

Field dependence-independence in Navajo children ⁽¹⁾

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Twenty Navajo boys and 20 Navajo girls 9 1/2 years of age were administered the *Children's Embedded Figures Test*. Mean scores were compared to Anglo normative scores for the same age range taken from Witkin *et al.* (1971). In contrast to previous research and hypothesized results, the Navajo sample scored significantly higher in a field independent direction than the Anglo sample. A multi-factor explanation comprised of genetic, environmental, experiential and linguistic factors unique to the Navajo is suggested to account for this outcome.

Recent studies of cultures within the United States indicate that type of family organization and degree of isolation from mainstream American culture is predictive of children's performance on field dependence-independence measures. Children reared in formally organized families that promote strong individual identity tend to be more field independent (Cohen, 1969). In contrast, children reared in shared function families, where critical functions are spread over all members of the family and where group identity is promoted, tend to be more field dependent (Dershowitz, 1971).

Ethnographic descriptions of Navajo family organization and socialization practices are consistent with those typically associated with field dependence as described by Ramirez and Price-Williams (1974). For example, Witkin and Berry (1975) identify a socialization factor where "independence, self-reliance and achievement is emphasized" for higher differentiation and "responsibility, obedience is emphasized (p. 17)" for lower differentiation. The Navajo's inherited membership in a clan imposes rigid restrictions and obligations to a large number of people and his acquiescence in the Navajo religious system requires the strictest form of self discipline. Leighton and Kluckhohn (1947) report that Navajo believe children "belong" to the mother and her family. Severe discipline in child-rearing is provided by the mother's brother rather than the child's father. Moreover, Navajo devotion to all relatives crosses nonbiological lines to include clan members.

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Field dependence-independence has also been found to relate to degree of isolation from westernized culture in general and mainstream American culture in particular. Berry (1966) found evidence for ranking cultural groups according to level of field dependence-independence based on level of acculturation to westernized technology. Traditional cultures within two unrelated populations (Temne and Eskimo) tended to score in a field dependent direction while transitional cultures of these same populations tended to score more field independently. Likewise, Ramirez and Price-Williams (1977) and Ramirez, Castaneda and Herold (1974) found that children from traditional Mexican communities in the United States were more field dependent than children from either dualistic communities (affected by both Mexican and Anglo cultures) or middle class American communities.

Living in a remote, high plateau, desert environment the Navajo are also largely isolated from middle class American culture. Annual family income was \$ 1,900 in 1970 placing the Navajo in the lowest income bracket of all ethnic groups in the United States (Wallace, 1972). Many items considered essential for urban living, such as electricity and plumbing, are still unavailable on many parts of the reservation. The Navajo also remain a tribally organized culture similar to underdeveloped parts of the world which have limited transportation and communication systems and are also geographically and socially isolated from middle class urban society.

Previous research has established that a direct relationship exists among family organization, cultural isolation and field dependence-independence for cultures of the United States and in other cultures of the world. In an attempt to determine that a similar relationship also holds for American Indian groups, this study assessed field dependence-independence in Navajo children. Because of (1) the shared-function structure of Navajo families, and (2) the isolation of Navajo culture from mainstream American culture, it was hypothesized that Navajo children would score in a more field dependent direction than middle class Anglo children.

METHOD

Subjects

Subjects were 20 Navajo males (M age = 9.48 years) and 20 Navajo females (M age = 9.40 years) selected at random from two Bureau of Indian Affairs boarding schools on the Navajo reservation. All children in this sample were bilingual and were selected from an area of the reservation that has been rated among the more traditional regions of the Navajo reservation. The Anglo data were taken from Witkin's original normative groups which were selected from a middle class urban environment in the northeast United States.

Procedure

All 40 children were administered the *Children's Embedded Figures Test* (C.E.F.T.) according to standard instructions (Witkin, Oltman, Raskin and Karp, 1971). Testers were two bilingual Navajo adult females who administered the C.E.F.T. instructions in English or Navajo whichever best communicated the task requirements to the child. A flexible

administration format was employed which, according to Witkin *et al.*, is desirable because it allows the tester to ascertain the child's understanding and readiness to perform the tasks required by the C.E.F.T. Such a procedure seems particularly appropriate with culturally different subjects such as Navajo children.

RESULTS

Mean scores for males, females, and the total sample were compared to Anglo norms (Witkin *et al.*, 1971) using two-tailed *t*-tests. Table 1 presents the means and standard deviations for both the Navajo sample and Anglo children of the same age.

TABLE 1
NAVAJO AND ANGLO NORMATIVE MEANS AND STANDARD DEVIATIONS
FOR THE CHILDREN'S EMBEDDED FIGURES TEST *

	<i>N</i>	Mean	<i>SD</i>
<i>Navajo :</i>			
Male.....	20	20.9	3.6
Female.....	20	19.4	4.4
TOTAL.....	40	20.1	4.0
<i>Anglo Norms:</i>			
Male.....	20	16.6	5.4
Female.....	20	16.3	5.7
TOTAL.....	40	16.4	5.5

* Anglo normative means and standard deviations taken from Witkin, Oltman, Raskin and Karp (1971).

