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A bias-corrected exploratory and confirmatory factor analysis of right-wing authoritarianism: Support for a three-factor structure

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ABSTRACT

The factor structure of right-wing authoritarianism (RWA) remains a contentious issue. Although designed to measure three underlying attitude clusters, aggression, submission and conventionalism, many items are deliberately double- or triple-barrelled, to capture the covariation of the three clusters in a unidimensional scale. Additionally, although the scale is balanced, there is an item wording direction bias in the clusters; aggression items are pro-trait, and conventionalism items are con-trait. Sub-scale structure is therefore potentially confounded with acquiescence bias. Although RWA as a unitary construct has been an effective tool for exploring prejudice, it would be useful in many cases to measure its underlying components directly. Proposed solutions to this problem include creating short-form scales as subsets of the original scale, or modifying items to simplify and un-confound the structure. We present convergent evidence of an underlying factor structure by considering one-, two- and three-factor solutions to the uncorrected scale and then using an indirect method to correct for acquiescence bias. Before and after correction, factor analysis supported a three-factor solution. Confirmatory factor analyses also support a three-factor solution compared to a one-factor solution.

1. Introduction

Right-wing authoritarianism (RWA; Altemeyer, 1981, 1988, 1996) has been shown to be an important predictor of political and social attitudes (e.g., Altemeyer, 1996, 2004; Crowson, DeBacker, & Thoma, 2005; Heaven & St. Quintin, 2003; Mirisola, Sibley, Boca, & Duckitt, 2007) and represents a measure of political conservatism focusing on resistance to change (Jost, Glaser, Kruglanski, & Sulloway, 2003; Ray, 1985). A major conceptual issue currently facing researchers in this area is the underlying dimensionality of the construct. RWA is conceptualised and measured as a unidimensional scale representing the covariation of three underlying components: authoritarian aggression, authoritarian submission, and conventionalism. There are a number of situations however in which it is useful or necessary to be able to consider the components separately.

Research on the relationship between authoritarianism and attitudes to: homosexuality, women's equality, and conservative attitudes to sexuality, for example, may be distorted by inclusion of these issues within the construct definition and measurement of authoritarianism. Researchers have noted possible consequences ranging from simple inflation of correlations (Whitley & Lee, 2000) to spurious regression coefficients (Mavor, Macleod, Boal, & Louis, 2009).

To explore these issues requires a scale in which the overall RWA construct can be reliably decomposed into its constituent components, but this has proven difficult. There are two main problems: the confounding of the components with wording direction, and the double- and triple-barrelled nature of many items in the scale. Together, these issues have made it very difficult to show the underlying structure of the scale using either exploratory or confirmatory factor analysis methods (Funke, 2005). While some researchers have tackled the issue of the complex item structure (e.g., Funke, 2005; Manganelli Rattazzi, Bobbio, & Canova, 2007), our main goal will be to complement these other approaches by addressing the confound due to item wording direction. We believe that this will provide convergent evidence of the underlying structure of the scale and encourage more researchers to explore authoritarianism at the component level of analysis.

Given that Altemeyer (1981) conceptualised the scale as unidimensional, it initially seemed sufficient to balance the overall scale with pro-trait (positively worded) and con-trait (negatively worded, reverse-scored) items. However, in that process, items that primarily tap the aggression component ended up being worded in a pro-trait direction, and items representing the conven-

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tionalism component were worded in a con-trait direction. Submission items are both positively and negatively worded, but are mostly double-barrelled items also capturing some of the other components (Duckitt & Fisher, 2003; Funke, 2005).

Summated rating scales can be susceptible to distortions in responding such as acquiescence bias (Ferrando, Lorenzo-Seva, & Chico, 2003); the tendency for participants to respond in a relatively positive or negative way to all items on a scale. Scale developers therefore seek to ensure a balance of pro-and con-trait items in a scale. In a balanced, unidimensional scale, the acquiescence bias can potentially inflate correlations among pro-trait items and among con-trait items, and reduce the correlations between items with opposite wording. This tendency might be sufficient to suggest a two-factor solution in exploratory factor analysis though typically the acquiescence effect is of little substance (Nunnally, 1978; Rorer, 1965). Researchers nonetheless tend to ignore factor solutions where the items heavily divided into pro-trait and con-trait factors. This is the interpretation that Altemeyer has given to two-factor solutions of the RWA scale:

