Cognitive Style, Gender, Alignable Differences and Category Sorting

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Introduction

Witkin et al. (2002) notes that field independents process analytically, whereas field dependents process globally. Markman and Genter (1993) define alignable differences (AD) as arising from an underlying commonality (e.g.,'one has more legs' arises from 'both have legs'). It follows that:

1) Field independents may produce fewer AD, sort more categories, and create less variable-sized categories than field dependents.
2) Cognitive style may interact with artificial stimulus sets, which vary in shared attributes (characteristics true of multiple category members). Specifically, the "mixed" set, the only one of the three sets allowing selective attention to vary between either "common" (i.e., majority shared) or "idiosyncratic" (i.e., minority shared) attributes, may elicit the largest difference in AD production between field independents and dependents.
3) There should be gender differences in cognitive styles (Witkin et al., 2002), number of categories sorted, and/or category size variability (Pettigrew, 1958).

Methods

Participants

87 (23M/64F) college students (98% Caucasian; M age = 19) from a Catholic school, participated for extra credit.

Materials

The Group Embedded Figures Test (GEFT) by Witkin et al. identified cognitive style. Nine stimulus sets, each with 20 artificial animal line drawings, allowed category sorting. Four "common" sets each consisted of 8 common attributes (e.g., "tail") with varying values (e.g., 'peacock') shared by 16/20 animals. One "mixed" set consisted of 8 common attributes; 4 shared by 16/20 and 4 shared by 4/20. Four "idiosyncratic" sets each consisted of 8 common attributes shared by 4/20 pairs. All sets were counterbalanced to ensure the same attributes/values were used across all sets. Response sheets were used to record category sort answers and the first difference noticed for each of 20 animal pairs.

Design and Procedure

All individually tested participants were randomly assigned one ordered stack of 20 animals, which they sorted into as many categories as they wanted. Then they listed the first difference they noticed for the same 20 animal pairs, followed by a second, identical category sort task with the same 20 animals. Finally, all were timed and scored on the GEFT test as instructed by Witken et al.

Results and Discussion

GEFT inter-rater reliability was 99%; AD reliability was 95%. *Hypothesis 1*: A multiple regression analysis (see Table 1) predicting AD, model $F(4,71) = 4.30$, adj.$R^2 = .15$, $p = .004$, showed that alignable differences decreased as field independence increased and as animal pairs became more different from each other (i.e., shared fewer attributes). A simple correlation, $r(74) = -.31$, $p = .003$, showed that as field independence increased, the sorted category size variability at Time 2 decreased.

Table 1: Multiple regression on alignable differences (AD).

Four I.V.s	Stand. *B*	*SE*	*p*-value
GEFT scores	**-.31**	.01	**.009**
Categ. sorted Time 2	+.06	.01	.608
Stimulus Set	**-.26**	.04	**.021**
Categ. variab. Time 2	-.18	.03	.156

Note: 11 participants' data were removed here due to uncorrected vision.

Hypothesis 2: There was no cognitive style X stimulus set interaction, though a corrected confound and more equal numbers tested per condition may change this in the future. *Hypothesis 3*: An unequal variance independent t-test, $t(55) = 2.32$, $p = .024$, showed that females ($M = 6.20$, $SD = 2.3$) sorted more categories at Time 1 than males ($M = 5.17$, $SD = 1.61$). However, for the Time 2 category sort, a 2-way ANOVA, $F(5,81) = 2.46$, $p = .04$, showed a significant gender X stimulus set interaction, $F(2,81) = 4.88$, $p = .01$. Females ($M = 7.59$, $SD = .48$) sorted more categories for "common" stimuli than males ($M = 5.20$, $SD = .78$), but males ($M = 7.63$, $SD = .88$) sorted more categories for "idiosyncratic" stimuli than females ($M = 5.78$, $SD = .58$). No gender differences in cognitive styles or sorted category size variability occurred.

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