculated according to Lawrence (2006). Finally, zero-order correlations between STAR and the AQ measures were calculated and are presented in Table 2.

SP and SF scores correlated with the total AQ score at a low-to-moderate level, sharing approximately 12% of common variance. For the UK and Polish data, the STAR factor composite scores correlated moderately with the AQ dimensions (mostly with anger and hostility).

Aggression differences (AQ scores) across sex and country

There was a significant sex difference for the total AQ aggression score, $F(1, 788) = 4.58$, $p < .05$, $\eta^2 = .010$. In addition, significant sex differences were found for the PA, $F(1, 485) = 43.63$, $p < .001$, VA, $F(1, 490) = 10.67$, $p < .001$, and anger, $F(1, 488) = 21.36$, $p < .001$, factor composite scores. The η^2 indices reached .08, .02 and .04, respectively.

A significant difference was found across countries with respect to the total AQ score, $F(2, 792) = 92.62$, $p < .001$, $\eta^2 = .19$. The means for the three countries (Poland, UK and Greece) were 2.51 ($SD = .54$), 2.51 ($SD = .63$) and 1.94 ($SD = .56$), respectively. No effects could be computed for the AQ dimensions for Greece as these dimensions were not available.

STAR score differences as a function of sex and country

To explore sex differences in STAR dimensions across the three countries, we employed general linear modelling and specifically tested for two successive 2 (sex: males, females) by 3 (country: UK, Poland and Greece) designs.

A significant interaction emerged for the provocation factor composite score, as presented in Figure 1, $F(2, 784) = 6.21$, $p < .01$, $\eta^2 = .016$, and was further explored through *post hoc* Scheffé comparisons. This interaction effect shows that UK males are more aggression-prone under provocation but females in general are more prone than males, with Polish females scoring the highest. As the interaction effect was statistically significant, the two main effects, although statistically significant, had no meaning, but are reported here for comparability reasons (for the sex main effect, $F(1, 784) = 6.81$, $p < .01$, $\eta^2 = .01$, and for the country main effect, $F(2, 784) = 8.06$, $p < .001$, $\eta^2 = .02$).

The same analysis was applied for the frustration factor composite score but no significant interaction was present, $F(2, 784) = 1.76$, $p > .05$, $\eta^2 = .004$, and no country differences were found, $F(2, 784) = 1.75$,

TABLE 2
Zero-order correlations among the STAR and the AQ measures

	SP	*SF*	*AQtot*	*PA*	*VA*	*A*	*H*
SF	***.66*** ** (793)	1					
AQtot	***.36*** ** (793)	***.33*** ** (793)	1				
PA	*.24* ** (486)	*.14* ** (486)	***.78*** (486)	*1*			
VA	*.18* ** (491)	*.09* * (491)	***.63*** ** (491)	***.42*** ** (486)	*1*		
A	***.32*** ** (489)	***.32*** ** (489)	***.78*** ** (489)	***.39*** ** (485)	***.41*** ** (489)	*1*	
H	***0.30*** ** (488)	*0.29* ** (488)	***0.69*** ** (488)	*0.28* ** (484)	*0.20* ** (488)	***0.46*** ** (487)	*1*

Notes: SP = sensitivity to provocation; SF = sensitivity to frustration; AQtot = AQ total score; PA = physical aggression (AQ factor 1); VA = verbal aggression (AQ factor 2); A = anger (AQ factor 3); H = hostility (AQ factor 4). Correlations above .30 are denoted in bold and the convergent validity correlations are shaded. Correlations for UK and Polish data only are denoted in italics. Degrees of freedom are given in brackets; *$p < .05$, **$p < .01$.