

DOES LOWER COGNITIVE ABILITY PREDICT GREATER ANIMAL EXPLOITATION?

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ABSTRACT

Previous literature has shown a statistically significant negative relationship between an individual's cognitive abilities and prejudicial attitudes, as mediated by right-wing ideologies (Hodson & Busseri, 2012; Dhont & Hodson, 2014a). This relationship was integrated into the Cognitive Ability and Style to Evaluation (CASE) model (Dhont & Hodson, 2014a). This model explains that individuals with lower cognitive abilities react to threatening situations through a prevention-focused response, which eventually forms a stable right-wing ideological belief system that predicts intergroup outcomes such as prejudice and stereotyping (Dhont & Hodson, 2014a). While there have been many studies that have examined these social scientific theories amongst human-human interactions, there have only been a few that have applied these principles to human-animal relations. This current study expanded upon the interactions described in the CASE model and hypothesized that (1) cognitive abilities predicts animal exploitation as mediated by right-wing ideology and (2) right-wing ideology predicts animal exploitation as mediated by human supremacy beliefs. 115 young adults from a largely undergraduate northeastern college were recruited to complete the study. Analyses of the Name-Face Associative Memory task and various surveys portrayed that the first hypothesis was partially supported since the only significant relationship was found between right-wing ideology and animal exploitation, in which the former variable negatively predicted the latter. However, the second hypothesis was fully supported. Thus, it is possible that aspects of human-human interactions, such as social dominance orientation, can be extended to predicting variables within models of human-animal interactions.

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Although researchers in the 1950s assessed the relationship between emotions and prejudice, many did not heavily focus on the influence of cognitive abilities—skills required to process and retain information, to solve complex problems, and to accomplish challenging tasks—on maintaining prejudicial attitudes (Hodson, 2014). Nevertheless, data obtained from studies examining this relationship presented potential confounds, such as socioeconomic status, education, and social background, which limited researchers' abilities to generalize findings (Dhont & Hodson, 2014a). These shortcomings have since been addressed in a study conducted by Hodson and Busseri (2012) in which the researchers concluded that lower intelligence levels during childhood predicted greater prejudice during adulthood, despite controlling for socioeconomic status and education. By analyzing data obtained from a sample of American undergraduates, Hodson and Busseri were also able to conclude that lower levels of abstract reasoning predicted greater right-wing authoritarianism, which predicted heightened prejudice towards homosexuals. Keiller (2010) conducted a similar study examining abstract reasoning skills and levels of anti-gay prejudice. He observed that abstract reasoning skills were negatively correlated with right-wing authoritarianism (RWA), which had the strongest positive correlation with anti-gay prejudice relative to other predictors such as contact with homosexuals.

Expanding upon these findings, Dhont and Hodson (2014a) proposed the Cognitive Ability and Style to Evaluation (CASE) model to explain why lower cognitive abilities predict greater prejudice. In their model, they accounted for psychological contributions to ideological belief systems (Dhont & Hodson, 2014a). In the first stage, cognitive variables such as styles and abilities directly influence the

assessments of threat in regards to physical or social aspects of the surrounding environment (Dhont & Hodson, 2014a). Individuals with lower cognitive abilities who prefer simplicity tend to perceive changing environments as threatening and their immediate response includes prevention (vs. promotion) reactions that reinforce what is familiar “in the interest of reducing uncertainty and anxiety and minimizing potential harm or danger” (Dhont & Hodson, 2014a, p. 457). This immediate prevention focused response eventually leads to a stable belief system that emphasizes resistance to change, known as a right-wing social-cultural ideology (Janoff-Bulman, 2009). With increased levels of threat, people resort to the right-wing ideology (Hetherington & Suhay, 2011) and consequently increase intergroup outcomes such as stereotyping (Strube & Rahimi, 2006) and prejudice (Crawford, Brandt, Inbar, & Mallinas, 2016) as a means to preserve existing societal traditions (Dhont & Hodson, 2014b). This model also includes a feedback component in which socially conservative ideologies lead to greater threat perceptions, which eventually lead to the justification of preexisting conservative beliefs (Dhont & Hodson, 2014a). This study uses this model to determine whether lower cognitive abilities predict greater animal exploitation, defined as the use of animals for human benefits, such as for rodeos or animal testing (Dhont & Hodson, 2014b).

