

The effects of ageing on self-reported aggression measures are partly explained by response bias

Andreu Vigil-Colet, Urbano Lorenzo-Seva and Fabia Morales-Vives
Universitat Rovira i Virgili

Abstract

Background: Recent studies have suggested that the age-personality relationship may be partly explained by age-related changes in response bias. In the present study, we analysed how age affected social desirability and acquiescence, and how this effect impacted the age-aggression relationship. **Method:** We used the Indirect-Direct Aggression Questionnaire, which provides response bias and physical, verbal and indirect aggression scores independently of each other. We applied this test to a sample of 616 individuals aged between 18 and 96 ($M = 49.24$, $SD = 24.81$) and analysed the relationships between age and aggression measures with and without response bias. **Results:** We found that social desirability and acquiescence increased by between one and two standard deviations between adulthood and old age. This affected the age-aggression relationship for all aggression scales and, especially for verbal and indirect aggression, whose relationships with age decreased from $r = -.192$ and $r = -.309$ to $r = .012$ and $r = -.159$, respectively, when response biases were controlled. **Conclusions:** When response bias and, in particular social desirability, are not controlled, elderly people tend to show aggression scores that are considerably lower than their true aggression levels.

Keywords: Aggression, response bias, personality.

Resumen

Los efectos del envejecimiento en las medidas de agresividad se explican en parte por los sesgos de respuesta. Antecedentes: estudios recientes han sugerido que las relaciones entre la edad y la personalidad pueden deberse parcialmente a los sesgos de respuesta. En el presente estudio hemos analizado los efectos de la edad en los sesgos de respuesta y cómo estos cambios afectan las relaciones entre la edad y la agresividad. **Método:** aplicamos el Cuestionario de Agresividad Indirecta-Directa que proporciona puntuaciones libres de sesgo en agresividad física, verbal e indirecta a 616 individuos con edades comprendidas entre los 18 y los 96 años ($M = 49.24$; $SD = 24.81$), analizando las relaciones entre las medidas de agresividad y la edad en presencia o ausencia de los efectos de los sesgos de respuesta. **Resultados:** ambos sesgos de respuesta presentaron incrementos de entre una y dos desviaciones típicas a lo largo del ciclo vital, afectando a la relación entre edad y todas las escalas de agresividad, especialmente en el caso de la agresividad verbal y la indirecta, cuyas relaciones con la edad disminuyeron desde $r = -.192$ y $r = -.309$ hasta $r = .012$ y $r = -.159$, respectivamente, al controlar los sesgos de respuesta. **Conclusiones:** cuando no se controlan los sesgos de respuesta y, especialmente, la deseabilidad social, los ancianos tienden a mostrar niveles de agresividad muy inferiores a sus niveles reales.

Palabras clave: agresión, sesgos de respuesta, personalidad.

Changes in personality in the course of ageing have often been considered a consequence of better emotional regulation and increased maturity, leading to higher scores in personality dimensions such as agreeableness or emotional stability in older people (Caspi, Roberts, & Shiner, 2005; Soto, John, Gosling, & Potter, 2011; Terracciano, McCrae, Brant, & Costa, 2005). Referring to these changes in older people, Marsh, Nagengast & Morin (2013) proposed the term “dolce vita effect”, arguing that old people are happier, more self-contented and self-centred because they are less worried about their career, work, etc., and therefore have a more positive attitude towards life.

Furthermore, various studies have shown that the ageing process also has positive effects on aggressive behaviour, with age

being negatively correlated with aggression, more specifically with physical aggression, although a negative relationship has also been found for verbal aggression and other aggressive behaviours such as aggressive driving (Archer, 2004; Gerevich, Bácskaï, & Czobor, 2007; Krahé & Fenske, 2002; O'Connor, Archer, & Wu, 2001). These negative relationships have been explained by authors such as Walker and Richardson (1998) and Walker, Richardson and Green (2000) taking into account that the potential danger associated with direct aggression might discourage the use of such approaches in older people, leading them to choose less risky strategies based upon indirect aggression through the manipulation of the social contacts within their interaction network.

