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AUTHOR Rabinsky, Leatrice B.; Kumar, V. K.
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ABSTRACT

Differences between 50 Israeli and 87 American students in grades 9 through 12 were investigated using the Torrance Tests of Creative Thinking-Figural Form A. Results showed that Israeli students scored higher than the American students in grades 9, 10 and 12 on fluency and flexibility. Israeli students scored higher on originality only in grade 10, while American students scored higher on elaboration only in grade 11. A quadratic trend was observed for fluency, flexibility, and elaboration across grade levels over both cultures, showing higher scores in grades 10 and 11 as opposed to grades 9 and 12. (Author/RD)

A Cross-cultural Study in Creativity, Israeli and American Students, Grades 9 Through 12

Beatrice B. Rabinsky
Cleveland Heights High School

V. K. Kumar
Department of Secondary Education
West Chester State College

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ABSTRACT

Differences between Israeli (n=50) and American (n=87) students (grades 9 through 12) were investigated using the Torrance Test of Creative Thinking - Figural Form A. Results showed that Israeli students scored higher ($P < .05$) than the American students in grades 9, 10 and 12 on "fluency" and "flexibility". Israeli students scored higher on "originality" only in grade 10, while American students scored higher on "elaboration" only in grade 11. A quadratic trend was observed ($P < .05$) for "fluency", "flexibility" and "elaboration" across grade levels over both cultures showing higher scores in grades 10 and 11 as opposed to grades 9 and 12.

A Cross-cultural Study in Creativity,
Israeli and American Students,
Grades 9 through 12

Studies in creativity have been gaining momentum in recent decades. A review of literature, however, revealed a limited number of cross-cultural studies. In a study by Torrance (1963), data, on three nonverbal and six verbal tasks for assessing originality, were obtained from six cultures: U.S.A. (Negro school in Georgia and another school system with a broad range of talent), Western Australia, Western Samoa, Germany (free Berlin) and India. In each culture, data were collected from about 1000 pupils in grades one through six. According to Torrance the creativity tasks did not favor one sex over the other or one culture over another. Comparison of countries, for developmental trends, revealed that the developmental curve varied from country to country reflecting periods of growth and slump. In the United States sample constituting a broader range of talent there appeared to be a period of growth from the first to the third grade with a slump in the fourth grade followed by another period of growth in the fifth and the sixth grades. In Germany slump appeared in the second and the third grades followed by growth in the fourth and fifth grades. In Western Samoa, although growth was continuous, the rate of progress was slow from the second to the third grades, etc. Torrance indicates that the slump periods may be related to mental health problems related to physiological changes increasing peer pressures, etc. Torrance (1963) also reported that examination of developmental curves in different cultures showed declines in creative thinking abilities occur at about ages five, nine, thirteen and seventeen and these are related to "the stresses imposed by cultural discontinuities and are accompanied by personality disturbances." (p. 72)

Investigators have also been interested in examining sex differences within cultures. Mearig (1967) compared boys and girls in accelerated seventh and

eighth grade classes in Massena, New York and in Skye an island in the Inner Hebrides off the Western coast of Scotland. The Skye students were bilingual who spoke Gaelic and English. Mearig was motivated by the assumption that sex differences in creative behaviors are related to cultural defined sex roles and values, e.g., there is greater initial reinforcement for language activities for girls and this may lead to their initial superiority over boys on fluency measures of creativity. However, she speculated that with maturation, boys will gain on fluency and by eleventh or the twelth grades, such differences will diminish. Mearig observed different trends in the two cultures. In Massena girls scores significantly higher than boys on fluency and flexibility. Although the same trend was evident for originality, the difference was not significant. In Skye, there were no sex differences obtained on the Torrance tests. Mearig contends that the sex differences may show up in the U.S.A., because of greater emphasis and recognition given to females for academic achievement. In Skye, Mearig points out, girl students rarely entertain intellectual goals and their vocational aspirations are related to service occupations. Further, Mearig noted that Skye students in general scored lower than the U.S.A. students on the Torrance measures of creative thinking. This according to her, may be related to the students lack of orientation to cognitive tasks required on the creativity in Skye, besides the possibility that in Skye schools there is little emphasis on cognitive approaches measured on the creativity tests. A procedure such as "brainstorming" may never be used in the Skye schools.