Previous studies have examined the relationship between cognitive abilities and right-wing ideologies; however, additional factors must be considered when trying to determine the relationship between the former and animal exploitation. Dhont and Hodson (2014b) acknowledge social dominance orientation (SDO) and right-wing authoritarianism, which are both components of right-wing ideologies, as strong predictors of outgroup prejudice and discrimination. SDO describes people who accept group-based inequalities and hierarchies, and RWA refers to individuals who are obedient and conform to traditional norms (Saeri, Iyer, & Louis, 2015). While many studies have examined the influence of social-ideological orientations among human-human relations, few have examined these relations in regard to exploitive attitudes of humans towards animals. For instance, Allen, Wilson, Ng, and Dunne (2000) recruited a sample of vegetarians and omnivores and asked them to complete questionnaires regarding human values, consumption values, and diet preferences. Using the results obtained from the sample, they concluded that participants who most strongly endorse hierarchies among human beings (omnivores) are more likely to maintain stronger beliefs in human-animal dominations and therefore engage in greater animal exploitation. Researchers then pursued to examine whether social scientific theories of human-human prejudice could be applied to human-animal prejudice. They concluded that this could be done with ease (Dhont, Hodson, Costello, & MacInnis, 2014; Hyers, 2006). Furthermore, Dhont and Hodson (2014b) performed experiments to assess human-animal prejudice by hypothesizing that individuals with higher SDO scores are expected to feel more entitled to exploit animals as a result of maintaining greater human supremacy beliefs. The data supported their hypothesis, and they were able to conclude that people higher in SDO tend to support or engage in greater animal exploitation and that right-wing ideologies predict animal exploitation through a psychological mechanism relevant to this study: the belief in human superiority over animals.

This current study utilizes the CASE model proposed by Dhont and Hodson (2014a) to assess the influence of cognitive abilities on animal exploitation, therefore expanding upon Dhont and Hodson’s (2014b) findings regarding the relationship between right-wing adherents and animal exploitive attitudes. The relationship between cognitive abilities and animal exploitation is not one that has been examined before. Based off of previous literature, it is expected that individuals with lower cognitive abilities are more likely to be right-wing adherents (i.e., score higher in SDO) and therefore are more likely to support or engage in animal exploitation because they maintain greater human supremacy beliefs. In other words, this study hypothesizes that cognitive abilities predict animal exploitation as mediated by right-wing ideology and right-wing ideology predicts animal exploitation as mediated by human supremacy beliefs. It also samples a group of American undergraduate students who are asked to complete an online questionnaire, which measures individual components of the CASE model and exploitive attitudes towards animals.

METHOD

Participants

We recruited 115 young adults (72% women, 28% men) from a largely undergraduate northeastern college through an online system. Participants received credit for participation in the study. All participants were required to be 18 years of age or older ($M = 19.33$ years, age range: 18 to 23 years, $SD = 1.18$). The majority of the sample (76%) identified as White, 9% as Asian or Pacific Islander, 7% as Latino, 4% as Black or African American, 2% as Asian Indian, Arab, or Middle Eastern, 1% as Puerto Rican, and 1% as Multiracial.

Materials and Procedures

Name-Face Associative Memory task. The Name-Face Associative Memory task was adopted from Ngo, Weisberg, Newcombe, and Olsen (2016). Participants were presented with face-name stimuli consisting of a digital color photograph of an unfamiliar face presented with a fictional first name printed in black underneath. The subjects were given 4 seconds to look at each photo within a series of photographs with their associated names and were then instructed to reproduce the fictional names at the end of familiarization. There were four different sets of images with names that the participant was asked to remember. The first two sets were used for practice and they included four different images of males with their associated names, each. After viewing each set of the images, the participants were shown the same photographs in a randomized order and were instructed to recall and type the names associated with the appropriate face. The last two sets were measured and they included 10 different images of females with their associated names, each. The participants were once again instructed to recall and type the appropriate names after viewing each set. The responses were scored as *correct* (1) and *incorrect* (0) and were then averaged together to form a single memory score for each participant. Higher averaged scores indicated greater cognitive functioning.

Animal Attitude scale ratings. Attitudes towards the treatment and use of animals for food, clothing, recreational resources, and research were measured on a 20-item 4-point modified Animal Attitude scale (Herzog, Betchard, & Pittman, 1991). Participants rated their level of agreement with each statement on a scale providing responses that included *strongly disagree* (1), *disagree* (2), *agree* (3), and *strongly agree* (4). Typical items included: "There is something morally wrong about hunting wild animals just for sport" and "I do not think there is anything wrong with using animals in medical research" (reverse-scored). Lower scores indicated greater acceptance of exploitive attitudes towards animals. We computed response averages to represent exploitive attitude scores ($\alpha = .88$).

