

Reflection - Impulsivity Among School Children in Kuwait

A. Saleh

ABSTRACT

One hundred-seventy four (174) 5—9 year old female and male Kuwaiti children were administered Kagan's Matching Familiar Figures Test (MFF) for the purpose of studying the utility of the construct of conceptual tempo cross-culturally. The data collected were compared with data collected in the United States on Children of comparable ages. The following hypotheses were supported by this study and by earlier comparable American studies: (1) There is a general developmental trend toward increasing mean latency and decreasing total errors with age; (2) moderate negative correlation exists between mean latency and total errors, the two dependent measures used by Kagan, Rosman, Day, Albert, and Philips (1964); and (3) the mean latency measures manifest higher internal consistency than do the total number of error scores. There were two main differences between the performance of this sample on the MFF and the performance of comparable U.S. children: (1) U.S. children have higher mean and median latencies and lower total errors than Kuwaiti children of the same age, and (2) mean and median latencies are generally higher and mean and median total errors are lower for Kuwaiti males than for Kuwaiti females. There is an opposite trend among U.S. children in this case.

Psychologists have long been interested in the study of individual differences in cognitive processes such as perception, memory and problem solving. In the last two decades, this line of research has been extended to include differences labeled as cognitive styles. An exam-

* Lecturer in the Department of Psychology at Kuwait University

ple of this extension is Kagan's research in the area of reflection - impulsivity or conceptual tempo. The reflection-impulsivity dimension, as Kagan sees it, describes the differences in tendency to reflect on the validity of a problem solution when several possible alternatives are presented and there is uncertainty over the correct alternative (Kagan, Rosman, Day, Albert and Philips, 1964). He developed the Matching Familiar Figures Test (MFF) to measure this tendency (See Figure 1). This is a 12 - item test using familiar objects such as a boat, a house or a pair of scissors. Each item consists of a standard picture and a set of six highly similar variants, one of which is identical to the standard. The child is presented with the standard and alternatives simultaneously and is asked to select the one alternative that exactly matches the standard. If the child answers correctly, he — she is instructed to go on to the next item. But if the child makes the wrong choice, the respondent is asked to try again to a maximum of five trials.

Both speed and accuracy scores are used for the MFF. Speed is operationally defined as the mean time (mean latency) in seconds to first response across all items. Accuracy is defined as the total number of errors the child makes across all items. Respondents are then classified into four groups using the double median splits: children whose mean latencies are below its median and total errors are above the median number of errors are called impulsives. Reflectives are those children whose mean latencies are higher than the median group mean latency while their total errors are lower than the median number of errors for that same group. Some researchers also studied the two other groups: fast accurates and slow accurates (e.g. Ault, Crawford and Jeffrey, 1972).

Researchers using the MFF have generally found that there is a developmental trend toward reflectivity with increasing age. Older children take a longer time to respond and get fewer errors than younger children. This trend continues until about the age of 10 years beyond which performance changes very little. Second, there is a moderate negative correlation between mean latency and total number of errors. This correlation also gets stronger until about the age of 10. Third, although very few studies found significant differences in conceptual tempo between males and females, a number of those studies

(e.g., Salkind, 1978) have shown that female children have generally longer mean latencies and fewer total errors than males. Fourth, a number of studies using the MFF have found that mean latency is a more internally consistent measure of conceptual tempo than the total number of errors. For a more comprehensive review of the MFF studies see Messer (1976).

It is important to apply the MFF cross-culturally for a number of reasons. First, cross-cultural methodology helps researchers test for the general utility and universality of a construct like conceptual tempo. Second, Witkin and Berry (1975) suggest that the concept of cognitive style is appropriate to study cross-culturally since it is assumed that the cultural universal of socialization is at least one of its antecedents. There should be similarities and differences in conceptual tempo between American and Kuwaiti children since personal observation suggests that there are distinctive similarities and differences in the process of socialization between the two cultures. Third, the pictures used by the MFF are familiar to children in other cultures. This is certainly true of children in Kuwait who have had no difficulty identifying these pictures. The use of language during the test administration is minimal. Finally, conceptual tempo is an interesting variable to study cross-culturally because although it is reasonably stable over time and across varied tasks (Mussen, Conger and Kagan, 1979), it is somewhat modifiable through training and susceptible to external modification through differential reinforcement (Stein and Landins, 1975) and modeling (Debus, 1970).

