

# Evolved Disease Avoidance Mechanisms, Generalized Prejudice, Modern Attitudes towards Individuals with Intellectual Disability

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**Abstract**—Previous research has demonstrated that negative attitudes towards people with physical disabilities and obesity are predicted by a component of perceived vulnerability to disease; germ aversion. These findings have been suggested as illustrations of an evolved but over-active mechanism which promotes the avoidance of pathogen-carrying individuals. To date, this interpretation of attitude formation has not been explored with regard to people with intellectual disability, and no attempts have been made to examine possible mediating factors. This study examined attitudes in 333 adults and demonstrated that the moderate positive relationship between germ aversion and negative attitudes toward people with intellectual disability is fully mediated by social dominance orientation, a general preference for hierarchies and inequalities among social groups. These findings have implications for the design of programs which attempt to promote community acceptance and inclusion of people with disabilities.

**Keywords**—avoidance, evolutionary psychology, intellectual disability, prejudice

## I. INTRODUCTION

THE present study focuses on the origins of attitudes toward people with an intellectual disability (ID). Such attitudes are often prejudicial and derogatory [1]. Recent research in the field of evolutionary psychology suggests that evolved disease avoidance mechanisms may in part drive prejudice toward, and avoidance of, people with disabilities. Although a sizeable literature exists on prejudicial reactions to individuals with ID, very little attention has been given to exploring the mechanisms that may contribute to such prejudice. The present study builds upon an emerging body of work that has linked prejudice toward various 'out groups' with disease-avoidance, where the prejudicial responses reflect an adaptive strategy to avoid potentially diseased others. The disease-avoidance model suggests that, to keep pathogens at bay, humans have evolved a 'behavioural immune system' [2] that is seen to be involved in the early detection and behavioural avoidance of disease carrying individuals.

Considering the ramifications of interacting with an individual who is potentially diseased, it would have been functional for individuals, and ultimately adaptive within populations, to readily identify diseased individuals and actively avoid them [3]. In keeping with most evolved mechanisms, these processes have been described as occurring quickly, with very little conscious, rational thought or deliberation.

It has been argued that current day prejudice could result from the over-activation of these mechanisms, leading to the avoidance of contact with people who may or may not be diseased. Kurzban and Leary [4] refer to this sensitivity to a wide range of behavioural and physical features as the 'over inclusive' quality of the behavioural immune system.

Recent research supporting this proposition has shown that individuals with chronically heightened concerns about disease tend to harbour more strongly negative attitudes toward cultural out-group members [5], report prejudice toward older adults [6] and people who are obese [7], and display xenophobic attitudes [3] or ethnocentric preferences [8].

The focus of the current study was to determine whether the same underlying processes suggested to be driving behavioural avoidance and prejudice toward people with physical disabilities also applies to people with ID. To date, no research has used a disease-avoidance model in order to investigate prejudice toward people with ID. This distinction is important as people with physical disabilities are generally readily identifiable by their physical appearance whereas people with ID generally are not.

Previous research has tended to assume a direct relationship between disease avoidance and prejudicial attitudes toward people with disabilities. The ideological orientation of generalized prejudice has, however, been connected to the development and maintenance of prejudice toward individuals with ID and has become progressively important in the literature. The construct of *Social Dominance Orientation* (SDO) has been proposed as a strong predictor of generalized prejudice [9]. SDO describes a general preference for hierarchies and inequalities among social groups, reflects a competition-driven motivation for superiority, dominance, and power, and has been found to predict prejudice against groups seen as socially subordinate and low in power and status. Because generalized prejudice has been shown to be an important variable contributing to prejudice toward individuals with ID, it is possible that it provides a pathway through which perceived vulnerability to disease predicts attitudes.

In support of this proposition, several studies have demonstrated the association between SDO and prejudicial attitudes toward people with disabilities [10-12], while there is emerging evidence that SDO is also associated with perceived vulnerability to disease (PVD; [6]). The present study examined the strength of the association between PVD and attitudes toward people with ID, and the extent to which SDO mediates this relationship.

## II. METHOD

### A. Participants

A sample of 333 adults (133 males) aged between 18 and 63 years ( $M=31.68$  years,  $SD = 11.58$ ) participated in the study. The majority of the participants were born in Australia

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(90.3%) with 28 other countries of origin identified. Most participants indicated that Australia was their main country of residence (93.1%) with 11 other countries identified.

### B. Procedure

All participants completed an on-line questionnaire. Responses were automatically stored anonymously in a third party database. They were presented with a description of a typical person with intellectual disability before completing the questionnaire.

