



Libraries and Learning Services

University of Auckland Research Repository, ResearchSpace

Version

This is the Accepted Manuscript version. This version is defined in the NISO recommended practice RP-8-2008 <http://www.niso.org/publications/rp/>

Suggested Reference

Ruffman, T., Wilson, M., Henry, J. D., Dawson, A., Chen, Y., Kladnitski, N., Myftari E., Murray J., Halberstadt J., Hunter, J. A. (2016). Age Differences in Right-Wing Authoritarianism and Their Relation to Emotion Recognition. *Emotion*, 16(2), 226-236. doi: [10.1037/emo0000107](https://doi.org/10.1037/emo0000107)

Copyright

Items in ResearchSpace are protected by copyright, with all rights reserved, unless otherwise indicated. Previously published items are made available in accordance with the copyright policy of the publisher.

<http://www.apa.org/pubs/authors/posting.aspx>

<http://www.sherpa.ac.uk/romeo/issn/1528-3542/>

<https://researchspace.auckland.ac.nz/docs/uoa-docs/rights.htm>

Running Head: AGE DIFFERENCES IN RWA

**Age Differences in Right-Wing Authoritarianism and Their Relation to Emotion
Recognition**

Ted Ruffman¹, Marc Wilson², Julie D. Henry³, Abigail Dawson¹, Yan Chen¹, Natalie Kladnitski¹, Ella Myftari¹, Janice Murray¹, Jamin Halberstadt¹, and John A. Hunter¹

¹University of Otago, Dunedin, New Zealand

²University of Victoria, Wellington, New Zealand

³University of Queensland, Brisbane, Australia

“in press”, *Emotion*

Acknowledgements: We thank the reviewers and editor for their very helpful comments on an earlier version of this manuscript.

Address for correspondence: Ted Ruffman, Department of Psychology, University of Otago, Post Office Box 56, Dunedin, New Zealand, 9054, fax: +64 3 479-8335, phone: +64 3 479-7670, e-mail: tedr@psy.otago.ac.nz

Abstract

This study examined the correlates of right-wing authoritarianism (RWA) in older adults. Participants were given tasks measuring emotion recognition, executive functions and fluid IQ and questionnaires measuring RWA, perceived threat and social dominance orientation. Study 1 established higher age-related RWA across the age span in more than 2600 New Zealanders. Studies 2 to 4 found that threat, education, social dominance and age all predicted unique variance in older adults' RWA, but the most consistent predictor was emotion recognition, predicting unique variance in older adults' RWA independent of all other variables. We argue that older adults' worse emotion recognition is associated with a more general change in social judgement. Expression of extreme attitudes (right- or left-wing) has the potential to antagonize others, but worse emotion recognition means that subtle signals will not be perceived, making the expression of extreme attitudes more likely. Our findings are consistent with other studies showing that worsening emotion recognition underlies age-related declines in verbosity, understanding of social gaffes, and ability to detect lies. Such results indicate that emotion recognition is a core social insight linked to many aspects of social cognition.

Age Differences in Right-Wing Authoritarianism and Their Relation to Emotion Recognition

Right-wing authoritarianism (RWA) is characterized by a high degree of submissiveness to authorities perceived as established and legitimate, aggressiveness towards those who deviate from group norms, and adherence to social ideals that are believed to be normative for a society (Altemeyer, 1981; 1996). RWA is perpetuated by perceived social threat and a sense of self-righteousness (Altemeyer, 1998), motivating individuals to express uncritical support for the existing social order and respond with negativity to those perceived to undermine this state of affairs (Altemeyer, 1996; Duckitt, 2001, 2006; Esses, Haddock, & Zanna, 1993; Sibley & Duckitt, 2008). Thus, whilst those high in RWA support the established authorities when they curtail human rights, resort to violence or go to war (Cohrs, Kielmann, Maes & Moschner, 2005), they are much more critical of minorities or those judged to be on the margins of society (Altemeyer, 1988; 1994; 1998).

RWA is assessed by means of the RWA scale (Altemeyer, 1988, 1998). Using this measure, respondents are given the opportunity to endorse a series of attitudinal statements. These reflect moralistic (*‘Obedience and respect for authority are the most important virtues children should learn’*), nationalistic (*‘Some of the worst people in our country nowadays are those who do not respect our flag, our leaders, and ...’*), homophobic (*‘There is nothing wrong or sick in somebody being a homosexual’* – reverse scored), paternalistic (*‘Young people sometimes get rebellious ideas but when they grow up they should get over them’*) and sexist sentiments (*‘Women should have to promise to obey their husbands when they get married’*).

RWA has been shown to change in response to situational manipulations (Duckitt & Fisher, 2003), societal threats (Doty, Peterson & Winter, 1991), group socialization (Poteat,

Espelage, & Green, 2007), the prevailing culture (Rydgren, 2005), and parental attitudes and education (Altemeyer, 1988). For such reasons it has been conceptualized as a somewhat malleable social attitude as opposed to a more stable personality disposition (Duckitt, 2001; 2006; Sibley & Duckitt, 2008).

Large-scale, cross-sectional studies in Poland and Belgium indicate that RWA tends to be higher in older adults than young adults (Cornelis, Van Hiel, Roets, & Kossowska, 2009). Indeed, RWA tends to increase for each decade of life, from the 20s through to the oldest category studied, 60 years and older, with correlations in the .33 to .37 range. Such findings are consistent with results indicating that older adults score higher on other scales measuring conservative attitudes, including the General Conservatism, Cultural Conservatism, and Wilson-Patterson Conservatism scales (Cornelis et al., 2009; Truett, 1993).

Studies have shown that individuals who score higher on RWA scales tend to express higher levels of prejudice, including homophobia, sexism, racism, as well as more intolerance towards different religions, Native Americans, racial and ethnic minorities, the physically disabled, HIV patients, and women (Duckitt & Farre, 1994; Goodman & Moradi, 2008; Whitley, 1999; Whitley & Kite, 2006). Further, like RWA, research indicates higher levels of prejudice in older adults than in young adults (Firebaugh & Davis, 1988; Stewart, von Hippel, & Radvansky, 2009; Wilson, 1996).

In order to understand the origins of RWA, it is helpful to turn to the literature on prejudice. Two primary explanations have emerged to explain prejudice in older adults. The first *normative* view argues that the current generation of older people were socialized during an era where the open expression of many forms of prejudice was the norm (Schuman, Steeh, Bobo, & Krysan, 1997). To this end, research indicates that aging is not accompanied by

increasing conservatism. Cutler and Kaufman (1975) studied attitude change between 1954 and 1975. Tolerance for non-conformity was greater in 1975 than 1954, and both young and older adults became more tolerant over time. However, the increase in tolerance was greater in younger cohorts than older cohorts, either because older cohorts grew up with more conservative attitudes in the first place or because aging itself leads to reluctance to change. The second explanation of prejudice in older adults is that diminished *executive functions* (EFs) contribute (Stewart et al., 2009; von Hippel, Silver, & Lynch, 2000).

These explanations of prejudice can easily be adapted to explain RWA. First, older people were socialized during an era when conservative attitudes were common. Second, diminished EFs could account for greater expression of extreme right-wing attitudes in older adults. In addition, a third view based on findings with young adults can be advanced: RWA should be higher when older adults feel *threatened* (as measured by perceived threat, inter-group anxiety and social dominance). That is, older adults might generally feel more marginalized by a rapidly changing society, leading to higher RWA. A fourth view, also suggested by previous findings with young adults, is that RWA could be higher in older adults relative to young adults because of their generally lower levels of *education*.

In the present study, we also tested a fifth view positing that declining *emotion recognition* accounts for increased RWA in older adults. Emotion recognition is plausibly related to RWA because it is reduced in older adults relative to young adults (Ruffman, Henry, Livingstone, & Phillips, 2008) and could influence RWA through an indirect or direct route. Regarding the former, it might lead to a reduction in feelings of understanding others, which might then heighten the sense of threat, causing an increase in RWA. There are numerous studies linking emotion recognition and threat perception. For instance, oxytocin administration enhances emotion recognition (Lischke, Berger, Prehn, Heinrichs, Herpertz, &

Domes, 2012) and social approach behavior (Kosfeld, Heinrichs, Zak, Fischbacher, & Fehr, 2005), while decreasing social threat (Bertsch et al., 2013).

