MULTIPLE INTELLIGENCES: PROFILING DOMINANT INTELLIGENCES OF GRADE EIGHT STUDENTS

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ABSTRACT. This paper outlines how verbal protocols were used to compare the self-perceived intelligences of students to teacher nominations. Teachers nominated students considered dominant in one of Howard Gardner's seven theorized intelligences. The students then verbalized aloud while ranking themselves, using scenarios depicting each intelligence. Concurrent and retrospective verbal protocols were taped, transcribed verbatim to text, coded, and analyzed. Results indicated a strong agreement between teacher nomination and student identification of Gardner's intelligences. More detailed studies should be completed before determining the validity and reliability of profiling such intelligences.

RÉSUMÉ. L'auteur de cet article analyse la façon dont les protocoles verbaux ont servi à comparer l'intelligence des étudiants telle que perçue par eux-mêmes et l'opinion des professeurs. Les professeurs ont nommé les étudiants qui à leur avis dominaient dans l'un des sept types d'intelligence théorisée de Howard Gardner. Les étudiants ont ensuite parlé à haute voix pour se classer eux-mêmes en se servant de scénarios illustrant chaque type d'intelligence. Les protocoles verbaux concurrents et rétrospectifs ont été enregistrés, transcrits *in extenso*, codés et analysés. Les résultats indiquent une forte concordance entre l'opinion des professeurs et l'identification des types d'intelligence de Gardner par les étudiants. Il faudrait réaliser des études plus fouillées pour établir la validité et la fiabilité du profil de ces intelligences.

Have you recently observed intellectual development in an elementary school classroom only to realize that many of the students therein appeared as intelligent as the ones formally identified as "gifted"? If your response was in the affirmative, then what follows may interest you. Historically, views about intelligence have been polarized. At the more conservative extreme, the unitary view of intelligence reigns, a view depicting student potential as an almost innate birthright, more as a result of nature than of nurture. Intelligence is, from that viewpoint,

considered to be mainly a unitary mental entity. This single "general g" which is based, in the main, on reasoning and verbal abilities as reflected by standardized Intelligence Quotient (IQ) tests supposedly comes in varying degrees, with some possessing more of it than others (Eysenck, 1981; Freeman, 1950; Jensen, 1982; Piaget, 1971; Wechsler, 1958, 1974).

At the opposite end of the intellectual continuum, and more the focus of this paper, lies a pluralistic, incremental, and dynamic notion of intelligence, to be more precise, intelligences, or "frames of mind". This "many kinds of minds" notion is fostered by numerous theorists, in particular cognitive psychologists who postulate the existence of a much broader intellectual spectrum (Carroll, 1982; Davidson, 1990; Ceci, 1990; Das, 1992; Fodor, 1983, 1985; Gardner, 1983, 1987, 1990, 1993, 1995; Gould, 1981; Horne, 1979; Hunt, 1990; Resnick, 1976, 1979; Sternberg, 1979, 1985a, 1985b, 1986a, 1986b, 1991; Sternberg & Salter, 1982; Sternberg & Smith 1988; Turnbull, 1979). These researchers posit that intelligence involves, in the main, many "varieties of thinking" (Howard, 1990), and, according to Howard Gardner's Multiple Intelligences (MI) model, can be exemplified by all individuals in many diverse and multiple ways. However, little research currently exists relating such intellectual conditions to public school students (Blythe & Gardner, 1990; Sternberg, Okagaki, & Jackson, 1990; Olson, 1988), and virtually none exists as to how grade 8 students and their homeroom teachers perceive dominant student intelligences (from a perspective such as Gardner's). In other words, the relationship between Gardner's MI model and the self-perceived dominant intelligences of grade 8 students and their homeroom teachers has never been explored.

