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Navigating the Diverse Dimensions of Stereotypes, with Domain Specific Deficits: Processes of Trait Judgments about Individuals with Disabilities

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NAVIGATING THE DIVERSE DIMENSIONS OF STEREOTYPES, WITH DOMAIN SPECIFIC DEFICITS: PROCESSES OF TRAIT JUDGMENTS ABOUT INDIVIDUALS WITH DISABILITIES.

by

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Navigating the Diverse Dimensions of Stereotypes, with Domain Specific Deficits: Processes of

trait judgments about individuals with disabilities.

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Abstract

Stereotype groups are interrelated. For example, in Australia, New Zealand, and the United States, racial minorities are referred to special education at a much higher rate than are majority racial groups (Tse, Lloyd, Petchkovsky, and Manaia, 2005; Harry, Arnaiz, Klingner, Sturges, 2008). The Stereotype Content Model describes stereotype relationships in terms of an interaction between competence and warmth. Warmth is the more consistent dimension. The nature of competence remains elusive (Fiske, Cuddy, and Glick, 2007; Fiske, Cuddy, Glick, and Xu, 2002). Knowledge of relationships between stereotype groups, which themselves may be effects of bias, could factor into observed competence effects. Disabilities are characterized by objective competence deficits. Disabilities stereotype research allow for more refined models of competence. While competence perception may vary between disabilities, with different domains of competence deficits, unifying disability schemas may also exist. In either case, different competence processes could be inferred.

We compared ratings on the Fiske scale (FC, FW), a multimodal competence scale (MMC), a quality of life scale (QL-T), and an overt threat scale (OPT) for five disability groups (DS) and a set of established stereotype (ES) groups. Our MMC analysis indicates the competence dimension and stereotype group interaction was more significant for DS and ES together than for DS alone. This is surprising, because the multimodal competence scale was designed to target specific disability groups. Results indicate there may be some unifying disability schema. Marginally significant differences between disability groups on the QL-T indicate complex relationships between disabilities stereotypes may also exist.

Key Words: Stereotype Content, Competence, Disability

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1. Introduction

There are ethnic and racial differences in population norms on neuropsychological test scores, even when participants are matched for other demographic factors. For example, in Australia, New Zealand, and the United States, racial minorities are referred to special education at a much higher rate than are majority racial groups (Tse, Lloyd, Petchkovsky, and Manaia, 2005; Harry, Arnaiz, Klingner, Sturges, 2008). This has left some researchers to question if and how race should be considered in neuropsychological test design (Brickman, Cabo, and Manly, 2006). Possible solutions could involve the mitigation of stereotype effects on perception for both the patient and the clinician.

Stereotype threat theory alleges that fear of intellectual stereotypes negatively affects the performance of women and ethnic minorities on academic measures. For example, gender differences on math tests can be eliminated when women are told that the test does not have a gender bias (Spencer, Steele, and Quinn, 1998; Steele, and Aronson, 1995). Accordingly, it is possible for negative ability stereotypes to result in stereotype threat and affect performance on measures, including neuropsychological tests. A better understanding of disability stereotypes and how they relate to other stereotyped groups can help predict and prevent this type of stereotype threat. Disability stereotype structures can also be predictive of stereotype threat experienced by individuals with disabilities.

To our knowledge, disability stereotype decision processes have only been investigated in the context of the Stereotype Content Model (SCM). The model describes relationships between stereotypes in terms of interactions in warmth and competence (Fiske, Cuddy, and Glick, 2007; Fiske, Cuddy, Glick, and Xu, 2002). Researchers have yet to

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determine whether SCM ratings for "disability" reflect a unifying schema or a particular subset of disabilities.

In the context of SCM, the investigation of disabilities may prove particularly informative. Trust, a dimension of warmth, is associated with face valence processing and activation in the amygdala (Todorov and Engell, 2008). Competence is a more convoluted dimension, and consistent relationships between competence ratings and any cognitive or neural processes have yet to be identified. Disabilities reflect competence deficits specific to particular competence domains. It is possible that research that focuses exclusively on disability stereotypes might allow for more refined models of SCM competence effects.

The present study uses survey data to identify the structure of individual stereotypes and any unifying disability schema. We hope to use this information to explore the possibility that disability trait decisions may be useful in the investigation of competence effects. We compared ratings on the Fiske scale (FC, FW), a multimodal competence scale (MMC), a quality of life scale (QL-T), and an overt threat scale (OPT) for five disability groups (DS) and a set of established stereotype (ES) groups. We expected to find significant differences between groups on the MMC, and since the MMC was designed to target the DS groups, we expected these effects to be more pronounced for the DS groups.

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2. Theory

2.1

Disability Research

Studies on third-person trait judgments about individuals with disabilities are much less common. The vast majority of this research is from organizational psychology, sociology, and business model studies on employer attitudes toward disability (Hernandez, Mcdonald, Divilbiss, Horin, Velcoff, and Donoso, 2008; Stone and Colella, 1996). Apart from Fiske's research, other studies that measure cognitive and behavioral effects of disability stereotypes include Stevenage and McKay (1999), who compared images of wheelchair users to individuals with port-wine stains to study the effects of appearance on hiring decisions.

In stereotype content research, disability categories (blindness, retardation, and "disability") have appeared in the "pity" or low competence, high warmth stereotype group (Fiske, Cuddy, and Glick, 2007; Fiske, Cuddy, Glick, and Xu, 2002). To our knowledge, all SCM studies that have included disability groups have also included a general "disability" category label. How this category label relates to the diverse range of disorders that can be classified as a disability is uncertain. It is possible that this category label only represents key features of a handful of highly visible disabilities, which frequently appear in popular culture (e.g., blindness, deafness, and mobility disabilities). It is also possible that the disability label is unrelated to perceptions of individual disabilities, and disability stereotypes do not contain related stereotype content.

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2.2

Stereotypes

[Figure 1 about here]

The Stereotype Content Model describes how perception of warmth and competence can predict behavior with respect to stereotyped groups (Fiske, Cuddy, and Glick, 2007; Fiske, Cuddy, Glick, and Xu, 2002). Warmth judgments include judgments about "friendliness, helpfulness, sincerity, trustworthiness and morality." Competence traits include "intelligence, skill, creativity" (Fiske, Cuddy and Glick 2007). Using warmth and competence vectors, the model places stereotypes into one of four categories: "Pride" (high warmth, high competence), "Disgust" (low warmth, low competence), "Envy" (low warmth, high competence), and "Paternalistic" (high warmth, low competence) (Fiske et al. 2002) (see Figure 1).

