



Dropout delinquent adolescents: psycho-diagnostic aspects of using the Bender-Gestalt Test and WISC-R

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Abstract

This study aims to demonstrate the way in which the BGT (Bender-Gestalt Test) can indicate the existence of subgroups among dropout delinquent adolescents and to examine the relationship between BGT and WISC-R (Wechsler Intelligence Scale for Children – Revised) scores in dropout adolescents and normative youth. The subjects were 232 adolescents who underwent diagnostic testing at a psycho-educational center in Israel. They were divided into three research groups: Dropout delinquents living in residential institutions; dropout delinquents living at home; and a contrast group who were neither dropouts nor delinquents. The findings indicated that the BGT could differentiate between these groups, and help define the status of each group. Results showed significant correlation between BGT and WISC-R results. The importance of diagnostic ability for educators and researchers is discussed.

Key words: adolescents, dropouts-delinquents, Bender-Gestalt Test, WISC-R test, psycho-diagnostic

Dropout delinquent adolescents in Israel

Adolescents who drop out of school and socially detached adolescents are problems known in Israel, as they are worldwide. A dropout is defined as a young person who left of school prior to completing the 10 years of compulsory education mandated by law. Most of these teenagers, ranging in age from 15 to 18 years, do not work or study. Those who do work hold unskilled or casual jobs, and usually come from large families of low socioeconomic status. They seek treatment after a long history of failure and transfers from one educational framework to another; some are not involved in any framework whatsoever (Gottlieb & Brainin-Porat, 1987; Lahav, 1993, 1994, 1999).

Over the years, different terms have been used to describe this population. Lahav (1993) records the terms street youth, marginal youth, street gangs, youth in distress, and detached youth as having been used in Israel. In other parts of the world, terms for these adolescents included school-disadvantaged dropouts, delinquent youth at risk, gangs, street-corner groups, juvenile delinquent youth, and unattached youth. Lahav (1994) described stages in the process of detachment of these young people from their studies in school and their relationships with formal frameworks through rejection and vagrancy, resulting eventually in delinquency. In a recent survey of dropout delinquent adolescents in Israel, Kahan-Strawczynski, Dolev, and

Shemesh (1999) found that most of them were from single-parent families with socioeconomic difficulties, parental unemployment and elementary education or less, violent families with alcohol or drug abuse, prostitution, or criminal activities.

Accordingly, we refer to this population as "dropout delinquent adolescents." These adolescents can remain at home and be treated within the community, but in more severe cases, where they do not respond to limitations or restrictions of their educational therapeutic or family framework, they are taken out and treated within residential institutions as is described in more details in the sample of this research.

Whether treated in the community or in special facilities, these adolescents undergo testing. The BGT is one of the most popular psycho-diagnostic tests used for the assessment of development, perceptual and motor skills of youth (Wilson & Reschly, 1996), and is used as part of a comprehensive battery of tests (such as the WISC-R). The BGT is easy to administer, is readily accessible, and has successfully assimilated among the various psychological disciplines. However, there is no systematic research to indicate whether the BGT can differentiate between youth subgroups, nor is there evidence as to its relationship to their intelligence. The perspective of this study is to discriminate types of dropout delinquent adolescents with the BGT.

Research review of the BGT and the WISC-R

The Bender-Gestalt Test (BGT), developed by Laretta Bender (1938), is a widely used diagnostic instrument in psychology and education (Brannigan, 1995; Cummings & LaQuerre, 1990; Dixon, 1998; Foxcraft, 1997; Fuller & Vance, 1995; McIntosh, Belter, Saylor, Finch, & Edwards, 1988; Moose & Brannigan, 1997; Sattler, 1992; Shapiro & Simpson, 1995). The BGT provides an estimate of perceptual-motor development, which in general parallels the mental development of children between the ages of 4 and 11 years. However, little is known about the systematic use of the BGT with adolescents (e.g., Hain, 1964; Pascal & Suttell, 1951).