Multiple intelligences

At the classroom level, there are several reasons why teachers must foster the above broader approach to intellectual functioning. Gone are the days when a singular IQ score represents the sole sum of intellectual capabilities (Hatch & Gardner, 1986; Sternberg, 1985a). Due to space limitations, just two reasons shall be reiterated here. First, as intellectual development is dynamic and multifaceted, it is misleading to quantify the process of intelligence in the form of a single number (Armstrong, 1993, 1994; Blythe & Gardner, 1990). Yet, many schooling systems continue to do so by using the IQ score as the major criterion for including or excluding students from access to special resources (Armstrong, 1988; Kolligian & Sternberg, 1987; Maker, 1992; Maker, Nelison, & Rogers, 1994; Matthews, 1988; Scherer, 1985;

Sternberg, Okagaki, & Jackson, 1990; Vail, 1987). And in spite of constant references to domain specific intellectual competencies, multiple talents, or multiple gifts, to name just three, the "bottom line" for entrance into most special school options seems to be based mainly on a single IQ score.

Second, the practice of using IQ scores exclusively as the indicator of intellectual ability underestimates the tremendous potentiality within all students. Not only do such scores fail to "predict success in non-academic settings, but they also are poor predictors of success in school" (Maker, 1992, p. 12). The many "strengths" of pupils can be nurtured and cultivated, yet practice in most public schools continues to treat "intelligence" as a rational or analytic mind (Faggella & Horowitz, 1990; James, 1991). And finally, over the years psychometricians, in attempting to analyze the raw data behind the IQ test, have accumulated vast amounts of statistical data, in an attempt to isolate "primary mental abilities" — verbal, numerical, and spatial, among others. All capacities that can not be factored out are supposedly allocated to a general "g". However, the statistical assumptions involved in reducing such data are so narrow that very little of theoretical significance has ever come from them (Kornhaber, Krechevsky, & Gardner, 1990).

A more practical approach is Gardner's concept of "many kinds of minds": structured experiential learning that recognizes multiple intelligences and based more on the psychology of holistic learning. While established schooling has focused mainly on logical-mathematical and linguistic-verbal skills, Gardner (1982, 1987, 1989, 1990, 1991, 1993, 1995; see also Gardner, Kornhaber, & Wake, 1996) suggests that there are at least five additional "smarts." His model thus can be readily blended into programs, by providing teachers with a practical, thematic approach that will challenge children's thinking.

Using an elaborate set of criteria, including evidence from studies of brain damage, prodigies, developmental patterns, cross-cultural comparisons, and various types of tests, Gardner identifies seven central intelligences: (1) linguistic-verbal: a language-based competence requiring listening, speaking, reading, and writing skills, (2) logical-mathematical: dealing with abstract concepts, patterns, and symbols required for deriving scientific proofs, (3) visual-spatial: using mental imagery for discerning orientation in space, (4) bodily-kinesthetic: using physical body movements to express emotion, (5) musical-rhythmic: recognizing tonal and rhythmic patterns, and creating harmony,

(6) social-interpersonal: a social type of intelligence that operates primarily through person-to-person relationships and communication, and (7) solidarity-intrapersonal: an unaccompanied and intuitive style of learning useful in understanding the self. Gardner believes that each of these separate intelligences can be enhanced. More importantly, he places those five latter ways, figuratively speaking, on the **same** cerebral pedestal as the former two IQ-types. Gardner believes that each of the above domain-specific faculties may develop almost independently; he places no order of priority among them.

Research objectives

This study represented an attempt to blend Gardner's many kinds of minds to grade 8 students and their homeroom teachers. The students were asked to self-assess their own intellectual capacities. The study had three objectives: 1) to determine how grade 8 students interpreted their dominant intelligences as they interacted with characteristics representing each of the seven intelligences, 2) to see if homeroom teachers had a high level of agreement with the self-perceptions of grade 8 students, and 3) to investigate the usefulness of applying verbal data from student protocols as a meaningful problem-solving avenue when assessing the intellectual profiles of students. These objectives were operationalized through the following research question: How reliable are teacher nominations of students' dominant intelligences when compared with the self-perceived three dominant intelligences of the same students?

METHODOLOGY

Subjects

The study involved 34 grade 8 students between the ages of 12 and 14 years (mean age = 13 years, 7 months). The students consisted of 21 males and 13 females. They were drawn from five grade 8 classes from one public elementary school. The subjects were selected in the month of May, having been observed by their homeroom teachers since the previous September. Twenty-nine were Caucasian, four were Black, and one was Oriental. All were naive with respect to the research task, and all students voluntarily participated. An incentive for participating was the opportunity of understanding more about their own "intelligences."