The Stereotype Content Model originated from investigations of "social good" and "social bad" versus "intellectual good" and "intellectual bad" conducted by Rosenberg et al. (Fiske, Cuddy, and Glick, 2007; Fiske, Cuddy, Glick, and Xu, 2002; Wojciszke, Bazinska, and Jaworski, 1998). In the decades since its initial conception, the model has been validated cross culturally (in 19 nations, according to Fiske, Cuddy and Glick, 2007). Certain trends have emerged in studies of the model. Warmth appears to be more important than competence. Participants make warmth judgments more rapidly than competence judgments (Fiske, Cuddy, and Glick, 2007). Competence judgments are more strongly associated with judgments about individuals, while warmth judgments are more strongly associated with judgments about groups. Additionally, negative warmth information is more influential than

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positive warmth information, while the positive competence information is more influential

than negative competence information (Fiske, Cuddy, and Glick, 2007; Wojciszke, 2005).

2.3

Neural Correlates of Trust

There is an established relationship between social judgments about trust (a dimension

of warmth) and neural systems related to processing of negative valance stimuli and threat,

such as the amygdala, the insula, and the anterior cingulate (Engell, Haxby, and Todorov,

2007; Spezio et al., 2008; Todorov, Gobbini, Evans, and Haxby, 2007). The evidence is

particularly strong for a relationship between activation in the amygdala and perception of

untrustworthy faces in trust decisions (Engell, Haxby, and Todorov, 2007; Todorov, Baron,

and Oosterhof, 2008; Todorov and Engell, 2008).

Engell, Haxby, and Todorov (2007) report activation negatively correlated with face

trustworthiness in the bilateral amygdala (Engell et al., 2007). They found consensus

trustworthiness (ratings across participants) was a better predictor of amygdala response than

individual trustworthiness ratings (Engell et al., 2007). Todorov, Baron, and Oosterhof

(2008) were successfully able to replicate the findings reported in Engell et al. (2007) with

computer generated face stimuli, which were modeled on averages of faces that received high

and low trust ratings. However, they only found significant activation in the right amygdala

(Todorov, Baron, and Oosterhof, 2008). Both of these studies indicate amygdala activity for

consensus untrustworthiness judgments, but not idiosyncratic judgments (Engell, Haxby, and

Todorov, 2007; Todorov, Baron, and Oosterhof, 2008). These findings indicate the amygdala

might be involved in processing more basic trust information.

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Todorov and Engell (2008) assessed amygdala responses to stimuli valence across fourteen different social dimensions including trustworthiness, caring, intelligence, confidence, attractiveness, etc. They found the general valence accounted for 62.9% of amygdala activity variance. The authors suggest the amygdala is involved in general face valence. However, their results also indicate that among social dimensions, trustworthiness was most correlated with amygdala response. This data indicates trustworthiness may be a good approximation of face valance (Todorov and Engell, 2008).

2.4

Neural Correlates of Competence

Political psychology research has repeatedly shown that competence can strongly influence electoral decisions (Todorov, Mandisodza, Goren, and Hall, 2005; Olivola and Todorov, 2010; Antonakis and Dalgas, 2009). However, Spezio et al. (2008) found threat judgments, not competence judgments, were the best predictors of actual election outcomes. They also found that candidates whom participants had not voted for elicited higher activations in the bilateral anterior cingulate and the bilateral insula. In contrast, they found that winning candidates did not elicit significant activation in their regions of interest (Spezio, et al., 2008). Greater activation for losing candidates is consistent with the effects of negative stimuli on warmth and threat judgments, but not with competence judgments.

Harris and Fiske (2010) hypothesized that inconsistent stereotypes will induce prediction error responses. In an fMRI study, they presented participants with a series of sentences describing behavior that had been rated as either highly good (warmth) or highly intelligent (competence) and images of people (from stereotyped groups) who were supposed to have carried out the behavior. They found warmth (good) stereotype consistencies yielded

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activations in Broadman areas 21, 18 and 19 and in the inferior parietal lobule, and

competence (intelligent) stereotype consistencies were differentially active in Broadmann

areas 34 and 2.

Cikara, Farnsworth, Harris, and Fiske (2010) explored the neural correlates of

competency trait inference and their relationship to social valuation of group members from

stereotyped groups. Cikara et al. (2010) found that when participants observed a low

competence target being sacrificed, the left middle occipital gyrus showed greater activity,

and that when a high competence target was saved, the left anterior cingulate showed greater

activity. Cikara et al. (2010) used a whole brain planed contrast to examine the warmth-

competence interaction and found significant activation in the mPFC when high warmth and

high competence "Pride" targets were saved. These data suggest that competence is mediated

by warmth judgments. Together, these data suggest that competence is not a singular basic

process, but is more likely to be affected through more distributed, richer, and more complex

processes.

2.5

Complex Warmth Processes

According to SCM theories, warmth and competence should be interrelated. In the

model, warmth trait judgments allow the perceiver to make inferences about another's

intentions, while competence judgments access another's ability to carry out their intentions

(Fiske, Cuddy, and Glick, 2007). Therefore, it is possible that some dimensions of

competence may be associated with processes involved in complex warmth decisions.

Todorov, Gobbini, Evans, and Haxby (2007) examined the effects of verbal information

recall on face perception. Previous research had indicated that the amygdala responds

differentially to facial information, but does not respond to descriptions of immoral or

untrustworthy people (Engell et al., 2007). In an fMRI paradigm, participants were shown

images of faces, accompanied by verbal descriptions of behaviors that were aggressive,

disgusting, nice or neutral (Todorov, Gobbini, Evans, and Haxby, 2007).

In addition to activations in the amygdala for untrustworthy faces, Engell, Haxby, and

Todorov (2007) found significant regions in the bilateral parahippocampal gyrus, left uncus,

right middle temporal gyrus, left inferior temporal gyrus, bilateral middle occipital gyrus, and

the right cuneus, correlated with consensus untrustworthiness judgments. They also found

one significant cluster for idiosyncratic judgments in the left middle frontal gyrus. The

authors suggest the amygdala is involved in early facial processing, but is mediated by other

systems, including those linked to idiosyncratic judgments (Engell, Haxby, and Todorov,

2007).

