

Toward an Objective Evaluation Procedure of the Kinetic Family Drawings (KFD)

DAVID V. MYERS
University of Alabama

Summary: The feasibility of employing a quantitative scoring procedure for evaluating the Kinetic Family Drawings (KFD) was examined. A quantitative scoring procedure was developed from the clinical hypotheses Burns and Kaufman (1970, 1972) to score 21 measurable KFD styles, actions, and characteristics. The scoring procedure was employed to evaluate 116 KFDs obtained from four groups of boys to determine the effectiveness of the procedure to differentiate among two levels of emotional adjustment and the two levels of age. The results indicated that four of seven sets of extracted component scores significantly differed between the emotionally well-adjusted and the emotionally disturbed groups. One set of component scores significantly differed between the younger and the older groups, while two sets of component scores did not differ among any of the four groups. The KFD total score was found to differ significantly only between the young emotionally disturbed and the young emotionally well-adjusted groups. It was concluded that a quantitative scoring procedure for the KFD is feasible.

Recently a promising new projective drawing technique was introduced by Burns and Kaufman (1970, 1972). Viewing emotional problems in children as stemming from the disturbances in interpersonal, generally family, relationships, these authors have developed a procedure known as the Kinetic Family Drawings (KFD) which provides a basis for examining the interpersonal dynamics of the child. After 12 years of carefully studying and analyzing these family drawings, Burns and Kaufman (1972) reported the clinical significance of certain characteristics, actions, styles, and symbols found in them.

KFD characteristics, according to Burns and Kaufman (1972), are static qualities commonly found in the drawings. Pencil erasures (reflecting ambivalence) and hyper-extended arms (reflecting the need to control the environment) are typical examples of KFD characteristics. Actions in KFDs are movements of energy between people and objects. According to Burns and Kaufman, certain objects and depicted actions are said to have energy invested in them. These "fields of force" reflect such things as inhibition, anger, competition, and need for affec-

tion, and are found in actions associated with certain objects such as balls, burning fires, lights, etc. Styles, a third dimension of interpretation, refers to certain approaches to the drawing of KFDs that are considered indicative of defensiveness and emotional disturbance. Compartmentalization (intentionally separating family members by the use of lining) and Edged Placement (rectangularly placing all of the family figures on the perimeter of the page) are examples of what Burns and Kaufman refer to as styles. Symbols, the final aspect of interpretative significance in Burns and Kaufman's KFDs, follow from a traditional psychoanalytic perspective. However, the authors are less emphatic in assigning hard and fast meanings to KFD symbols than they are in the characteristics, actions, and styles.

Unlike most previous projective drawings, the KFD provides information that can permit the unique and valuable investigation of the personal *and* interpersonal perspectives of the child. However, the KFD, while promising, has two general shortcomings.

First, Burns and Kaufman (1970, 1972) offer no empirical validity for their hypotheses, but rather rely on the presentation of clinical cases which have been subjectively interpreted. Only two empirical studies have been reported with the KFD. O'Brian and Patton (1974) attempted to

A longer version of this paper was presented to the Spring Convention, American Association of Psychiatric Services for Children, Richmond, Virginia, May, 1976.

Table 1
Distribution of Groups of Subjects by Emotional Adjustment and Age

Age	Emotional Adjustment			
	Well Adjusted (EA)	<i>n</i>	Disturbed (ED)	<i>n</i>
Young (6-8 years)	YEA	30	YED	28
Older (12-14 years)	OEA	30	OED	28

develop an objective scoring system via a step-wise regression analysis. However, their study was conducted prior to the release of Burns and Kaufman's (1972) *Actions, Styles, and Symbols in Kinetic-Family-Drawings (KFD): An Interpretive Manual*, and thus did not examine all of the variables considered significant by Burns and Kaufman. Also, O'Brian and Patton did not include emotionally disturbed children in their sample, further reducing the utility of their study. McPhee and Wegner (1976) examined differences in KFD styles between "normal" and emotionally disturbed children but failed to specifically control for the effects of age, intelligence, and other quantifiable aspects of the KFD such as characteristics and actions. A second shortcoming of the KFD technique of Burns and Kaufman (1972) is that no normative data are given with respect to any developmental differences in children, in spite of the overwhelming evidence that graphic abilities are directly related to age and intelligence (Goodenough, 1926; Koppitz, 1968).