As an added inducement, a follow-up home visit was arranged, eight months after the initial interview. During this second one-hour session,

subjects and their parents received literature delineating the overall research, including a sheet containing a vertical bar graph outlining their child's perceived intelligences (see Figures 1), and a verbatim copy of their protocols.

Materials

Two instruments were developed for this study: a Teacher Nomination Checklist and a set of Gardner Scenario Cards. The Teacher Nomination Checklist (see Appendix A) comprised intellectual characteristics grouped into seven categories, each category reflecting one of Gardner's seven dimensions. These characteristics were compiled from a literature review on Gardner. As described in more detail in the section that follows, the checklist was submitted to grade 8 homeroom teachers to nominate as research subjects students demonstrating a particular dominance in one of the Gardner dimensions. The Gardner Scenarios (see Appendix B) were developed from the Teacher Nomination Checklist and portrayed in paragraph format. The sentences (in the version shown to the subjects) were typed in large black print on white sheets of 8.5 x 11.0 inch paper.

Unknown to the subjects, dispersed among the characteristics of each scenario were at least two different characteristics borrowed from at least one of the other six dimensions. The reasoning for inserting these other characteristics into the scenarios was twofold: to encourage subjects to verbalize more, and to make their problem solving task (i.e., ranking their intelligences) more of an ill-defined nature. The single underlined sections (in the scenarios) highlight characteristics of a more positive nature and are borrowed from two of the other dimensions. The double underlined sections highlight characteristics of a more negative nature and, in a similar fashion, were borrowed from one of the other dimensions.

The decision to implement the scenario approach was considered the foremost way to represent common life situations to the subjects. Gardner's MI model was best viewed as the basis for educational reform, proposing reform that would immediately benefit students. Also, his model posited that individuals were somewhat intelligent in each intellectual dimension, stronger in some dimensions and weaker in others. Thus, the development of scenarios was considered a practical method for representing real-life situations. To sum, the Gardner scenarios attempted to ground a meaningful context, presenting subjects with practical intelligent situations within the confines of their lives, thus

presenting them with a "gestalt" or holistic picture for the seven intellectual dimensions.

Procedure

Subjects were selected on the basis of their performance on three criteria: 1) school grades, 2) achievement test scores, and 3) judgments from their homeroom teachers. Five grade 8 homeroom teachers were provided with a checklist showing a series of intellectual characteristics for each of Gardner's seven intelligences (see Appendix A). Participants were asked to have one of their parents complete a statement of consent to their participation. Consent forms were collected by the school principal, and individual times for each home interview were arranged.

Verbal Protocols

Verbal protocol analysis was selected as the methodology for this research project. Hayes (1981) defines a verbal protocol as a description of the activities, ordered in time, in which a subject engages while performing a task. According to Ericsson and Simon's theory (1980, 1984, 1993; see especially Ericsson & Oliver, 1988), the conventional method of getting subjects to verbalize their thought is to instruct them to "think aloud". And, to remind the subject to think out loud, the experimenter will often ask the subject to "keep talking."

Two types of verbal protocol procedures were used: concurrent verbalizations and retrospective comments. Concurrent verbalizations represent information that is still being attended to in short-term memory. Retrospective comments consider the information after the completion of the task-directed process. Ericsson and Simon (1993) argue that such retrospective verbalizations represent "a subset of the sequence of thoughts occurring during performance of a task [as] stored in long-term memory" (p. xvi). To that end, the rationale for using verbal protocol analysis as a method for assessing cognitive processing represents a central thesis for what follows (De Groot, 1965; Newell & Simon, 1972; Rowe, 1985; Schael & Dionne, 1991; Schoenfeld, 1985).