The direct path from emotion recognition to RWA might come about because expressing extreme views of any kind (e.g., left- or right-wing) will be unpalatable to, and lead to a feeling of discomfort in, listeners who are not like-minded. Older people were socialized during an era where the open expression of many forms of prejudice was the norm (Schuman et al., 1997). Yet research shows that opinions are in many cases malleable, and that the expression of opinions depends on whether it will enhance one's self-image, which in turn, is dependent on the social circumstances, with an emphasis on expressing opinions consistent with those of listeners (Blair, 2002; Brown, 2010; Oakes, Haslam, & Turner, 1994). For this reason, speakers must monitor the opinions of listeners in an attempt to streamline their expression of ideas. Right-wing attitudes tend to be antagonistic to those with an orientation rooted in personal freedoms or human rights (Altemeyer, 1988; Moghaddam & Vuksanovic, 1990), yet expression of such antagonism will often be subtle and indirect (Brown, 2010), and reduced emotion recognition would result in less awareness of subtle cues and a greater tendency towards expressing extreme attitudes.

Consistent with this idea, declines in emotion recognition mediate age differences in other social insights, including older men's verbosity (Ruffman, Murray, Halberstadt, & Taumoepeau, 2010), older adults' understanding of social gaffes (Halberstadt, Ruffman, Murray, Taumoepeau, & Ryan, 2011; although see Stanley, Lohani, & Isaacowitz, 2014 for evidence that older adults do not always find social gaffes harder to identify), and older adults' lie detection (Ruffman, Murray, Halberstadt, & Vater, 2012). The explanation given for these relations is that difficulty detecting emotional cues makes it more likely that one will continue to talk despite emotional cues to stop (verbosity), fail to understand how certain

things make others feel uncomfortable and therefore should not be said (social gaffes), or detect emotional leaks in liars. Difficulty detecting subtle emotional cues might, likewise, result in a tendency to express extreme social attitudes even though they could antagonize others.

We examined these ideas in four studies. In Study 1, we examined whether we would replicate earlier findings of an increase in RWA across the lifespan in a sample from New Zealand. Studies 2 to 4 examined potential causes of heightened RWA in older adults, including emotion recognition and a range of potentially confounding variables, such as age-related difficulties with EFs, lower levels of education, reduced general cognition (fluid intelligence), a heightened sense of threat or inter-group anxiety, as well as a social dominance orientation (Pratto, Sidanius, Stalworth, & Mallé, 1994), a measure of endorsement for unequal social relationships. These variables would plausibly relate to RWA in older adults; EFs because they are related to prejudice in young adults (see above), education, threat, anxiety and social dominance because they relate to RWA in young adults (see above and Altemeyer, 1998; Cohrs, Moschner, Maes, & Kielmann, 2005; Heaven, Ciarrochi, & Leeson, 2011), and fluid intelligence because it declines with age (Horn & Cattell, 1967).

Study 1

Method

Participants. The participants were respondents to an online survey (delivered via SurveyMonkey©), solicited through the Sunday Star Times, a national New Zealand newspaper. The survey was promoted during September, 2011, as an investigation of New Zealanders' political and social attitudes. The survey was open for a two-week period, after which the data were collated and summarized for serialization in the newspaper. There were

2,658 people who completed the measures relevant to this study (62% female; 87% identified as New Zealand European and 4% as Māori; $M = 51.12$ years, $SD = 15.22$ years). There were 269 20-year-olds (16 to 29 years), 367 30-year-olds (30 to 39), 509 40-year-olds (40 to 49), 636 50-year-olds (50 to 59), and 877 60⁺-year-olds (60 to 87).

Measures. As well as demographic and background information, the survey included a range of measures relating to attitudes to topical social issues, and constructs related to socio-political attitudes. A larger data set, drawn from this survey and using other measures not relevant to this study, was used by Milfont, Richter, Sibley, Wilson, and Fischer (2013). The summary below describes only those measures of relevance to the present study.

Right-Wing Authoritarianism. Shortened scales are regularly used in research on RWA. For instance, a recent meta-analysis examined 16 studies, of which only three used the full RWA scale (Sibley, Robertson, & Wilson, 2006). Thus, in Study 1, RWA was assessed using six balanced items, selected based on Mavor, Lewis, and Sibley's (2010) factor-analytic separation of the 30 standard items. Items assessed the three constellations of authoritarian submission (e.g., "Obedience and respect for authority are the most important virtues children should learn."), authoritarian aggression (e.g., "What our country really needs is a strong, determined leader who will crush evil, and take us back to our true path."), and conventionalism (e.g., "There is nothing wrong with premarital sexual intercourse", reverse-coded). The negatively and positively worded items with the highest loadings from each of the three factors identified by Mavor et al. were adopted for use in this study, and participants indicated the extent of their agreement with each on a 1 (strongly disagree) to 7 (strongly agree) scale. After reverse coding, an RWA scale score was calculated as the mean of the six items ($\alpha = .71$; $M = 2.89$, $SD = 1.03$).

Big Five Personality Characteristics. Because RWA relates to the “big five”

personality characteristics (see above), participants were given the Ten Item Personality Inventory (TIPI: Gosling, Rentfrow, & Swann, 2003). This measure includes two items for each of the five personality dimensions, with each item rated on a 7-point scale that ranges from 1 (disagree strongly) to 7 (agree strongly), with the mean of the two items taken as a measure of each dimension.

Results and Discussion

Participants' scores on the measures of RWA and personality are shown in Table 1. All measures were examined using analysis of variance (ANOVA) with RWA or one of the five personality measures as the dependent variable, and the independent variable (Age) having five levels (five age groups). The ANOVAs for RWA ($F(4, 2653) = 71.02, p < .001, \eta_p^2 = .10$), extroversion ($F(4, 2650) = 2.95, p = .02, \eta_p^2 = .004$), agreeableness ($F(4, 2647) = 35.13, p < .001, \eta_p^2 = .05$), conscientiousness ($F(4, 2648) = 30.44, p < .001, \eta_p^2 = .04$), and emotional stability ($F(4, 2649) = 35.32, p < .001, \eta_p^2 = .05$) were all significant. In contrast, the ANOVA for openness ($F(4, 2649) = 0.83, p = .50, \eta_p^2 = 0$) was not. Because of its theoretical interest, the significant ANOVA for RWA was followed up with post-hoc Bonferroni tests. There was no difference between the RWA scores of 20- and 30-year-olds, or 40- and 50-year-olds. However, the 40-year-olds obtained higher scores than the 20- and 30-year-olds, the 50-year-olds obtained higher scores than the 20- and 30-year-olds, and the 60+-year-olds obtained higher scores than all other age groups.

The correlation between age and RWA was in the same region as in previous studies, $r(2657) = .32, p < .001$. We then examined correlations between RWA and the five personality characteristics. As in previous research, openness was a modest, though significant correlate of RWA in each of the five age groups ($.14 \leq r \leq .19$, all $ps < .008$), but

none of the other personality characteristics correlated with RWA. In sum, consistent with findings from Belgium and Poland, RWA is higher in older New Zealanders and is related to the Big Five personality characteristic, openness.

Studies 2 to 4 Overview

Having established that RWA is higher in older adults, Studies 2 to 4 examined several factors that might help to explain higher levels of RWA in the oldest group (60+ years). It is common for different researchers to use different measures of RWA and emotion recognition, and we do likewise in Studies 2 to 4. We hypothesize that relations between RWA and emotion should be general rather than specific to particular items in each measure, and consistent findings with different measures would help to indicate a clear relation between RWA and emotion recognition that is not tied to particular items.

None of the participants in Studies 2 to 4 had experienced strokes or head injuries. Some of the emotion stimuli were presented visually and other emotion stimuli (in Studies 2 and 3) were acoustic. Thus, older participants were given vision tests and all had corrected-to-normal vision (i.e., wearing eye glasses). Further, participants were allowed to adjust the volume (in Studies 2 and 3) until they could clearly hear stimuli (demonstrated to provide adequate perception of auditory stimuli: Orbelo, Grim, Talbott, & Ross, 2005). The older participants were recruited through newspaper advertisements or word-of-mouth, were tested in a university laboratory, and were reimbursed for travel expenses, whereas the younger participants were either reimbursed financially for their participation or received a small amount of credit towards a course grade for writing a report detailing the study. **Some of the variables had a skewed, non-normal distribution, including (in at least one study), emotion recognition, social dominance, fluid IQ, inter-group anxiety, education and RWA.**

Transformations to normalize data were sometimes but not always successful for individual variables and for this reason we opted for non-parametric correlations throughout.