The BGT has also been used to screen children for indications of brain damage and psychopathology (Sattler, 1992). Various scoring systems have been developed, mainly for adults in clinical and non-clinical groups (e.g., Hain, 1964; Koppitz, 1963, 1975; Hutt, 1985; Pascal & Suttell, 1951). The Koppitz Developmental Scoring System is the procedure most commonly used to objectively score the BGT results of children aged 5-12 years who undergo diagnostic testing in school and in clinical settings (Neale & McKay, 1985; Sattler, 1992).

Hutt's (1985) adaptation of the BGT, allows it to be utilized as a projective device. Extending beyond classical Gestalt laws of perception, the BGT aims at understanding both the process of responding and the final product elicited. This adaptation maximizes the understanding of behavior, personality style, general style of adaptation, needs, areas of conflicts and defenses, as well as the level of maturation, coping methods, and ego strengths.

Efird (1984) claims that there is no uniform set of scoring criteria that is consistently used by clinicians. Nevertheless, based on data from their pilot study, Bolen, Hewlett, Barry, Cathy, and Mitchell (1992), concluded that the integration of visual-motor functioning appears to be objectively measurable and quantifiable in adolescents.

Piotrowski (1995) points out that the BGT has been used as a tool for assessment of intelligence, specifically of nonverbal IQ, as a technique for screening neuro-psychological dysfunction, as a clinical tool for sampling visual-motor proficiency, and as a standard projective technique for the assessment of personality. Critics contend, however, that the test belongs in the realm of clinical folklore and that sound empirical studies have not supported claims based on clinical experience (Golden, 1990). Furthermore, as noted by Piotrowski and Zalewski (1993), the clinical popularity of a test does not necessarily reflect its psychometric credibility. Although the BGT is usually administered as part of a comprehensive battery of tests, it is

important to be aware of precisely what it purports to test, and to check its validity for a specific purpose. However, because of its wide use both clinically and in research, the BGT should continue to be part of the training curriculum for psychologists.

Various studies (Goldstein & Britt, 1994; Sattler, 1992; Shapiro & Simpson, 1995; Siegel, 1989;) found negative correlations between BGT performance and intelligence (as measured by the WISC-R).

The Wechsler Intelligence Scale for Children-Revised (WISC-R; Wechsler, 1974, 1976) is a frequently used instrument for the evaluation of intelligence. Gross and Hubble (1998) described a field study in which the discrepancy between verbal and nonverbal skills among 150 male delinquents was assessed. Results indicated that the WISC-R Verbal-Performance IQ discrepancy showed up reliably more often among delinquents than among controls. There is a strong tendency associating delinquency with $P > V$ in younger adolescents on the WISC and WISC-R Scales (Kaufman, 1990; Romi & Marom, in press).

In special populations such as people with learning disabilities, delinquent groups, or ethnic groups, the distinctions were also examined based on factors other than differences between Verbal IQ and Performance IQ. For example, Valencia, Rankin, and Oakland (1996) used the WISC-R factor-structure model to test Kaufman's (1990) three-factor solution. The model consisted of Verbal Comprehension (Factor 1), Perceptual Organization (Factor 2), and Freedom from Distractibility (Factor 3). The results showed the relevance of Kaufman's three-factor solution for ethnic groups.

Reviews of research that has applied WISC-R, show that groups of children with learning disabilities scored low on the original Freedom from Distractibility (FD) factor (Arithmetic Coding, and Digit Span subtests) relative to other factors (Kaufman, 1994; Wielkiewicz, 1990), and on the Freedom from Distractibility (FD) factor in comparison to other subtests (Joschko & Rourke, 1985).

The first assumption of this study (partially confirmed by Shapiro & Simpson, 1995) was that dropout delinquent adolescents living in residential institutions would have a greater number of erroneous responses on the BGT (which implies deficient 'perceptual-motor skills' and behavior difficulties) than dropout delinquent adolescents living at home, and that both subgroups would attain lower scores than non-delinquent adolescents living at home. The second assumption was that the relationship between the BGT and the WISC-R (Wechsler Intelligence Scale for Children – Revised) is negative in dropout adolescents.