For authors such as Marsh et al. (2013), the ageing process in older people leads to higher levels of agreeableness and emotional stability and lower levels of openness and extraversion. These studies have mainly been carried out using self-reports, which are sensitive to response biases such as social desirability (SD) and acquiescence (AC). These response biases are positively related to age, so various authors have recently suggested that age-personality

relationships may be reflecting not only changes in personality but also the effect on test scores of changes in response bias related to age, and especially to changes in SD (Soubelet & Salthouse, 2011; Vigil-Colet, Morales-Vives, & Lorenzo-Seva, 2013).

The effects of age-related changes in social desirability have often been reported, and it seems that there is a tendency among older people to present themselves favourably, showing higher scores in SD than young and middle-aged adults (Dijkstra, Smit, & Comijs, 2001; Ray, 1988; Stöber, 2001). These effects also seem to be of a considerable magnitude. Stöber (2001), for instance, reported differences between older people and adolescents of 1.75 standard deviations. A similar effect of 1.9 standard deviations was reported by Vigil-Colet, Morales-Vives and Lorenzo-Seva, (2013) in a sample aged 13 to 95. Bearing in mind the magnitude of these increases, it is possible that the lifetime evolution of personality scores for traits that are more affected by SD may be partly reflecting the effect of these increases in. Furthermore Vigil-Colet, Morales-Vives and Lorenzo-Seva (2013) found that the increases in response bias associated with age were slightly greater for women. Consequently, these increases also had a larger effect on the age/personality relationship.

In this respect, Soubelet and Salthouse (2011) analyzed the relationships between the personality traits of the five-factor model and age, finding that age was negatively related to neuroticism and positively related to conscientiousness and agreeableness. However, these relationships were reduced when SD was controlled and, in the case of agreeableness, the relationship actually disappeared. As a result, they concluded that some of these age-related differences in personality and other variables, such as affect measures, could be attributable to age-related increases in SD.

In the study by Soubelet and Salthouse (2011), SD effects were controlled using the traditional procedure whereby the measures of interest and an SD scale are administered together, with the SD scale then being used to partial out the SD effects.

This procedure has two main limitations that should be taken into account. Firstly, it involves administering a second scale together with the scale of interest and, secondly, it assumes that the items on the SD scale and the content scale are parallel measurements, which is highly improbable (Leite & Cooper, 2010).

A different approach which may overcome these limitations was proposed by Ferrando, Lorenzo-Seva and Chico (2009), based on a procedure that can be used to control not only SD but also AC and that provides bias-free scores for the content variables. To this end the method first identifies a factor related to SD by using a few items that are taken as SD markers. The inter-marker correlation matrix is then analysed using factor analysis and the corresponding loading values are used to compute the loading values of the content items for the SD factor. The variance explained by the SD factor is then removed, leaving a residual inter-item correlation matrix without SD effects. This matrix is then analysed and the variance due to acquiescent responding is removed from the content items. This analysis can be made using a method proposed by Lorenzo-Seva and Ferrando (2009) which identifies acquiescence response in a style factor in partially balanced scales (i.e., where the number of content reversed items does not equal the number of directly worded items). The procedure analyzes the inter-item correlation matrix and identifies a common factor related to acquiescence. The variance caused by acquiescent responding is then removed from the content items to obtain a second residual inter-item correlation matrix. This second residual inter-item correlation matrix is free

of both SD and AC. Finally, a classical exploratory factor analysis is performed on this residual matrix to determine item loadings on content factors. This allows individuals' factor scores to be obtained free of response bias effects. It should be noted that these SD and AC factors are orthogonal to each other and to the content factors; hence the removal of SD and AC bias does not affect the valid variance of the content factors.

Vigil-Colet, Morales-Vives, Camps, Tous and Lorenzo-Seva (2013) used this method to develop a test to assess personality within the framework of the five-factor model. This test, known as the Overall Personality Assessment Scale (OPERAS), provides bias-free scores for the five personality scales plus SD and AC scores for each individual. It is also possible to compute scores for each individual without removing bias effects, thereby enabling the age-personality relationship to be analysed using personality scores with and without response bias effects. When the age-personality relationship was analysed for both types of score, Vigil-Colet, Morales-Vives and Lorenzo-Seva (2013) found that response bias affects the relationships of conscientiousness (CO) and agreeableness (AG) with age, with these dimensions being the ones most affected by SD. In the case of AG, when the response biases were not controlled, the relationship with age was positive, but when the response bias effects were removed, the relationship became negative.