Social Dominance Orientation scale ratings. Preference for inequality and hierarchies among social groups was measured on a 16-item 4-point Social Dominance Orientation scale (Pratto, Sidanius, Stallworth, & Malle, 2001). Participants rated their level of agreement with each statement using the 4-point scale that was previously described. Typical items included: "Some groups of people are simply inferior to other groups" and "It would be good if groups could be equal" (reverse-scored). Higher scores indicated a higher social dominance orientation. We computed response averages to represent social dominance orientation scores ($\alpha = .93$).

Human Supremacy Beliefs scale ratings. Attitudes towards hierarchies between animals and humans were assessed on a 6-item 4-point Human Supremacy Beliefs scale (Dhont & Hodson, 2014b). Participants rated their level of agreement with each statement using the 4-point scale that was previously described. Typical items included: "Animals are inferior to humans" and "In an ideal world, humans and animals would be treated on an equal basis" (reverse-coded). Higher scores indicated greater human supremacy beliefs. We computed response averages to represent human supremacy beliefs scores ($\alpha = .84$).

Procedure. Participants were asked to come to a computer laboratory to complete the study. When they arrived, they signed in and sat down at any computer. They were then instructed to approach the researcher in the room once they completed the survey. The link to the survey was written on the board, so participants entered the link into the internet browser and took the survey once they were told that

they could begin. The survey included the questions in the same order as they were described above. After finishing the questionnaire, the subjects signed out and were given credit for completion.

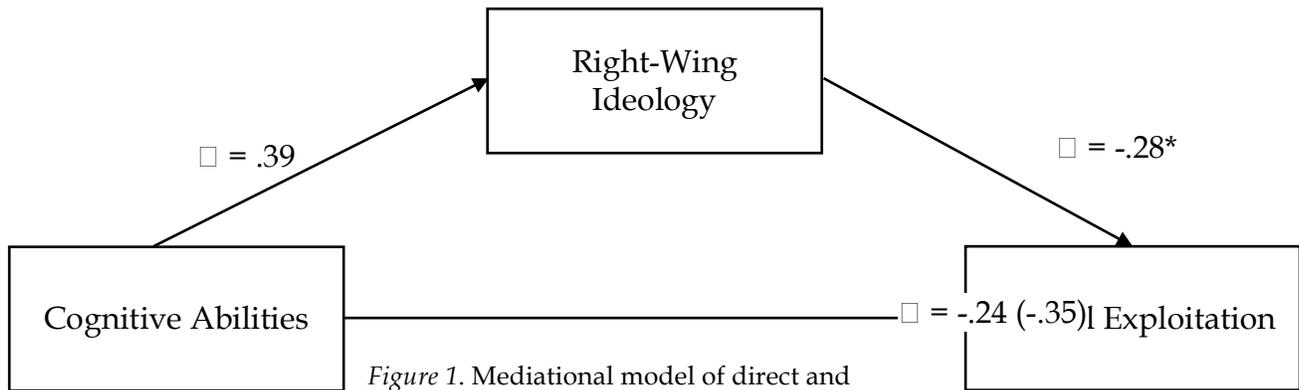
RESULTS

To test the hypothesis that cognitive abilities predict animal exploitation via the mediator right-wing ideology, we performed a regression with mediation that was developed by Preacher and Hayes (2008). Because the 95% confidence interval (which ranged from -.36 to .04) calculated did include zero, the indirect effect was not significant. See Figure 1. To test the hypothesis that right-wing ideology predicts animal exploitation via the mediator human supremacy beliefs, we performed another regression with mediation. Because the 95% confidence interval (which ranged from -.28 to -.08) calculated did include zero, the indirect effect was significant. See Figure 2. Table 1 provides descriptive statistics for each variable.

Table 1
Summary of Mean and Standard Deviation for Scores on the NFAMT, AA, SDO, and HSB

Measure	M	SD
1. NFAMT	0.36	0.19
2. AA	2.11	0.46
3. SDO	3.43	0.54
4. HSB	2.62	0.62

Note. NMFAT = Name-Face Associative Memory Task; AA = Animal Attitude scale; SDO = Social Dominance Orientation scale; HSB = Human Supremacy Beliefs scale.



indirect effects of cognitive abilities on animal exploitation. Values in parentheses indicate direct effects before the mediator was included in the analysis. *p < .05