The purpose of the present study was to test the feasibility of employing a quantitative scoring procedure for evaluating KFD protocols. By developing such a procedure, the issues of both normative information and empirical validity could be explored. For these purposes, an empirically-based KFD Scoring Guide was developed by the present author using 21 measurable KFD characteristics, actions, and styles derived from the hypotheses of Burns and Kaufman (1972) and the graphic scoring procedures of McPhee (1974).

Because of Burns and Kaufman's contention that the interpretation of KFD symbols is highly variable, no attempt was made to include symbols in the quantification.

The scoring procedure was employed to evaluate KFDs obtained from two clinically different groups of children to determine the ability of the procedure to differentiate between the two groups. The clinical groups participating in the study were boys judged to be either emotionally well adjusted or emotionally disturbed. Further, the KFDs of each group were obtained from two separate age ranges within each group to examine the sensitivity of the procedure to age differences. That is, each group was divided into younger and older subsamples, yielding four groups of subjects (i.e., young emotionally well adjusted [YEA], young emotionally disturbed [YED], older emotionally well adjusted [OEA], older emotionally disturbed [OED]). These groups are presented in Table 1.

Method

Subjects and Materials

The subjects participating in the present study were 116 boys, ages 6 through 8, and 12 through 14 who were diagnosed as either emotionally well adjusted or emotionally disturbed. For each pro-

¹ See NAPS document No. 3192. Order from: NAPS c. c. Microfiche Publications, P. O. Box 3513, Grand Central Station, New York, N.Y. 10017. Remit in advance for each NAPS number. Institutions and organizations may use purchase orders however, there is a billing charge of \$5.00 for this service. Make checks payable to Microfiche Publications. Photocopies are \$5.00. Microfiche are \$3.00 each. Outside the United States and Canada, postage is \$3.00 for a photocopy and \$1.00 for a fiche.

spective subject, scores were obtained on the Peabody Picture Vocabulary Test (PPVT) (Dunn, 1965) and the Missouri Children's Behavior Check List (MCBC) (Sines, Pauker, Sines, & Owen, 1969). Based on their ages and normal IQ scores on the PPVT, as well as their performance on the MCBC, the boys were selected for membership in one of the four groups. Normal IQs were defined as falling within the range of 80 to 120.

The 60 well-adjusted boys were selected from a public school system in Northeast Georgia. For inclusion in the EA groups each boy was referred by his teacher as being emotionally well adjusted, scored within the normal IQ range on the PPVT, obtained normal to well-adjusted scores on the subscales of Aggression, Inhibition, Activity Level and Sociability on the MCBC, and had never received, nor been referred for special services for emotional or learning problems.

The 56 emotionally disturbed boys were obtained from four units of the Georgia Psychoeducational System, a statewide program for emotionally disturbed children which accepts for treatment those referrals diagnosed as emotionally disturbed by a Board-certified psychiatrist. For inclusion in this ED group, each boy, in addition to the psychiatric diagnosis of emotional disturbance, scored within the normal IQ range on the PPVT and received scores within one standard deviation of the mean for psychiatric populations on at least two of the above four subscales of the MCBC.

Procedure

Each subject was requested to produce a KFD according to the specifications of Burns and Kaufman (1972, p. 5). The testing situation was terminated when the subject indicated that he was finished and when the investigator had recorded the child's description of the drawing and had labelled the characters in the drawing according to the child's direction.

Each drawing so obtained was then scored according to the KFD Scoring Guide. Interscorer reliabilities of the 21 scoring variables in the guide were computed on a random 27% of the total sam-

ple of KFDs. The average agreement between two trained scorers was 94%, with a range of 81%-100%.

The original scores obtained using the KFD Scoring Guide with the 116 KFD protocols was transformed into a 20×20 "within groups" product-moment correlation matrix of variables common to the four groups. One variable, Folding Compartmentalization, was deleted from the study since no subject included that style in his KFD protocol. To obtain a smaller and experimentally more manageable number of variables, a principal-components analysis of the intercorrelation matrix was performed. Three criteria were considered jointly in determining the number of components to be extracted: (a) the scree test, (b) the number of components yielding Eigenvalues greater than unity, and (c) the component solution providing the most easily interpretable structure for use in subsequent analyses.

The results of jointly considering the above criteria yielded a component solution that was employed to generate component scores for each component. The component scores were then analyzed for each extracted component via a 2×2 parametric factorial ANOVA. KFD total scores were also analyzed via a 2×2 parametric factorial ANOVA. In each case, the independent variables in each ANOVA consisted of two levels of age and two levels of emotional adjustment. In the ANOVA procedures, the .01 level of probability was used as a criterion of significance.