Bearing in mind that response bias seems to affect the personality-age relationship and that this effect is especially relevant for those dimensions most affected by SD, the question is whether response bias and in particular SD may also be affecting the relationships of age with other personality measures that are highly impacted by SD. This is especially relevant in the case of self-reported aggressiveness, because aggressiveness is related to age, and self-reported measures of aggressiveness are highly affected by SD.

Although it is possible that age may affect aggression strategies in the sense suggested by Walker and Richardson (1998), it also needs to be taken into account that if aggressive measures are highly impacted by SD, then changes in SD associated with age may also partly explain the relationships between age and aggression measures. In this respect, it is also important to take into account that most of the studies that analyse the relationships between age and aggression have been conducted in samples aged under 60, and the few studies carried out with older samples up to age 95 have reported that quite high levels of impulsivity and aggression may also be found in some older individuals (Morales-Vives & Vigil-Colet, 2010; 2012).

Several studies have shown that there is a substantial relationship between SD and aggression measures. Biaggio (1980) and Selby (1984), for example, reported correlations between the Buss-Durkee Hostility Inventory (BDHI) and the Marlow-Crowne Social Desirability (MCSD) in the range of $r = -.3$ to $-.5$. Similar results have been found for the Buss and Perry Aggression Questionnaire (BPAQ) (Becker, 2007; Harris, 1997; Morren & Meesters, 2002), and for indirect aggression measures (Selby, 1984).

All the above results regarding the relationships between SD and aggression measures were obtained by analysing the relationships between the scores of self-reported aggression and SD scales. A different approach was adopted by Vigil-Colet, Ruiz-Pamies, Anguiano-Carrasco and Lorenzo-Seva (2012), who administered two aggression measures, the BPAQ and a Spanish adaptation of the Indirect Aggression Scale (Anguiano-Carrasco & Vigil-Colet, 2011) together with four SD items which, following the procedure developed by Ferrando et al. (2009), made it possible to obtain

the loadings on SD of the items of those aggression measures. The results obtained by Vigil-Colet et al. (2012) showed that both direct and indirect aggression measures were highly impacted by SD, with physical and verbal aggression scales for more than half the items at $\lambda > .30$ on the SD factor, while indirect aggression showed a lower but still relevant impact of SD, with 30% of items at $\lambda > .30$.

Taking into account the relationships between age, aggression and SD set out above, the purpose of this study is to analyse the impact of response bias on the relationship between age and self-reported aggression and, more specifically, whether SD may partly explain the observed relationships between aggression and age. To this end, we will use a new aggression measure, the Indirect-Direct Aggression Questionnaire recently developed by Ruiz-Pamies, Lorenzo-Seva, Morales-Vives, Cosi and Vigil-Colet (2014), following the method developed by Ferrando et al. (2009). This test will enable us to obtain measures of physical, verbal and indirect aggression free of SD and AC, together with scores on both response biases. It will also be possible to compute scores for the aggression scales without removing response biases, thereby enabling their impact on the relationships between age and aggression to be evaluated. We will also test whether these effects have any sex-related differences, as they do in overall personality measures.

The main hypothesis of the study is that if self-reported aggression measures are impacted by response biases, and these biases increase with age, the negative relationship between age and aggression should decrease when response biases are controlled, especially for those aggressive behaviours that are less related to potential physical danger to older people, such as verbal and indirect aggression.

Method

Participants

The sample consisted of 616 adults ranging between 18 and 96 years of age ($M = 49.24$; $SD = 24.81$). 228 individuals were aged between 18 and 37, 141 between 38 and 57, 126 between 58 and 77, and 118 between 78 and 97. 60.2% of the sample was female.

Taking into account that we had to tap a wide age range, various strategies were used to collect the sample, because it is difficult to find one specific population comprising people from late adolescence to old age. To this end, the test was administered to: (1) university students in their classrooms (52% females); (2) workers from different companies during training activities; (55% females) (3) participants in academic university activities for graduates/adults (64% females); and (4) older people in nursing homes and on specially-designed university courses (67% females).