Another investigation (Coone, 1969) examined sex differences in four cultures: U.S.A., Germany, Australia and India. This study showed that in U.S.A., boys scored higher on originality than girls, while the reverse was true for figural elaboration. In all other samples except India sex differences were non-significant. In India boys scores significantly higher than girls on figural originality. This study also involved a comparison in performance

changes between grades three and four. For both sexes on figural, verbal and total measures the U.S. sample showed a drop more often than gain from the third to the fourth grade, while the reverse was the case for samples from other countries suggesting the importance of cultural factors.

Mar'i (1971) examined cultural differences and sex differences in a study involving modern American and traditional Israeli-Arab rural eighth grade students. Mar'i used forms Verbal B and figural B of the Torrance tests for creative thinking. His study showed that the Israeli-Arab girl students fell significantly behind boys on all measures of creativity, although the latter showed greater variability in performance as compared to the former. Within the American sample, no significant sex differences were found except in fluency and originality on one problem only and this was in favor of females. In general overall American students performance was superior to the Arab students and the former showed greater individual differences than the latter. Mar'i explained that in a modern society individuality is encouraged and required while in traditional societies individuality is punished.

Torrance and his associates also examined the affect of mono or bilingualism on creativity. Torrance argued that a negative transfer in creativity in inevitable when the child begins to attend school and learn the language of instruction. A study by Torrance, Gowan, Wu and Aliotti (1970) compared the creative functioning of 1003 monolingual and bilingual Chinese and Malayan children in Singapore in grades three, four and five using the Figural Form A of the Torrances test. The subjects included Chinese children in Chinese speaking schools, Chinese in English speaking schools, Malayans in Malayan speaking schools and Malayans in English speaking schools. Their results indicated that the monolingual children excelled the bilinguals on fluency and flexibility, but a reverse trend was evident for originality and elaboration.

It is interesting to note that a large number of cross-cultural studies have employed Torrance's measures (see also Singh, 1970) and, it seems, that investigators do not find any problem using these tests. However, caution has been expressed by Torrance, Tan and Allman (1970) about the validity of the tests in cultures other than U.S.A. In this regard a study by Ogletree (1971) is noteworthy. Ogletree conducted a validation study of the Torrance's creativity tests in Germany (n=493), Scotland (n=193) and England (n=479) in twelve different state and private schools in grades three to six. Tests were administered orally in respective native tongues. In order to test the concurrent validity of the creativity measures, Ogletree asked each participating teacher to select the most and the least creative students. Results indicated that out of a total of 1165 subjects, 302 students were selected by teachers as most creative and 863 students as least creative. The two groups showed significant differences on verbal fluency, flexibility, originality and figural elaboration. Ogletree concluded that "not only teachers were successful in selecting most creative pupils, but the creativity measures exhibit a significant degree of concurrent validity other than the U.S.A." (p. 130).

From the literature reviewed, it is evident that there is a growing interest in cross-cultural research in creativity. Thus far, there is some evidence in the literature that shows (a) degree of modernization of a culture is related to performance on creativity tests (b) each culture shows critical periods of growth and slump in their development. In the U.S.A., there appears to be a slump in the fourth grade level and (c) bilingualism hurts performance on fluency and flexibility but may facilitate performance on originality and elaboration. The literature with respect to sex differences shows great variation from culture to culture.

In view of the large number of cultures in the world, the number of cross-cultural studies done, thus far, is only a small handful. The relative

dearth of cross-cultural studies is not surprising in view of the expenditure and effort involved in conducting such studies. Cross-cultural studies, especially in the area of creativity are of value not only from the point of view of generating a cross-cultural theory of creativity (Mar'i, 1976), but also in understanding what may be some of the special factors that are associated with higher or lower expression of creativity in some cultures. A knowledge of such factors should be of help in designing educational programs to promote creativity. Creative contributions in the arts, sciences, and humanities can enhance the life styles for mankind on a global basis.

Georgis and Helms (1978) observed that social sciences have come under several criticism for being "primarily oriented toward the white Western World" (p. 945). They cite Hsu (1973) who in referring to his colleagues in anthropology, asked them to be more open minded to the assumptions of other countries. Hsu cautioned that "there is a world of difference between a truly cross-cultural science of man and a white centered science of man with cross-cultural decorations" (p. 1). The present study was a step in this direction.