Study 2

Study 2 examined education, emotion recognition, EF, perceived threat, and inter-group anxiety as potential predictors of RWA in both young and older adults, and was part of a larger study examining performance on a cyberball task. The cyberball task was unrelated to RWA and, because it was not relevant to present study, will not be discussed further.

Method

Participants. The participants were 53 young adults (27 females; $M = 22$ years; range = 18 to 33 years), and 43 older adults (22 females; $M = 71$ years; range = 64 to 82 years). Occupations for older adults were classified according to the New Zealand Socioeconomic Index of Occupational Status (Davis, McLeod, Ransom, & Ongley, 1997). Education for older adults was categorized as: (1) primary school, (2) some high school, (3) high school certificate, (4) trade certificate, (5) technical certificate, (6) BA/BSc, and (7) post-graduate. Table 2 includes descriptive statistics for occupations and education. In young adults, education and occupation were not relevant because all were identical in having only high school degrees and were too young to have meaningful occupations.

Materials. Study 2 employed a shortened RWA scale. Eight items of the RWA questionnaire developed by Altemeyer (1998) were randomly selected and this same set of items was administered to all participants ($\alpha = .85$). Participants rated the extent to which they agreed with various statements on a 1 (very strongly disagree) to 9 (very strongly agree) scale.

To examine emotion recognition, we used two tasks that combined to tap an understanding of facial, bodily and auditory emotion expressions. One task required matching

of one of six simultaneously displayed bodily expressions (body postures expressing basic emotions: angry, sad, fearful, disgusted, surprised or happy) to an auditory expression (again, one of the six basic emotions). The second task required matching of one of six facial expressions to an auditory expression (again using basic emotion expressions). For each task there were 24 items, with four items for each of the basic emotions. The emotion items for each task were initially pretested along with a larger pool of similar items in a pilot study in which both young and older adults labeled the emotion expressed, after which a subset of final items were chosen based on the ratings of both age groups and used in two studies (Ruffman, Halberstadt, & Murray, 2009; Ruffman, Sullivan, & Dittrich, 2009). This method avoided the assumption that young adults necessarily know better. Although the items were initially chosen by both young and older adults, like other emotion recognition tasks, a new group of older adults were still worse at recognizing emotion in these items compared to young adults.

To examine EF, we used a reading test previously shown to correlate with prejudice (von Hippel et al., 2000). Each participant was audio-recorded in an experimental and a control condition. In the experimental condition, participants read a passage in which most but not all words were written in italics. The instruction was to read all words in italics, but not the non-italicized words. There were four such passages, and four corresponding control passages in which all words were italicized. This task is thought to measure inhibition (of the automatic tendency to read words). The measures of interest were error difference (reading a non-italicized word) on the experimental versions minus the control versions, and time difference on the experimental versions minus the control versions.

The second measure of EF ability was the Trail Making task (Reitan & Wolfson, 1995). This is a classic test of EFs known to be related to problem gambling (von Hippel, Ng,

Abbot, Caldwell, Gill, & Powell, 2009) and socially inappropriate behavior (Henry, von Hippel, & Baynes, 2009) in older adults. Performance is related to fluid intelligence and processing speed (Salthouse, 2011). Each participant took part in an experimental and a control condition. In the experimental condition, participants drew a line from number to letter in ascending order (e.g., 1 – A – 2 – B ...), with difficulty created by having to join numbers to letters while inhibiting the tendency to join consecutive numbers. The control condition contained just numbers. As above, the measures of interest were error difference (e.g., drawing a line from number to number) on the experimental condition minus the control condition, and time difference on the experimental minus the control condition.

Perceived threat was measured using 14 items, including seven symbolic threat items measuring perceived threats to New Zealand culture by Asian immigrants (e.g., “Immigration from Asia is undermining New Zealand culture”), and seven realistic threat items measuring perceived threats to economic well-being and safety by Asian immigrants (e.g., “Social services have become less available to New Zealanders because of Asian immigration”). We chose Asian immigrants because they experience substantial prejudice in New Zealand (Duckitt & Sibley, 2007). Participants rated each item on a 10-point scale (strongly disagree to strongly agree) and five items were reverse-coded. The two threat scales correlated highly in both young ($r = .62$) and older adults ($r = .63$), and were therefore combined to form a single threat scale ($\alpha = .85$). The inter-group anxiety scale consisted of 12 items (apprehensive, friendly, uncertain, comfortable, worried, trusting, threatened, confident, safe, anxious, at ease). Participants rated how much they would feel each emotion when interacting with Asian immigrants on a scale from 1 (not at all worried) to 10 (extremely worried), with six items reverse-coded ($\alpha = .89$). Threat and anxiety measures were adapted from Stephan, Ybarra, and Bachman (1999). The Mini-Mental State Exam (MMSE, Folstein, Folstein, &

McHugh, 1975) was used as a screening measure for cognitive impairment to ensure that participants were undergoing a process of healthy aging.

Procedure. For the two emotion tasks, participants were instructed to sit 30 centimetres from a 32 x 25cm computer monitor. Emotion photographs (six faces or six bodies) were presented six-at-a-time on the monitor. Participants listened to an auditory expression through headphones (with volume self-adjusted), and clicked on the picture that matched the auditory expression, pushing the space bar to reveal each new set of photographs. Item transition was self-timed. The MMSE was presented at the beginning of each testing session, with the RWA questionnaire in between the two emotion recognition sets, and the EF measures at the end.

Results

All participants scored at least 24 on the MMSE (young $M = 30.0$, older $M = 28.7$), and the analyses reported below are based on the full sample. Nevertheless, when analyses were repeated after eliminating the five participants with MMSE scores between 24 and 26, an identical pattern of results was obtained.

Descriptive statistics for relevant variables are presented in Table 2. We used Mann-Whitney U tests (see Table 2) to compare young versus older adults' performance on each task, employing Holm's correction to ensure the family-wise error was kept to $p < .05$. Older adults had significantly higher RWA scores, inter-group anxiety, Trail Making time (difference between time in experimental – control version), and Story time. Older adults also had significantly lower emotion recognition scores. The two significant measures of EF ability (time difference) were also related to each other ($r_s(42) = .55$, $p < .001$, see Table 3), so that a composite made from the mean scores of these two measures was created.

To examine specific emotions, we collapsed across the tasks and summed emotion scores for the different emotion types. We then examined the number correct using a 2 (age group) x 6 (emotion: anger, sadness, fear, disgust, surprise, happiness) mixed ANOVA, with age group as a between-subjects variable and emotion as a within-subjects variable. The effect for emotion was significant, ($F(5, 505) = 69.03, p < .001, \eta_p^2 = .41$), as was the effect for age, ($F(1, 101) = 19.10, p < .001, \eta_p^2 = .16$), and the interaction, ($F(5, 505) = 2.32, p < .05, \eta_p^2 = .02$). The interaction was examined with six independent samples *t*-tests using Holm's correction to ensure the family-wise error was maintained at $p < .05$. Older adults were significantly worse on anger, $t(101) = 4.09, p < .001$ (young adults: $M = 4.45, SD = 1.85$; older adults: $M = 3.06, SD = 1.60$), sadness, $t(101) = 3.89, p < .001$ (young adults: $M = 5.57, SD = 1.65$; older adults: $M = 4.24, SD = 1.81$), surprise, $t(101) = 2.83, p = .006$ (young adults: $M = 6.72, SD = 1.80$; older adults: $M = 5.62, SD = 2.13$), happiness, $t(101) = 3.74, p < .001$ (young adults: $M = 4.40, SD = 1.06$; older adults: $M = 3.50, SD = 1.36$), but not fear, $t(101) = 0.85, p = .40$ (young adults: $M = 3.49, SD = 1.74$; older adults: $M = 3.18, SD = 1.96$), or disgust, $t(101) = 1.91, p = .06$ (young adults: $M = 3.32, SD = 1.75$; older adults: $M = 2.74, SD = 1.27$).