The test was administered by a person whose native tongue is the same as the children; in this case, it is the Arabic language. The use of collaborators from the same culture as the children is one of the suggestions of how to cope with some of the shortcomings of cross-cultural research (Malpass, 1977).

HYPOTHESES

The following hypotheses are based on results that have been reported in previous studies with U.S. children. There will be:

- a . A general developmental trend toward an increase in reflec-

tivity and a decrease in impulsivity with age;

- b . A moderate negative correlation between mean latency and total number of errors;
- c . greater internal consistency for mean latency scores than for total number of error scores;
- d . no sex differences for the conceptual tempo measure; and
- e . similar developmental trends of means and medians for mean latency and total number of errors as found in earlier studies.

METHOD

Subjects

One hundred-seventy four (174) 5-9 year old (— 6 months) male and female children were observed in this study. The children formed 10 groups (2 sexes x 5 age levels). The sample included 91 females and 83 males. They attended two elementary schools in Kuwait, 31 from a public school, and 143 from a private school. Participants came from families which belong to the middle class. The schools social workers reported that all these children are normal. The children in this study included several different Arab nationalities: 16 Kuwaitis, 36 Egyptians, 84 Palestinian- Jordanians, and 38 Syrians and Lebanese.

Procedures

Children were administered the standard form of the MFF which includes two practice items and 12 test items. As noted earlier, each item consists of a standard picture of a familiar object together with six highly similar variants, one of which is identical to the standard. The child is asked to point to the alternative which is identical to the standard. The steps and instructions used in this study are comparable to those used by Salkind (1978) except the medium of communication was Arabic in this case. The test was administered individually to each child in a separate room in each of the two schools by a senior female

student majoring in psychology. A stop watch was used to record latency to first response for each test item. Total number of errors for each test item were also recorded.

ANALYSIS AND RESULTS

Using data from the whole sample, analyses were performed separately for males and females and for both sexes combined. In these two analyses, data from the total sample ($n = 174$) were used because the traditional way of categorizing children into reflectives and impulsives has been criticized strongly on grounds of losing test power, underestimating test reliability and loss of information (Ault, Mitchell and Hartman, 1976).

Table 1 gives the means and standard deviations for mean latency by age and sex for the total sample. These results show a developmental trend towards an increase in mean latency with age for both sexes separately and combined (see Figure 2); thus confirming the findings of earlier studies.

Table 2 presents means and standard deviation for total number of errors by age and sex for the whole sample. It can be seen that the Table 2 results are generally supportive of the hypothesis of a decrease in number of errors with increase in age as can be seen from Figure 3.

The developmental trend of decreasing the number of errors with age is less consistent than the Salkind study (1978).

Table 3 presents the Pearson product-moment correlations between total number of errors and mean latency by age and sex as well as by age for the total sample. Table 3 shows that the correlation between latency and total number of errors are all negative, tend to get stronger with age, and generally have values comparable to those found in previous studies. Thus, the hypothesis of a moderate negative correlation between speed and accuracy was supported.

Table 4 shows t - values of the differences between the sexes at each age level. The differences between 9 year old boys and girls in

total number of errors reach significance ($p < .05$). Five other sex comparisons yielded t - values larger than one, but they are not large enough to reach statistical significance ($p < .10$).

Table 5 presents the medians for total number of errors and mean latency at each age level. These median values are somewhat higher than those reported by Salkind (1978) for similar ages.