Instruments

Aggression measures

The Indirect-Direct Aggression Questionnaire (I-DAQ; Ruiz-Pamies et al., 2014). This test gives SD and AC-free scores for the factors Physical Aggression (PA), Verbal Aggression (VA), Indirect Aggression (IA) and Overall Aggression (OA), plus SD and AC scores for each individual. The questionnaire consisted of 6 items measuring PA, 7 items measuring VA and 10 items measuring IA plus 4 items used as SD markers. The factors measured by I-DAQ

have appropriate factorial ($r_{00} = .83$; $r_{00} = .77$ and $r_{00} = .78$) and test-retest ($r_{tt} = .71$; $r_{tt} = .61$ and $r_{tt} = .69$) reliabilities for PA, VA and IA, respectively. The test also has good convergent and criterion validity with other aggression and personality measures. The test gives the scores for each content scale and for response biases on the T-scale. Detailed information about the items and psychometric properties of the test can be found at <http://psico.fcep.urv.cat/tests/idaq/en/index.html>.

Cognitive measures

The Mini-Mental State Examination (MMSE) (Folstein, Folstein, & McHugh, 1975). We administered the Spanish version of the MMSE (Lobo et al., 1999), which is a quick test for screening cognitive function deficits in older people and one of the most widely-used questionnaires for this purpose. The test consists of 23 items and their scores range from 0 to 35 points. We administered the aggression questionnaire only to individuals with scores above 23 in the MMSE, which is the recommended cut-off point for detecting people at risk of having dementia. This cut-off point gives good sensitivity (90%) and specificity (75%), with an area under the ROC curve of .92. Twenty-four individuals were not included in the study because they had scores under the cut-off point used to detect possible cases of dementia.

Procedure

The test was administered by a psychologist to students and workers in groups of between 20 and 40 individuals. In the case of older people, the test was administered individually or in small groups (up to five people) by a psychologist experienced in dealing with older people. These participants were also tested to exclude people with dementias. The aggression questionnaire was self-administered and the participants were volunteers and were asked for no information that could have identified them, and their anonymity was therefore guaranteed. They were not paid for their participation.

Data analysis

We computed the factor scores for each participant on the aggression measures for the factor solution obtained before and after SD and AC effects had been removed. This procedure makes it possible to compare the relationships between age and aggression measures when aggression scores are free of or affected by response bias. It also provides SD and AC scores for each individual. With these scores, we computed the product moment correlations between age and response bias. We also computed the correlations between aggression measures and age for both corrected and uncorrected scores. To graphically represent the relationship between these variables, we split the individuals into four age groups because these relationships and the effects of removing response biases are displayed more clearly than with a scatter plot.

Results

Table 1 shows descriptive statistics for response bias and content scores with and without response bias effect, which allow us to evaluate the impact of response bias on the relationships between age and self-reported aggression measures.

Table 1
Descriptive statistics for bias and content scales across four age groups with and without response bias (Scores in T-Scale)

Age	Social desirability		Without response bias								With response bias											
			Acquiescence		Physical		Verbal		Indirect		Overall		Physical		Verbal		Indirect		Overall			
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
18-37	47.0	8.2	49.9	10.3	52.0	10.0	48.9	9.7	51.3	10.0	51.2	9.5	52.1	10.1	50.2	9.3	52.4	10.2	52.1	9.3		
38-57	53.2	10.2	49.9	9.7	47.7	8.7	48.5	10.2	49.5	9.2	48.2	9.1	47.8	8.8	47.2	10.4	48.1	8.9	47.1	8.9		
58-77	60.9	8.6	56.2	10.5	48.3	8.7	51.6	12.5	47.4	9.6	48.3	9.8	44.9	9.4	48.5	12.5	46.1	9.2	45.4	10.3		
78-97	64.8	6.6	55.8	8.4	46.4	7.5	48.6	12.1	47.7	10.2	46.6	9.7	42.7	8.5	44.3	11.4	44.8	8.6	42.2	9.0		

It can be seen that the response bias increased with age, and that this increase was greater for SD than for AC, with SD increasing by almost two standard deviations from the youngest to the oldest group (see Figure 1). As far as aggression measures are concerned, physical, indirect and overall aggression decreased with age, but this decrease was much greater when the response biases were not controlled, reflecting a possible effect of response bias on aggression scores across age groups. This effect was especially relevant for verbal aggression, which apparently showed no age effect when the response biases were controlled but did show an age effect when they were not.