Given the age differences on the emotion, inter-group anxiety and EF tasks, the next question was how these variables related to RWA. In this study and the remaining studies we used linear regression to examine variables' influence on RWA. In Study 2, the dependent variable was RWA and the predictor variables were emotion, EF, inter-group anxiety and age group. The statistics for *t* and *p* relate to independent variance each variable accounted for with all predictors in the model predicting RWA, that is, the amount of unique variance a variable accounts for after the variance due to all other variables has been accounted for. ΔR^2 refers to the proportion of additional variance each variable accounted for when entered into

the final model. With all four predictor variables in the model, emotion ($t = 2.55, p = .01, \Delta R^2 = .06$) and inter-group anxiety ($t = 2.72, p = .01, \Delta R^2 = .07$) were significant predictors of RWA, but EF ($t = 0.65, p = .52, \Delta R^2 = 0$) and age group ($t = 1.09, p = .28, \Delta R^2 = .01$) were not. Thus, inter-group anxiety and emotion recognition contributed independently to RWA, whereas age group and EF did not.

The cross-sectional analyses comparing young to old described above help to explain age differences and provide a point of comparison to previous studies that have included such analyses (e.g., von Hippel et al., 2000). However, another important question is whether there are relations between emotion, EF and RWA *within* age groups. The lower part of Table 3 reports the Spearman's correlations between key variables separately for the young and older age groups. In the young age group, there were only two measures that correlated with RWA: one of the variables indexing EF and perceived threat, both consistent with previous research (see the introduction). To examine independent variance in the young group, we used linear regression, predicting RWA scores from story errors and threat (the two significant variables). Threat was a unique predictor of RWA ($t = 2.70, p = .009, \beta = .35, \Delta R^2 = .12$), but not story errors ($t = 1.83, p = .07, \beta = .23, \Delta R^2 = .05$). **The two variables accounted for 20% of the variance in RWA.** In the older age group, higher RWA was associated with lower occupation, education and emotion scores, advanced age, higher inter-group anxiety and higher perceived threat. To examine independent variance, we used linear regression, predicting RWA scores from age, emotion, inter-group anxiety, perceived threat, and the highest of the two socio-economic variables, education. Education was a unique predictor of RWA ($t = 2.65, p = .01, \beta = -.32, \Delta R^2 = .08$), as was emotion ($t = 2.56, p = .02, \beta = -.28, \Delta R^2 = .07$), and threat ($t = 3.13, p = .003, \beta = .42, \Delta R^2 = .11$), but not age ($t = .85, p = .40, \beta = .11$,

$\Delta R^2 = .01$) or inter-group anxiety ($t = 0.10$, $p = .93$, $\beta = .01$, $\Delta R^2 = 0$). Together, the five variables accounted for 59% of the variance in RWA.

Emotion recognition related to RWA in older adults but not young adults. To examine whether this was a significant difference, we re-ran the earlier regression but included an interaction term, age group x emotion score, in addition to education, threat, inter-group anxiety, story errors, age group and emotion. The interaction term was significant, ($t = -2.02$, $p < .05$, $\beta = -.70$, $\Delta R^2 = .03$), indicating that emotion had a larger effect in older than young adults.

Discussion

As in Study 1, older adults had a higher level of RWA than young adults. Replicating previous research, perceived threat and a measure of EF were predictors of RWA in young adults. In older adults, these two measures were again predictors along with education, inter-group anxiety, and emotion recognition, but only education, threat and emotion recognition accounted for independent variance in RWA. Emotion recognition was significantly more likely to be related to RWA in older adults than young adults, indicating a different aetiology in young and older adults. Age differences have been obtained previously for a variety of cognitive capacities, including source memory (Glisky & Kong, 2008), delayed recall (Jacobs, Rakitin, Zubin, Ventura, & Stern, 2001), and general cognitive abilities (Baker & Bischel, 2006). In each case, the ability in question has different correlates in young and older adults, suggesting a different origin. Finally, there are sometimes differences even within the older age group; for instance, emotion recognition correlates with older men's verbosity but not older women's (Halberstadt, Ruffman, Murray, Taumoepeau, & Ryan, 2011). Thus, there are many examples of similar age-related findings in the literature.

Study 3

Study 2 established that worse emotion recognition helped to explain differences in RWA between age groups and contributed independent variance to RWA within the older age group. Because emotion recognition related only to older adults' RWA, studies 3 and 4 focused exclusively on older adults. Study 3 examined whether the relation between RWA and emotion is independent of other aspects of general cognitive decline. Low general intelligence is a predictor of RWA (e.g., Heaven et al., 2011) and a decline in general cognition or fluid IQ is one of the most reliable findings in age-related research. In Study 3 we measured fluid IQ using a matrices task because it is the most frequently used measure of fluid IQ and shows reliable age-related decline. A second aim was to examine the correlation between emotion recognition and RWA using a larger number of items from the RWA scale. Many different versions of the RWA scale are in use and, although shortened RWA scales are the norm (Sibley et al., 2006), we checked our finding with the original 30-item RWA scale employing the full number of items to ensure that the RWA items used in Study 2 were not biased in any way. Study 3 was part of a larger study examining moral reasoning but these tasks were unrelated to RWA and will not be discussed below.

Method

Participants. The participants were 40 older adults (20 female; $M = 72.7$ years; range = 61 to 88 years). Table 4 includes descriptive statistics for education.

Materials. The measure of RWA included all 30 items of the Altemeyer (1981) scale. For each item, participants used the same 1 to 9 rating scale as in Study 2 ($\alpha = .93$). To examine emotion recognition, we used the 60 items of the Facial Expressions of Emotion: Stimuli and Tests (FEEST; Young, Perrett, Calder, Sprengelmeyer, & Ekman, 2002; 10 items for each basic emotion), as well as 24 bodily expressions and 24 vocal expressions from Ruffman, Halberstadt, and Murray (2009, four items for each basic emotion). The MMSE

was used as a screening measure for cognitive impairment, with all participants scoring 27 or above ($M = 29.49$). Fluid IQ was measured using the Series Completion and Odd One Out subtests of the Cattell Culture-Fair Test (Cattell, 1949).

Procedure. Tests were administered as in Study 2.

Results and Discussion

The mean proportion correct on the emotion recognition task was 0.79 ($SD = 0.07$). The remaining descriptive statistics are presented in Table 4. RWA correlated with education ($r(39) = -.46, p = .003$), fluid IQ ($r(39) = -.40, p = .01$), and emotion recognition ($r(39) = -.53, p < .001$), but not age ($r(39) = .20, p = .22$). To examine independent variance, we used linear regression, predicting RWA scores from education, fluid IQ and emotion. Education was a unique predictor of RWA ($t = 2.06, p < .05, \beta = -.29, \Delta R^2 = .07$), as was emotion ($t = 2.48, p = .02, \beta = -.37, \Delta R^2 = .10$), but not fluid IQ ($t = 1.12, p = .27, \beta = -.16, \Delta R^2 = .02$). Together, the three variables accounted for 39% of the variance in RWA. In sum, lower education and worse emotion recognition were associated with higher RWA in older adults independent of fluid IQ and each other, ensuring that the findings of Study 2 were replicable with the full RWA scale.

Study 4

Study 4 was designed to determine whether emotion recognition would relate again to RWA in older adults, while controlling for a range of variables linked to RWA in this set of studies or previous research, including education, inter-group anxiety, perceived threat, social dominance, and EF. Study 4 was part of a larger study examining gambling but the gambling tasks were unrelated to RWA and will not be discussed further.

Method

Participants. The participants were 49 older adults (25 female; $M = 73.0$ years; range = 61 to 88 years) with educational information listed in Table 4.

Materials. RWA was measured using the current 22-item version (Altemeyer, 2006), with participants rating each statement on a -4 (very strongly disagree) to +4 (very strongly agree) scale ($\alpha = .92$). To examine emotion recognition, we used the 60 items of the FEEST. The MMSE was used as a screening measure for cognitive impairment, with all participants scoring 26 or above ($M = 29.33$).

Threat and inter-group anxiety were measured using the same scale described in Study 2. The two threat scales correlated highly ($r = .61$) and were therefore combined to form a single threat scale. Social dominance orientation was indexed using the 14-item measure of Pratto, Sidanius, Stallworth, and Malle (1994) and a 1 (strongly disagree) to 7 (strongly agree) scale, with six items reverse-coded. All scales had good reliability in the current study (threat: $\alpha = .82$; inter-group anxiety: $\alpha = .91$; social dominance: $\alpha = .90$).