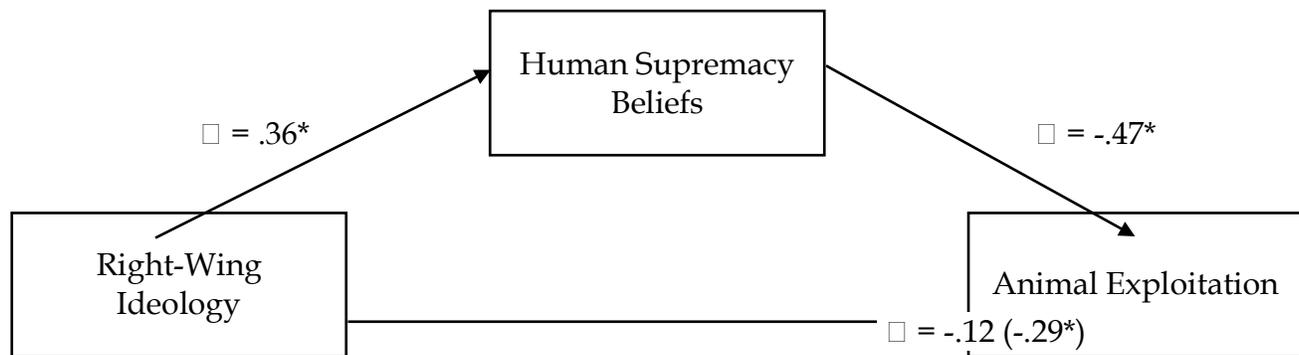


Figure 2. Mediation model of direct and indirect effects of right-wing ideology on animal exploitation.

Values in parentheses indicate direct effects before the mediator was included in the analysis. * $p < .05$.

DISCUSSION

This study tested the hypothesis that individuals with lower cognitive abilities are more likely to support or engage in animal exploitation through greater adherence to right-wing ideologies. The results partially supported the hypothesis. The direct effects of cognitive abilities on right-wing ideology and animal exploitation were not significant. In addition, the indirect effect of cognitive abilities on animal exploitation via the mediator right-wing ideology was not significant. The only significant relationship was found between right-wing ideology and animal exploitation, in which the former variable negatively predicted the latter. This finding supported the predictions because higher scores on the Social Dominance Orientation scale predicted greater animal exploitation, which was indicated by lower scores on the Animal Attitude scale.

This study also tested the hypothesis that right-wing adherents are more likely to support or engage in animal exploitation as a result of maintaining greater human supremacy beliefs. The results fully supported the second hypothesis. As hypothesized, right-wing ideology positively predicted human supremacy beliefs, which negatively predicted animal exploitation. In other words, higher Social Dominance Orientation scale scores predicted greater human supremacy beliefs, which predicted lower Animal Attitude scale scores (i.e., greater animal exploitation). Also, the effect of right-wing ideology on animal exploitation was fully mediated by human supremacy beliefs. The absence of direct effects on animal exploitation in the mediation model indicated that human supremacy beliefs largely accounted for why right-wing adherents supported or engaged in greater animal exploitation. These findings were supported by the mediation model presented by Dhont and Hodson (2014b). Their model displayed that individuals with higher Social Dominance Orientation scale scores were expected to feel more entitled to exploit animals because they maintained greater human supremacy beliefs. This model paralleled the relationship that this current study found between right-wing ideology and animal exploitation, as mediated by human supremacy beliefs.

While this study's findings did support the relationship between right-wing ideologies and prejudicial attitudes that was indicated in the CASE model, they differed from the rest of the model (Dhont & Hodson, 2014a). The CASE model depicted a negative relationship between cognitive abilities and right-wing ideologies; however, our findings showed a non-significant positive relationship. In other words, the findings of this study contrasted with its hypothesis and the CASE model by demonstrating that lower cognitive abilities were non-significantly related to lower right-wing ideologies. Furthermore, it is important to note that because the relationship was non-significant, the likelihood of the results and this relationship being replicated in future studies is low.

Nevertheless, the CASE model could also be used to explain these findings. It shows that people with lower cognitive abilities tend to prefer simplicity and perceive changing environments as threatening. Their immediate response includes a stable belief system which avoids change, known as a right-wing social-cultural ideology (Janoff-Bulman, 2009). It could be possible that the potential threat to

existing beliefs measured in this study was not salient enough to actually be perceived as a threat. Therefore, individuals with lower cognitive abilities were not affected by the measures which questioned their beliefs towards the exploitation of animals for human benefit. As a result, they were less likely to adopt right-wing ideologies.