Some dimensions of competence may involve verbal or semantic trait information.

The fact that the amygdala is differentially responsive to faces, but not verbal descriptions of

moral behavior, hardly means that it is unresponsive to verbal information. It also does not

mean that trust decisions about faces and warmth ratings for stereotype labels are necessarily

unrelated. However, if warmth ratings of stereotype labels and trust decisions about faces do

involve related neural processes, then it is likely that warmth ratings rely on imagery

associated with stereotype labels. If it is indeed the case that warmth ratings relay on visual

stereotype imagery, then one aspect of SCM competence effects might include processes that

are more associated with verbal information.

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2.6

Disabilities and the Stereotype Structure and Processes

While modeling disability stereotypes was the initial goal of our research, as we investigated the Stereotype Content Model further, we realized that disability stereotypes would be an ideal group to use in the investigation of competence and the further investigation of stereotype structure. When we refer to stereotype structure, we are referring to the social conceptual definition of a stereotype label. To a certain extent social conceptual definitions are the aim of SCM research, as SCM defines trends in social ideals associated with groups of stereotypes. However, while some possible component groups of stereotypes have been investigated (e.g., whites, poor whites, disability, blind, "retarded"), to our knowledge SCM research has yet to fully deconstruct its stereotype groups.

Disabilities stereotypes are an ideal test group for deconstruction of both an SCM stereotype label and SCM competence effects. Disabilities stereotypes are an ideal SCM label to deconstruct, because they represent such a diverse range of concepts. They are an ideal stereotype for the deconstruction of the competence dimension, because disabilities have specific competence deficits.

With many low competence stereotypes historical and modern bias has interacted with current social conditions, so that it can be hard to distinguish between a stereotype and perception of real social conditions. However, disability groups have objective, medically defined deficits in socially defined competence. Within the context of socially defined competence, disabilities have areas of objective deficits that are cannot be caused by any bias, except in the perception of the competence. If one says that, in general, individuals who use wheelchairs are probably less adept at walking than the general population, this would be

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a rational assumption and not bias. If one says that, in general, deaf individuals and

individuals who use wheel chairs are equally less adept at walking, compared to the general

population, then this would be bias.

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3. Methods

3.1

Participants

Sixty three participants, 43 women and 20 men, were recruited through a Facebook event, a Scripps College mailing list, and posts on Internet forums. Participants were selected on the basis of age (over 18) and "familiarity" with American culture. Current United States residents, who grew up in the US, have obtained citizenship, or have lived in the country for more than five years, were eligible to participate (recent expatriates, those who had grown up in the United States and have lived in the country within the past five years, were also included).

Forty two participants were under the age of 25, six participants were between the ages of 25 and 40 and 15 participants were over the age of 40. Two participants were Latino, five were Asian, 49 were Caucasian, and seven were mixed race. Two participants identified with some form of asexuality, eleven identified as gay, bisexual, or heteroflexible, and 50 participants identified as heterosexual. Among participants who chose to report their income, the median income range was $31,000-$50,000. Critical to the question at hand, nine participants identified as individuals with disabilities. Two identified with Autism Spectrum disorders; two identified with hearing impairments; fourteen identified with visual impairments; one identified as having a mobility disability; and one indicated that he or she had received a score below 70 on an intelligence quotient test.

Since student status has been significant in previous SCM studies (Cuddy, and Glick, 2007; Fiske, Cuddy, and Glick, 2002), we took an extensive index of this variable. Thirty participants were full time students; nine participants had not been a student for exactly one

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year; and sixteen had not been a student of any kind for or five years or more. Two

participants had not been students of any kind for the past two years; four were current part

time students; and two were recent (within the past five years) part time students.

3.2

Materials and Procedure

[Table 1 about here]

A survey, created on Survey Monkey asked participants to rank stereotype groups

according to five measures. The first measures were from the stereotype content scale,

reported by Fiske, Cuddy, and Glick (2002) and included a competence scale (FC) and a

warmth scale (FW). The third measure was a quality of life scale (QL-T). To obtain this scale

we modified the Q-LES-Q-SF©, a standard quality of life measure, used by clinicians

(Endicott, Nee, Harrison, Blumenthal, 1993), so that questions would be applied in the third

person. The fourth measure was an author developed multimodal competence scale (MMC),

which was designed to measure competence perception with respect to vocations, most of

which were relevant to our target disabilities. The last measure was an overt personal threat

scale (OPT). We based this scale on the requirements for obtaining a restraining order.

Average survey completion time was over ninety minutes.

Participants were asked take the survey in a single session, without simultaneous

activities. Questions asked participants to rate groups on a 1-5 (where 1 is "not at all" and 5

is "extremely") scale. One question asked participants to rate groups' quality of life on a 10-

point scale (where 1 is "very bad" and 10 is "very good"), and one question asked

participants to rate how likely they are to be threatened by a member of each group on a 10-

point scale (where 1 is "very unlikely" and 10 is "very likely.") See Table 1 for question text.

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The directions read as follows: "You will be asked to indicate how groups are perceived in American society. We are not interested in your personal beliefs, but in how you think members of these groups are viewed by others" (Fiske, 2002).

[Table 2 about here]

Five (DS) groups were selected, because each of these groups had deficits that were specific to a different potential competence dimension. These groups included people who use wheelchairs (kinesthetic ability), high functioning individuals with Autism (social ability), individuals with low IQ (intellectual ability), blind people (visual ability), and deaf people (auditory ability). ES groups were selected from those used by Fiske, Cuddy, and Glick (2002). As our study focused on disabilities that participants might not be familiar with and we could not provide definitions for these groups and not others without drawing special attention to these groups, specific definitions were provided for each group. To minimize cross-associations between groups, we designed our definitions to encourage participants to think specifically about the group (see Table 2). For all groups, unless the stated definition indicated otherwise, participants were asked to assume: most are under the age of 30; most have no known disabilities; most are exclusively attracted to the opposite sex; most, in terms of cultural standards, are neither attractive, nor unattractive; most have normal occupations; most have normal incomes; most are Caucasian (excluding Latinos and/or Chicanos); 50% of group members are male and 50% of group members are female. For all questions all of the group definitions were the same. The order in which groups appeared varied between questions.