The trail-making task was to measure EFs and was identical to that used in Study 2. Because there were very few errors, and because time difference (time on experimental task – time on control task) was more consistently linked to age in Study 2 (and in this study), we only report time difference in this study.

Procedure. Participants completed the RWA scale, then the emotion recognition test, the other questionnaires, and then the Trail-Making test.

Results and Discussion

The mean proportion correct on the emotion recognition task was 0.84 ($SD = 0.08$). The remaining descriptive statistics are presented in Table 4. RWA correlated with threat ($r(48) = .36, p = .01$), inter-group anxiety ($r(48) = .44, p = .002$), social dominance ($r(48) =$

.60, $p < .001$), age ($r(48) = .48$, $p < .001$), the trail-making difference score ($r(48) = .43$, $p = .003$) and emotion recognition ($r(48) = -.55$, $p < .001$), but not education ($r(48) = -.23$, $p = .12$). To examine independent variance, we used linear regression, predicting RWA scores from all predictor variables. Age ($t = 2.21$, $p = .03$, $\beta = .29$, $\Delta R^2 = .05$), social dominance ($t = 2.42$, $p = .02$, $\beta = .31$, $\Delta R^2 = .06$) and emotion ($t = 2.15$, $p = .04$, $\beta = -.27$, $\Delta R^2 = .05$) were unique predictors of RWA. Education approached significance ($t = 1.79$, $p = .08$, $\beta = -.21$, $\Delta R^2 = .04$). Threat ($t = 0.18$, $p = .86$, $\beta = .02$, $\Delta R^2 = 0$), inter-group anxiety ($t = 0.28$, $p = .78$, $\beta = .04$, $\Delta R^2 = 0$), and inhibition ($t = 0.52$, $p = .61$, $\beta = .07$, $\Delta R^2 = 0$) were not significant. Together, all variables accounted for a substantial 58% of the variance in RWA. Thus, worse emotion recognition was associated with higher RWA in older adults independent of age, threat, anxiety, social dominance and EF.

General Discussion

Consistent with previous large-scale studies examining RWA in Poland and Belgium, we found higher RWA in older adults relative to young adults in New Zealand. At the outset we outlined five reasons for why expression of RWA might be higher in older adults: (1) the *normative* view, arguing that the current generation of older people were socialized during an era where the open expression of highly conservative attitudes was common, (2) diminished *EFs* in older adults, (3) a heightened sense of *threat* in older adults, (4) lower levels of *education* in older adults, and (5) worse *emotion recognition* in older adults. Our results were most consistent with the latter three views. As anticipated, perceived threat was a unique predictor of RWA in both young and older adults in Study 2. In addition, emotion was a unique predictor of RWA in all three of the relevant studies, education in two studies, and age and social dominance in one study. Thus a key finding was that even when controlling for education, age, EF, fluid intelligence, threat, social dominance, and inter-group anxiety,

emotion was a unique predictor of RWA. Further, this was true whether our emotion task measured matching of auditory to facial or bodily expressions, or facial expressions on their own, and regardless of the precise RWA scale we used. These are also the only studies we have carried out examining the link between emotion recognition and RWA in older adults, thereby indicating a significant link in each of the three studies conducted

What of the other two views, EF and social norms? There are well-established declines in EF ability with age and previous research indicates that older adults' higher level of prejudice is related to declining EF ability (Stewart et al., 2009; von Hippel et al., 2000). Our EF tasks were chosen based on correlations with prejudice and social behavior in previous research, the different EF measures correlated with one another (Study 2), we replicated previous findings in that older adults had worse performance than young (Study 2), and EF ability correlated with RWA in the older adult age group (Study 4). However, EF ability was unrelated to RWA once other factors were accounted for.

As regards social norms, there clearly were differences in social norms during the time when older adults were raised. Indeed, this might help explain why we did not obtain a relation between emotion recognition and RWA in young adults. Older adults were socialized during the 1940s and 50s, a time of relative social and political conservatism and at a time when the open expression of many forms of prejudice was the norm (Schuman et al., 1997). Furthermore, although both young and old become more tolerant to non-conformity over time, change in older adults is less marked (Cutler & Kaufman, 1975) either because of greater non-tolerance initially when younger, or due to the aging process itself. These factors would contribute to higher levels of RWA in older adults. In addition, the expression of opinions is often malleable and will depend on whether it will enhance one's self-image, with an emphasis on expressing opinions consistent with those of listeners (Blair, 2002; Brown,

2010; Oakes, Haslam, & Turner, 1994). For this reason, speakers typically monitor the opinions of listeners in an attempt to streamline their expression of ideas. In old age, then, there is both a higher level of RWA (22% higher in Experiment 2) as well as worse emotion recognition (20% lower in Experiment 2). The combination of higher baseline RWA and a reduced ability to recognize emotions would mean that older adults would be more prone to expressing extreme right-wing attitudes. Moreover, Study 2 indicates that the variance on the emotion recognition and RWA scales is greater in older adults than young adults (see Table 2), which would also lead to larger correlations in older adults relative to young adults.

In this way, the social norms during formative years might have contributed to cohort effects and older adults' higher RWA. We also note that emotion recognition predicted RWA within the older age group. The age range in the older group was 18 years in Study 2 and 27 years in Studies 3 and 4. These ranges within the older group are broad enough such that different social experiences for young-old and old-old could have led to differences even as young adults (e.g., depressed emotion recognition as young adults in the old-old but not the young-old). For such reasons, one could argue that social experiences create different norms within the older age group, contributing to links between emotion and RWA. Nevertheless, against this view, we did include age as a predictor variable, thereby accounting for the variance due to age, yet still found a consistent relation between emotion recognition and RWA within the older age group, and this argues against age and cohort effects as contributing factors within the older group. Ultimately, whether cohort effects created different social norms for older adults and contributed to the emotion-RWA link or not, the present study provides the entirely novel information that emotion recognition is related to RWA in older adults.

An alternative to the cohort view is that emotion recognition deteriorates with age due to reductions in brain volume and neurotransmitters (Ruffman et al., 2008). There are at least two findings that indicate that neural differences relate to emotion recognition. First, fear recognition is directly related to an age-related decline in frontal grey matter (Williams et al., 2006). Second, older men given oxytocin (a neuropeptide that facilitates neurotransmission) experience a substantial boost in emotion recognition relative to those given placebo (Campbell, Ruffman, Murray, & Glue, 2014). Thus, it seems that emotion recognition decline does relate to neural decline although it remains possible that cohort differences experienced by older adults when young resulted in such neural differences rather than that they declined over time.

We also outlined two paths for how emotion recognition might relate to higher levels of RWA in older adults. The first route is through threat, with groups deemed threatening eliciting higher RWA (Duckitt, 2006). Worse emotion recognition might lead to a reduction in feelings of understanding others, and a heightened sense of threat. The second route is direct from emotion recognition. Expression of extreme attitudes (right- or left-wing) will antagonize many people leading to heightened discomfort, yet the discomfort will often be subtly expressed. Better emotion recognition would help to detect discomfort and might encourage one to avoid holding and expressing extreme attitudes that might antagonize others. Our data are consistent with the second of these ideas. Although threat and inter-group anxiety were related to RWA in both young and older age groups, and threat explained unique variance in RWA, across two studies emotion recognition remained a significant predictor of RWA even after controlling for threat and inter-group anxiety. Hence, there are likely multiple causes of higher RWA in old age, including threat and social dominance (unique predictors in one of three studies), a lower level of education (a unique predictor in

two studies), and emotion recognition (a unique predictor in all three studies). Likewise, there are likely to be both similarities and differences in the causes of RWA in young and older adults, with threat and education relevant in both age groups, but emotion recognition only relevant in older adults.