Method

Participants

The study participants were 232 adolescents (196 boys and 36 girls, ranging in age from 12.8 to 17.7 years), who were referred to a psycho-educational center in central Israel for diagnostic evaluation and psycho-educational recommendations. The participants were divided into three groups: (1) Dropout delinquent adolescents living in residential institutions – DDI (117 boys and 5 girls, mean age = 15.6 years). This group included adolescents who have been sent to institutions after having committed repeated crimes of theft and burglary of homes and vehicles. Following difficulties receiving treatment in the community they were sent for authoritative treatment within institutions. (2) Dropout delinquent adolescents living at home – DDH (55 boys and 23 girls, mean age = 15.4 years), who were referred by welfare agencies. This group includes adolescents who had committed a single crime or those who are only suspected of committing similar ones; they receive psychotherapy within the community.

(3) Contrast group of non-delinquent adolescents living at home and studying within a formal educational framework – ND. Years of detachment were measured by file reports about withdrawal from formal education and working frameworks. They had been referred by their parents for psychological evaluation in order to assist them in their studies (24 boys and 8 girls, mean age = 14.8 years). Demographic characteristics of the study participants from archive files are presented in Table 1.

Table 1
Demographic Characteristics of the Study Participants

		DDI (<i>n</i> = 122)	DDH (<i>n</i> = 78)	ND (<i>n</i> = 32)
Gender	MF	117	55	24
		5	23	8
Education (in years)	<i>M</i>	8.4	8.9	8.8
	<i>SD</i>	2.2	1.2	1.3
Age	<i>MSD</i>	15.6	15.4	14.8
		1.1	1.2	1.2
Years of Detachment		1.2	1.2	—

Note:

DDI – Delinquent dropout adolescents living in residential institutions

DDH – Delinquent dropout adolescents living at home

ND – Non-delinquent adolescents contrast group

Instruments

The Bender Gestalt Test (BGT)

Originally known as the Bender Visual Motor Gestalt Test (Bender, 1938), the BGT is a rapidly administered pencil and paper test in which participants are required first to copy 9 geometric line-and-dot drawings and then recall the drawings and reproduce them. The test can be used as a screening instrument for neurological and personality abnormalities, and to assess one type of constructional and memory ability. For these reasons, its inclusion within a comprehensive battery of diagnostic tests seems appropriate. The reliability coefficients as Alaudanjoki et al. (2001) reported was Cronbach's $\alpha = .76$

The Wechsler Intelligence Scale for Children

The revised version of this test (the WISC-R), in its Hebrew translation and standardization (1976) is still the most widely applied intelligence test in Israel, though it is gradually being replaced by the WISC-III. The WISC-R, which remains the standard instrument for the clinical assessment of intelligence of patients between 6 and 16 years of age, provides data that reflects on general intellectual functioning and verbal and nonverbal performance. The WISC-R has served as an essential component of virtually all psychological and neuropsychological evaluations (for recently example D'Angiulli and Siegel, 2003). Though the WISC-R is designed for use with a population up to the age of 16.3 years, it is administered in Israel to dropout delinquent youth up to the age of 18, as a result of their absence from a formal educational framework. As the findings in our study for participants aged 16.3 years and younger were identical to those for the entire study group, the results for the entire population were in-

cluded. The reliability coefficients range as the manual reported were between .72 to .96 by Split-half technique with adjustment of Spearman-Brown equation.

Procedure

The BGT was administered in two phases – copy phase and recall phase, and was scored by the writers, experienced and licensed psychologists. The BGT is usually administered at the beginning of any psycho-diagnostic battery of tests. BGT protocols were scored using the Hutt (1985) scoring system, which was renewed for purposes of this study and is described in the results section. Blind scoring ensured that examiners were not aware of the group to which the participants belonged.