At the end of the survey participants were asked about how they imagined the race, gender, attractiveness, sexuality, disability status, and age of the typical member of each

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group, when they were answering questions. At least 50% of participants reported that they

followed the directions to avoid cross associations for each group on most categories, except

for gender where 71-98% of participants reported that they imagined that stereotype group

members were male, for all groups that did not have a defined gender (except for "welfare

recipients," in which case 52% of participants indicated that they imagined this group as

female). Among disability related imagery errors, 7% of participants selected "intellectual"

for the "Autism" group disability type; 49% selected 31-50 for the "Deaf" group age range,

and 51% of participants selected 31-50 for the "wheelchair users" age range. In addition,

78% selected "poor" for the IQ group income level, 29% selected "unattractive" for IQ group

attractiveness, and 32% selected 31-50 for the IQ group age range. These data are interesting

and bear further scrutiny. For the moment, they indicate that we cannot assume our directions

regarding cross associations had an effect on our results.

3.3

Analysis

Difference Scores

All analyses were done using difference scores, which were calculated by

subtracting the average rating a participant gave for a particular question from the rating he

or she gave for all of the groups on that question.

General Analysis

In SPSS a full factorial repeated-measures ANOVA was carried out, comparing both

DS and ES groups across dimensions for each measure (individual questions, see Table 1).

Participants' age, student status, disability identification, orientation, gender, and income

were included as covariates. Type III sum of squares was used. Assumed sphericity was

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tested using Mauchly's Test of Sphericity and Greenhouse-Geisser epsilon estimation[1]. As a result, a Greenhouse Geisser correction was used for group main effects and interactions for group effects and group and dimension interactions on values reported for all scales. A pairwise comparison of the stereotype groups was carried out, using a Bonferroni correction for multiple comparisons.

Disability Analysis

In SPSS a full factorial repeated-measures ANOVA was carried out, comparing for the five DS groups across questions for each measure. Participants' age, student status, disability identification, orientation, gender and income were included as covariates. Type III sum of squares was used. Assumed sphericity was tested using Mauchly's Test of Sphericity and Greenhouse-Geisser epsilon estimation[2]. As a result, a Greenhouse Geisser correction was used for group main effects and interactions for group effects and group and dimension interactions on values reported for all scales. A pairwise comparison of the stereotype groups was carried out, using a Bonferroni correction for multiple comparisons.

ES Comparison Analysis

Based on the results of the DS analysis, a follow up analysis was done to see if DS MMC effects were unique or the result of similar competence groups. The mean MMC DS scores were compared with the mean MMC ES scores. Since only three ES groups (elderly people, welfare recipients, and poor people) were in the range of the DS group, and we wished to have the same degrees of freedom in our comparison analysis, we added the two groups closest to the DS range (homemakers and Latino/a Americans). The standard error for the mean MMC difference scores of the five DS groups was 0.513, and the standard error for the mean MMC difference scores of our comparison ES was 0.420.

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In SPSS a full factorial repeated-measures ANOVA was carried out, comparing for the five DS groups, across questions on the ES comparison group MMC difference scores. Participants' age, student status, disability identification, orientation, gender, and income were included as covariates. Type III sum of squares was used. Assumed sphericity was tested using Mauchly's Test of Sphericity and Greenhouse-Geisser epsilon estimation[3]. As a result, a Greenhouse Geisser correction was used for group main effects and interactions for group effects and group and dimension interactions on values reported.

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4. Results

4.1

General Analysis

[Table 3 about here]

Fiske Competence

A repeated-measure ANOVA was carried out on Fiske competence scale ratings difference scores for both ES and DS groups. The main effects for stereotype group were not significant, $F(4.384)= 0.654$, $p>0.638$ (see Table 3). There was a significant participant race and ethnicity stereotype group interaction, $F(4.383)=2.608$, $p<0.032$, a significant participant gender and stereotype group interaction, $F(4.383)=2.695$, $p<0.027$, and a significant student status and stereotype group interaction, $F(4.383)=2.558$, $p<0.035$. The measure dimension and stereotype group interaction was not significant, $F(30.287)=0.984$, $p>0.492$ (see table 3). The dimension, stereotype group, and participant race and ethnicity interaction was significant, $F(30.287)=1.497$, $p<0.041$.

Fiske Warmth

A repeated-measure ANOVA was carried out on Fiske warmth scale ratings difference scores for both ES and DS groups. The main effects for stereotype group were not significant, $F(6.549)= 0.495$, $p>0.853$ (see Table 3). The measure dimension and stereotype group interaction was not significant, $F(19.747)=1.137$, $p>0.305$ (see Table 3).

Multimodal Competence

A repeated-measure ANOVA was carried out on multimodal competence scale ratings difference scores for both ES and DS groups. The main effects for stereotype group were not significant, $F(4.318)=0.528$, $p>0.729$ (see Table 3). There was a marginally

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significant participant race and ethnicity and stereotype group interaction, $F_{(4.318)}=2.206$,

p=0.064 and a marginally significant student status and stereotype group interaction,

$F_{(4.318)}=2.187$, p=0.066. The measure dimension and stereotype group interaction was

significant, $F_{(25.292)}=1.563$, p<0.037 (see Table 3). The dimension, stereotype group, and

participant disability status interaction marginally significant, $F_{(25.292)}=1.488$, p=0.57. The

dimension, stereotype group, and participant orientation interaction was marginally

significant, $F_{(25.292)}=1.414$, p=0.084. The interaction between dimension, stereotype group,

and participant race and ethnicity was significant, $F_{(25.292)}=2.276$, p<0.0001.

Quality of Life

A repeated-measure ANOVA was carried out on quality of life scale ratings

difference scores for both ES and DS groups. The main effects for stereotype group were not

significant, $F_{(5.149)}=0.944$, p>0.455 (see Table 3). There was a significant participant age

stereotype group interaction, $F_{(5.149)}=2.454$, p<0.032, a significant and a marginally

significant student status and stereotype group interaction, $F_{(5.149)}=2.054$, p=0.070.

