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Short Communication

Are there sex differences in physical aggression in the elderly?

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ABSTRACT

Sexual selection theory proposes that sex differences in physical aggression are due to greater male than female competition for reproduction which leads males to use more risky strategies. This difference seems to peak around 20–30 years old, which is consistent with this theory. Nevertheless, no studies have focused on sex differences in aggression in the elderly. The present study explores sex differences in aggression in an elderly sample (aged 65–96). Results showed that although sex differences in physical aggression were present, the effect size was small and lower than the effect sizes obtained in younger samples. Furthermore, women showed higher levels of anger. Although the results seem to fit with sexual selection theory, they will have to be confirmed by future studies in new cohorts.

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1. Introduction

The study of sex differences usually generates considerable interest and controversy, and sex differences in aggression, in particular, is one of the most widely studied topics. Men are usually viewed as more aggressive than women and different approaches have tried to explain these differences from a biological, social or evolutionary viewpoint (Campbell, 1999; Carlo, Raffaelli, Laible, & Meyer, 1999).

Psychometric measures have been widely used to analyze sex differences in aggression. Most studies have used the aggression questionnaire (AQ) (Buss & Perry, 1992) but some have used the aggression inventory (AI) (Gladue, 1991) with similar results. As far as the AQ is concerned, Buss and Perry (1992) reported that men had higher scores on physical aggression, verbal aggression and hostility, but not on anger. Sex differences were much larger on the physical scale, and showed a large effect size while effects for verbal and hostility scales were medium and small, respectively. These results have been partially replicated in other studies, a review of which shows consistent differences in physical aggression between men and women. Some studies only found differences for the physical scale (Bernstein & Gesn, 1997; Williams, Boyd, Cascardi, & Poythress, 1996), while others also found differences for verbal aggression although they had smaller effect sizes than physical aggression did (Archer, Kilpatrick, & Bramwell,

1995; Nakano, 2001; Ramirez, Andreu, & Fujihara, 2001). Finally, only Ramirez et al. (2001) found sex differences in hostility. The pattern of differences in physical and verbal aggression has also been found in laboratory studies, with smaller effects for verbal aggression (Bushman & Anderson, 1998).

Two theories have tried to explain gender differences in physical aggression. The first, sexual selection theory (SST), focuses on the fact that males compete more than females for reproduction, which leads to more intense male competition. On the other hand, for females, access to a mate is less dependent on within-sex competition, and they have more to lose in terms of reproductive fitness from potentially damaging confrontations. This means that men use more risky strategies, as the costs of direct aggression for females are higher (Archer, 2004; Campbell, 1999). Laboratory aggression measures have also provided evidence in favour of this theory by showing that men tend to be more aggressive against high status competitors who are a threat to them (Terrell, Hill, & Nagoshi, 2008).

The second, social role theory (SRT), focuses on the supposed gendered characteristics implied by roles, which lead to different patterns of behaviours transmitted during socialization processes.

Both theories propose that males will show high levels of physical aggression. SST explains this difference by the fact that the greater sexual competition of males involves more risky strategies such as physical aggression. On the other hand, SRT proposes that physical aggression is encouraged by the masculine role but its manifestation will depend on the extent to which context aspects activate role expectancies. Although both theories may explain sex differences in physical aggression, they do not agree about how age affects this difference.

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If these differences depend on learning processes, as SRT proposes, then differences must be almost nonexistent in early childhood but increase subsequently due to the accumulative effect of social learning, particularly during childhood. Nevertheless, many studies have shown that physical aggression is present in early childhood, peaking at around 30 months and decreasing with age (Archer & Côté, 2005; Campbell, 2006; Tremblay & Nagin, 2005). Furthermore, the liberalization of sex roles in Western societies since the 1970s has not had the effects on aggressive behaviour that SRT would have led us to expect. The involvement of women in violent crime has decreased since the 1970s and the pattern for gun and non-gun homicide rates over the last 20 years has been the same (Fagan, Wilkinson, & Davies, 2007; Kenrick & Giskevicius, 2009). Therefore, the decrease in physical aggression in children over time and the rates of extremely violent acts in recent decades seem to be inconsistent with the theories that claim that physical aggression is mainly related to social learning.

Although these results seem to show that aggressive behaviour is not learned and, as a result, do not support the explanations for sex differences in aggression provided by SRT, they do not mean that sex differences in aggressive behaviour cannot be learned. In fact, Archer (2009) pointed out that aggression is an innate pattern of behaviour that is inhibited by social learning so any differences in this inhibitory process associated to sex may explain differences in physical aggression between men and women. Nevertheless, the size of sex differences in physical aggression during childhood does not progressively increase and this is inconsistent with the explanation that boys and girls learn to inhibit their aggression at different rates (Archer, 2009; Archer & Côté, 2005; Baillargeon et al., 2007).