The current study's findings also presented that lower cognitive abilities were non-significantly related to lower acceptance of exploitive attitudes towards animals. In contrast, the CASE model depicted that lower cognitive abilities predict greater prejudice. Therefore, our findings did not support this relationship described in the model. Previous research conducted by Brandt and Crawford (2016) could be used to explain the findings of this study. In their study, a representative sample of the United States population was used to determine targets of prejudice and which groups of people show intergroup bias. The results of this study suggested that both people with lower and higher cognitive abilities show similar levels of intergroup bias, but towards different groups of people. For instance, people with lower cognitive abilities show prejudice towards groups who are perceived as liberal or unconventional, while those with higher cognitive abilities show prejudice towards groups who are perceived as conservative or conventional. The results of this study could be applied to the findings of our study because differing cognitive abilities were not observed to be significantly associated with various levels of prejudice. In the case of our study, attitudes towards animal exploitation may have been a measure of prejudice that remained similar between those with higher and lower cognitive abilities.

Similar to other studies and experiments, this study consisted of various limitations that may have affected the results. For instance, the Name-Face Associative Memory task used in this study tested associative memory. Since only a single component of cognitive ability was assessed by this task, it may not have been representative of the general cognitive functioning that was intended to be measured in order to determine the relationship between cognitive abilities and animal exploitation. Further studies should focus on expanding this measure to include various assessments of cognitive abilities, such as verbal and mathematical abilities and problem solving. Doing so may contribute to creating a more salient disparity between those with higher and lower cognitive abilities because participants are being tested on multiple mental abilities. Additionally, the procedures outlined in this study allowed students to register for the time-slot that they would be available to come to the computer laboratory in order to complete the surveys and cognitive task. It is important to note that students have varying schedules and that it is very difficult to control for the cognitive demand that classes may place on the participants prior to completing the associative memory task. Fatigue induced by cognitive demanding tasks has been found to compromise executive control and therefore contribute to an increase in typical errors and sub-optimal performance (van der Linden, Frese, & Meijman, 2003). The associative memory task may not have accurately measured mental abilities for individuals who were mentally fatigued, which may have led to a less than typical cognitive performance. Along with fatigue, the time-of-day that the cognitive task was completed could have affected performance. Schmidt, Collette, Cajochen, and Peigneux (2007) observed that the time-of-day affected performance on a wide variety of cognitive tasks which tested attention, executive functioning, and memory. Since the Name-Face Associative Memory task measured the capacity of an individual's working memory and executive function, performance could have been influenced by the time-of-day that the task was completed. Future research should try to limit the cognitive demand that is placed upon an individual prior to participation by requiring that the individual does not take part in any mentally fatiguing tasks prior to completing the cognitive abilities measures. Additionally, generalizability of the results to a larger population was limited because a majority of the sample included females.

Despite the limitations, there are many valuable implications of our findings. As mentioned before, the results did not support the first hypothesis since they depicted that lower cognitive abilities do not predict a greater likelihood for supporting or engaging in animal exploitation because of adherence to right-wing ideologies. However, we did find support for the second hypothesis and were able to conclude that adherence to right-wing ideologies leads to greater exploitive attitudes towards animals via maintaining greater human supremacy beliefs. These results emphasize the differences between individual beliefs regarding group-based dominance and rights. Furthermore, the differences between those who have higher versus lower Social Dominance Orientation scale scores regarding exploitive attitudes is evidently related to power, status, and a feeling of entitlement to exploiting animals as the

former group believes in humans maintaining superiority over animals. Also, the results contribute to previous findings on human-animal relations and further emphasize the presence of a relationship between social scientific theories of human-human prejudice and human-animal prejudice (Dhont & Hodson, 2014b; Dhont, Hodson, Costello, & MacInnis, 2014; Hyers, 2006). They show that aspects of human-human interactions such as social dominance orientation can be extended to predicting variables within models of human-animal interactions. Likewise, this study introduces a novel concept of relating the CASE model (Dhont & Hodson, 2014a), which describes human-human interactions, to the human-animal group context. Our results did support a relationship proposed by the CASE model relating right-wing ideologies to prejudice. Even though our model observed prejudicial attitudes of people towards animals as opposed to each other, the results were still significant. Therefore, aspects of the former interaction can aid in understanding variables of the latter relationship and vice-versa. Additionally, the results contribute to a better understanding of the attitudes held by individuals who do not promote animal welfare. It can be understood that those who believe in a hierarchy within humans and between humans and animals are less likely to be supportive of promoting animal welfare. This information can be useful to animal rights activists, as they can adjust the methods they use to spread animal rights awareness to counter the hierarchical mindset that opponents may maintain.

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