Scoring

Testing yielded data for six factors: Collision, perceptual rotation, retrogression, preservation, condensation, and omission, and these were analyzed in two ways. First, each of the six factors were viewed as a dichotomous variable (i.e., each participant could either demonstrate or not demonstrate the specific erroneous response in both the copy and the recall phases of the BGT). Next, two test indexes were created as a renewed approach to the Hutt (1985) scoring system. They included the number of times each erroneous response was made by each participant, with the resulting creation of 12 (6 copy and 6 recall) ratio-scale variables expressing the error-rate for each phase of the BGT. The indexes allowed for grouping the 12 factors into three general error-rate indexes: (a) the copying error-rate index, computed as the total number of erroneous responses¹ in the copying phase of the test; (b) the recall error-rate index, computed as the total number of erroneous responses in the recall phase of the test; and (c) the general error-rate index, computed as the total number of erroneous responses in the whole test.

The WISC-R was administered to the participants by the same psychologists (total IQ scores: Group A, $M = 93.52$, $SD = 15.36$; Group B, $M = 99.54$, $SD = 15.75$; Group C, $M = 107.74$, $SD = 13.5$). Partialing out of the total IQ scores was computed in order to compare the BGT results of the three groups. No gender-significant differences were found between the mean IQ scores, and therefore all participants (male and female) were included in the analysis.

Results

The three groups were compared in a two-way frequency table. A χ^2 test was used to determine the significance of differences among the three groups. No gender-significant differences were found between the groups on the BGT scores, therefore, all participants (male and female) were included in the analyses. The percentage of participants who recorded erroneous responses is presented in Table 2.

As shown in Table 2, differences between the groups were significant for 3 of the 6 factors (rotation in the copy and recall phases and retrogression in the recall phase were significant). The recorded value refers to the percentage of participants who gave an erroneous response. For example, 37.5% of the non-delinquent adolescents (ND) manifested a rotation error in the copy phase. Only 3 factors showed significant differences between the groups. The percentage of participants demonstrating erroneous responses was highest for the dropout delinquent adolescents living in residential institutions (DDI) (50.0% compared with 26.9% and

37.5% for rotation in the copy phase, 57.0% compared with 40.3% and 37.5% for rotation in the recall phase, and 57.9% compared with 51.3% and 31.3% for retrogression in the recall phase). Furthermore, Table 2 shows a similar pattern for the two phases of the test. For the factors rotation, preservation, and retrogression (all in the copy phase) and rotation and retrogression (both in the recall phase), the dropout delinquent adolescents living in residential institutions (DDI) had the most errors. The non-delinquent adolescents (ND) had the fewest errors in preservation, omission, and retrogression (in the copy phase) and in rotation, omission, and retrogression (in the recall phase). The dropout delinquent adolescents living at home (DDH) had the fewest errors, only in rotation and collision (in the copy phase). The second type of analysis was based on the frequency of each erroneous response. Three indexes were computed:

1. Copying error-rate index, computed as the total number of erroneous responses in the copy phase of the test.
2. Recall error-rate index, computed as the total number of erroneous responses in the recall phase of the test.
3. General error-rate index, computed as the total number of erroneous responses on the whole test.

Table 2

Comparison of the Percentages of Erroneous Responses in the Three Groups

Erroneous response		DDI (<i>n</i> = 122) % error	DDH (<i>n</i> = 78) % error	ND (<i>n</i> = 32) % error	% error	All three groups (<i>n</i> = 232) % error	$\chi^2_{(2)}$
Copy Phase	Rotation		50.0	26.9	37.5	40.5	10.65**
	Preservation		33.6	30.8	21.9	31.0	1.63
	Condensation ^a		—	—	—	0.0	—
	Omission		6.6	9.0	6.3	7.3	0.47
	Collision		9.8	7.7	18.8	10.3	3.06
	Retrogression		47.5	41.0	31.3	43.1	2.95
Recall Phase	Rotation		57.0	40.3	37.5	48.7	7.16***
	Preservation		28.9	31.2	31.3	30.0	0.14
	Condensation ^b		—	—	—	4.4	—
	Omission		28.1	32.5	21.9	28.7	1.28
	Collision ^c		—	—	—	2.6	—
	Retrogression		57.9	51.3	31.3	52.0	7.20***