Results

The data obtained from the "within-groups" intercorrelation matrix of the scoring variables on the KFD were reduced by a principal-components procedure. Seven components, accounting for 53% of the total variance, were extracted and rotated via the varimax method. The component loadings of the 20 KFD scoring variables on the seven components are presented in Table 2.

Scores on the seven components were obtained for each subject using the formula given by Farr (1971, p. 97). For each component, a 2×2 ANOVA procedure

Table 2
Rotated Component Loadings for the Kinetic Family Drawings (KFD)

Variable	Components						
	I	II	III	IV	V	VI	VII
1. Physical Proximity	-.01	.07	.09	-.74	-.02	.01	.10
2. Barriers	-.09	.01	.68	-.09	.07	-.09	.01
3. Relative Height	.16	.20	.08	-.13	.02	.10	-.73
4. Force Fields	-.10	-.30	.02	-.11	.66	.08	.13
5. Erasures	-.07	.06	.19	-.04	.15	.06	.50
6. Arm Extensions	-.18	.08	.19	.20	.35	.11	-.18
7. Description	-.19	.31	-.45	-.41	.12	.12	-.33
8. Safety of Figure	.26	-.08	-.36	.03	.42	-.07	-.22
9. Body Parts	-.29	.39	-.18	.12	-.15	.39	-.18
10. Rotations	-.07	-.15	.12	.03	.20	.75	-.15
11. Shading	.61	.22	.03	-.04	.32	.17	.10
12. Compartment.	-.03	.14	.09	.12	.56	-.14	.19
13. Underlining Figures	.07	.57	.20	.04	.23	-.24	-.11
14. Bottom Lining	.66	-.04	-.03	.12	-.07	-.07	-.18
15. Top Lining	.66	-.13	.09	-.10	-.27	.06	-.10
16. Encapsulation	.27	.20	.67	-.06	.08	.05	-.01
17. Edged Placement	.27	-.02	-.17	.01	-.23	.74	.14
18. Evasions	.02	.41	-.32	-.23	.05	-.12	.48
19. No. of Members	.01	-.01	.04	-.82	-.08	-.06	-.10
20. Back Placement	-.05	.74	.09	-.10	-.17	.01	.04
Eigenvalues	1.90	1.88	1.77	1.44	1.32	1.27	1.20

was performed employing the appropriate set of component scores as the dependent variable. For each significant difference obtained in each of the analyses of the component scores, the variables contributing most highly to the differences, (i.e., had the highest component loadings for the component from which the scores were derived) were delineated.

Analysis of variance of the Component I scores indicated a significant main effect for adjustment, $F(1,112) = 7.97, p < .01$, but no significant effects were obtained for the interaction of age and adjustment. The variables loading most highly ($\pm .30$)

on Component I were Shading, Bottom Lining, and Top Lining. For Component II scores, no significant main or interaction effects were obtained. The variables loading most highly on Component II were Force Fields, Description of Action, Body Parts, Underlining of Individual Figures, Evasions, and Back Placement. On Component III scores, a significant effect was also obtained for adjustment, $F(1,112) = 46.62, p < .01$, but no significant effects were obtained for age or the interaction. The variables loading most highly on Component III were Barriers, Description of Action, Safety of

Figures, Encapsulation, and Evasions. Similarly, a significant main effect for the Component IV scores were obtained for adjustment, $F(1,112) = 216.16, p < .01$, but no significant effects were obtained for age or interaction. The variables loading most highly on Component IV were Physical Proximity, Description of Action, and Number of Household Members. On the Component V scores, a significant main effect was obtained for age, $F(1,112) = 7.81, p < .01$, but no significant effects were obtained for adjustment or the interaction. The variables loading most highly on Component V were Force Fields, Arm Extensions, Safety of Figures, Shading, and Compartmentalization. A significant main effect was found from the analysis of variance of the Component VI scores for adjustment, $F(1,112) = 17.01, p < .01$, but no significant effects were obtained for age or the interaction of age or adjustment. The variables loading most highly on Component VI were Body Parts, Rotation, and Edged Placement. For the Component VII scores no significant main or interaction effects were obtained. The variables loading most highly on Component VII were Relative Height, Erasures, Description of Action, and Number of Household Members.