The following procedure was individually administered to the 34 subjects. Each interview lasted approximately 55 minutes. Upon arriving at the homes of the subjects, the investigator (the first author) informed subject and parents of the nature of the experiment and the requirements and benefits of participating in the study. Subjects were then interviewed in the absence of their parents who later returned to be

presented with the initial ranking results. Every semi-structured interview commenced with a warm-up exercise, the purpose of which was to familiarize the subject with the overall process of the methodology, in this case the verbalizing aloud procedure. When the investigator felt that the subject showed comfort with the underlying process and understood all of the instructions, the interview commenced. All verbalizations were audiotaped onto cassettes and considered as the primary source of field data.

During the interviews, the subjects were asked to complete three out-loud verbalization assignments: the initial two associated with concurrent verbal protocols; the final task was of a retrospective nature. First, subjects read aloud the scenarios. Then, they were asked to rank the scenarios by arranging (on a table) the seven (scenario) cards, from "most like me" (indicating that they strongly agreed with the scenario's characteristics) to "most unlike me" (indicating that they strongly disagreed with the scenario's characteristics). The three most dominant scenarios were placed in a row across the top of the table, with the card containing the scenario perceived to be most like the subject, in the upper-left hand corner. In the same manner, the three least dominant scenarios were placed at the bottom of the table, with the least dominant scenario located in the lower right-hand corner. The remaining scenario card, representing the subject's middle-of-the-road intelligence was centered between the other two rows of cards. During this and the subsequent two steps, subjects were encouraged to rearrange any or all of the cards, and at any time. To conclude the concurrent verbal protocol nature of the study, subjects were asked to verbalize, once again, their feelings on individual characteristics in each scenario, always commenting out loud either positively or negatively as to how they perceived themselves in relation to the nature of that intellectual characteristic.

Finally, the home interview concluded with the investigator posing the following five retrospective-type questions. After being asked to point to their most preferred and, in turn, to their least preferred scenario, subjects were asked: "Why do you think that scenario best represents you?" and "Why do you think that scenario least represents you?" Then, in order to gain additional retrospective verbalizations that would corroborate earlier concurrent protocols, subjects were asked two more questions: "What additional characteristics would you add to your 'most like me' scenario in order to make that scenario more like you?", and "What additional characteristics would you add to your 'least like me' scenario in order to make that scenario less like you?" And to conclude,

subjects were finally asked: "How confident do you feel about your rankings of the seven scenarios?" It was surmised that the responses to these five final questions were of a retrospective verbal protocol nature, and thus would delineate relevant supplementary field data thereby advancing the extent of representativeness and degree of confidence of the overall interview process (Ericsson & Simon, 1993). The encoding technique and scoring procedure for each out-loud verbalization is described in the section that follows.

DATA ANALYSIS

This section of the paper outlines how the raw field data were gathered, analyzed, and interpreted. First, protocols from the concurrent verbalizations were analyzed. Then, the retrospective verbalizations, reinforcing the concurrent verbalizations, were investigated.

Concurrent verbal protocols

After the audio cassette tapes were transcribed verbatim to 34 indi-vidual word processing text files, the captured verbatim comments were line numbered. Next, a coding grid was developed to convert the verbatim transcripts into a format accessible for verbal protocol analy-sis. The purpose of the coding grid was to record and produce "objective traces of the sequence of overt actions" (Schoenfeld, 1985, p. 283), in this case, every concurrent and retrospective verbalization. The coding grid was composed of a series of similar scales, each scale containing six ranking cells, ranging from "unlike me" to "good at" (see Table 1). The remaining four ranking cells were "don't enjoy", "not good", "like me", and "do enjoy." If a line number (from a verbatim transcript) was coded into a cell on one of the grid's three left-hand columns (see Table 2), the subject's verbalization to a characteristic was considered a negative statement; conversely, each time a line number was coded into one of the three right-hand columns, the verbalization was considered a posi-tive statement. Each negative statement was given a -1 value and each positive statement was given a +1 value. These values (i.e., -1 or +1) were then totaled and considered as one frequency count for that particular dimension. A separate coding grid was used for each subject.