A third analysis was performed on the data using only impulsives and reflectives at each age level. There is some justification for combining the sexes at each age level since differences between the groups based on sex did not reach significance except in one case referred to earlier. When the t - values for the differences between impulsives and reflectives on the mean latency measure were computed, the differences were significant beyond the .001 level. The same significant level is found when impulsives and reflectives were compared on the total number of errors measure.

The internal consistency of the MFF was computed using latency and then total number of errors as the dependent measures. It turned out that latency is a more internally consistent measure than the total number of errors. Latency has an internal consistency value of .64 while it was .20 for the total number of errors. The values of .64 and .20 were obtained as measures of the proportion of score variance associated with the first or largest principal component for the two scoring systems.

DISCUSSION

This cross-cultural study examined the generality of the construct of conceptual tempo as measured by the performance of children of several Arab nationalities on the MFF. The data collected from 5-9 year old Kuwaiti children in the United States of America. Certain attributes of the construct of conceptual tempo were confirmed by this study. The hypothesis that conceptual tempo as measured by the MFF follows a developmental trend of increasing reflectivity and decreasing impulsivity was confirmed. Children tend to have longer mean latencies and fewer errors with increasing age was confirmed among

American and Kuwaiti children. A close inspection of the data, however, shows that this trend was not completely uniform among Kuwaiti children if the total number of errors is the criterion measure. It is clear that 6 year old females have slightly higher numbers of errors than 5 year old females. There is only a slight difference between the 8 and 9 year old Kuwaiti females in their total number of errors. It is noteworthy that the total number of errors yielded a low ($r = .20$) internal consistency reliability whereas mean latency turned out to have a more satisfactory internal consistency reliability ($r = .64$).

Another attribute of the conceptual tempo as measured by the MFF that was confirmed by this study is the moderate negative correlation between mean latency and total number of errors. The strength of the correlation between the two measures improved with age except for the 8 to 9 year old males.

There are two obvious differences between this study and that of Salkind (1978) that are probably due to cultural differences and which need further investigation. Figure 1 shows that male Kuwaiti children have consistently higher mean latencies than female children, while American female children tend to get higher mean latencies on the MFF. Taking total number of errors for comparison, it can be seen that American female children (Salkind, 1978) have consistently lower total numbers of errors, while there is no consistency on this measure among Kuwaiti children. Five and 8 year old female Kuwaiti children have lower total numbers of errors than males while the opposite is true among 6, 7, and 9 year old Kuwaiti children.

The other obvious difference between the findings of this study and that of Salkind (1978) are the values of the mean latencies and total number errors. American children have consistently higher mean latencies and lower total number of errors than Kuwaiti children. This may be due to situational as well as cultural factors. Kuwaiti children are less exposed to testing than American children. They are more apprehensive about testing and its consequences than American children. Speed and accuracy are also probably valued differently in the two cultures, however. This topic needs more exploration.

Table 1

Means and S.D.'s for Mean Latency by Age and Sex (N = 174)

Age		Female			Male			Total	
	N	X	SD	N	X	SD	N	X	SD
5	19	3.57	1.53	16	4.42	1.68	35	3.96	1.60
6	20	4.09	1.49	21	4.90	1.87	41	4.51	1.69
7	14	6.82	4.60	15	8.82	5.33	29	7.85	5.00
8	23	7.10	4.51	18	8.07	5.52	41	7.52	4.78
9	15	8.44	4.96	13	9.39	2.13	28	8.88	3.87

Table 2

**Means and S.D.'s for Total Number of Errors
by Age and Sex (N = 174)**

Age		Female			Male			Total	
	N	X	SD	N	X	SD	N	X	SD
5	19	25.21	5.49	16	26.25	5.29	35	25.69	5.27
6	20	25.65	4.21	21	23.86	5.76	41	24.73	5.02
7	14	22.64	9.13	15	18.34	8.36	29	20.22	8.85
8	23	15.70	4.98	18	15.94	8.33	41	15.80	6.49
9	15	14.53	5.15	13	10.38	3.80	28	12.61	4.96