Note

a As none of the subjects recorded a response for this factor during the copy phase, no statistical analysis of frequency analysis was performed.

b As a very small percentage of all the subjects (4.4%) recorded a response for this factor during the recall phase, comparisons of frequency and Chi-square test are not valid.

c As a very small percentage of all the subjects (2.6%) recorded a response for this factor during the recall phase, comparisons of frequency and Chi-square test are not valid.

* $p < .01$ ** $p < .05$

** $p < .05$ *** $p < .01$

DDI — Delinquent dropout adolescents living in residential institutions

DDH — Delinquent dropout adolescents living at home

ND — Non-delinquent adolescents contrast group

The means of the three groups in each of the three error-rate indexes were compared using ANOVA. This was followed by two planned contrasts, the first compared the contrast group (ND) to both dropout delinquent groups, and the second compared the two dropout groups. The means, standard deviations, and contrasts of the three indexes are presented in Table 3.

Table 3

Comparison of the Numbers of Erroneous Responses in the Copy Phase, the Recall Phase, and the Whole Test Among the Three Groups

	DDI (<i>n</i> = 122)	DDH (<i>n</i> = 78)	ND (<i>n</i> = 32)	All three groups (<i>N</i> = 232)	<i>F</i> _(2, 229)	1st contrast (ND vs. DDI + DDH) <i>t</i> ₍₂₂₉₎	2nd contrast (DDI vs. DDH) <i>t</i> ₍₂₂₉₎
Copying error <i>M</i>	2.80	1.90	1.81	2.36	5.23**	1.65	8.13**
rate index <i>SD</i>	(2.42)	(1.85)	(1.84)	(2.21)			
Recall error <i>M</i>	2.77	2.49	1.78	2.54	3.20***	5.03***	0.96
rate index <i>SD</i>	(2.16)	(1.87)	(1.41)	(2.00)			
General error <i>M</i>	5.57	4.38	3.59	4.90	5.39**	4.36***	5.54***
rate index <i>SD</i>	(3.87)	(3.13)	(2.51)	(3.53)			

** *p* < .05 *** *p* < .01

Table 4

Pearson Correlation Coefficients between BGT Indexes and IQ Factor's Scores

Group		Freedom from Distractibility (FD)	Perceptual Organization (PO)	Verbal Comprehension (VC)	Perceptual Speed (PS)
DDI	Coping error Rate index	-0.34***	-0.43***	-0.23**	-0.37***
	Recall error Rate index	-0.16	-0.13	-0.05	-0.20**
	General error Rate index	-0.29***	-0.34***	-0.17	-0.35***
DDH	Coping error Rate index	-0.33***	-0.31***	-0.33***	-0.04
	Recall error Rate index	-0.19	-0.04	-0.11	-0.01
	General error Rate index	-0.31***	-0.21	-0.26**	-0.03
ND	Coping error Rate index	-0.17	-0.02	-0.27	-0.27
	Recall error Rate index	-0.11	-0.10	-0.10	-0.19
	General error Rate index	-0.19	-0.07	-0.26	-0.31

** *p* < .05 *** *p* < .01

Table 3 supplies additional support for the main research hypothesis. The ANOVA results show that F was significant for all three indexes, indicating that the three groups differed in the number of their erroneous responses in each phase of the BGT, as well as between the two phases. The contrast analyses presented in Table 3 specifically locates the differences. In the copy phase, dropout delinquents living in residential institutions demonstrated significantly more errors than dropout delinquents living at home (DDH) or than non-delinquents (ND). In the recall phase, however, the number of errors demonstrated by both dropout delinquent groups were similar, and were significantly higher than that of the contrast group (ND). The total number of erroneous responses made in the whole BGT discriminated between non-delinquent adolescents and dropout delinquent adolescents, as well as between the two delinquent groups.²

Total IQ scores revealed significant differences between the three groups. The total IQ scores in the non-delinquent group (ND) ($M = 107.74$, $SD = 13.5$), differed significantly from that in DDI ($M = 93.52$, $SD = 15.36$; $p < .05$) and DDH ($M = 99.54$, $SD = 15.75$; $p < .05$). The difference between the two dropout delinquent groups was also significant ($p < .01$).