We have demonstrated a relation between RWA and emotion recognition and argued that worse emotion recognition might lead to higher RWA. Logically, a second possibility is that higher RWA could cause worse emotion recognition, yet this second causal direction would have to explain how expression of attitudes such as, “The real keys to the good life are obedience and discipline”, could cause one to have worse emotion recognition. The relation could also be mediated by a third variable in which case the question would be, what is the third variable? For instance, there is some suggestion that RWA is related to verbal intelligence (Stenner, 2009). However, older adults have at least equal verbal ability to young adults (Craik & Salthouse, 2000). If verbal intelligence is maintained with age it is not plausible that it could mediate the decline in emotion recognition, higher RWA, or the emotion–RWA relation. **Another idea is that empathy is the mediator. However, there is research relating emotion recognition to both increased empathy (Hooker, Verosky, Germine, Knight, & D’Esposito, 2008) and to decreased empathy and manipulateness (Konrath, Corneille, Bushman, & Luminet, 2014). Moreover, if one focusses on affective empathy in particular, this ability is thought to be stable (Bailey, Henry, & von Hippel, 2008) or potentially increases with age (Beadle, Sheehan, Dahlben, & Gutchess, 2013; Richter & Kunzmann, 2011). Thus, empathy does not seem like a good candidate for mediator of age differences in RWA.** We also tested a range of other potential mediators, including education, EF ability, fluid intelligence, perceived threat, inter-group anxiety and social dominance orientation, yet none of these variables accounted for the emotion–RWA link. Thus, although

it remains logically possible that a third variable might mediate, it is not clear what this variable would be. Ultimately, future research could examine these issues further with a longitudinal study, although it might be necessary to track participants over decades to allow changes to take place.

In sum, we found increasing levels of RWA with age, and consistent relations between worse emotion recognition and higher levels of RWA in older adults. Our results can also be considered from the broader context of research on social cognition. Older adults' difficulty on various aspects of social understanding – their tendency to be verbose, difficulty detecting faux pas, and difficulty detecting lies – have all been linked to worse emotion recognition, with a similar hypothesis that declines in emotion recognition compromise social judgement. Thus, it seems reasonable to posit that emotion recognition is a core ability that declines with age, and plays a fundamental role in a variety of social insights and attitudes.

Acknowledgements

This research was supported by summer studentships from the Division of Science at the University of Otago to Natalie Kladnitski and Ella Myftari, by a University of Otago Research Grant, and by a University of Otago MSc scholarship to Abigail Dawson.

References

- Akrami, N., & Ekehammar, B. (2006). Right-wing authoritarianism and social dominance orientation: Their roots in big five personality factors and facets. *Journal of Individual Differences, 27*, 117-126. doi: 10.1027/1614-0001.27.3.117
- Altemeyer, B. (1981). *Right-wing authoritarianism*. Manitoba, Canada: University Press.
- Altemeyer, B. (1988). *Enemies of freedom: Understanding right-wing authoritarianism*. San Francisco: Jossey-Bass.
- Altemeyer, B. (1996). *The authoritarian specter*. Cambridge, MA: Harvard University Press.
- Altemeyer, B. (1998). The other “authoritarian personality” In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology* (Vol. 30, pp. 47-92). London: Academic Press.
- Altemeyer, B. (2006). *The authoritarians*. Winnipeg, Manitoba: University of Manitoba.
- Bailey, P. E., Henry, J. D., & von Hippel, W. (2008). Empathy and social functioning in late adulthood. *Aging and Mental Health, 12*, 499-503. doi: 10.1080/13607860802224243
- Baker, T. J., & Bischel, J. (2006). Personality predictors of intelligence: Differences between young and cognitively healthy older adults. *Personality and Individual Differences, 41*, 861-871. doi:10.1016/j.paid.2006.02.017
- Beadle, J. N., Sheehan, A. H., Dahlben, B., & Gutchess, A. H. (2015). Aging, empathy, and prosociality. *Journals of Gerontology: Psychological Sciences, 70*, 215-224. doi: 10.1093/geronb/gbt091
- Bertsch, K., Gamer, M., Schmidt, B., Schmidinger, I., Walther, S., Kastel, T., ... & Herpertz, S. C. (2013). Oxytocin and reduction of social threat hypersensitivity in women with borderline personality disorder. *American Journal of Psychiatry, 170*, 1169-1177. doi: 10.1176/appi.ajp.2013.13020263.

- Blair, I. V. (2002). The malleability of automatic stereotypes and prejudice. *Personality and Social Psychology Review*, 6, 242-261. doi: 10.1207/S15327957PSPR0603_8
- Brown, R. (2010). *Prejudice: Its social psychology*. Oxford: Blackwell.
- Campbell, A., Ruffman, T., Murray, J. E., & Glue, P. (2014). Oxytocin improves emotion recognition for older males. *Neurobiology of Aging*, 35, 2246-2248. doi: 10.1016/j.neurobiolaging.2014.04.021
- Cattell, R. B. (1949). *Culture free intelligence test, scale 1, handbook*. Champaign, Ill: Institute of Personality and Ability.
- Cohrs, J. C., Kielmann, S., Maes, J., Moschner, B., (2005). Effects of right-wing authoritarianism and threat from terrorism on restriction of civil liberties. *Analyses of Social Issues and Public Policy*, 5, 263-276. doi: 10.1111/j.1530-2415.2005.00071.x
- Cohrs, J. C., Moschner, B., Maes, J., & Kielmann, S. (2005). The motivational bases of right-wing authoritarianism and social dominance orientation: Relations to values and attitudes in the aftermath of September 11, 2001. *Personality and Social Psychology Bulletin*, 31, 1425-1434. doi: 10.1177/0146167205275614
- Cornelis, I., Van Hiel, A., Roets, A., & Kossowska, M. (2009). Age differences in conservatism: Evidence on mediating effects of personality and cognitive style. *Journal of Personality*, 77, 51-88. doi: 10.1111/j.1467-6494.2008.00538.x
- Craik, F. I. M., & Salthouse, T. A. (2000). *Handbook of aging and cognition* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cutler, S. J., & Kaufman, R. L. (1975). Cohort changes in political attitudes: Tolerance of ideological non-conformity. *International Journal of Public Opinion Research*, 39, 69-81. doi: 10.1086/268200

- Davis, P., McLeod, K., Ransom, M., & Ongley, P. (1997). *The New Zealand Socioeconomic Index of Occupational Status (NZSEI): Research Report #2*. Statistics New Zealand, Wellington.
- Doty, R. M., Peterson, B. E., & Winter, R. M. (1991). Threat and authoritarianism in the United States, 1978-1987. *Journal of Personality and Social Psychology*, *61*, 629-640. doi: 10.1037/0022-3514.61.4.629
- Duckitt, J. (2001). A dual process cognitive-motivational theory of ideology and prejudice. *Advances in Experimental Social Psychology*, *22*, 41-113. doi: 10.1016/S0065-2601(01)80004-6
- Duckitt, J. (2006). Differential effects of right wing authoritarianism and social dominance orientation on outgroup attitudes and their mediation by threat from and competitiveness to outgroups. *Personality and Social Psychology Bulletin*, *32*, 684-696. doi: 10.1177/0146167205284282
- Duckitt, J., & Farre, B. (1994). Right-wing authoritarianism and political intolerance among Whites in the future majority-rule South Africa. *Journal of Social Psychology*, *134*, 735-741. doi: 10.1080/00224545.1994.9923008
- Duckitt, J., & Fisher, K. (2003). The impact of social threat on world-view and ideological attitudes. *Political Psychology*, *24*, 199-222. doi: 10.1111/0162-895X.00322
- Duckitt, J., & Sibley, C. G. (2007). Right-Wing Authoritarianism, Social Dominance Orientation and the dimensions of generalized prejudice. *European Journal of Personality*, *21*, 113-130. doi: 10.1002/per.614
- Duriez, B., & Van Hiel, A. (2002). The march of modern fascism: A comparison of social dominance orientation and authoritarianism. *Personality and Individual Differences*, *32*, 1199-1213. doi: 10.1016/S0191-8869(01)00086-1

- Esses, V. M., Haddock, G., & Zanna, M. P. (1993). Values, stereotypes and emotions as determinants of intergroup attitudes. In D. M. Mackie & D. M. Hamilton (Eds), *Affect, cognition and stereotyping: Interactive processes in group perception* (pp. 137-166). San Diego, CA: Academic Press.
- Firebaugh, G., & Davis, K. E. (1988). Trends in antiblack prejudice, 1972-1984: Region and cohort effects. *American Journal of Sociology*, *94*, 251-272. doi: 10.1086/228991
- Folstein, M. F., Folstein, S. E., McHugh, P. R. (1975). "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, *12*, 189-198. doi: 10.1016/0022-3956(75)90026-6
- Glisky, E. L., & Kong, L. L. (2008). Do young and older adults rely on different processes in source memory tasks? A neuropsychological study. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *34*, 809-822. doi: 10.1037/0278-7393.34.4.809
- Goodman, M. B., & Moradi, B. (2008). Attitudes and behaviors toward lesbian and gay persons: Critical correlates and mediated relations. *Journal of Counseling Psychology*, *55*, 371-384. doi: 10.1037/0022-0167.55.3.371
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*, *37*, 504-528. doi: 10.1016/S0092-6566(03)00046-1
- Green, M. J., Williams, L. M., & Davidson, D. J. (2001). Processing of threat related affect is delayed in delusion-prone individuals. *British Journal of Clinical Psychology*, *40*, 157-165. doi: 10.1348/014466501163607
- Halberstadt, J., Ruffman, T., Murray, J., Taumoepeau, M., & Ryan, M. (2011). Emotion perception explains age-related differences in the perception of social gaffes.