An example of a subject's coding grid containing the line numbers representing out-loud verbalizations and including borrowed character-istics, is outlined in Table 2. Here, six line numbers (234, 240, 246, 254, 258, and 264) were placed in the three left-hand columns, and five line numbers (i.e., 227, 228, 229, 238, and 261) were placed in the three

TABLE 1. The verbal-linguistic dimension of the verbal protocol coding grid

Scenario 1A Verbal-Linguistic		unlike me	don't enjoy	not good	like me	do enjoy	good at
a1	a grade 8 pupil in French Immersion						
a2a	likes reading about biographies						
a2b	likes writing about biographies						
a3	often tells jokes in English classes						
a4	repeats tricky tongue twisters						
a5 5	enjoys playing piano & practicing						
a6	likes to play word games (directions)						
a7 -4	doesn't like to play any sport						
a8	likes memorizing poems						
a9	likes telling long detailed stories						
a10 7	will not often listen to teachers						

right-hand columns. Since the columns to the left housed only line numbers for negative-type verbalizations, the frequency count for those six comments totaled -6; conversely, the three right-hand columns housed five line numbers representing positive-type verbalizations, the total being +5. Thus, the sum, including any borrowed characteristics (-6 plus +5) was -1. In the same manner, when the borrowed characteristics were removed, the sum (-3 plus +5) was 2. As some scenarios contained more characteristics than others, all frequency totals were converted to percent. As outlined in greater detail below, these percent scores were used to determine the dominance dimensions for each subject.

As the homeroom teachers considered only the most dominant intelligence of each nominated student, just the subject's three highest rankings were analyzed and interpreted. These rankings (see Table 3) were combined in the following way: the column heading "Rank 1" contained the "most like me", or most dominant student response; the heading "Ranks 1 and 2" contained the "most like me" and "second most like me" responses. Likewise, the column heading "Ranks 1, 2, and 3" contained the top three dominant rankings, namely, the "most like me", the "second most like me", and the "third most like me" subject rankings. During the interview, the more dominant a scenario appeared to represent the subject's perceived intelligence, the higher the subject ranked that scenario. Thus, what follows outlines subject rankings by

TABLE 2. The verbal-linguistic dimension of the verbal protocol coding grid

Scenario 1A Verbal-Linguistic		unlike me	don't enjoy	not good	like me	do enjoy	good at
a1	a grade 8 pupil in French Immersion				227		
a2a	likes reading about biographies					228	
a2b	likes writing about biographies					229	
a3	often tells jokes in English classes						238
a4	repeats tricky tongue twisters	234					
a5 5	enjoys playing piano & practicing		240				
a6	likes to play word games (directions)			246			
a7 4	doesn't like to play any sport	248					
a8	likes memorizing poems	258					
a9	likes telling long detailed stories	✓				261	
a10 7	will not often listen to teachers	264					

revealing two sets of results: a wide range of agreement between homeroom teachers and their nominated students, and comparisons of results between different aspects of the same studied group.

First, when the Teacher Nomination (TN) was compared to the Student Perceived Profile (SPP) on Rank 1 alone, the level of agreement (i.e., between the five teachers and the 34 students) was 50%. When a similar comparison was made between TN and SPT+ (Student Profile Total including Borrowed Characteristics), the level of agreement on the dominant dimension was 29%. When a similar nomination was compared to SPT- (Student Profile Total excluding Borrowed Characteristics), the level of agreement increased to 38%. The difference in agreement level suggested a distraction effect from the borrowed characteristics.

Correspondingly, when the two higher rankings (Ranks 1 and 2) and the three highest rankings (Ranks 1, 2, and 3) were clustered together for comparison, results indicate a somewhat similar pattern. The agreement levels increased when the conditions for agreement were relaxed. For instance, when TN was compared with SPP, the increase in agreement grew to 74% when considering the relaxation Ranks 1, 2 and 3. A similar improvement pattern was shown when TN was compared with SPT+ and SPT-, respectively. The relaxed condition appeared to

favor the profiles, more so when the borrowed characteristics were excluded from the findings.