The present study investigated the possible differences between students in Israel and students in the U.S.A., grades 9, 10, 11 and 12 on four variables of creativity. Specifically, there were two main questions of interests: (a) are there differences on each of the four dependent variables, fluency, flexibility, originality and elaboration between the cultures within each grade and (b) are there differences, regardless of cultures on the four dependent variables among the grades. The study also employed an original biographical instrument (academic, home life, leisure activities, personal plans and wishes) to locate possible explanations for any differences between the cultures or among the grades.

Method

Subjects

A total of 137 students from Israel and the United States were involved in the study. In Israel, during the summer of 1973, students from three cities, Jerusalem, Tel Aviv, Rehovot, and Kibbutz Chofetz Chaim (a collective village) were invited to participate in the study. Principals of three schools in Israel were contacted and their help solicited to make appointments with students and to arrange for student participation. Tests were administered in each of the locations.

Students in Jerusalem represented the following academic high schools: Evelina D. Rothschild, Horeb High School and Netiv Meir High School. In Tel Aviv, students came from the following schools: Ironit 3, Bet Tzeirot Mizrachi, Tzeitlin, Gymnasium Herzeliya, and Engineering School-Tel Aviv. Rehovot students represented the following schools: Ulpana Kfar Pines, Tichon Dati Ironi, Amos D'Shalit High School, Ohr Etzion in Shafir and Ariel. In Kibbutz Chofetz Chaim, many of the students studied in the settlement high school. Several boys attended schools or seminaries away from the village.

In an attempt to bring together students from diverse Israeli backgrounds (Oriental, European, native Israeli) and different economic, educational, and social strata, the tests were administered in these four locations.

Jerusalem, the capitol of Israel, has a population of 326,400 (1973). The schools represented include students from all three backgrounds listed above. Students came from families of various economic, professional, and academic levels. In Tel Aviv, population 367,100 (1973), students came from highly-structured academic high schools. As indicated by the principals, a large number of parents were professionals, or skilled craftsmen.

Students in Rehovot, population ca. 50,000, also came from academic high schools. They represented European and native Israeli parentage. Kibbutz Chofetz Chaim located south of Tel Aviv, population 360 (1973), had the most

diverse student population. Many adolescents from disadvantaged and distressed urban families are sent to live in the kibbutz to receive improved educational, social, and economic opportunities. They attend school with children of kibbutz members. Some of the boys attend religious seminaries away from the kibbutz during the school year.

American students were from Cleveland Heights-University Heights school district in northeastern Ohio. The school district, population 10,813 (1974), had four junior high schools in 1974, Wiley, Monticello, Roosevelt, and Roxboro. One senior high, Cleveland Heights High School, population just under 3,000, served the entire district. Tests were administered during the school year, 1974, and during summer school sessions, 1974, to students from the junior highs and the high school. Cleveland Heights-University Heights school district has a diverse population, representing various racial, ethnic, economic, professional and working-class groups. Subjects in this study came from a heterogeneous population. The number of students in each grade in each culture who participated in the study are represented in Table 1.

Table 1 about here

Procedures

The Figural Form A of the Torrance Tests for Creative Thinking was used because of its adaptability to students of another culture. Instructions for the Torrance Test and the biographical instrument were translated into Hebrew for use in Israel. The tests were administered in identical form to all subjects. The Torrance tests were administered under timed conditions. The biographical instrument was administered following the test of creativity and no time limit was specified for the biographical inventory.

In Israel, three counselors, trained by the investigator (LBR), administered the tests in Hebrew under the supervision of the investigator. All tests given to the American students were administered by the investigator (LBR).

Since the tests were given in Israel during the summer vacation, a money incentive of five lirot (Israeli pounds equivalent to $1.25 in 1973) was offered to the subjects in an attempt to equate motivation.

Only one subject in Israel did not participate in the study. It was interesting to note her unique reaction to the test. She was a student in Kibbutz Chofez Chaim. As the instructions for the three tasks of the Torrance tests were presented and as the ten-minute time limit for the Picture Completion Activity was given, the girl stood up in obvious frustration, crumpled the test booklet and ran from the room in tears. The counselor later explained that this girl was from a disadvantaged family in an outlying district. Perhaps her reactions support Mearig's (1967) discussion about students from other cultures "who lack a familiarity with external tests, particularly timed ones (p. 116)."