Table 3

**Correlations between Mean Latencies and Total Errors
by Age and Sex (N — 174)**

AGE		FEMALE		MALE		TOTAL
	N	r	N	r	N	r
5	19	-.295	16	-.360	35	-.286
6	20	-.325	21	-.264	41	-.315
7	14	-.676	15	-.405	29	-.550
8	23	-.594	18	-.526	41	-.540
9	15	-.797	13	-.179	28	-.636

Table 4

**t -statistics Comparing Sexes
for Total Errors and Mean Latency
by Age**

AGE	N	TOTAL ERRORS	MEAN LATENCY
5	35	.551	1.529
6	41	1.105	1.487
7	29	1.322	1.031
8	41	.116	.516
9	28	2.307 *	.62

* $p < .05$

TABLE 5
MEDIANS FOR TOTAL ERRORS (TE) AND MEAN LATENCY (ML)
BY AGE

AGE	N	TE	ML
5	35	26	3.34
6	41	25.5	3.92
7	29	18	6.30
8	41	15	5.80
9	28	12.5	8.50

Figure 1

Sample Item from Matching Familiar Figures (MFF) Test.

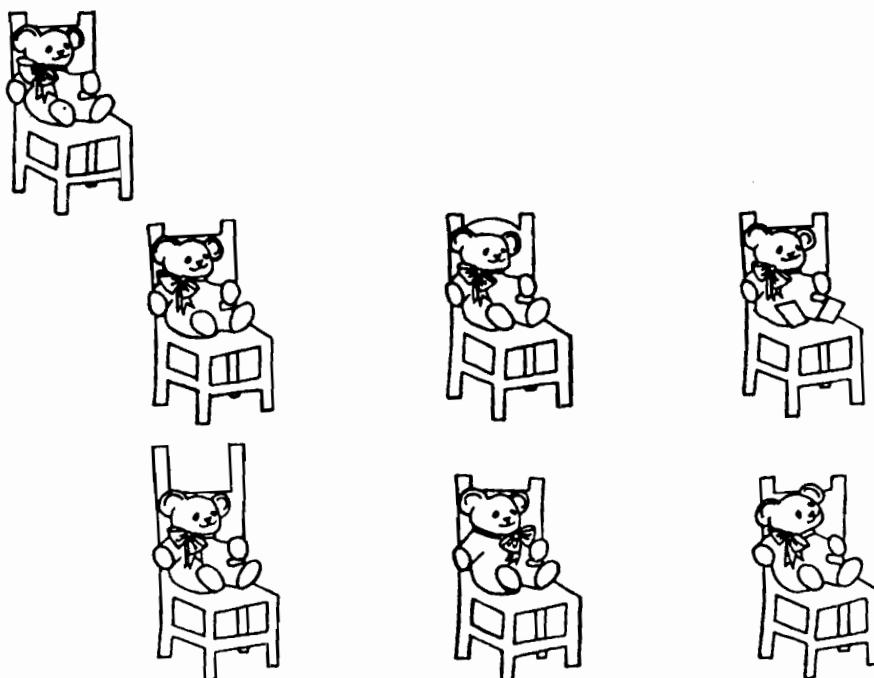


Figure 2
Mean Latency to First Response
for Males and Females by Age

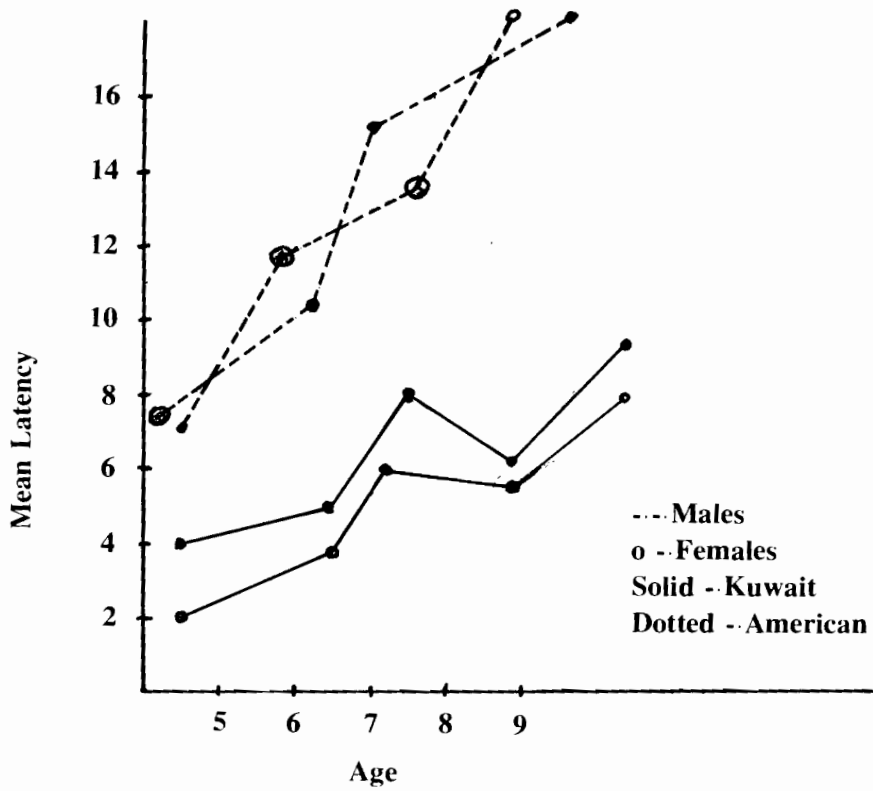
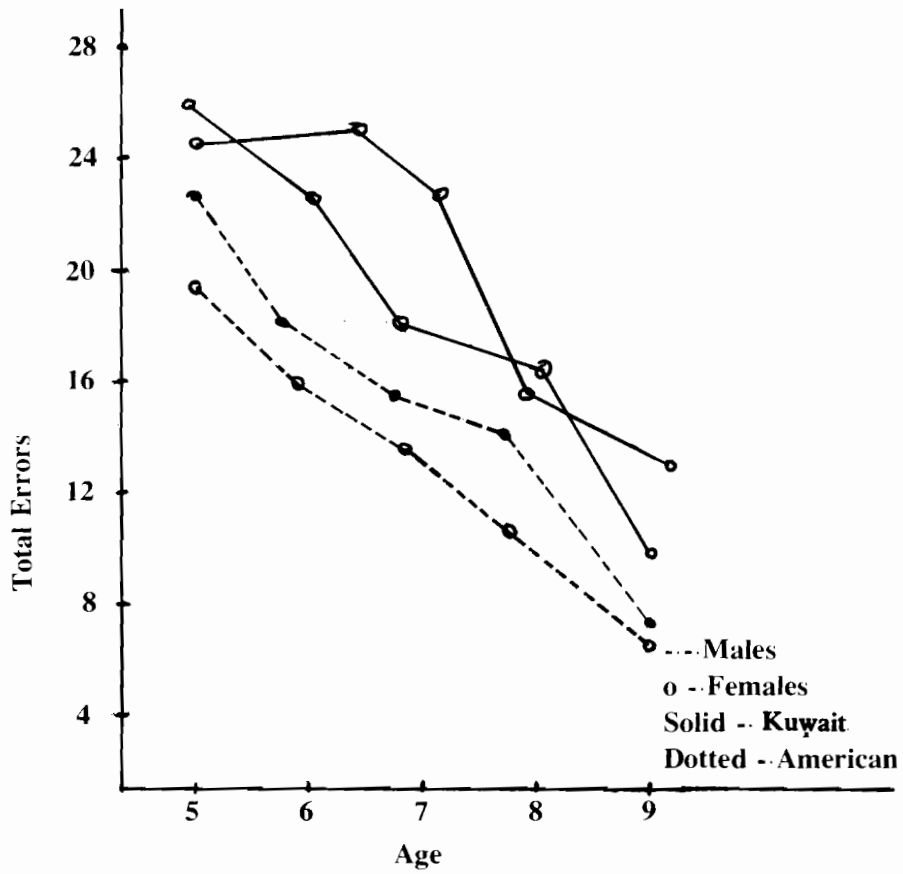