The measure dimension and stereotype group interaction was not significant,

$F_{(28.280)}=1.310$, p>0.128 (see Table 3). The dimension, stereotype group, and participant

sexual orientation interaction was significant, $F_{(28.280)}=1.484$, p<0.049. The dimension,

stereotype group and participant race and ethnicity interaction was also significant,

$F_{(28.280)}=1.558$, p<0.032.

Overt Personal Threat

A repeated-measure ANOVA was carried out on overt personal threat scale ratings

difference scores for both ES and DS groups. The main effects for stereotype group were not

significant, $F_{(3.035)}=0.816$, p>0.489 (see Table 3). The measure dimension and stereotype

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group interaction was not significant, $F(18.950)=1.086$, $p>0.359$ (see Table 3). The

dimension, stereotype group, and participant age interaction was significant,

$F(18.950)=1.700$, $p<0.031$. The dimension, stereotype group, and participant gender

interaction was marginally significant, $F(18.950)=1.540$, $p=0.065$. The dimension, stereotype

group, and participant gender interaction was significant, $F(18.950)=1.818$, $p<0.017$.

4.2

Disability Analysis

[Table 4 about here]

Fiske Competence

A repeated-measure ANOVA was carried out on Fiske competence scale ratings

difference scores for DS groups. The main effects for DS group were not significant,

$F(2.716)=0.184$, $p>0.891$ (see Table 4). The measure dimension and DS group interaction

was not significant, $F(14.942)=1.366$, $p>0.158$ (see Table 4). The dimension, DS group, and

participant race and ethnicity interaction was significant, $F(14.292)=1.786$, $p<0.033$.

Fiske Warmth

A repeated-measure ANOVA was carried out on Fiske warmth scale ratings

difference scores for DS groups. The main effects for DS group were not significant,

$F(3.225)=0.305$, $p>0.836$ (see Table 4). The participant income and DS group interaction was

marginally significant, $F(3.225)=2.108$, $p=0.096$. The measure dimension and DS group

interaction was not significant, $F(11.770)=1.284$, $p>0.224$ (see Table 4).

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Quality of Life

[Figure 2 about here]

A repeated-measure ANOVA was carried out on quality of life ratings difference scores for DS groups. The main effects for DS group were marginally significant, $F(2.133)=2.738$, $p=0.066$ (see Table 4 and Figure 3). The participant race and DS group interaction was significant, $F(2.133)=3.169$, $p<0.043$ The measure dimension and DS group interaction was not significant, $F(17.147)=1.049$, $p>0.401$ (see Table 4). The dimension, DS group, and participant orientation interaction was significant, $F(17.147)=1.992$, $p<0.009$. The dimension, stereotype group, and participant race and ethnicity interaction was significant, $F(17.147)=1.650$, $p<0.046$.

Multimodal Competence

[Figure 3 about here]

A repeated-measure ANOVA was carried out on multidimensional competence scale ratings difference scores for DS groups. The main effects for DS group were not significant, $F(2.976)=0.670$, $p>0.571$ (see Table 4). The measure dimension and DS group interaction was not significant, $F(16.642)=1.345$, $p>0.159$ (see Table 4 and Figure 3). The dimension, stereotype group, and participant orientation interaction was significant, $F(16.642)=1.777$, $p<0.028$. The dimension, stereotype group, and participant race and ethnicity interaction was significant, $F(16.642)=2.021$, $p<0.009$.

Overt Personal Threat

A repeated-measure ANOVA was carried out on overt personal threat scale ratings difference scores for DS groups. The main effects for DS group were not significant, $F(2.030)=1.331$, $p>0.269$ (see Table 4). The measure dimension and DS group interaction

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was not significant, $F_{(8.523)}=1.273$, $p>0.252$ (see Table 4). The dimension, stereotype

group, and participant student status interaction was significant, $F_{(8.523)}=2.249$, $p<0.020$.

4.3

ES Comparison Analysis

A repeated-measure ANOVA was carried out on overt personal threat scale ratings

difference scores for ES comparison groups. The main effects for ES comparison group were

not significant, $F_{(3.031)}=1.255$, $p>0.292$. The participant orientation and ES comparison

group interaction was significant, $F_{(3.031)}=3.790$, $p<0.011$. The participant income and ES

comparison group interaction was significant, $F_{(3.031)}=2.222$, $p=0.087$. The measure

dimension and DS group interaction was significant, $F_{(16.161)}=2.288$, $p<0.003$. The

dimension, stereotype group, and participant disability status interaction was significant,

$F_{(16.161)}=2.057$, $p<0.008$. The dimension, stereotype group, and participant race and

ethnicity interaction was significant, $F_{(16.161)}=1.963$, $p<0.013$.

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5. Discussion

5.1

General Discussion

Contrary to our hypothesis, significant differences between disability groups were not observed, except for participant group demographic interactions. This result is supported by our follow up ES comparison analysis where significant differences were observed for the MMC. The ES comparison groups had mean MMC difference values within or close to the disability group range and a lower group mean standard error than the disability group. These data indicate that the homogeny of DS responses did not result solely from floor effects, but rather was unique to DS groups. for the MMC Marginally significant effects were observed for disability group main effects on the QL-T. These were the only main effects for group observed for any test on any of the analyses.

For the Fiske scale and the OPT the only significant effects were for participant demographic interactions. Our population did not have enough participants in these categories to support any participant demographic dependent claims about the Fiske scale, or threat. Therefore, will focus on MMC effects and the surprising absence of warmth effects, apart from participant demographic interactions.

5.2
Competence Effects

The MMC was designed to target specific disability groups. Therefore, the fact that the MMC group and dimension interaction was only significant for the general analysis and the ES comparison analysis is surprising. Together these data indicate the existence of one or more unifying disability competence schema. However, the marginally significant QL-T

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differences between disability groups indicate more complex relationships between

disabilities stereotypes may also exist. Further investigation of these relationships is needed.

5.3

Warmth Effects

It is curious that we did not find effects for warmth, other than the DS group

participant income interaction. In SCM research, warmth is normally the more influential

dimension. Warmth decisions are made more rapidly and warmth judgments have greater

effects on behavior (Fiske, Cuddy, and Glick, 2007). Neural evidence indicates trust, a

component of warmth, is associated with implicit valance processes (Engell, Haxby, and

Todorov, 2007; Todorov, Gobbini, Evans, and Haxby, 2007).

The absence of warmth effects could have been an artifact of our experiment design.

