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AUTHOR Bowd, Alan D.
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ABSTRACT

This paper presents a study which investigated the relationship between field-dependence, perceptual egocentrism, and inductive reasoning in 53 kindergarten children. The general objective of the study was to assess the validity of the field-dependence measures in early childhood. Field-dependence was found to relate positively with perceptual egocentrism and inductive reasoning, however the field-dependence measures employed showed only moderate correlations with each other. Factor analysis and the absence of sex differences gave little support for the construct validity of the field-dependence measures. The usefulness of field-dependence as a meaningful construct in describing perceptual development in young children was considered doubtful. (Author/CS)

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Alan D. Bowd
University of Manitoba

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Alan D. Bowd,
Department of Educational Psychology, University of Manitoba, Winnipeg, Canada.

Objectives

The principal objective of the present study was to investigate the validity of the field-dependence construct (Witkin *et al*., 1962) among kindergarten children. More specifically, it was anticipated that measures of field-dependence suitable for young children would relate to non-verbal reasoning ability and to the types of spatial skills involved in tasks constructed by Flavell and his co-workers (1968) to assess the ability to decenter perception. Two questions of relevance to the basic theoretical issue concerned the stability of field-dependence and sex differences which might be anticipated from the literature, in which most reported studies have utilized older subjects.

Theoretical framework

Field-dependence refers to a relatively stable preference in the perceptual organization and conceptual categorization of stimuli in the environment, such that the individual's perception may be classified according to a "global" *versus* "articulated" continuum. The broad psychological dimension incorporating the cognitive style of field-dependence is referred to as "differentiation" by Witkin and his colleagues (1962). Differentiation encompasses a wide variety of developmental psychological functions -- cognitive, emotional, motivational and social, a principal aspect of field-dependence itself being the inability to overcome a perceptual "embedding context". The theory implies that psychological development tends toward "inner differentiation" which is associated with "greater articulation of experience of the world" (Witkin *et al*., 1962, 16).

According to Witkin, field-dependence decreases with age as a function of perceptual growth, the child's mode of perception becoming characteristically less dominated by the overall organization of the field and consequently more immediately directed toward the perceiving of objects as discrete within an organized background.

A conceptual similarity is evident between general definitions of field-dependence and egocentrism as it characterizes perception. Rubin (1973) and Looft (1972) have referred to the latter as indicating "an embeddedness of one's own view", and a general lack of "differentiation". Tasks used to assess perceptual egocentrism (e.g. Flavell *et al*., 1968; Piaget, 1967) appear to involve similar skills to the ones used in solving the types of embedding problems encountered in tests of field-dependence. Therefore the basic objective of this study was to obtain evidence relating to the validity of the field-dependence tests with kindergarten children.

The relationship between field-dependence and "intelligence" has been established for several age and ability levels above kindergarten (Goodenough & Karp, 1961; Elitcher, 1967), and it was hypothesized that the Childrens Embedded Figures Test and Draw-A-Person technique would show a positive relationship with inductive reasoning among younger children.

According to Witkin et al. (1962), field-dependence scores show a sex difference in which males are consistently more field-independent. There has been conflicting evidence for this with older children (e.g. Bigelow, 1971; Ruble & Nakamura, 1972), and a related objective of the present study was to establish whether sex differences would be present among kindergarten children; their presence would support the validity of the construct.

Method and data source

Subjects: Fifty three children (34 boys and 19 girls) were selected from two kindergarten classes of an elementary school in Winnipeg. The mean age of the group tested was 71 months (S.D.= 4 months). The children were mainly from working-class families, the majority falling in class 5 of the seven-categoried Blishen Scale of Social Standing in Canada (Blishen, 1958).

Instruments: All testing was carried out on an individual basis by the author. Field-dependence was assessed by using the Children's Embedded Figures Test (Karp & Konstadt, 1963) and the Draw-A-Person Technique scored according to Witkin's criteria to indicate articulation of body concept (Witkin et al., 1962). Non-verbal reasoning ability was measured with the Coloured Progressive Matrices test (Raven, 1956), a set of tasks in which the subject must select one of several possible inserts to complete a design or "matrix" for each item. A slightly modified series of four tasks originally developed by Flavell and his colleagues (1968) to assess aspects of decentering was also employed. The tasks were designed to discover whether the child was capable of taking account of the experimenter's perceptual perspective through orientation problems with pictorial materials.

Results and conclusions

Means and standard deviations and intercorrelations between test variab were as follows:

TABLE 1

Means, standard deviations, intercorrelations

Variable	$\bar{X}$	S.D.	1	2	3	4
Coloured Matrices	13.04	4.19	-			
Draw-A-Person	2.94	1.28	.48**	-		
Embedded Figures	6.49	3.21	.40**	.37**	-	
Total Egocentrism	2.43	2.82	-.21	-.26*	-.32**	-

* significant .05 level (1-tail test)
** significant .01 level (1-tail test)

Contrary to expectations stemming from Witkin's theory and research, sex differences on the two field-dependence measures were not significant. For the Draw-A-Person technique the mean for girls was 3.05 (S.D.= 3.27), for boys, mean = 2.88 (S.D.= 1.30); t= .46. For the C.E.F.T. the mean for girls was 5.68 (S.D.= 2.54), for boys mean= 6.94 (S.D.= 3.49); t= 1.38.

Both field-dependence measures show moderately high correlations with Raven's Matrices test. Egocentrism, however, does not correlate significantly with induction, while it does relate to field-dependence. More field-dependent children also tend to be more perceptually egocentric. A significant relationship was maintained between C.E.F.T. and egocentrism after partialling out induction ($r_{12.3}$= -.26, p .05) while the Draw-A-Person test failed to retain a significant correlation with other variables.

Apparently the Draw-A-Person technique, although scored according to Witkin's criteria, is substantially a measure of reasoning ability in the present sample. The C.E.F.T. appears to measure inductive reasoning plus skills which relate to the overcoming of perceptual egocentrism. Retest reliability data gathered on 47 of the children 10 months later showed moderate stability for the test (r= .80), but with no significant change in mean score.

A principal components analysis followed by varimax rotation with factors retained accounting for 10% or more total variance indicated a single "decentration" factor with which the egocentrism measures were associated* The two field-dependence tests loaded quite highly along with Matrices on a second factor interpreted as induction, the C.E.F.T. loading highly on a third spatial visualization factor.

Scientific implications

It seems evident that the Children's Embedded Figures Test and the Draw-A-Person technique for field-dependence both measure inductive reasoning skills as well as certain characteristics of perception in young children that might more fruitfully be described within the Piagetian framework as "decentration". Reservations concerning the salience and theoretical limits of the field-dependence construct have been expressed elsewhere (e.g. Wachtel, 1972), and future studies of perceptual development with young children might more usefully adopt the theoretical framework suggested by Piaget for the overcoming of egocentrism. Longitudinal studies are called for with children in the pre-school and kindergarten years.

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*Table attached.

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VARIMAX ROTATED FACTOR MATRIX*

Variable	Factors I	II	III	IV
Matrices	-.01	.84	.12	-.04
Draw-a-person	-.20	.69	.12	-.35
Children's E.F.T.	-.14	.45	.68	-.13
Task 1	.71	-.20	-.13	.07
Task 2	.79	-.03	.06	-.27
Task 3	.82	-.09	-.14	.23
Task 4	.13	.10	-.83	-.01
Sex	.21	.15	.47	.69
Socioeconomic status	.10	.24	.24	-.68
Age	-.35	.65	-.32	.28
Cumulative % variance accounted for	28	44	57	69

*Loadings greater than .30 italicized.