> I have a definite hypothesis about the factor structure of the RWA scale, namely, that it is essentially unidimensional. So I can take advantage of common factor analysis' ability to tell me if I am wrong.
>
> Over the years, my common factor analyses have sometimes produced just one factor on which most of the items have appreciable loadings, or else two factors that correlate .40–.70 when oblique rotations are performed. ... The one factor, or two factors together, account for about 25–35% of the total variance of the RWA scale. ...
>
> Two factors seemingly disconfirm my hypothesis that the RWA scale measures basically one thing. But the two factors were well correlated. Furthermore, ... all the protrait items (save one) loaded higher on one factor, and all the contraits had their higher loading on the other.
>
> ... when we pull the common variance apart, the best we can do is get the portrait and con-trait items into largely separate piles. (Altemeyer, 1996, pp. 53–54).

We propose several arguments that allow for a revised view on this issue. First and foremost is that item direction is confounded with the measurement of aggression and conventionalism. If we start with an alternative hypothesis that RWA is at least two-dimensional, then the same factor analysis findings support that view. Secondly, correlations between factors are not sufficient to argue against meaningful sub-scales. Finally, Altemeyer does not report analyses beyond two factors, perhaps because these accounted for most of the variance, and broke into pro- and con-trait factors. However, given that there are three clusters theorised within RWA, it makes sense to consider a three-factor solution. If the scale is really unidimensional, and the second factor is due to acquiescence bias, then a third factor should not show any particular meaningful pattern. An interpretable three-factor solution however would support the contention that the two-factor pattern was due to a meaningful aggression/conventionalism distinction rather than merely pro- versus con-trait items.

Funke (2005) modelled a method factor in a confirmatory factor analysis of the RWA scale, as well as trying to deal with the multi-barrelled nature of many items. The combination of these two issues made it impossible to obtain satisfactory models using the original items, and Funke instead designed new items that were less dimensionally complex, and balanced within each component. Other researchers have used short-form component scales based on the original RWA items (e.g., Duncan, Peterson, & Winter, 1997; Smith & Winter, 2002).

The approach we have taken is to analyse the original RWA scale to address the alternative factor analysis hypothesis directly, and then attempt to control for acquiescence bias using a novel analysis. A closely related measure, Social Dominance Orientation (SDO; Pratto, Sidanius, Stallworth, & Malle, 1994) is frequently included with RWA in predicting a range of social attitudes (Duckitt, 2001). SDO is closely conceptually related to RWA and yet often correlations are relatively low. SDO is generally considered to be unidimensional (but see Jost & Thompson, 2000). The commonly used 16-item version of the scale has 8 pro-trait items expressing dominance views, and 8 con-trait items expressing equality views. If some participants are responding partly on the basis of acquiescence bias, then this should be detectable in the SDO responses. The measured bias in SDO can be used to estimate acquiescence bias in the responses to the RWA items in the same sample, and the RWA items can be corrected accordingly. Exploratory factor analyses on the corrected item correlations should then be a better test of the dimensionality of the scale. If the emergence of two or more factors in RWA were based only on acquiescence bias then a single clear factor should emerge from the corrected matrix. If the scale does have a real underlying multi-factor structure then this should emerge clearly in the corrected correlation matrix.

2. Method

2.1. Participants

Participants were 545 New Zealand undergraduates (258 men, 287 women; M_{age} = 27.9, SD_{age} = 17.0). Four hundred and two participants, self-identified as New Zealand European, 40 as Asian, and 32 as Maori (61 identified as other/unreported).

2.2. Materials and procedure

Participants completed the 16-item version of the SDO scale (Pratto et al., 1994), and the full 30-item version of the RWA scale (Altemeyer, 1996) as part of a mass testing session. All items were rated on a scale ranging from −3 (strongly disagree) to 3 (strongly agree).

3. Results

3.1. Overview of analyses

Our first step was to conduct a factor analysis on the original RWA items without any correction, and directly explore the possibilities of one, two and three factors. The second step was to estimate the acquiescence bias from the responses to the SDO scale, compute an adjusted correlation matrix for the 30 RWA items, and examine factor analyses on the corrected matrices. We then constructed item parcels for RWA to test confirmatory factor models for one versus three-factor solutions.

3.2. Factor analysis of the uncorrected RWA scale

To consider Altemeyer's (1996) argument about the factor solution of the scale, we report the one, two, and three-factor solutions in Table 1. We used a principal axis factoring method of factor extraction, and a Promax rotation method (Tabachnick & Fidell,