Scoring of the Creativity Tests

In order to avoid any bias on the part of the investigators, the Torrance tests were scored professionally by the Personnel Press, Lexington, Massachusetts. Complete instructions and explanations for scoring for fluency, flexibility, originality, and elaboration are given in the Torrance Directions Manual and Scoring Guide (1974 Revision).

Results

Creativity Tests

Analysis of the data corresponded to a two-way ANOVA design with cultures nested within each grade level. A multivariate analysis considering all the four dependent variable, fluency, flexibility, originality and elaboration, for differences between cultures at each grade yielded F (4, 126) values between 2.47 and 8.70, with $p < .05$ in all cases; the multivariate F (12, 334) = 2.84, $p < .001$ was obtained for differences among grades.

Since multivariate analysis yielded significant F values, further analysis was done using univariate ANOVA's (two-way design) on each of the dependent

variables. Table 2 summarizes the univariate analysis for the variable fluency.

Table 2 about here

Table 2 shows that cultures scored differently in grades 9, 10 and 12 ($p < .05$ in all cases), but not in grade 11 ($p > .10$). The main effect for differences among grades was also significant ($p < .005$). The means for different conditions are presented in table 3.

Table 3 about here

Table 3 shows that the Israeli students as compared to the American students in grades 9, 10 and 12 scored significantly higher on fluency. It may also be noted that, although for grade 11 the difference was not significant, the same trend is shown.

The means for each grade level as seen in Table 3 appear to indicate a quadratic trend, with the means for grades 9 and 12 lower than the means for grades 10 and 11. The existence of a quadratic trend was confirmed by a post-hoc analysis using Scheffé's procedure, F (3, 129) = 12.55, $p < .01$; critical F value = 10.44.

Table 4 presents the univariate ANOVA for the dependent variable flexibility.

Table 4 about here

It was found that the cultures scored differently in grades 9, 10 and 12 (in all cases $p < .05$). For grade 11, the obtained F value was not significant; $F < 1.0$. The main effect of differences among grades was significant ($p < .006$). The means for different conditions are reported in Table 5.

Table 5 about here

Table 5 shows that Israeli students as compared to the American students in grades 9, 10 and 12 scored significantly higher in flexibility. It may also be noted that, although for grade 11 the difference was not significant, the same trend is shown.

The means for each grade level as seen in Table 5 appears to indicate a quadratic trend with the means for grades 10 and 11. The existence of a quadratic trend was confirmed by a post-hoc analysis using Scheffé's procedure, F (3, 129) = 12.93, $p < .01$; critical F value = 10.44.

The univariate ANOVA for the dependent variable originality is presented in Table 6.

Table 6 about here

It was found that the cultures' scores did not differ significantly in grades 9, 11 and 12 ($p > .05$ in all cases). For grade 10, the obtained F value was, however, significant ($p < .001$). The main effect of differences among grades was not significant ($p > .10$). The means for different conditions are reported in table 7.

Table 7 about here

Table 7 shows that in the Table of Means for Originality there is an indication of the quadratic trend similar to the trends in the results for fluency and flexibility. The trend, however, was not tested since the main effect of grade was not significant ($p > .05$).

Only in grade 10 is there a significant difference in means indicating that the Israeli students scored higher in originality than did students in the United States.

Table 8 presents the univariate ANOVA for the dependent variable, elaboration.

Table 8 about here

It was found, however, that the cultures' scores did not differ significantly in elaboration in grades 9, 10 and 12 ($p > .05$ in all cases). For grade 11, the obtained F value was significant ($p < .037$). The main effect of grades was significant ($p < .001$). The means for different conditions are reported in table 9.

Table 9 about here

Table 9 shows that Israeli students as compared to the American students in grades 9, 10 and 12 scored higher, but not significantly ($p > .05$ for grades 9, 10 and 12), on the test of elaboration. Only in grade 11 was there a significant difference with the American students scoring higher than the Israeli students ($p < .037$).

The means for each grade level as seen in Table 9 appear to indicate a quadratic trend (as in Table 5 and Table 3) with the means for grades 9 and 12 lower than the means for grades 10 and 11. The existence of a quadratic trend was confirmed by a post-hoc analysis using Scheffé's procedure, $F(3, 129) = 16.20$, $p < .01$; critical F value = 10.44.