Psychology and Aging, 26, 133-136. doi: 10.1037/a0021366.

- Heaven, P. C. L., Ciarrochi, J., & Leeson, P. (2011). Cognitive ability, right-wing authoritarianism, and social dominance orientation: A five-year longitudinal study amongst adolescents. *Intelligence*, 39, 15-21. doi: 10.1016/j.intell.2010.12.001
- Heaven, P., & Connors, J. (2001). A note on the value correlates of social dominance orientation and right wing authoritarianism. *Personality and Individual Differences*, 31, 925-930. doi: 10.1016/S0191-8869(00)00194-X
- Henry, J. D., von Hippel, W., & Baynes, K. (2009). Social inappropriateness, executive control, and aging. *Psychology and Aging*, 24, 239-244. doi: 10.1037/a0013423
- Hooker, C. I., Verosky, S. C., Germine, L. T., Knight, R. T., & D'Esposito, M. (2008). Mentalizing about emotion and its relationship to empathy. *Social, Cognitive and Affective Neuroscience*, 3, 204-217. doi: 10.1093/scan/nsn019
- Horn, J. L., & Cattell, R. B. (1967). Age differences in fluid and crystallized intelligence. *Acta Psychologica*, 26, 107-129. doi: 10.1016/0001-6918(67)90011-X
- Jacobs, D. M., Rakitin, B. C., Zubin, N. R., Ventura, P. R., & Stern, Y. (2001). Cognitive correlates of mnemonics usage and verbal recall memory in old age. *Neuropsychiatry, Neuropsychology, and Behavioral Neurology*, 14, 15-22.
- Konrath, S., Corneille, O., Bushman, B. J., & Luminet, O. (2014). The relationship between narcissistic exploitativeness, dispositional empathy, and emotion recognition abilities. *Journal of Nonverbal Behavior*, 38, 129-143. doi: 10.1007/s10919-013-0164-y
- Kosfeld, M., Heinrichs, M., Zak, P. J., Fischbacher, U., & Fehr, E. (2005). Oxytocin increases trust in humans. *Nature*, 435, 673-676. doi: 10.1038/nature03701
- Lischke, A., Berger, C., Prehn, K., Heinrichs, M., Herpertz, S. C., & Domes, G. (2012). Intranasal oxytocin enhances emotion recognition from dynamic facial expressions and

leaves eye-gaze unaffected. *Psychoneuroendocrinology*, *37*, 475-481. doi:

10.1016/j.psyneuen.2011.07.015

Mavor, K. I., Louis, W. R., & Sibley, C. G. (2010). A bias-corrected exploratory and confirmatory factor analysis of right-wing authoritarianism: Support for a three-factor structure. *Personality and Individual Differences*, *48*, 28-33. doi:

10.1016/j.paid.2009.08.006

McCourt, K., Bouchard, T. J., Lykken, D. T., Tellegen, A., & Keyes, M. (1999).

Authoritarianism revisited: Genetic and environmental influences examined in twins reared apart and together. *Personality and Individual Differences*, *27*, 985-1014. doi:

10.1016/S0191-8869(99)00048-3

Milfont, T. L., Richter, I., Sibley, C. G., Wilson, M. S., & Fischer, R. (2013). Environmental consequences of the desire to dominate and be superior. *Personality and Social Psychology Bulletin*, *39*, 1127-1138. doi: 10.1177/0146167213490805

10.1177/0146167213490805

Moghaddam, F. M., & Vuksanovic, V. (1990). Attitudes and behavior toward human rights across different contexts: The role of right-wing authoritarianism, political ideology, and religiosity. *International Journal of Psychology*, *25*, 455-474. doi:

10.1080/00207599008247877

Oakes, P. J., Haslam, A., & Turner, J. C. (1994). *Stereotyping and social reality*. Oxford: Blackwell Publishers.

Orbelo, D. M., Grim, M. A., Talbott, R. E., & Ross, E. D. (2005). Impaired comprehension of affective prosody in elderly subjects is not predicted by age-related hearing loss or age-related cognitive decline. *Journal of Geriatric Psychiatry and Neurology*, *18*, 25-32.

doi: 10.1177/0891988704272214

- Poteat, P., Espelage, D., & Green, H. (2007). The socialization of dominance: Peer group and contextual effects on homophobic and dominance attitudes. *Journal of Personality and Social Psychology, 92*, 1040-1050. doi: 10.1037/0022-3514.92.6.1040
- Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology, 67*, 741-763. doi: 10.1037//0022-3514.67.4.741
- Reitan, R. M., & Wolfson, D. (1995). Category Test and Trail Making Test as Measures of Frontal Lobe Functions. *The Clinical Neuropsychologist, 9*, 50-56. doi: 10.1080/13854049508402057
- Richter, D., & Kunzmann, U. (2011). Age differences in three facets of empathy: Performance-based evidence. *Psychology and Aging, 26*, 60-70. doi: 10.1037/a0021138
- Ruffman, T., Henry, J. D., Livingstone, V., & Phillips, L. H. (2008). A meta-analytic review of emotion recognition and aging: Implications for neuropsychological models of aging. *Neuroscience and Biobehavioral Reviews, 32*, 863-881. doi: 10.1016/j.neubiorev.2008.01.001
- Ruffman, T., Murray, J., Halberstadt, J., & Taumoepeau, M. (2010). Verbosity and emotion recognition in older adults. *Psychology and Aging, 25*, 492-497. doi: 10.1037/a0018247
- Ruffman, T., Murray, J., Halberstadt, J., & Vater, T. (2012). Age-related differences in deception. *Psychology and Aging, 27*, 543-549. doi: 10.1037/a0023380
- Ruffman, T., Halberstadt, J., & Murray, J. (2009). Recognition of facial, auditory, and bodily emotions in older adults. *Journals of Gerontology: Psychological Sciences, 64B*, 696-703. doi: 10.1093/geronb/gbp072

- Ruffman, T., Sullivan, S., & Dittrich, W. (2009). Older adults' recognition of bodily and auditory expressions of emotion. *Psychology and Aging, 24*, 614-622. doi: 10.1037/a0016356
- Rydgren, J. (2005). Is extreme right-wing populism contagious? Explaining the emergence of a new party family. *European Journal of Political Research, 44*, 413-437. doi: 10.1111/j.1475-6765.2005.00233.x
- Salthouse, T. A. (2011). What cognitive abilities are involved in trail-making performance? *Intelligence, 39*, 222-232. doi: 10.1016/j.intell.2011.03.001
- Saucier, G. (2000). Isms and the structure of social attitudes. *Journal of Personality and Social Psychology, 78*, 366-385. doi: 10.1037/0022-3514.78.2.366
- Schuman, H., Steeh, C., Bobo, L., & Krysan, M. (1997). *Racial attitudes in America: Trends and interpretations* (rev. ed.). Cambridge, MA: Harvard University Press.
- Silbey, C. G., & Duckitt, J. (2008). Personality and prejudice: A meta-analysis and theoretical review. *Personality and Social Psychology Review, 12*, 248-279. doi: 10.1177/1088868308319226
- Sibley, C. G., Robertson, A., & Wilson, M. S. (2006). Social dominance orientation and right-wing authoritarianism: Additive and interactive effects. *Political Psychology, 27*, 2006. doi: 10.1111/j.1467-9221.2006.00531.x
- Stanley, J. T., Lohani, M., & Isaacowitz, D. M. (2014). Age-related differences in judgments of inappropriate behavior are related to humor style preferences. *Psychology and Aging, 29*, 528-541. doi: 10.1037/a0036666
- Stenner, K. (2009). Three kinds of conservatism. *Psychological Inquiry, 20*, 142-159. doi: 10.1080/10478400903028615

