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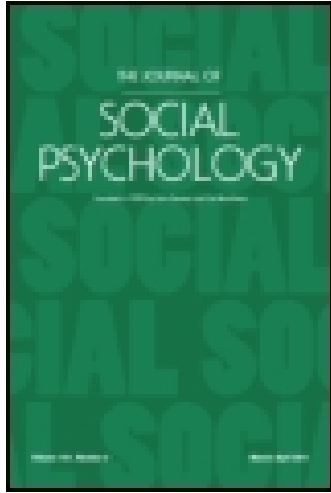
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The “Rod and Fran Test”: Relationship Priming Influences Cognitive-Perceptual Performance

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ABSTRACT. We theorized that interpersonal relationships can provide structures for experience. In particular, we tested whether primes of same-sex versus mixed-sex relationships could foster cognitive-perceptual processing styles known to be associated with independence versus interdependence respectively. Seventy-two participants visualized either a same-sex or other-sex relationship partner and then performed two measures of cognitive-perceptual style. On a computerized Rod and Frame Test, individuals were more field-dependent after visualizing a mixed-sex versus same-sex relationship partner. On a measure involving perceptions of group behavior, participants demonstrated more holistic/contextually based perception after being primed with a female versus male relationship partner. These findings support the hypothesis that activated cognitive structures representing interpersonal relationships can shape individuals’ cognitive/perceptual performance.

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Keywords: field dependence, relationship priming, Rod and Frame Test, social cognition,

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SOCIAL EXISTENCE PROVIDES FRAMEWORKS FOR thought and action. This idea has been explored at the cultural level, where interdependent/collectivist cultures and independent/individualistic cultures foster different constructs for making sense of experience, and different sets of procedures for attention and interpretation (Oyserman & Lee, 2008). Cultural differences have been observed on construal tasks, such as interpreting that a fish at the front of a group of fish is leading rather than being chased by the group (Hong, Morris, Chiu & Benet-Martinez, 2000; Masuda & Nisbett, 2001; Morris & Peng, 1994), and even on basic cognitive-perceptual performance, for example on the Rod and Frame Test (RFT: Witkin & Goodenough, 1977) of field dependence/independence in which the task is to orient a line vertically within a tilted – and so potentially disorienting – frame. The latter finding (Ji, Peng, & Nisbett, 2000; Kitayama, Duffy, Kawamura & Larsen, 2003) that people from interdependent cultures (who process information in a more holistic manner and so are less likely to ignore context) are more influenced by contextual distracters on this nonsocial, implicit measure demonstrates the pervasive effects of cultural frameworks in shaping socially situated cognition (Oyserman et al., 2009).

We theorized that not only cultures but also interpersonal relationships can provide structures for experience. That is, just as being a participant in a particular kind of culture can foster a style of information processing, so also can—on a smaller scale—being a participant in a particular kind

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of relationship. Several links between relationship aspects and field dependence are already known (see Dreyer, 1991, for a review). Previous research, for example, has linked anxious attachment with field dependence (Vermigli & Toni, 2004). In our study we instead examined the influence of interpersonal context with reference to same-sex and mixed-sex relationships. Any relationship involves a balance between interdependent connection and differentiation/self-expression (see, e.g., Dreyer, 1991); here we capitalized on a recent finding that cross-sex relationships involve a higher level of relational-interdependence than same-sex relationships (Morry & Kito, 2009). We hypothesized that cognitively activating a context of cross-sex relationships might engender cognitive processes similar to those of interdependent cultures (in particular, an increase in field dependence), as opposed to same-sex relationships which would engender processes similar to those of independent cultures.

Method

Participants

Participants were 72 (25 male; average age = 19.79 yrs., $SD = 1.65$) undergraduates, participating for course credit or monetary compensation of \$10CDN.

Procedure

Premeasure. Because of previous research linking field dependence to attachment orientation, prior to the session we asked participants to complete the Experiences in Close Relationships Scale – Short Form (Wei et al, 2007) which includes anxiety and avoidance subscales.

Prime. We asked participants to nominate eight people with whom they had different kinds of relationships, including one close relationship with a female, and another with a male. Participants were subsequently randomly assigned by computer to visualize for one minute either the male or female close relationship partner. Because these instructions were randomly assigned to male and female participants, this amounted to assigning participants to visualize a same-sex or mixed-sex relationship.

Rod and Frame Task. The Rod and Frame task was the implicit measure of field dependence-independence. This computerized version of the task (see Bagust, 2005, and Docherty and Bagust, 2010 for details) required the participant to use the computer mouse to rotate two points on the screen to a vertical orientation, from various starting orientations within a square frame that was tilted on the critical trials to either 18° counterclockwise or 18° clockwise (8 replicates each). For each subject, we calculated the mean absolute error, in degrees, which served as the score of field dependence.