Our survey was online and untimed allowing for substantial self monitoring. The average

completion time was over ninety minutes and the survey was expected to take forty five

minutes. We may not have observed warmth effects, because they occur more rapidly than

competence effects. However, when we conducted an analysis of our FW data, for

completion time effects the between subject differences were not significant (see Appendix

B). This said, only six participants completed the survey in less than fifty minutes (a time

frame that would reflect decisions, without extensive deliberation), while nineteen

participants spent over two hours on the survey. Therefore, it is still possible that are results

reflect differences in the timing of competence and warmth effects.

Other aspects of our design could also have repressed warmth effects. Trust decisions

are strongly associated with amygdala activity. The amygdala responds differentially to facial

information, but does not respond to descriptions of immoral or untrustworthy people (Engell

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et al., 2007). If processes involved in trust decsions can be genralized to other warmth

decisions, it is possible that we not see warmth effects, because our stereotype information

was verbal. Previous SCM studies have relied on sterotype images or lables (Cikara,

Farnsworth, Harris, and Fiske, 2010; Fiske, Cuddy, and Glick, 2007; Fiske, Cuddy, Glick,

and Xu, 2002). One has used verbal descriptions, with images, in a rapid decision paradigm

(Harris and Fiske, 2010). Others have relided on free response trait lists (Wojciszke,

Bazinska, and Jaworski, 1998). We may not have seen warmth effects, because participants

responded to our verbal descriptions of stereotype groups, instead of their visual stereotype

group imagry. We are in the process of developing a model to analyze the effects of

participant responces to the follow up questions (how they "imagined" members of

stereotype groups, see methods) to see if variables like attractiveness ratings affected warmth

ratings, in this context.

5.4

Disability Stereotypes

The MMC was designed to target specific disability groups. Therefore, the fact that

the MMC group and dimension interaction was only significant for the general analysis and

the ES comparison analysis is surprising. These data indicate the existence of one or more

unifying disability competence schema. However, the marginally significant QL-T

differences between disability groups indicate more complex relationships between

disabilities stereotypes may also exist. Further investigations of these relationships are

needed.

It is surprising that there was a dimension, DS group, and participant disability status

interaction in the ES comparison analysis, but no effects for participant disability status in the

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DS analysis. However, there were only nine participants, who identified with as disabled. It is likely that these results are due to individual differences and sample size.

On almost every MMC competence dimension a disability group received the lowest mean difference score ("welfare recipients" received the lowest mean difference score for "own a puppy," as did "elderly people" for "play a sport"). It is likely that competence, especially as it relates to ability, as it did on the MMC, is a key feature in disability schema. Competence might not be as consistent if other stereotype groups were deconstructed. Likewise, if we developed a paradigm where we observed significant warmth or quality of life effects, we might see significant differences between disability groups.

5.5

Future Work

Future work should focus on the effects of response time and stimuli time on competence and warmth ratings. We are particularly interested in potential relationships between rapid processing of disability visual stimuli, rated for warmth, in a moral task paradigm and quality of life effects observed between disability groups. The purpose of this study would be to determine the extent of the variability in quality of life ratings, which may be explained by warmth.

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Footnotes

1. Sphericity could not be assumed for FC scale stereotype group effects, χ^2=651.014, p<0.0001, ε=0.244. The χ^2 approximation was not significant for the FC scale stereotype group dimension and interaction, but epsilon was low, ε=0.244. Sphericity could not be assumed for FW scale stereotype group effects, χ^2=557.993, p<0.0001, ε=0.364. The χ^2 approximation was not significant for the FW scale stereotype group and dimension interaction, stereotype group dimension and interaction, but epsilon was low, ε=0.183. Sphericity could not be assumed for MMC scale stereotype group effects, χ^2=711.173, p<0.0001, ε=0.240. The χ^2 approximation was not significant for the MMC stereotype group and dimension interaction, but epsilon was low, ε=0.141. Sphericity could not be assumed for QL-T scale stereotype group effects, χ^2=685.548, p<0.0001, but epsilon was low, ε=0.286. The χ^2 approximation was not significant for the OPT stereotype group and dimension interaction, but epsilon was low, ε=0.121. Sphericity could not be assumed for QL-T scale stereotype group effects, χ^2=832.576, p<0.0001, ε=0.170. The χ^2 approximation was not significant for the OPT stereotype group dimension interaction, but epsilon was low, ε=0.263.

2. For FC scale, sphericity could neither be assumed DS group effects, χ^2=53.199, p<0.0001, ε=0.679, nor for the group dimension interaction, χ^2=632.529, p<0.0001, ε=0.534. For the FW scale, sphericity could neither be assumed for DS group effects, χ^2=56.391, p<0.0001, ε=0.669, nor for the group dimension interaction, χ^2=702.959, p<0.0001, ε=0.355. For the QL-T scale, sphericity could not be assumed for DS group effects, χ^2 =92.801, p<0.0001, ε=0.533. The χ^2 approximation was not significant for the QL-T scale DS group dimension interaction, but epsilon was low,

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$\varepsilon=0.330$. For the MMC scale, sphericity could neither be assumed for DS group

effects, $\chi^2=48.606$, p<0.0001, $\varepsilon=0.744$, nor for the DS group dimension interaction

$\chi^2=1261.855$, p<0.0001, $\varepsilon=0.416$. For the OPT scale, sphericity could neither be

assumed for DS group effects, $\chi^2=117.614$, p<0.0001, $\varepsilon=0.507$, nor for the DS group

dimension interaction, $\chi^2=364.253$, p<0.0001, $\varepsilon=0.533$.

3. For the ES comparison group MMC scale scores, sphericity could neither be assumed

    for group effects, $\chi^2=43.531$, p<0.0001, $\varepsilon=0.758$, nor for the group dimension

    interaction, $\chi^2=1296.054$, p<0.0001, $\varepsilon=0.404$.

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Tables and Figures

Table 1.