Likewise, the total scores of the KFD protocols were analyzed via a 2×2 ANOVA. In that analysis, a significant effect was obtained for the interaction of age and adjustment, $F(1,112) = 7.40, p < .01$, along with a significant main effect for adjustment, $F(1,112) = 17.68, p < .01$. No significant main effect was obtained for age. Examination of the cell means indicated that the KFD total scores varied as a function of emotional adjustment in the young groups but not for the older groups. The young emotionally well-adjusted subjects obtained significantly lower total scores than the older well-adjusted or either of the ED groups.

A summary of the results is displayed in Table 3. Of the components with component scores that significantly differentiated among the four groups, Components I, III, IV, and VI were associated with significant differences between the well-adjusted and the emotionally dis-

turbed groups, while Component V was associated with significant differences between the young and older groups. The KFD total scores significantly differentiated the young emotionally well adjusted from the young emotionally disturbed.

Discussion

The results generally support the feasibility of employing a quantitative scoring procedure with the KFD to differentiate emotionally well adjusted from emotionally disturbed boys. The results of the analyses of variance of the scores derived from Components I, III, IV, and VI indicate that the variables associated with those component scores hold promise as discriminators of emotional adjustment. Specifically, the results indicated that, in linear combination with other variables, 11 variables (i.e., Physical Proximity, Barriers, Description of Action, Body Parts, Rotations, Bottom Lining, Top Lining, Encapsulation, Edged Placement, Evasions, and Number of Household Members) differentiated the emotionally well adjusted from the emotionally disturbed boys, in directions that are consistent with the hypotheses developed by Burns and Kaufman (1972).

The results also indicated that the quantitative scoring procedure, was, in part, sensitive to age differences between the young and older groups. The analysis of variance of the scores derived from Component V resulted in significant effects for age, with the older groups scoring higher than the younger groups. Of the five variables that loaded highly on Component V, three of the variables (i.e., Force Fields, Arm Extensions, and Compartmentalization) only loaded significantly on one component and therefore differentiated between only the age groups. The two other variables, (i.e., Safety of Figures and Shading) also loaded highly on Components I and III, respectively, and these components differentiated between adjustment. Thus, in the present study, Force Fields, Arm Extensions, and Compartmentalization were not found to differentiate between the emotionally well adjusted and the emotionally disturbed groups, and there-

Table 3
Summary of Component Analysis and Analysis of Variance

Variable	Component on Which Variable Loaded	Groups Differentiated by Component Scores	Direction of Difference
1. Physical Proximity	IV	Adjustment	EA < ED
2. Barriers	III	Adjustment	EA < ED
3. Relative Height	VII		
4. Force Fields	II, V	Age	Young < Older
5. Erasures	VII		
6. Arm Extensions	V	Age	Young < Older
7. Description of Action	II, III, IV, VII	Adjustment	EA < ED
8. Safety of Figures	III, V	Adjustment, Age	EA < ED Young < Older
9. Body Parts	II, VI	Adjustment	EA < ED
10. Rotations	VI	Adjustment	EA < ED
11. Shading	I, V	Adjustment, Age	EA < ED Young < Older
12. Compartmentalization	V	Age	Young < Older
13. Underlining Figures	II		
14. Bottom Lining	I	Adjustment	EA < ED
15. Top Lining	I	Adjustment	EA < ED
16. Encapsulation	III	Adjustment	EA < ED
17. Edged Placement	VI	Adjustment	EA < ED
18. Evasions	II, III, VII	Adjustment	EA < ED
19. Number of Members	IV	Adjustment	EA < ED
20. Back Placement	II		

fore should not be automatically accepted as indicators of emotional disturbance, particularly when scored by the present scoring procedure. The present evidence suggests that these three variables, in combination with the other variables of Component V, bear little relationship to emotional adjustment. Safety of Figures and Shading, the remaining variables loading highly on Component V, provided no dif-

ferential information, since these variables also loaded on components that differentiated between the emotionally well-adjusted and the emotionally disturbed groups. Of the remaining six variables, four (i.e., Relative Height, Erasures, Underlining Figures, and Back Placement) did not load highly on any of the components which were associated with significant differences among the groups. The

KFD total scores significantly differentiated between the young emotionally well adjusted and the emotionally disturbed but did not differentiate among the three remaining groups.