Archer (2004) performed a meta-analysis which summarized the results of comparing men and women on aggression measures. The main results of this study pointed out that direct aggression is more frequent in men, especially in the case of physical aggression, and that sex differences between men and women peak at around 20–30 years old and then decrease. The fact that sex differences in physical aggression decrease with age seems to be more compatible with SST – which proposes that they are related to a decrease in competition for reproduction – than with the accumulative learning effect proposed by SRT. Nevertheless, it is not well established whether the accumulative learning effects of aggressive behaviour can take place after childhood and adolescence.

It should be noted that most of Archer's studies (2004) focus on the 15–40 age range, only a few focus on older adults, and almost none analyze sex differences in physical aggression in the elderly. This is an important issue because if SST is right, sex differences should not increase in the elderly; they should even decrease because of the decrease in male competition for reproduction. A review of previous research shows that only one study analyzes sex differences in aggression in the elderly (Walker, Richardson, & Green, 2000) and it reports that men show more direct aggression than women). Nevertheless, the study comprised only 32 males (in a sample of 110 individuals) and they reported extremely low scores for direct aggression. The mean for males was 1 on a scale with scores ranging from 1 to 35 and the measure of aggression was an overall one that did not take into account its nature (physical, verbal, etc.).

Taking into account this lack of data on sex differences in aggression in the elderly, the present study intends to analyze these differences using the Buss and Perry aggression questionnaire (1992) in a sample of elderly individuals with no cognitive impairment and test whether, as SST proposes, the differences are similar or even less than those observed in other populations in previous studies.

2. Method

2.1. Participants

The sample was drawn from various senior citizen leisure facilities and retirement homes in Tarragona (Spain) and the surrounding area. Individuals above the age of 65 were invited to take part as volunteers in the study. A total of 181 individuals (84 men and 97 women) agreed to participate in the study, with ages comprised between 65 and 96 years old (mean = 77.58, s.d. = 6.9). There were no significant differences in age between men (mean = 78.25, s.d. = 7.2) and women (mean = 77, s.d. = 6.6). A total of 92 percent of the individuals had no education or had only been to primary school, and only eight percent had attended high school or had a university degree. All the participants were of Spanish origin and most of them were of school age during the Spanish civil war (1936–1939) or during the immediate post-war years, a period in which most of the children in Spain did not receive any formal education. This explains the high rate of individuals with a low educational level in the sample.

2.2. Measures

The reduced Spanish version of the Buss and Perry aggression questionnaire (AQ) was used (Vigil-Colet, Lorenzo-Seva, Codorniu-Raga, & Morales, 2005). The questionnaire measures the four scales proposed by Buss and Perry (1992); physical aggression (PA), verbal aggression (VA), anger (AN) and hostility (HO). It shows a good fit to the four factor model, is free of sex bias, and has internal consistencies of 0.82, 0.77, 0.68 and 0.75 for PA, VA, AN and HO, respectively (Morales-Vives, Codorniu-Raga, & Vigil-Colet, 2005; Condon, Morales-Vives, Ferrando, & Vigil-Colet, 2006).

The Mini-Mental Status Examination (MMSE) is a quick test for screening cognitive function deficits in the elderly. It was developed by Folstein, Folstein, and McHugh (1975) and is one of the most widely used tests for this purpose (Tombaugh & McIntyre, 1992). We administered the Spanish adaptation of the MMSE (Lobo et al., 1999). The authors reported that the optimal cut-off point for the cognitive deficits associated with dementia was 23 which gives good sensitivity (90%) and specificity (75%), with an area under the ROC curve of 0.92 (Lobo et al., 1999).

2.3. Procedure

The participants were individually tested by one psychologist with experience in elderly people in their homes (43%), their retirement homes (18%) or their leisure centers (39%). The psychologist helped the participants when they had difficulties understanding the items. Of the participants, ten were rejected because their scores on the MMSE were below the cut-off point of 23. We took this decision because of the relationships between dementia and aggressivity levels so the final sample of 171 individuals was assumed to be free of this kind of pathology. Of the participants 40% were tested in the morning and 60% in the evening.

3. Results

Table 1 shows descriptive statistics for the AQ and MMSE questionnaires. A series of *t*-tests showed that men had higher levels of physical aggression ($t_{(167)} = 1.98, p < 0.05$) and women higher levels of anger ($t_{(167)} = 3.57, p < 0.01$), while no differences were found for either verbal aggression ($t_{(167)} = 0.61, p > 0.05$) or hostility ($t_{(167)} = 1.75, p > 0.05$).