Correlation between the BGT indexes and total IQ scores were negative and significant only in groups DDI and DDH. Correlation between the BGT indexes and the Wechsler's IQ factors' scores, as described by (Cohen, 1959; Blaha & Wallbrown, 1996; Dickerson Mayes, Calhoun & Crowell, 1998; Greenway & Milne, 1999; Law & Faison, 1996) revealed the same general pattern – negative and significant correlations only in groups DDI and DDH. These findings support the second assumption of this study. Results of Pearson correlation coefficients between the BGT indexes and IQ factor scores are presented in Table 4.

The results presented in Table 4 show that these correlations were more frequent in group DDI then in group DDH, especially in the copying-error rate index. To determine whether the differences reflected in the comparisons between the BGT scores of the three groups were influenced by the intelligence level, an additional comparison was made after eliminating the intelligence variable from the BGT results (Partialing out of Intelligence: Total IQ scores). The results of Partialing out of Total IQ from BGT scores are presented in Table 5.

The results presented in Table 5 shows that partialing out of the intelligence scores altered the differences among the three groups, though this difference was significant only for the copying phase, $F_{(2, 229)} = 2.96$, $p < .05$. Analysis of post-hoc contrasts revealed that although the ANOVA for the altered general error rate index did not reveal a significant difference, the difference between the two dropout delinquent groups was still significant. Interaction between the groups and the indexes of the BGT was not significant.

Table 5
Partialing out of Total Wechsler IQ from BGT Results

	DDI (<i>n</i> = 122)	DDH (<i>n</i> = 78)	ND (<i>n</i> = 32)	All three groups (<i>n</i> = 232)	$F_{(2, 229)}$	1st contrast (ND vs. DDI+DDH) $t_{(229)}$	2nd contrast (DDI vs. DDH) $t_{(229)}$
Copying error rate index <i>M</i>	2.66	1.91	2.42	2.66	2.96***	0.11	5.86**
Recall error rate index <i>M</i>	2.75	2.51	2.06	2.75	1.43	2.15	0.64
General error rate index <i>M</i>	5.40	4.41	4.47	5.40	2.19	0.44	3.84***

** $p < .05$ *** $p < .01$

DDI – Delinquent dropout adolescents living in residential institutions

DDH – Delinquent dropout adolescents living at home

ND – Non-delinquent adolescents contrast group

Discussion

The results of this study show the contribution of the BGT to the psycho-diagnostic process and its ability to distinguish between groups.

These findings appear to support the general professional impression, based on clinical experience, that the BGT can be helpful in providing certain types of diagnostic information (Sattler, 1989; Siegel, 1992). Nonetheless, the present study's findings did not support Kopera and Zielinski's results (1995) that no differences were found between their groups (Fetal Alcohol Syndrome versus Fetal Alcohol Effects) using the BGT, in spite of significant difference between the groups on the Wechsler scores. Perhaps the explanation refers to the uniqueness of the participants of that study.

This study is unique due to the introduction of error-rate indexes which yielded more significant results than those obtained from any erroneous response examined separately even though significant distinctions were found between the groups (namely, in rotation). These findings support the assumption that in diagnosing a particular group, the sum of erroneous responses is more accurate than a separate examination of each error (Riethmiller & Handler, 1997).

The participants in this study were dropout delinquent adolescents, a unique group not usually included in previous studies, in contrast to juvenile delinquents who are incarcerated, and therefore readily accessible (Ames, Metraux, & Walker, 1995).