FC	FW	MMC	OPT	QL-T
•Competent[a] •Confident •Independent[a] •Competitive[a] •Intelligent[a] •Capable[a] •Efficient[a] •Skillful[a]	•Tolerant[a] •Warm[a] •Good natured[a] •Sincere[a] •Friendly[a] •Well-intentioned[a] •Trustworthy[a]	•Babysit •Own a puppy •Defend themselves in court attend college •Run a business •Work at a customer service desk, in a super market •Play a sport •File federal tax forms, without assistance •Go outside to enjoy the outdoors •Teach a class for adults •Learn to play an instrument	•Physical health[b] •Mood[b] •Occupation[b] •Household activities[b] •Social relationships[b] •Family relationships[b] •Leisure time activities[b] •Ability to function in daily life[b] •Sexual drive, interest and/or performance[b] •Economic status[b] •Living/housing situation? [b] •Ability to get around physically without feeling dizzy or unsteady or falling? [b] •Overall sense of well being[b]	•Abuse a spouse •Stalk you •Verbally threaten you, with bodily harm •Physically assault you •Present a physical threat to you

a. Fiske, Cuddy, Glick, and Xu (2002), b. Q-LES-Q-SF©, Endicott, Nee, Harrison, and Blumenthal (1993), copywrite permissions include use for non industry research.

Table 1. Survey text for Fiske competence (FC), Fiske warmth (FW), multimodal competence (MMC), overt personal threat (OPT), and quality of life (QL-T) scales. Survey text read "As viewed by society how (insert dimension word or phrase) are members of this group?" for FC and FW (Fiske, Cuddy, Glick, and Xu, 2002); "Taking everything into consideration estimate how ('competent', for the MMC; 'satisfied' for the QL-T; 'likely to' for the OPT) would members of this group be ('with their' for the QL-T, 'to' for the MMC and the OPT) (insert dimension word or phrase)". Phrasing for MMC, QL-T, and OPT questions based on phrasing of Q-LES-Q-SF© questions (Endicott, Nee, Harrison, and Blumenthal, 1993).

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Table 2.

Stereotype Group	Definition
Welfare Recipients	Adult recipients of government provided cash, food stamps, medical care or other services designated for single parent families and individuals with limited income and resources
Poor People	Adults, with incomes below the federal poverty level
Latino Americans	Adults with one or more ancestors from Middle or South America, including Mexico
Asian Americans	Adults, with one or more recent (past 300 years) ancestors from Asia
Rich People	Adults who have a lot more money than most people
Professionals	Adults, who are qualified and engaged in a profession
African Americans	Adults with one or more recent (past 300 years) ancestors of African decent
High Functioning People with Autism	Adults, who have normal or above intelligence and specific deficits related to social interactions, abstract language use and understanding and interpreting emotions
Women	Female adults
Professional Women	Female adults, who are qualified and engaged in a profession
Homemakers	Adult females who manage a home and are not engaged in a profession
Gay Men	Male adults, who are exclusively attracted to other men
People who use Wheelchairs	Adults, who have mobility limitations that require them to use a wheelchair to get around
Men	Male adults
Deaf people	Adults, who are unable to hear sound
Elderly People	Adults, over the age of 70
People with low IQ	Adults, who have below normal intelligence
Lesbians	Female adults, who are exclusively attracted to other women

Table 2. Stereotype groups and descriptions used in survey text.

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Table 3.

	FC	FW	MMC	OPT	QL-T
Grp	$F(4.38)=0.65$	$F(6.55)=0.93$	$F(4.32)=0.92$	$F(3.05)=0.82$	$F(5.15)=0.944$
Grp x Dim	$F(30.29)=0.28$	$F(19.75)=1.20$	$F(25.29)=1.56**$	$F(18.95)=0.29$	$F(28.28)=1.31$

Table 3. General ANOVAs. Repeated measure ANOVAs conducted for each scale, to test for the effects for both DS and ES stereotype groups (Grp), across measure dimensions (Dim). Correlating factors that were controlled for in this analysis were participant age, sex, disability status, income, sexual orientation, race and student status (a score, ranging from 0-5, based on how many years it has been since the participant was a full time student), $*p<0.1$, $**p<0.05$.).

Table 4.

	FC	FW	MMC	OPT	QL-T
Grp	$F(2.18)=0.18$	$F(3.23)=0.31$	$F(2.98)=0.67$	$F(2.03)=1.33$	$F(2.13)=2.74*$
Grp x Dim	$F(14.94)=1.37$	$F(11.77)=1.28$	$F(16.64)=1.35$	$F(8.52)=1.27$	$F(17.15)=1.05$

Table 4. Disability ANOVAs. Repeated measure ANOVAs conducted for each scale, to test for the effects for both DS and ES stereotype groups (Grp), across measure dimensions (Dim). Correlating factors that were controlled for in this analysis were participant age, sex, disability status, income, sexual orientation, race and student status (a score, ranging from 0-5, based on how many years it has been since the participant was a full time student), $*p<0.1$, $**p<0.05$.).

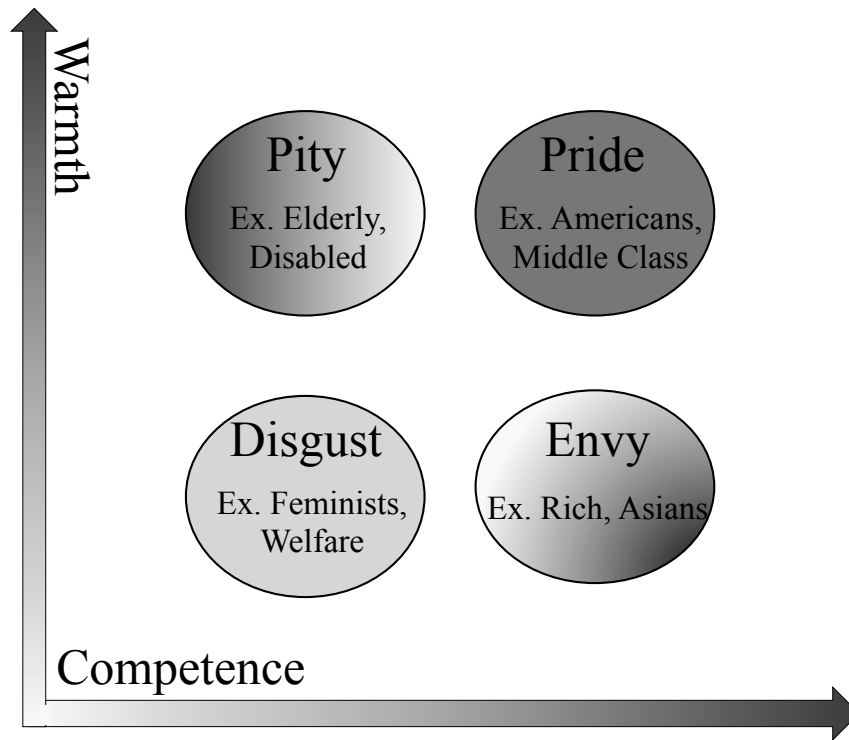Domain Specific Deficit Stereotype Processes

Figure 1.