Biographical Data

Biographical data was examined to look for possible sources of explanation of significant differences between the cultures and among the grades. The biographical information was compiled in four descriptive categories: academic, home-life, leisure activities and personal plans and wishes. Because all of the data was nominal in nature, the differences between cultures and among grades were examined using Chi-square tests. If the results were significant at $p < .05$ level, the Chi-square test was followed by a post-hoc test using a procedure based on Scheffé's method (Marasacilo, 1972). This analysis revealed, in most part, similar responses for Israeli and American students and students

in different grades. Hence, the analysis is not reported in detail here.

Discussion

The results of the study basically revealed that differences between cultures were specific to variables and grade levels. To explain why Israeli students scored higher on fluency and flexibility in grades 9, 10 and 12, but not 11 is extremely difficult particularly in view of the similarity of responses on the biographical instrument. The same can be said about the variables elaboration and originality. (It may be recalled that for originality, a significant difference was found only in grade 10 in favor of the Israeli students. For elaboration a significant difference was found only in grade 11 in favor of the American students.)

The second question of interest to the study was whether there were any significant differences among the grades regardless of cultures. In this regard, it was noted that the main effect of grade was significant for fluency, flexibility and elaboration but not for originality. However, it was interesting to note the existence of a significant quadratic trend for fluency, flexibility and elaboration; the scores in grades 10 and 11 were higher as compared to grades 9 and 12. Although not significant, the quadratic trend was also observed for the variable originality. As there is little in the literature to support the evidence of such a trend, some speculations are offered based on personal observations and experience.

It appears that psychological demands associated with development, curriculum and societal expectations provide a possible explanation for the quadratic trend (Cf Torrance, 1963). In explaining the lower scores in the ninth grade two factors can be suggested, one dealing with teen age development at age 14-15 (ninth grade), and the other, with the type of curriculum introduced in the ninth grade. Ninth grade is a definite transition period from the often immature "middle school years" to the more mature years of high school age. This transition period has been the subject of interest of many writers.

Keniston (1966) refers to this period as the "agonizing moment" characterized by conflicts of the emerging adolescent with the adult world. Erikson (1963) has talked about the crisis of identity versus role confusion during the adolescent period and the problem of "psychosocial moratorium" where "delay" is the key word. Further, ninth grade in both Israeli and American society heralds the beginning of high school and students are required to plunge into serious curriculum, classical literature and foreign grammar. The ninth grade student is concerned with practical matters of dealing with subject matter, acquiring respectable grades and digesting predetermined courses of study and established values. It is the year where students are encouraged to "excel fast" and begin to establish the personal achievement record for college and university. In this regard, it might be noted that Israel and the U.S.A. have similar educational systems. Israel provides for "compulsory public education" for ages 6 to 14 years patterned very much like the U.S. Presently, the organization of the educational system for Israel is in a transition period. That is, formerly organized on an 8 primary and 4 secondary plan, the 6-3-3 plan is now slowly being adopted (Sharp, 1974). Further, it has been traditional for students in Israel in post-primary education to choose either a vocational or an academic high school, beginning with grade 9. The trend for vocational training in the U.S. has also been gaining momentum.

If the lower ninth grade results can be attributed to the emerging adolescent coming to grips with self and an intensive program of studies, what may account for the higher scores, on a par, in grades 10 and 11? It is clear, both from personal teaching experience and from a study of the literature that there is no clear division between early and late adolescence. Keniston (1966) explains that this distinction is only a relative one.

> "Nonetheless, this distinction is meant to suggest that one of the ways we recognize the "successful" progress of adolescence is by a gradually decreased preoccupation with issues of emancipation, independence,

> and autonomy from family coupled with issues of emancipation, independence, and autonomy from family coupled with a slow growth in concern with questions about the future, the integration of self, the development of a sense of social role and personal purpose. (p. 6)

Certain trends and characteristics do emerge in tenth and eleventh grade, which support Keniston's theory and which may account for the rise in scores in the quadratic trend. Once the student begins to adjust to the high school course, he or she begins to look at the immediate world around him and to explore interests, values, friends, school and often, community activities. This adjustment may help in the elevation of the creativity scores in the tenth and eleventh grades.

