

Article Addendum

Ecoculture, social interdependence and holistic cognition

Evidence from farming, fishing and herding communities in Turkey

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It has been hypothesized that interdependent (versus independent) social orientations breed more holistic (versus analytic) cognitions. If so, farming and small-scale fishing, which require more cooperation (and represent a more interdependent mode of being) than does herding, may encourage a more holistic mode of cognition. To test this hypothesis we compared responses to tasks measuring categorization, reasoning and attention by members of herding, fishing and farming communities in the eastern Black Sea Region of Turkey. The samples did not differ from each other in important demographic variables such as nationality, ethnicity, language and religion, as well as age and education. As hypothesized, in all three tasks, results indicated a greater degree of holistic mode of cognition exhibited by the members of fishing and farming communities than members of herding communities. The findings support the notion that level of social interdependence fostered by ecocultural settings is likely to shape the ways in which individuals perceive and attend to their surrounding world.

It has been suggested that interdependent (versus independent) social orientations breed more holistic (versus analytic) cognitive processes.¹⁻⁴ This hypothesis has so far been tested by comparing East-Asian cultures whose members are mutually obligated to each other and try to fit in social groups to maintain social harmony with Western cultures whose members are unique and separate from social groups and try to pursue their own goals and preferences.^{5,6} It has been shown that individuals in East Asian cultures have a more context-dependent holistic cognitive processing style where the emphasis is on the relationship between the object and the context in which the object is embedded whereas individuals in Western cultures have a context-independent analytic cognitive processing style where the emphasis is on a salient object independent of its context.^{1,7-11}

Although the assumption has been that the observed cognitive differences between East-Asians and Westerners are due to

differences in social orientation in these cultural groups, these groups differ in many other ways. To address this issue in a naturalistic design we adopted a minimal difference approach where we compared communities that share a national identity, ethnicity, language and religion, but differed on social orientation afforded by the ecological characteristics where these communities reside. This design feature allows keeping constant as many potentially confounding variables as possible while testing the influence of the variable of interest on cognition.

Specifically, we compared members of fishing, farming and herding communities in the eastern Black Sea region of Turkey in terms of their cognitive processing styles. We expected that members of farming and fishing communities which require collaborative work and mutual interdependence should exhibit a more holistic processing style than members of herding communities which require reliance on individual decision-making and autonomy.¹²⁻²⁰ We compared responses to cognitive tasks measuring categorization, reasoning and attention by participants in these three ecocultural groups who did not differ from each other in terms of age, educational background, gender break down and marital status. One variable on which there was group difference was income where herders reported earning significantly less income than fishermen and farmers. We therefore controlled all statistical analyses for income.

The task measuring categorization²¹ asked participants to attend to three pictures and identify which two of the three they thought went together. In a series of 18 triads of objects, two of the three objects shared either a functional/contextual relationship (example) and two of the three objects shared a category (example). As hypothesized, farmers and fishermen were more likely than herders to use functional/contextual themes (glove and hand) over categories (glove and scarf).

The task assessing reasoning²² inquired participants to carefully examine two groups of four objects each and a target object and judge which of the two groups of objects the target object resembled. The judgment required the use of either abstract unidimensional rules in determining category membership (i.e., does the target object have the same defining characteristic as in the objects in one group?) or perceptual overall similarities (i.e., do the objects in the group share a larger number of features with the target object overall while no one feature was shared by all members?). In line with our hypotheses, farmers and fishermen were more likely than herders to use overall similarities over a formal rule in determining category membership.

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Finally in the task measuring attention²³ participants were presented with a series of squares with vertical lines drawn starting from the midpoint of the upper horizontal line of the square. They then received an empty square of a different or same size and asked to draw a line identical to the original line in either absolute length (absolute task) or in proportion to the height of the surrounding square frame (relative task). Performance in the absolute task would benefit from the ability to detach the object from the context in which it is embedded and would thus be decreased by holistic attention. The performance in the relative task would benefit from the ability to process objects within the context in which they appear and would thus be decreased by analytic attention. The analysis of the performance error measured in millimeters showed that, as predicted, farmers and fishermen were more capable of taking contextual information into account and thus performed better than herders in the relative task, whereas herders were more capable of ignoring the context and thus performed better than fishermen and farmers in the absolute task. In sum, results of all three cognitive tasks revealed convergent evidence that farmers and fishermen who live in more socially interdependent ecocultural settings have a more holistic mode of processing of their world than do herders. Importantly, these differences held for each task after levels of schooling is controlled.

One strength of this work is that it examines communities with similar ethnic, national and linguistic characteristics and yet vary in the crucial theoretical variable of social interdependence. The findings therefore get us one step closer to the inference that social interdependence fosters holistic cognition than many other possible differences observed between cultures around the world.