Table 2 shows the differences in physical aggression obtained using the reduced version of AQ between our sample and other

Table 1
Descriptive statistics for the whole sample (men and women).

Variable	All		Men	Women
	Mean	s.d.	Mean	Mean
Physical	11.22	3.83	11.84	10.68
Verbal	10.50	2.84	10.65	10.38
Anger	10.84	2.97	10.09	11.49
Hostility	11.93	3.29	11.46	12.34
MMSE	31.88	2.64	32.06	31.71

$p < 0.01$, $p < 0.05$.

Table 2
Means for men and women in physical aggression and effect sizes in our study and previous studies using the Spanish short version of AQ.

Sample	Age range	Men	Women	<i>d</i>
Adolescents ^a	12–16	17.66	14.7	0.465
Adults ^a	21–50	11.3	9.11	0.435
Elderly	65–92	11.84	10.68	0.306

^a Extracted from data reported by Vigil-Colet, Morales-Vives, and Tous (2008).

Table 3
Correlation matrix between aggression measures, MMSE and age.

	Age	Physical	Verbal	Anger	Hostility	MMSE
Age						
Physical	0.002					
Verbal	0.021	0.267				
Anger	−0.077	0.449	0.448			
Hostility	0.001	0.367	0.265	0.427		
MMSE	−0.204	−0.055	0.135	0.116	0.024	

Spanish samples. As can be seen, for all samples men showed higher levels of physical aggression but in the elderly sample we found a lower effect size. On the other hand, this effect size ($d = 0.306$) is lower than the one reported by Archer (2004) in his meta-analysis of self-reported physical aggression in European samples, falling below the reported confidence interval for this kind of sample ($d = 0.45$ (C.I. 0.39–0.51)).

Table 3 shows product-moment correlations between aggression measures, cognitive status and age. As in most studies, AQ measures are correlated, with anger showing the biggest relationships with the other scales. Age showed no significant relationship with aggression measures, which indicates that the levels of aggression across the age range of the study are quite stable.

4. Discussion

The results reported above seem to fit quite well with the sexual selection theory, which proposes that reduced competition of males for reproduction will reduce their physical aggression. In this sense, the present study showed that the effect size differences in physical aggression are lower in the elderly than both, the ones previously reported in Spanish adolescent and adult samples using the reduced version of AQ, and the ones reported in Archer's (2004) meta-analysis. Although Walker et al. (2000) proposed that the decline in physical strength associated with age may reduce physical aggressivity and, as a result, make men and women more equal in their expression of aggression, the scores obtained in our study for PA are equivalent to the ones reported for adults so, the reduction in sex differences in PA may not be explained by the absence of PA in the elderly.

Furthermore, the results reported should be considered with caution because they were not obtained in a longitudinal study, and the data was compared with other studies with no guarantee

of sample equivalence. On the other hand, the specific characteristics of the cohort (education during or immediately after a civil war and living for 40 years under a dictatorial state) imply that future research is required with new cohorts to confirm the results obtained.

One result that should be specifically mentioned is the higher level of anger in women. Archer's (2004) meta-analysis showed that there are no overall sex differences in anger and the few studies that have found them reported very small effect sizes. The effects were also consistent across age categories (6–55 years old). The higher level of anger reported in the present study and its effect size ($d = 0.47$) may indicate that the effect is specific to elder populations or that it is caused by the specific characteristic of the cohort. In this regard, it is worth pointing out that Thomas (1995), in a cross-sectional study of anger in women, found that the oldest group (55 and older) showed the highest score in the anger-in scale of Spielberger's State Trait Anger Expression Inventory (Spielberger, 1983). His explanation for this result was that this group was born around 1930 and were adolescents in a very conservative society, which may lead to increased levels of anger in women. The women in our sample lived in a highly conservative society during their adolescence and adulthood (democracy began in Spain in 1975), which meant that most of them had little education, no job and little chance of taking decisions. This may explain their higher levels of anger.

To summarize, despite its limitations, the present study is the first to test aggression differences in the elderly using the AQ and they are consistent with SST. Nevertheless, results such as the ones obtained with the anger scale indicated that further research is needed to compare new cohorts and, above all, to carry out longitudinal studies that are not affected by this kind of effect. It should also be taken into account that SRT may provide alternative explanations to the reduction of sex differences in aggression in the elderly. For example, the elderly may no longer carry out the traditional roles that segregate the sexes and, as a result, differences in aggression may decrease. Further research with additional measures will have to clarify which of the two theories explains these differences or whether they are the result of a mixture of innate processes and learned processes. For instance, if SST is right, measures of sexual competition and motivation in the elderly should show a pattern of decrease similar to that observed for differences in aggression between sexes.

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