Table 2 shows the correlations between age, response bias and aggression measures. Age is positively related to both response biases, its relationship being much higher for SD than for AC. Indeed age accounts for more than 40% of the variance of SD. In the case of aggression measures, when response biases are not controlled, age is negatively related to all aggression measures. However, when we computed the correlations using scores free of response bias, all these relationships decreased and in the case of verbal aggression disappeared. Figure 2 shows these effects across age groups. It can be seen that the age effects on aggression using corrected and uncorrected scores are quite similar for the first two age groups, but in the two older groups, the uncorrected scores show considerably lower aggression levels than the corrected scores.

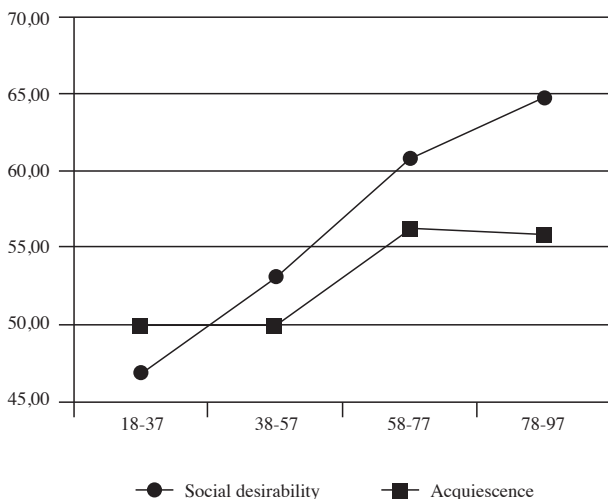


Figure 1. Social desirability and acquiescence across age categories

In order to determine which response bias was affecting the age-aggression relationship, we computed partial correlations between age and aggression scales controlling for SD and AQ. Table 2 shows these correlations, and it can be seen that when the AC effects were partialled out, the size of the correlations increased. However, when the SD effects were controlled, the size of the correlation between age and physical aggression decreased, disappearing for the other measures, thereby indicating that the main cause of the differences found when age was related with corrected and uncorrected aggression scores was SD.

Taking into account the fact that some studies have proposed differences in levels of SD associated with gender, we analysed the age-aggression relationships for men and women separately. The results are shown in Table 3. It can be seen that the age-aggression relationship was quite similar for both men and women, and that the differences between the observed correlations were only significant for physical and verbal aggression, but with a low effect size. The only relevant effect was that AC was more related to age in women than in men, while the much larger relationship of SD with age was very similar for both sexes.

Discussion

The results set out above confirm the hypothesis that response biases and, more specifically SD, partly explain the relationships between age and aggression. Furthermore, these results are similar to those of other studies that showed that SD and AC were

Table 2
Correlations of age with response bias and content scales, with and without response bias effects on content scores and controlling for acquiescence and social desirability

		Social desirability		Acquiescence	
Age		.652**		.270**	
		Physical	Verbal	Indirect	Overall
Age	Scores controlling bias	-.220**	.012	-.159**	-.180**
	Scores with response bias	-.373**	-.192**	-.309**	-.383**
	Controlling acquiescence	-.286**	-.240**	-.420**	-.402**
	Controlling social desirability	-.279**	.067	.002	-.088*