Ideas worth exploring in future studies that emerged out of this study are as follows. First, our samples consist of individuals who had lived most of their lives in the recruitment site. Although this feature of the sample allowed us to minimize any potential effects of self-selection to live in a chosen ecoculture and acculturation to a different culture, it does not eliminate the possibility that those who might fit better to the social demands of the ecoculture are the ones who chose to live in that ecoculture. Comparing those who left the communities studied here and those who stayed should help tackle the question of self-selection. Second, it is anticipated that some communities in the region will undergo change in the economic activities on which the communities rely on for their income. For example tea plants which have been cultivated for over half a century will eventually need to be replaced with new ones to improve the quality of the tea leaves (personal communication with a lab researcher at Caykur, May 7, 2008). Some communities may decide not to adopt such demanding changes and switch to other means of income. These potential naturalistic transitions would provide the means to study the change in cognitive make-up of individuals residing in these communities (see 24 for a similar design).

References

1. Fiske AP, Kitayama S, Markus HR, Nisbett RE. The cultural matrix of social psychology. In: Gilbert DT, Fiske ST, Lindzey G, eds. *Handbook of Social Psychology*. New York: McGraw-Hill 1998; 915-81.
2. Kitayama S, Duffy S. Cultural competence—Tacit, yet fundamental: Self, social relations and cognition in the US and Japan. In: Sternberg RJ, Grigorenko EL, eds. *Culture and Competence*. Washington, DC: American Psychological Association 2004; 55-87.
3. Markus HR, Kitayama S. Culture and the self: Implications for cognition, emotion and motivation. *Psychol Rev* 1991; 98:224-53.
4. Oyserman D, Uskul AK. Individualism and collectivism: Societal-level processes with implications for individual-level and society-level outcomes. In: van de Vijver F, van Hemert D, Poortinga Y, eds. *Multilevel Analysis of Individuals and Cultures*. Mahwah, NJ: Lawrence Erlbaum 2006; 145-73.
5. Markus HR, Kitayama S. Culture and the self: Implications for cognition, emotion and motivation. *Psych Rev* 1991; 98:224-53.
6. Triandis H. The self and social behavior in differing cultural contexts. *Psych Rev* 1989; 96:506-20.
7. Nisbett RE. *The Geography of Thought: How Asians and Westerners Think Differently ...And Why*. New York: The Free Press 2003.
8. Nisbett RE, Peng K, Choi I, Norenzayan A. Culture and systems of thought: Holistic versus analytic cognition. *Psychol Rev* 2001; 108:291-310.
9. Nisbett RE, Masuda T. Culture and point of view. *Proc Natl Acad Sci* 1999; 100:11163-70.
10. Norenzayan A, Choi I, Peng K. Cognition and perception. In: Kitayama S, Cohen D, eds. *Handbook of Cultural Psychology*. New York: Guilford Publications 2007; 569-94.
11. Shweder RA. *Thinking through Cultures: Expeditions in Cultural Psychology*. Cambridge: Harvard University Press 1991.
12. Barry H, Child IL, Bacon MK. Relation of child training to subsistence economy. *Am Anthropol* 1959; 61:51-63.
13. Berry JW. Temne and Eskimo perceptual skills. *Int J of Psychol* 1966; 1:207-29.
14. Berry JW. Independence and conformity in subsistence-level societies. *J Pers Soc Psychol* 1967; 7:415-8.
15. Berry JW. A cultural ecology of social behavior. In: Berkowitz L, ed. *Advances in Experimental Social Psychology*, 12th ed. New York: Academic Press 1979:177-206.
16. Edgerton RB. "Cultural" vs. "Ecological". Factors in the expression of values, attitudes and personality characteristics. *Am Anthropol* 1965; 67:442-7.
17. Edgerton RB. *The Individual in Cultural Adaptation: A Study of Four East African Societies*. Los Angeles: University of California Press 1971.
18. Heinrich J, Boyd R, Bowles S, et al. In search of Homo economicus: Experiments in 15 small-scale societies. *Am Econ Rev* 2001; 91:73-9.
19. Knudsen S. Fisheries along the Eastern Black Sea coast of Turkey: Informal resource management in small scale fishing in the shadow of a dominant capitalist fishery. *Hum Org* 1995; 54:437-48.
20. Witkin HA, Berry JW. Psychological differentiation in cross-cultural perspective. *J of Cross-Cult Psychol* 1975; 1:5-87.
21. Ji L, Zhang Z, Nisbett RE. Is it culture or is it language? Examination of language effects in cross-cultural research on categorization. *J Pers Soc Psychol* 2004; 87:57-65.
22. Norenzayan A, Smith EE, Kim BJ, Nisbett RE. Cultural preferences for formal versus intuitive reasoning. *Cogn Sci* 2002; 26:653-84.
23. Kitayama S, Duffy S, Kawamura T, Larsen JT. A cultural look at New Look: Perceiving an object and its context in two cultures. *Psychol Sci* 2003; 14:201-6.
24. Greenfield PM, Maynard AE, Childs CP. Historical change, cultural learning and cognitive representation in Zinacantec Maya children. *Cogn Dev* 2003; 18:455-87.