Figure 3

Total Errors
for Males and Females by Age



FOOTNOTE :

Many thanks go to those who either helped in data collection or participated in the study as subjects. I would also to thank the staff of the schools where the data were collected. . Thanks are also due to the staff at the Computer Center at Kuwait University. The help of Dr. Robert M. Pruzek of SUNY-Albany in the reanalysis of the data and in reading earlier drafts of this paper is greatly appreciate.

REFERENCES

- (1) Ault , Ault, R. L., Crawford, D. E., and Jeffrey, W. E. Visual scanning strategies of reflective, impulsive, fast/accurate and slow - inaccurate on the Matching Familiar Figures Test. **Child Development**, 1972, **43**, 1412-1417.
- (2) Ault , R., Mitchell, C. and Hartman, D. P. Some method-ological problems in reflection - impulsivity research. **Child Development**, 1976, **47**, 227 - 231.
- (3) Bentler , P.M., and McClain., J. A multimethod - multitrait analysis of reflection - impulsivity. **Child Development**, 1976, **47**, 218-226.
- (4) Debus , R. Effects of brief observation to model behaviors on conceptual tempo of impulsive children. **Developmental Psychology**, 1970, **2**, 22-32.
- (5) Kagan , J., Rosman, B.L., Day, D., Albert, J., and Philips, W. Information processing in the child: Significance of analytic and reflective attitudes. **Psychological Monographs**, 1964, 78 (1, Whole No. 578).
- (6) Malpass, R.S. Theory and method in cross-cultural psychology. **American Psychologist**, 1977, **32**, 1069-1079.
- (7) Messer , S.B. Reflection-impulsivity: A review. **Psychological Bulletin**, 1976, **83**, 1026-1052.
- (8) Mussen , P.H., Conger, J. J., and Kagan, J. **Child development and personality**. New York: Harper and Row, 1979.
- (9) Salkind, N.J. **The development of norms for Matching Familiar Figures Test**. Lawrence, Kansas: University of Kansas, 1978.
- (10) Stein , N., and Landis, R.D. Differential reinforcement of low rates performance by impulsive and reflective children. **Journal of Experimental Child Psychology**, 1975, **19**, 35-50.
- (11) Witkin , H.A., and Berry, J.W. Psychological differentiation in cross-cultural perspective. **Journal of Cross-Cultural Psychology**, 1975, **47**, 218-226.

التأملية - الاندفاعية كأنسلوب معرفي عند الأطفال في الكويت

د. عبد الرحيم صالح

اختيرت عينة عشوائية من ١٧٤ طفلاً تتراوح أعمارهم من خمس إلى تسع سنوات وهم ينتمون إلى جنسيات عربية مختلفة ، كما انهم من الذكور والإناث وأعطوا فحص كيجان للأشكال المألوفة الذي يقيس بعد الاندفاعية - التأملية . وقد وجدت الدراسة ما يلي :

(١) ان هناك اتجاهًا في النمو نحو التأملية كلما ازداد عمر الأطفال . .

(٢) إن مدة زمن الرجوع للاستجابة الأولى تزداد وعدد الأخطاء تقل كلما تقدم الأطفال في السن ،

(٣) هناك علاقة ارتباطية معتدلة وسالبة بين عدد الأخطاء ومتوسط زمن الرجوع . وقد قورنت المعايير المبنية (المأخوذة) على هذه العينة بمعايير مبنية على عينة أمريكية من نفس العمر الزمني .