Figure 1. Fiske Stereotype Content Model. Low warmth and low competence ratings characterize a "disgust" group, low warmth and high competence ratings characterize an "envy" group, low competence and high warmth ratings characterize a "pity" group, and high competence and high warmth ratings characterize a "pride" group[1,2]. (Figure adapted from Cuddy, Fiske, and Glick, 2007).

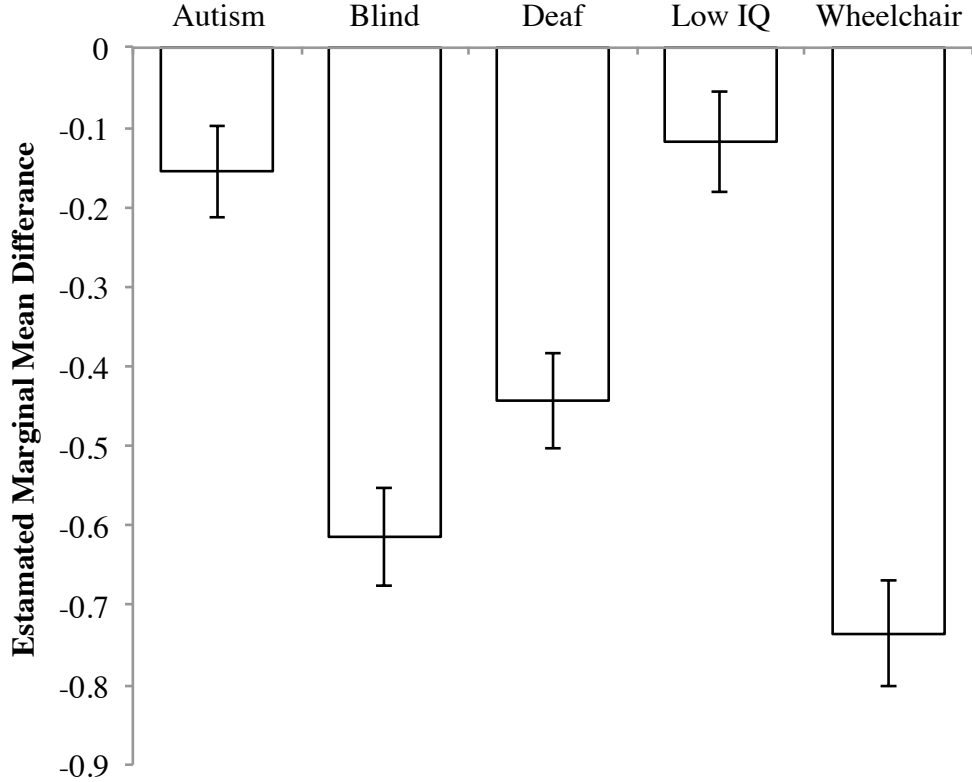Domain Specific Deficit Stereotype Processes

Figure 2.

Figure 2. Estimated marginal means for disability group ratings difference scores on the quality of life third person rating scale. A repeated measures ANOVA was conducted to test for differences between disability groups. Marginally significant effects for disability were found F(2.133)= 2.738, p=0.066.

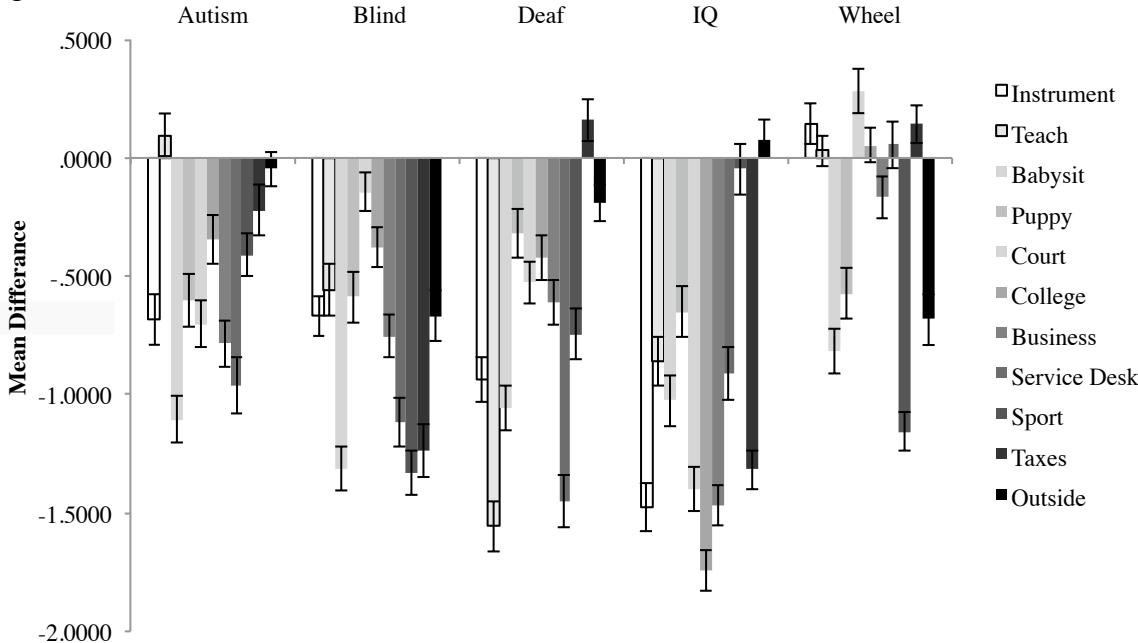Domain Specific Deficit Stereotype Processes

Figure 3.

Figure 3. Means for disability group ratings difference scores on the multimodal competence rating scale. A repeated measures ANOVA was conducted to test for differences between disability groups. No significant interaction was found between disability group and test question, $F_{(16.642)}=1.345$, $p.>0.159$.