Navajo males scored significantly higher on field independence ($t = 2.93$, $df = 38$, $p < .01$) than Anglo norms. Although not statistically significant, Navajo females showed a similar trend toward field independence ($t = 1.89$, $df = 38$, $p < .10$). Navajos as a group scored significantly higher on field independence ($t = 3.43$, $df = 78$, $p < .01$) than the Anglo children.

DISCUSSION

Navajo children with a shared-function family orientation scored in a more field independent direction than Anglo children from middle class urban environments. This finding is inconsistent with previous research

which showed that children from shared-function families and/or traditional cultures scored field dependently. This inconsistency suggests the need for re-examination of explanations attributable to family structure or degree of westernization for differential performance on field dependence-independence tasks.

A multi-factor explanation comprised of genetic, environmental, experiential and linguistic factors unique to the Navajo is suggested to account for the outcomes. The Navajo's "long walk" during the middle of the last century may be a factor in a genetic explanation of differences. The walk was the forced movement in mid-winter of the entire Navajo nation from their traditional homeland to an isolated reservation 350 miles distant. This journey was extremely difficult and resulted in a drastic reduction in the Navajo population. In the truest sense only the fittest survived. The Navajo population remaining on the reservation today may form an "isolated gene pool" with genetically transmitted perceptual-cognitive abilities strongly related to disembedding tasks. If evolutionary factors are working, present Navajo progeny may have highly adapted cognitive skills necessary to survival in an extremely harsh environment. However, it is unclear whether individual autonomy and self-reliance or group allegiance and conformity were more effective survival strategies. It appears that a complex integration of both strategies may have led to a greater probability of survival.

Cognitive-perceptual skills such as disembedding would also prove useful for increasing one's chances of survival under current environmental conditions on the reservation. For example, the ability to distinguish a rattlesnake from its similarly colored background would directly increase an individual's chances of survival. Similarly, the ability to identify various predator animals that often blend naturally into the background of the reservation terrain would also be essential in an environment in which domestic animals play a significant role in survival.

The role models provided by Navajo adults is a separate factor unique to the Navajo which also would explain greater field independence performance. For example, Navajo weavers duplicate intricate rug patterns completely from memory which requires remarkable cognitive abilities in separating individual patterns from the total design. In addition to observing these behaviors from an early age children are taught to weave primarily through reinforced behavioral modeling. Thus, social learning may be a prime experiential contributor to field independence in Navajo children.

Perhaps the strongest cultural factor for explaining heightened field independence performance is the Navajo language. The classic study by Carroll and Casagrande (1958) showed the tendency of Navajo children to match objects on the basis of form or material rather than size or color. They concluded that the grammatical structure of Navajo required "the learner to make certain discriminations of form and material in the earlier stages of language learning in order to make himself understood at all... (p. 31)." This stress on form-dominated linguistic patterning is in contrast

to the experiences of exclusively English speaking Navajo children and Anglo children. The cognitive-perceptual consequences of early linguistic training among the Navajo clearly suggests a field-independent cognitive style.

The present results underscore the inadequacy of single constructs, such as family organization, for explaining cross-cultural differences in field dependence-independence. Often, in cross-cultural research a good predictor variable for several cultural groups turns out to be unpredictable for a number of groups sharing the same characteristics. Although Navajo children cluster on the lower differentiation side of the antecedent factors identified in previous field dependence-independence research (Witkin and Berry, 1975) polarity of factors is not mutually exclusive in Navajo culture. Navajo family organization is definitely shared-function as Reichard (1974) has elegantly stated: "He (the Navajo) retains his individualistic attitude because of the system rather than in spite of it (p. 38)." However, individualism is defined in terms of the larger social group such that a "good Navajo" makes individual decisions but he is also able to live with others without friction. Clearly, family organization alone does not provide enough information on which to characterize the breadth of Navajo culture. Nor do global dimensions, such as family organization, reveal the complex interplay of cultural and group dynamics which relate to individual cognitive-perceptual performances. The importance of using multifactor designs rather than simple correlational designs is clearly indicated in future research on field dependence-independence among culturally different children.

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RÉSUMÉ

La dépendance-indépendance du champ a été étudiée chez 20 garçons et 20 filles Navajo d'environ 9 ans, au moyen du *Children's Embedded Figures Test*. Contrairement à certaines recherches antérieures et aux hypothèses émises, les Navajos se révèlent significativement plus indépendants du champ que l'échantillon repère équivalent de la population anglo-saxonne originellement étudiée par Witkin *et al.*, (1971). L'auteur propose une interprétation de ces résultats en termes d'influences multiples (héritéité, environnement, expérience, langage).