### C. Measures

The questionnaire was comprised of four components; (1) *Demographic Questions* (age, sex, occupation, ethnicity, whether the participant identify as having a disability); (2) *Modern Attitudes Scale toward People with Intellectual Disability* (MAS; [10]), a measure of covert prejudice which attempts to minimize responses bias due to political correctness and social desirability. Modern prejudice is characterized as: the denial of continued discrimination; antagonism toward minority group demands; and resentment about special favors for minority groups. The MAS attempts to measure attitudes which are less explicit than those tapped by other widely used scales. It consists of 11 items; statements such as 'There have been enough societal efforts in favour of people with intellectual disabilities' and 'The situation for people with intellectual disabilities is good as it is', to which the participant indicates level of agreement on a Likert-type 4-point scale ranging from strongly disagree to strongly agree. Cronbach's alpha for the MAS was .82; (3) *Perceived Vulnerability to Disease Scale* (PVD; [6]). This scale assesses beliefs about personal susceptibility to the transmission of infectious diseases and emotional discomfort in the presence of potential disease transmission. The scale includes 15 items found to load on two conceptually distinct subscales; Perceived Infectability (e.g. 'In general, I think I am very susceptible to colds, flu, and other infectious disease') and Germ Aversion (e.g. 'I'm comfortable sharing a water bottle with a friend'). Item responses are made on a Likert-type 8-point scale ranging from strongly disagree to strongly agree. Cronbach's alphas were .88 for Perceived Infectability and .77 for Germ Aversion; (4) *Social Dominance Orientation Scale* (SDO; [13]), an indicator of the extent to which one desires social in-group domination and superiority over out-groups. SDO is considered to be a general attitudinal orientation toward intergroup relations, reflecting whether one generally prefers such relations to be equal, versus hierarchical, that is, ordered along a superior-inferior dimension. People who are more social-dominance oriented will tend to favour hierarchy-enhancing ideologies and policies, whereas those with lower scores on SDO will tend to favor hierarchy-attenuating ideologies and policies [9]. The scale has been found to correlate with prejudice towards groups perceived as socially subordinate and derogated, but that are not perceived as dangerous (like individuals with ID). We used the original 14-item scale. Participants rated their responses on a Likert-type 4-point scale ranging from strongly disagree to strongly agree.

Example items include 'It's OK if some groups have more of a chance in life than others', and 'Inferior groups should stay in their place'. Cronbach's alpha for the SDO scale was .82.

### III. RESULTS

The relationships between MAS scores and the PVD subscale scores were examined using Pearson product-moment correlations (see Table I). The relationship between Perceived Infectability and Modern Attitudes was not significant but there was a moderate, positive relationship between Germ Aversion and the MAS score.

A Hotelling's T test indicated that MAS scores were more strongly correlated with Germ Aversion than with Perceived Infectability ( $z = 2.21, p < .01$ ). As SDO was also correlated with both Germ Aversion and MAS, a MEDIATION analysis was conducted in order to determine the direct and indirect effects of Germ Aversion on Modern Attitudes.

TABLE I  
CORRELATIONS AMONG VARIABLES

	1.	2.	3.	4.
1. MAS	-	.46*	.23*	.09
2. SDO		-	.33*	.08
3. Germ Aversion			-	.29*
4. Perceived Infectability				-

\*  $p < .001$ .

Germ Aversion accounted for significant variance in Modern Attitudes, [ $R^2 = .05$ ;  $F(1, 331) = 18.57, \beta = .23, p = .00$ ]. When Germ Aversion was regressed onto SDO, it was found that SDO accounted for significant variance in Germ Aversion, [ $R^2 = .109$ ;  $F(1, 331) = 40.68, \beta = .33, p = .00$ ]. When controlling for SDO, Germ Aversion no longer accounted for a significant portion of the variance in Modern Attitudes [ $\Delta R^2 = .01$ ;  $F(1, 330) = 2.93, \beta = .09, p = .09$ ] indicating that SDO fully mediated the relationship between Germ Aversion and Modern Attitudes. The Sobel test, an asymptotic test of variance, yielded a significant indirect effect ( $z = 5.14, p < .001$ ), confirming full mediation (see Fig. 1 for a graphical depiction of the mediation model).

As an additional check on the accuracy of the above findings, bootstrapping was used in order to account for the nonparametric distribution of SDO [14]. Results from the bootstrapping analysis, based on 1000 bootstrapped samples, using bias-corrected and accelerated 95% confidence intervals, showed that SDO fully mediated the relationship between Germ Aversion and Modern Attitudes as shown by the significant indirect effect (lower 95% CI=0.04, upper 95% CI=0.09).