The differences observed between the three groups call attention to the dropout delinquent's problem. Our findings show significant and consistent differences between the two dropout delinquent groups at the copy phase, even after partialing out of intelligence. This might be explained in terms of the unique participant population, which might have difficulty in their perceptual-motor development, i.e., translating their visual images into controlled, coordinated motor action. This complicated integrative process is subject to maturation in the receptive and expressive functions (Siegel, 1989). Our findings suggest that these functions are still relatively undeveloped and the dropout adolescents' immaturity in the expressive area explains their difficulty to reproduce the BGT figures correctly as they perceive them. Perhaps this implies that they also have basic disabilities in visual information processing, visual discrimination and spatial-mechanical ability. That, in turn, influences their ability to integrate into a formal educational framework that may stimulate them towards dropping out and delinquency.

A significant relationship exists between intelligence and accuracy of BGT reproductions. The dropout adolescent's impairment is severe. They may not have sufficient intellectual skills to learn alternate means of problem solving, they lack family or school support, and they cannot develop effective compensatory skills, all of which impair their reproductions. Results supported Farrington's (1995) description of characteristics and predictors of such youth toward delinquency who stated that they have low intelligence, poor school attainment and are impulsive on psychomotor tests.

Previous studies found $P > V$ (performance > verbal) I.Q. in delinquent adolescents. Our research shows that dropout adolescents have difficulties in avoidance of distractibility (FD), in perceptual organization (PO), and in perceptual speed (SP), and they may also have attention – deficit disorder.

Practitioners tend to assume that in the recall phase, concealing the cards will also enable the examinee to project certain personality traits more authentically. Surprisingly, a significant difference was noted only between the non-delinquent group (ND) and the two dropout delinquent groups. This distinction disappeared after partialing-out of intelligence, and no significant difference was found between the two dropout delinquent groups.

A possible explanation for this is the assumption that the level of intelligence influences the BGT test. The recall phase is more strongly affected by intelligence than the copy phase. As short-term memory is one of the elements examined in the WISC-R, and found to correlate

with poor reproduction on the BGT (Jarzebska, 2001), one can assume that the recall phase would be more strongly affected by intelligence than the copy phase. Therefore, it is expected that this difference will no longer exist once intelligence is partialled out.

The non-delinquent group attended a normal, formal school and lived at home. They had been referred to the psycho-educational center by their parents in order to find ways to assist them in their studies. Our findings show that adolescents in this group exhibited weakness in the same areas as the two dropout delinquent groups. We can therefore relate to this group only as a contrast group and not as regular control group. Nevertheless, the significant differences that were found between this group and the other two, point to the extreme problems of dropout delinquent adolescents. This is especially true for those in group DDI who live in institutions, and are detached from educational frameworks, formal work, home and family.

Future studies should attempt to determine whether the dropout phenomenon originates in an environment of neglect or in specific personality or organic problems causing these youth to drop out of normative life frameworks. The origins of this phenomenon should be examined in further studies using additional tests.

Conclusions

Although the BGT is still very popular, few modern studies have attempted to provide up-to-date interpretations of this test. The present study demonstrates that the BGT can successfully distinguish between two adolescent groups in serious need of psycho-educational treatment and has significant relationships with the Wechsler scores (IQ). An objective scoring system is necessary while doing research with the BGT.

The present research results, using Hutt's (1985) scoring system show that only by engaging in a systematic analysis of the BGT, this test can demonstrate both diagnostic value and certain characteristics of dropout delinquent adolescents.

Acknowledgments

We would like to thank the Research Foundation of the School of Education, Beit-Berl College and the Schnitzer Foundation of the Social Sciences Faculty, Bar-Ilan University for their support, and our colleagues in the Beit-Berl Psycho-educational Center for their encouragement.

Notes

1. Here, as in the next two indexes, we counted each error and not the number of types of errors.
2. We also conducted separate comparisons of means for each type of erroneous responses. The results were similar to those of the proportion comparisons.

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