*p<.05; **p<.01

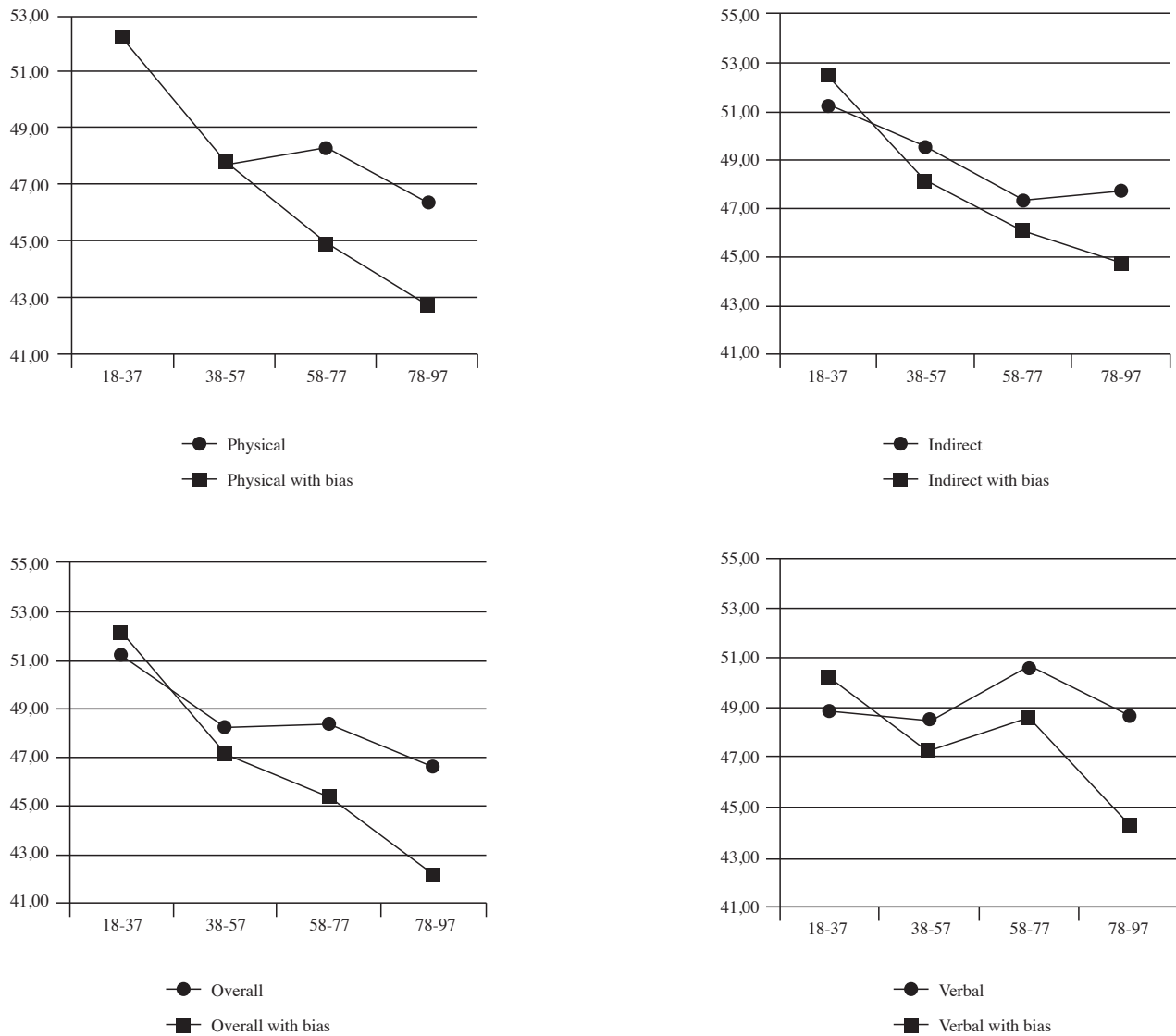


Figure 2. Evolution of physical, verbal, indirect and overall aggressiveness across age categories for bias-corrected and bias-uncorrected scores

Table 3
Comparisons for the correlations of age with response bias and content scales for men and women using Fisher's r-to-z transformation test

	Variable	Men	Women	p (z test)
Controlling bias	Social desirability	.596**	.682**	n.s.
	Acquiescence	.115	.387**	<.01
	Physical aggression	-.287**	-.124*	<.05
	Verbal aggression	-.163*	-.087	<.05
	Indirect aggression	-.218**	-.077	n.s.
	Overall aggression	-.196**	-.131	n.s.
With response bias	Physical aggression	-.363**	-.357**	n.s.
	Verbal aggression	-.064	-.265**	<.05
	Indirect aggression	-.388**	-.214**	<.05
	Overall aggression	-.378**	-.36**	n.s.

* p<.05; ** p<.01

affected by age, especially in older people (Becker, 2007; Harris, 1997; Morren & Meesters, 2002). In this respect, SD is the most affected response bias, showing an increase of nearly two standard deviations in the course of adulthood. However, our main objective was not to establish the magnitude of these increases but to analyse the effects of the increases in response bias on the age-aggression relationship. In this respect, our results seem to show that response bias accounts for a relevant part of the variance between age and the scores from aggression self-reports. These results are along the same lines as the ones reported for the effects of response bias on the age-personality relationships within the framework of the Big Five model of personality (Soubelet & Salhouse, 2011; Vigil-Colet, Morales-Vives, & Lorenzo-Seva, 2013).