While high school students in tenth and eleventh grade tend to be more involved with activities related to school, family and personal interests, students in the twelfth grade tend to be more concerned with preparation for life after high school. Similar trends emerge among senior high school students in both the United States and in Israel which may account for the reduction in scores for twelfth grade in the quadratic trend. From personal involvement with twelfth grade students as a homeroom and classroom teacher, the senior author observed consistent concerns, anxieties and involvements which preoccupied many senior students. More gifted and academically successful students were concerned with searching for the "right college or university", taking standardized achievement tests, filling out applications and seeking funding for tuition. Students in twelfth grade tend to have a higher rate of class absenteeism while they are in pursuit of these activities. Twelfth grade students who are not contemplating college are concerned with seeking permanent employment. They are concerned about their qualifications for a good job. Many seniors in both categories who have completed most graduation requirements by the twelfth grade attend school only half days and are employed in the afternoons. They have little time for their academic

subjects, much less for creative involvement in school projects and activities.

In Israel, the twelfth grade student is also burdened with important concerns. Competition is keen in Israel for the limited number of places in the universities. The Bagrut examination is a very real concern for twelfth grade students (Sharp 1974). Senior students in Israel, however, cannot look forward to entering universities upon graduating from high school. Graduates of academic and vocational high schools as well as older adolescents who have been employed instead of attending school must enter the Israeli army at age eighteen and serve for three years. Only girls of Orthodox religious persuasion may be excused from army service. These girls often volunteer for Sherut L'Am, an ancillary service organization offering educational and social welfare help to people in disadvantaged or distressed areas.

Another issue of special importance to the older adolescent may also account for the reduction in scores for twelfth grade students. Keniston (1966) noted that the intimate relationship of the questions of "self-definition in the wider world and the capacity for intimacy, including sexual intimacy, with the opposite sex (p. 7)." In discussing the seeking for identity and intimacy among the late adolescent, Keniston indicated that most girls "see relationship with men as a primary way of achieving identity and fulfillment in life." For late adolescent boys, however, while vocational concerns may be the primary concerns, the fundamental considerations of developing identity and "maleness" have much to do with "increasingly intense relationships with girls (p. 7)."

The present study does offer support to Torrances contention of critical periods of growth and decline in creativity scores. The obvious implication of these findings is to place special emphasis on creative thinking or creative problem solving in grades such as the ninth and the twelfth. Creative approach

to solving problems related to choice of occupations or social concerns may actually benefit the youngsters who are in the midst of turmoil and anxiety related to these problems. The interpretations offered in the study are speculative and must be treated with caution. Further research is needed to substantiate the findings obtained in the present study, especially, since it suffers from the usual weaknesses of typical cross-cultural study (see Malpass, 1977). Perhaps such cross-cultural studies need be conducted periodically with K-12 time span to study changes over time that may be related to political, economic and social changes.

REFERENCES

Coone, J. G. A Cross-cultural Study of Sex Differences in the Development of Selective Creative Thinking Abilities. Unpublished doctoral dissertation, University of Georgia, 1969. Dissertation Abstracts, 1969, 29 (12-B), 4828-4829.

Erikson, E. H. Identity, Youth and Crisis. New York: W.W. Norton and Company, 1963.

Giorgis, Tedla W. and Helms, Janet E. Training International Students from Developing Nations as Psychologists. American Psychologist, 1978, 33, 945-951.

Hsu, F. K. L. Prejudice and Its Intellectual Effect in American Anthropology: An Ethnographic Report. American Anthropologist, 1973, 75, 1-19.

Keniston, K. The Tasks of Adolescence. Yale University School of Medicine, 1966.

Malpass, R. S. Theory and Method in Cross-cultural Psychology. American Psychologist, 1977, 32, 1069-1079.

Mar'i, S. K. Creativity of American and Arab Rural Youth: A Cross-cultural Study. Unpublished doctoral dissertation, University of Wisconsin-Madison, 1971. (Dissertation Abstracts International, 1971, 31 (12-A), 6407-6408.)

Mar'i, S. K. Toward a Cross-cultural Theory of Creativity. Journal of Creative Behavior, 1976, 10, 108-116.

Mearig, J. Sex and Cultural Differences in Performance of Certain Verbal Creativity Measures. Journal of Educational Research, 1967, 61, 114-117.

Ogletree, E. J. Are Creativity Tests Valid in Cultures Outside the United States? Journal of Research and Development, 1971, 4, 129-130.

Sharp, Ted. Education in Israel. College and University, 1974, 49, 659-663.