- Stephan, W. G., Ybarra, O., & Bachman, G. (1999). Prejudice toward immigrants. *Journal of Applied Social Psychology, 29*, 2221–2237. doi: 10.1111/j.1559-1816.1999.tb00107.x
- Stewart, B. D., von Hippel, W., & Radvansky, G. A. (2009). Age, race, and implicit prejudice. *Psychological Science, 20*, 164–168. doi: 10.1111/j.1467-9280.2009.02274.x
- Truett, K. R. (1993). Age differences in conservatism. *Personality and Individual Differences, 14*, 405–411. doi: 10.1016/0191-8869(93)90309-Q
- von Hippel, W., Ng, L., Abbot, L., Caldwell, S., Gill, G., & Powell, K. (2009). Executive functioning and gambling: Performance on the Trail Making Test is associated with gambling problems in older adult gamblers. *Aging, Neuropsychology, and Cognition, 16*, 654–670. doi: 10.1080/13825580902871018
- von Hippel, W., Silver, L. A., & Lynch, M. E. (2000). Stereotyping against your will: The role of inhibitory ability in stereotyping and prejudice among the elderly. *Personality and Social Psychology Bulletin, 26*, 523–532. doi: doi10.1177/0146167200267001
- Whitley, B. E. (1999). Right-wing authoritarianism, social dominance and prejudice. *Journal of Personality and Social Psychology, 77*, 126–134. doi: 10.1037//0022-3514.77.1.126
- Whitley, B. E., & Kite, M. E. (2006). *The psychology of prejudice and discrimination*. Australia: Wadsworth.
- Williams, L. M., Brown, K. J., Palmer, D., Liddell, B. J., Kemp, A. H., Olivieri, G., ..., & Gordon, E. (2006). The mellow years?: Neural basis of improving emotional stability over age. *The Journal of Neuroscience, 26*, 6422–6430. doi: 10.1523/JNEUROSCI.0022-06.2006
- Wilson, T. C. (1996). Cohort and prejudice: Whites' attitudes toward Blacks, Hispanics, Jews and Asians. *Public Opinion Quarterly, 60*, 253–274. doi: 10.1086/297750

- Young, A., Perrett, D., Calder, A., Sprengelmeyer, R., & Ekman, P. (2002). *Facial expression of emotion: Stimuli and tests (FEEST)*. Bury St. Edmunds: Thames Valley T
- Altemeyer, B. (1988). *Enemies of freedom: Understanding right-wing authoritarianism*. San Francisco: Jossey-Bass.

Table 1

Study 1 Means, (SDs) and Ranges

Measure	Age Group				
	16 to 29	30 to 39	40 to 49	50 to 59	60 to 87
RWA	2.46 (0.90)	2.52 (0.82)	2.76 (0.96)	2.82 (1.02)	3.30 (1.08)
	1.00-5.33	1.00-5.20	1.00-6.60	1.00-6.00	1.00-6.67
Extraversion	4.00 (1.55)	4.17 (1.47)	4.34 (1.43)	4.29 (1.46)	4.22 (1.32)
	1.00-7.00	1.00-7.00	1.00-7.00	1.00-7.00	1.00-7.00
Agreeableness	4.73 (1.05)	4.84 (1.15)	5.07 (1.02)	5.30 (1.05)	5.39 (0.99)
	2.00-7.00	1.50-7.00	2.00-7.00	2.00-7.00	2.00-7.00
Conscientiousness	4.96 (1.24)	5.57 (1.00)	5.61 (1.02)	5.69 (1.04)	5.75 (1.03)
	1.50-7.00	2.50-7.00	2.00-7.00	1.00-7.00	2.50-7.00
Openness	5.23 (1.07)	5.23 (1.04)	5.20 (1.03)	5.26 (1.08)	5.17 (1.10)
	2.00-7.00	2.00-7.00	2.50-7.00	1.50-7.00	1.00-7.00
Stability	4.60 (1.39)	4.97 (1.21)	5.23 (1.13)	5.39 (1.13)	5.46 (1.12)
	1.00-7.00	1.00-7.00	1.00-7.00	1.50-7.00	1.00-7.00

Table 2

Study 2 Means, SDs, Reliabilities and Ranges

	Young Adults				Older Adults			
	<i>M</i>	<i>SD</i>	<i>α</i>	Range	<i>M</i>	<i>SD</i>	<i>α</i>	Range
RWA	4.03 ^a	1.42	.78	1.13-7.00	4.93 ^b	1.77	.88	1.38-8.25
Emotion	28.21 ^a	5.81	.74	13.00-9.00	22.70 ^b	6.50	.77	11.00-35.00
Perceived Threat	4.62	1.33	.85	1.79-8.36	4.92	1.32	.81	2.43-9.00
Inter-Group Anx	3.07 ^a	1.33	.89	1.08-7.67	3.80 ^b	1.31	.85	1.50-7.08
Trails Errors Diff	0.19	0.52		0-3.00	0.38	0.88		-1.00-4.00
Trail Time ¹	30.60 ^a	25.76		-0.32-155.00	51.43 ^b	35.21		7.00-155.00
Story Errors Diff	1.34	1.52		0-7.00	2.44	3.67		0-41.00
Story Time ¹	71.27 ^a	34.99		14.56-192.69	131.13 ^b	99.14		38.06-418.17
Occupation ²					52.77	18.81		25.00-90.00
Education					3.88	2.00		1.00-7.00

Note. ¹Seconds. ²Possible values range from 10 to 90 on this scale, with larger values indicating higher occupational status. ^{ab}Different superscripts indicate significantly different means between young and old (using Mann-Whitney *U* Tests: $p \leq .01$).

Table 3

Spearman's correlations between measures of Right-Wing Authoritarianism (RWA), emotion recognition, executive functions (Trail, Story) and demographic variables for young adults (above diagonal) and older adults (below diagonal) in Study 2.

	RWA	Age	Emotion	Trail Errors	Trail Time	Story Errors	Story Time	Occupation	Education	Perceived Threat	Inter-Group Anxiety
RWA	---	-.08	-.11	.21	.14	.31 ^a	.22	---	---	.46 ^b	.10
Age	.38 ^a	---	-.01	-.12	.21	-.08	.18	---	---	-.05	-.10
Emotion	-.40 ^b	-.21	---	-.22	-.31 ^a	-.06	-.12	---	---	-.14	-.03
Trail Errors	-.30	.17	.08	---	.36 ^b	.16	.20	---	---	.14	.05
Trail Time	.08	.41 ^b	-.17	.39 ^a	---	.20	.46 ^b	---	---	.22	.18
Story Errors	0	.24	-.26	.37 ^a	.70 ^c	---	.46 ^c	---	---	.10	.16
Story Time	-.08	.27	-.25	.34 ^a	.59 ^c	.68 ^c	---	---	---	.17	.03
Occupation	-.33 ^a	-.03	.15	.31 ^a	.06	-.04	.07	---	---	---	---
Education	-.50 ^b	-.32 ^a	.06	.18	-.15	-.13	-.02	.71 ^c	---	---	---
Threat	.60 ^c	.45 ^b	-.19	-.34 ^a	.07	-.05	-.02	-.08	-.27	---	.10
Intergrp Anx	.48 ^b	.30	-.23	-.05	.18	.31 ^a	.25	-.25	-.47 ^b	.57 ^c	---

Note. ^a $p < .05$, ^b $p < .01$, ^c $p < .001$.

Table 4

Study 3 and 4 Means, SDs, Reliabilities and Ranges

	Study 3				Study 4			
	<i>M</i>	<i>SD</i>	<i>α</i>	Range	<i>M</i>	<i>SD</i>	<i>α</i>	Range
RWA	4.35	1.15	0.93	2.00-7.00	3.21	1.28	0.92	1.10-6.35
Trail Time Diff ¹					42.35	7.10		6.60-170.40
Threat					9.48	2.60	0.82	4.71-15.29
Inter-Group Anx					3.28	1.39	0.91	1.00-5.92
Social Dominance					2.92	0.95	0.90	1.29-5.14
Education	4.38	1.84		2.00-6.00	3.35	1.73		
Fluid IQ	11.10	3.24		1.00-19.00				

Note. ¹Seconds.