Collectively, these results establish that SDO fully mediates the predictive relationship between Germ Aversion and Modern Attitudes.

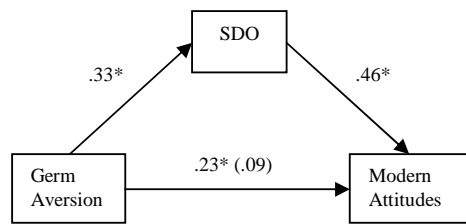


Fig. 1 Standardised regression coefficients of Germ Aversion and Modern Attitudes mediated by SDO (\* $p < .001$ ; direct effect in parentheses)

#### IV. DISCUSSION

The present study provided additional information on the prevailing attitudes held toward individuals with ID. Overall, the results are consistent with the hypothesis that a heightened fear of disease infection (as measured by germ aversion) is positively associated with increased prejudicial responses. They extend the knowledge base by demonstrating that this relationship holds when individuals are reporting in response to a group of individuals which has been defined with reference to cognitive functioning and overt behaviour as opposed to physical appearance or disability. It has been argued that people are prone to associate diseases with groups that have difficulties with the valued attributes of body control and socially normal behaviour [15]. The description of the person with ID provided to participants in the present study emphasized inadequacies in self-care and social skills. Extending the evolutionary perspective, the fact that perceived-disease avoidance is associated with negative attitudes when priming for behaviour as opposed to appearance could also be due to the fact that most life-threatening diseases are accompanied by abnormal behavioural cues (loss of body functions, loss of speech, drooling) as well as physical appearance cues [4]. It seems that overt behaviours not normally associated with disease may also cue concern about contagion.

Our finding that, of the two PVD subscales, germ aversion is the stronger predictor of attitudes toward people with disabilities is consistent with previous research [6] and requires further investigation. Examination of individual items in the subscales suggests that the perceived infectability items address somewhat hypothetical self-assessments of the adequacy of one's immune function, whereas the germ aversion items present more real and graphic images likely to trigger disgust sensitivity. Disgust sensitivity, in turn, has been suggested as a disease avoidance-mechanism, and disgust can be elicited by imaginal exposure to concrete stimuli [16]. The utility of the perceived infectability construct in this discussion remains questionable.

The result of the mediation analysis, while suggesting that concerns about disease do relate to prejudicial attitudes, also indicates that this association is indirect. The result supports a model in which germ aversion predicts individual differences in the ideological orientation of SDO, and SDO predicts prejudicial attitudes toward particular out-groups wherein

individuals with disabilities are viewed as less than human and less worthy of fair treatment [17].

In essence, it can be argued that people with heightened disease concerns could take their feelings of irrational discomfort and desire to avoid people with ID in such a way that it reinforces a view that advocates a society where dominant groups rule over subordinate groups and intergroup contact is discouraged. This belief system then leads to prejudicial attitudes towards individuals with ID.

#### V. LIMITATIONS

Although the participant group was drawn from across a broad section of the adult population, it could be argued that university students were over-represented. Students, compared to the general population, have less crystallized attitudes [18], and people with higher educational levels generally show less prejudice toward individuals with ID [19]. The research should be replicated with a participant group more representative of the general population. It should also be noted that the research was conducted in Australia and the generalisability of the findings to countries that are culturally different is unknown.

The importance of being able to measure attitudes accurately was paramount to the present study, as the aim was to investigate the potential link between concerns about disease and the largely irrational, and uncontrolled prejudicial reactions to individuals with ID. The MAS tapped participants' more automatic attitudes toward individuals with ID, and in turn minimize the confounds of social desirability bias and explicit deliberative reasoning, both of which are known to dampen these kinds of responses [20]. Nevertheless, the fact remains that the MAS is an explicit measure. Further research should be conducted using implicit attitude measures.

#### VI. RECOMMENDATIONS

As well as adding to the knowledge base on the formation of attitudes toward minority groups, the results of this study have implications for the design of programs intended to reduce prejudice toward people with ID and to promote social inclusion. It appears that unconscious processes concerning disease avoidance, while relevant to the formation of attitudes toward people with ID, operate via attitudes of social dominance orientation which are more strongly associated with both constructs. To date, neither of these factors has been considered in program design, which tends to be based on assumptions that direct exposure to individuals with disabilities, coupled with education about disability and discussions on values and human rights, will promote community acceptance. Further research is required in order to determine how best to address the factors which contribute to prejudice when designing interventions.

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