The results obtained by comparing the relationships with age of corrected and uncorrected scores on the IDAQ scales showed that when response biases were controlled, the negative relationship between age and aggression is much smaller than the relationship found when they are not controlled. This effect is almost the same

for both sexes and is especially relevant in the case of verbal aggression, which, using bias-free scores, apparently remains stable throughout adulthood, although it is negatively related to age when the response bias effects are not controlled.

One interesting question is to determine which response bias is responsible for the decrease observed in the age-aggression relationships. When the effects of SD and AC were individually controlled, it was observed that the correlations decreased in the case of SD but increased in the case of AQ. These results, which may seem contradictory, could be explained by taking into account that response bias may be considered content variance or error variance.

This last issue is a long-standing subject of discussion in response bias research. There are two main points of view regarding SD and AC. The first considers them as measurement error or artefacts that are of no substantive interest, while the second considers them as individual difference variables that have a certain degree of stability and consistency (Ferrando et al., 2009). These points of view have different predictions about how the removal of biases from the content variable affects its validity coefficients. If response bias is measurement error, then when it is removed, the coefficients should increase, whereas if response bias is a meaningful trait, then when it is removed, the correlations should decrease. As Paulhus (1991) has pointed out, there are various SD measures with an appropriate reliability and temporal stability, but the few AC measures that exist do not have the appropriate psychometric properties. Furthermore, different studies have found relationships between SD and personality measures, which is not compatible with the idea of SD as measurement error, but these kinds of relationship have not been found for AC (Li & Bagger, 2006; McCrae & Costa, 1983; Ones, Viswesvaran, & Reiss, 1996). Consequently it seems that SD is a meaningful trait whereas AC is more related to error variance. Nevertheless, the present study has not been specifically designed to test this hypothesis, so further research is needed so that it can be verified and generalized to other personality domains.

These differences between SD and AC may explain the observed effects on the age-aggression relationship when response biases are controlled. In the case of AC, when response bias is removed, the correlation between age and aggression measures tends to increase because the associated decrease in measurement error in aggression measures results in an increase in correlation coefficients. However, SD seems to be a meaningful trait that affects aggression measures and increases with age because, when response bias is controlled, the age-aggression relationship decreases.

Nevertheless, although age-aggression relationships are affected by response biases, the fact is that even when response biases are controlled, there is a tendency to find a negative relationship between age and aggression measures, though this is smaller than

that reported when response biases are not controlled. When this relationship is analysed for each kind of aggression, we can see that physical aggression clearly decreases from young adulthood until age 50-60 and that this decrease is lower for indirect aggression and non-existent in the case of verbal aggression. These results are similar to those reported by Walker and Richardson (1998) and Walker et al. (2000), who suggested that older people use strategies to minimize the effect-danger ratio, which, taking into account the decline in strength and health of older adults, may favour the use of aggressive behaviours that involve no risk to health, unlike in the case of physical aggression. More specifically, Walker and Richardson (1998) suggested that these processes should be reflected in a decrease in the likelihood of direct forms of aggression (especially physical aggression) compared to other forms of aggression (especially indirect aggression). The results reported above follow similar lines, showing that physical aggression decreases in favour of more indirect aggression as individuals get older. However, our results showed that verbal aggression remains stable throughout the life span, so the differences in direct aggression associated with age may be due mainly to variations in physical aggression levels.

The results set out above have relevant implications for assessment in older people and especially for the assessment of aggressive behaviour. Our study, like previous studies, shows that the highest levels of SD and AC are reached in older people, and therefore the results of self-reports that do not incorporate any correction for response bias should be viewed with caution. Older people may show themselves to be less aggressive than they really are, making it difficult to carry out a valid assessment of their aggression levels. The main problem arises from the fact that old people have the highest levels of SD and AC, and their response bias scores also show considerable variability. Therefore, if variance due to response bias is not removed, any comparison of individuals with their reference group may be contaminated by these sources of error, and clinicians may take wrong decisions. This is especially relevant bearing in mind that there are a considerable number of individual differences in faking aggression questionnaires, especially for indirect and verbal aggression (Anguiano-Carrasco, Vigil-Colet, & Ferrando, 2013).

The present study suffers the classical problem of cross-sectional studies and the possible effects of using different birth cohorts (i.e., different values that may affect SD scores, different academic levels that may affect AC). Further research is therefore needed to verify whether the effects reported above can be reproduced in a longitudinal study.

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