As a secondary measure of relatively explicit holistic versus analytic construals, we showed participants an image copied from Hong et al. (2000; their Figure 3), depicting one fish swimming ahead of a larger group of fish, and asked them to characterize the scene using a 12-point scale ranging from “It is leading the group” (1) to “It is being chased by the group” (12). Although this measure of holistic processing is only indirectly related to field dependence, and is arguably more explicit than the relatively implicit Rod and Frame approach to measuring that construct, we included it to try to triangulate on the processing style being activated.

Results and Discussion

Preliminary analyses revealed that RFT scores correlated with premeasured Attachment Anxiety, $r(59) = .29$, $p = .024$ (degrees of freedom vary across analyses due to instances of missing data). We analyzed RFT scores in a 2 (visualization condition: Male vs Female) \times 2 (participant gender: Male vs Female) ANOVA, controlling for Attachment Anxiety. As predicted, each gender was relatively more field dependent when primed with an opposite-sex rather than a same-sex relationship (see Figure 1), and the predicted interaction between condition and gender was significant, $F(1, 56) = 4.50$, $p = .038$, $\eta^2 = .074$. This finding is the first evidence we are aware of that minimal relationship primes can influence performance on the RFT, and is consistent with the hypothesis that mixed-sex (versus same-sex) relationships prime an interdependent mindset.

We analyzed responses to the Hong et al. (2000) task designed to assess explicit holistic versus focused interpretations, with the same 2 \times 2 ANOVA (without a covariate since neither Attachment Anxiety nor Avoidance correlated with the dependent measure; we discuss this lack of correlation shortly). There was only a significant main effect for condition: Participants primed with a female relationship partner displayed a significantly greater holistic perceptual style ($M = 3.81$, $SD = 3.06$) than subjects visualizing a male ($M = 2.43$, $SD = 1.84$), $F(1, 68) = 5.46$, $p = .022$, $\eta^2 = .074$. This unpredicted main effect likely reflects the general tendency to perceive men as more independent than women (e.g., Spence & Helmreich, 1978), a difference that may have been projected on the perception of the fish as a function of the gender of the primed person.

Exploratory analyses showed that the relatively implicit RFT task and the relatively explicit Fish task were not well correlated ($r = -.17$), suggesting that they were measuring somewhat different processing styles. When analyzing only male participants however this correlation was relatively strong and positive: $r(20) = .45$, $p = .034$: In contrast, among women, the correlation was marginally negative, $r(43) = -.28$, $p = .065$. This, along with the between-group findings, suggests that priming a male relationship partner led to explicit agentic judgments of the fish in both genders, however on the implicit RFT task, information processing was influenced instead by the independent or interdependent nature of the primed relationship with that partner. The difference in findings on the two measures may reflect the nature of the judgment tasks being performed: It may be that the Hong et al. (2000) fish task indirectly tapped into aspects of leadership and group relations whereas the Rod and Frame was responsive to aspects of interpersonal, dyadic relations as we intended. This speculation is indirectly supported by the finding that attachment orientation was statistically related to performance on the Rod and Frame but not on the Fish task.

The results support our hypothesis that relationships provide frameworks for basic cognition, consistent with a view of the human mind as deeply interpersonal (e.g., Baldwin, 1992, 1997). It is too soon to speculate on the precise causal mechanisms underlying this association, but an analysis of relationship effects could draw on theoretical work in the culture literature by Oyserman and colleagues (2008, 2009), who have offered a detailed analysis of mechanisms whereby individualism and collectivism influence cognition such as by activating knowledge content, goals, cognitive procedures, or self-construals. Now that a relationship effect on field dependence/independence has been documented, it remains to be explored which particular

aspects of relationships contribute to this form of socially situated cognition (Baldwin, 1992; Smith & Semin, 2004). More broadly, although it may be too soon to suggest changing the name of the well known measure of field dependence-independence to the “Rod and Fran” Test, it nonetheless seems wise to remain alert to the extent that basic cognition is indeed grounded in aspects of interpersonal relatedness.

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Figure 1. Gendered Relationship Priming and Field-Dependence

Rod and frame test scores as a function of participant gender and prime condition. Higher numbers represent greater absolute errors and therefore greater field dependence. Scores adjusted for covariate. Y-axis is shortened for display purposes: observed scores ranged from .56 to 6.47 ($M= 1.70, SD=1.09$).