Singh, S. P. Creative Abilities: A Cross-cultural Study. In Raina, M. K. Research Developments in Creativity in India. Journal of Research and Development in Education, 1971, 4, 118-128.

Torrance, E. R. Education and the Creative Potential. Minneapolis: University of Minnesota Press, 1963.

Torrance, E. P. Torrance Tests of Creative Thinking, Norms-Technical Manual. Princeton: Personnel Press, 1966.

Torrance, E. P. Testing the Educational and Psychological Development of Students from Other Cultures and Subcultures. Review of Educational Research, 1968, 38, 71-76.

Torrance, E. P. Torrance Tests of Creative Thinking, Norms-Technical Manual (2nd ed:), Princeton: Personnel Press, 1974.

Torrance, E. P., Bruch, C. B., & Morse, J. A. Improving Predictions of the Adult Achievement of Gifted Girls by Using Autobiographical Information. Gifted Child Quarterly, 1973, 17, 91-95.

Torrance, E. P., Gowan, J. C., Wu, J. J., & Aliotti, N. Creative Functioning of Monolingual and Bilingual Children in Singapore. Journal of Educational Psychology, 1970, 61, 71-75.

Torrance, E. P., Tan, C. A., and Allman, T. Verbal Originality and Teacher Behavior: A Predictive Validity Study. Journal of Teacher Education, 1970, 21, 335-341.

TABLE 1

Sample Size of Student Participants by Culture and Grade

	Grades				
Culture	9	10	11	12	Total
Israel	9	16	17	8	50
American	11	16	22	38	87

TABLE 2

Analysis of Variance Summary for the Dependent Variable Fluency

Source of Variability	df	MS	F	p <
Between cultures				
Culture within grade 9	1	152.22	4.72	.032
Culture within grade 10	1	892.53	27.66	.001
Culture within grade 11	1	69.25	2.15	.145
Culture within grade 12	1	227.59	7.05	.009
Grade	3	147.02	4.56	.005
Error	129	32.25		

TABLE 3

Table of Means for Dependent Variable Fluency

Group	9	10	11	12	Grand Means
Israel	18.00	24.56	20.82	21.00	21.54
United States	12.46	14.00	18.14	15.13	15.35
Overall Means both cultures	14.95	19.28	19.31	16.15	

TABLE 4

Analysis of Variance Summary for the Dependent Variable Flexibility

Source of Variability	df	MS	F	p <
Between cultures				
Culture within grade 9	1	125.76	6.77	.010
Culture within grade 10	1	420.50	22.65	.001
Culture within grade 11	1	3.35	.180	
Culture within grade 12	1	124.60	6.71	.011
Grade	3	80.42	4.33	.006
Error	129	18.56		

TABLE 5

Table of Means for Dependent Variable Flexibility

Group	9	10	11	12	Grand Means
Israel	15.22	19.38	16.00	17.00	17.10
United States	10.18	12.13	15.41	12.66	12.94
Overall Means both cultures	12.45	15.75	15.67	13.41	

TABLE 6

Analysis of Variance Summary for the Dependent Variable Originality

Source of Variability	df	MS	F	p <
Between cultures				
Culture within grade 9	1	30.07	:29	
Culture within grade 10	1	1250.00	11.87	.001
Culture within grade 11	1	238.72	2.27	.135
Culture within grade 12	1	14.35	.14	
Grade	3	220.36	2.09	.104
Error	129	105.53		

TABLE 7

Table of Means for Dependent Variable Originality

Group	9	10	11	12	Grand Means
Israel	25.56	35.75	30.35	25.50	30.44
United States	23.09	23.25	25.36	24.03	24.10
Overall Means both cultures	24.20	29.50	27.54	24.28	

TABLE 8

Analysis of Variance Summary for the Dependent Variable Elaboration

Source of Variability	df	MS	F	p <
Between cultures				
Culture within grade 9	1	.27	.00	
Culture within grade 10	1	91.13	.07	
Culture within grade 11	1	5880.03	4.44	.037
Culture within grade 12	1	1586.39	1.20	.276
Grade	3	11829.77	8.94	.001
Error	129	1323.10		

TABLE 9

Table of Means for Dependent Variable Elaboration

Group	9	10	11	12	Grand Means
Israel	95.78	114.00	104.65	93.63	104.28
United States	95.55	110.63	129.41	78.13	99.28
Overall Means both cultures	95.65	112.31	118.62	80.83	