The findings that scores derived from certain components were sensitive to age differences, while others appeared to be sensitive to both age and adjustment, detracts from the utility of the present quantitative scoring procedure. Also, that the total scores were insensitive to differences in adjustment in the older groups, further underscores the limited effectiveness of the scoring procedure in its present form.

The findings of the present study are generally consistent with the previous research on effectiveness of various scoring procedures used with human figure drawings to differentiate among clinically different groups (e.g., Reznikoff & Tomblin, 1956). While the effectiveness of the KFD quantitative scoring procedure to differentiate between clinically different groups does not provide incontrovertible evidence for its validity, it does add support to the concurrent validity of the KFD. In the present study, clinical groups were defined by scores on the Missouri Children's Behavior Check List (Sines, Pauker, Sines, & Owen, 1969) and by psychiatric diagnosis. That the KFD scores derived from the quantitative scoring procedure also effectively differentiated the clinical groups is consistent with other studies indicating that the KFD agrees with concurrent psychometric and behavioral data, (e.g., O'Brian & Patton, 1974; Sims, 1974).

The findings of the present study are, however, in contradiction with several of the findings of McPhee and Wegner (1976). In a study examining KFD styles, McPhee and Wegner concluded that the six styles defined by Burns and Kaufman (1972) occurred more frequently among emotionally normal children. In the present study, the styles of Bottom Lining, Top Lining, Encapsulation and Edged Placement, in linear combination with other variables, occurred more frequently in the emotionally disturbed than in the emotionally well-adjusted groups.

While it is not entirely clear why the

present study's findings contradict those of McPhee and Wegner, it is possible that the KFD styles appear more often in ED groups when the styles are measured in combination with other variables. Additionally, it is possible that differences in the sample characteristics could account for the differences obtained with respect to styles. That is, McPhee and Wegner compared the KFD's styles with emotionally "normal" children with the KFD styles of emotionally disturbed children, while the present study compared the KFD styles to the emotionally well-adjusted children with those emotionally disturbed.

Finally, that the findings of the present study indicate that scoring system differentiates certain clinical groups does not suggest that the same system will provide reliable diagnostic information in the individual case. In fact, the analysis of the means and standard deviations of the component and total scores in the present study indicate that the scoring procedure employed offers relatively poor clinical discrimination for the individual case and should be used only as a research tool from which more sensitive scoring approaches can be developed.

References

- Burns, R. C., & Kaufman, S. H. *Kinetic Family Drawings (KFD): An introduction to understanding children through kinetic drawings*. New York: Brunner/Mazel, 1970.
- Burns, R. C., & Kaufman, S. H. *Actions, styles, and symbols in kinetic family drawings (KFD)*. New York: Brunner/Mazel, 1972.
- Dunn, L. M. *Peabody Picture Vocabulary Test Manual*. Circle Pines, Minnesota: American Guidance Service, 1965.
- Farr, S. D. Component scores for reduced rank transformed solutions. *American Educational Research Journal*, 1971, 8, 93-104.
- Goodenough, F. L. *Measurement of intelligence by drawings*. Yonkers, N. Y.: World Books, 1926.
- Koppitz, E. M. *Psychological evaluation of children's human figure drawings*. New York: Grune & Stratton, 1968.
- McPhee, J. P. *Empirical evaluation of the Kinetic Family Drawing (KFD) styles as a detector of emotionally disturbed childhood behavior*. Unpublished doctoral dissertation, Boston College, 1974.
- McPhee, J. P., & Wegner, K. W. Kinetic-Family-Drawing styles and emotionally disturbed childhood behavior. *Journal of Personality Assessment*, 1976, 46, 487-491.

- O'Brian, R. P., & Patton, W. F. Development of an objective scoring method for the Kinetic Family Drawing. *Journal of Personality Assessment*, 1974, 38, 156-164.
- Reznikoff, M., & Tomblin, D. The use of human figure drawings in the diagnosis of organic pathology. *Journal of Consulting Psychology*, 1956, 20, 467-470.
- Sims, C. A. Kinetic Family Drawings and the Family Relations Indicator. *Journal of Clinical Psychology*, 1974, 30, 87-88.
- Sines, J. O., Pauker, J. D., Sines, L. K., & Owen, D. R. Identification of the clinically relevant dimensions of children's behavior. *Journal of Consulting and Clinical Psychology*, 1969, 33, 728-734.

David V. Myers, PhD
Dept. of Psychology
The University of Alabama
P. O. Box 2968
University, Alabama 35486

Received: August 11, 1977
Revised: January 26, 1978