Before describing below a similar comparison involving both concurrent and retrospective verbal protocols, a short diversion is necessary. During a home interview, a father of one of the female subjects expressed concern that some of the scenarios contained bias against the female (n=13) population. More specifically, he felt that some of the scenario activities fostered male-type cultural associations. An analysis of the results from the concurrent verbal protocols showed no such marked difference. For example, when a comparison was made with the male subjects (n=21), the level of agreement was 43% on the highest ranking, 62% on the first two highest rankings, and 81% when the first three subject rankings were considered. Similarly, when the dominant dimensions of the female student (n=13) were compared to the teacher nomination, the level of agreement moved from 62% on the two higher rankings, to 69% when the three highest rankings were considered. Again, and as expected, the level of agreement increased when the agreement criteria were relaxed. To sum, the percent differences, while based on a modest number of subjects (n=34), did not appear to detect any significant gender bias.

Finally, Table 3 compares the initial scenario rankings of the students (SPP) to two other results: first, when the borrowed characteristics were included (SPP+) in the final calculations, and then when the borrowed characteristics were excluded (SPT-). Stated slightly differently, SPP is compared to the more detailed student profiles, SPT+ and SPT-, respectively. The dominant dimensions of each profile are compared to determine the agreement levels between three ways of identifying a student profile. For example, when the dominant dimension of SPP was compared to the dominant dimension of SPT+, the level of agreement was 44% on Rank 1. When a similar comparison involving the top two rankings was made, the percentage of agreement was 65%. When the top three rankings were included, the percentage of agreement was 79%. In like manner, when the sum of the borrowed characteristics were excluded from the results, the agreement was 35% on the most preferred ranking, 59% on the two dominant rankings, and 85% on the first three dominant rankings, respectively. In both instances, the percentages improved as the level of relaxation increased. As with earlier results, these findings suggest that, in the main, the presence of the borrowed characteristics may have aided the subjects as they were ranking the scenarios including their characteristics.

Concurrent and retrospective verbal protocols

One objective of the study was to compare teacher nominations to all of the dominant rankings as self-perceived by the students. Restated slightly differently and as a question, how did the retrospective comments reinforce the earlier concurrent verbalizations? The results are outlined in Table 4. When teacher nominations (TN) were compared to the dominant dimensions (DD), the level of agreement was 21% on the first ranking, 38% on the first two rankings, and 50% when the initial three subject rankings were considered. When TN was compared to all dominant dimensions, including the borrowed characteristics (DD[C+R]), the level of agreement was 29% on the first ranking, 53%

TABLE 3. Percentage of agreement on the dominance of Gardner's Dimensions

	THREE MOST DOMINANT RANKINGS					
Comparison of	Rank 1		Ranks 1 & 2		Ranks 1, 2, & 3	
Dominances	(f)	%	(f)	%	(f)	%
1. TN vs. SPP	17	50%	21	62%	25	74%
2. TN vs. SPT+	10	29%	18	53%	21	62%
3. TN vs SPT-	13	38%	2	6%	24	71%
4. TN vs SPP (males)	9	43%	13	62%	17	81%
5. TN vs SPP (females)	8	62%	8	62%	9	69%
6. SPP vs SPT+	15	44%	22	65%	27	79%
7. SPP vs SPT-	12	35%	20	59%	29	89%

Legend:

TN	=	(Grade 8 homeform) teacher nomination
SPP	=	(Most Dominant) student perceived profile (from interview ranking)
SPT+	=	Student profiles from totals including borrowed characteristics
SPT-	=	Student profiles from totals excluding borrowed characteristics

on the first two rankings, and 62% on the first three rankings. When TN was compared to the dominant dimensions including concurrent *and* retrospective verbalizations (DD[C+R]), the level of agreement was 24% on the most dominant rankings, 44% on the highest two rankings, and 62% on the first three dominant rankings. These statistics seem to suggest that the retrospective comments supported the concurrent verbalizations. And, as expected, the percentage of agreement increased as the criteria were relaxed.

When TN was compared to DD(CAR) for the male subjects (n=21), and for the female subjects (n=13), the levels of agreement were 29% and 15% on the first ranking, 43% and 46% on the first two rankings, and 62% and 62% on the first three rankings, respectively. Similar to

earlier results, the level of agreement increased when the agreement criterion was relaxed. And, resembling the conclusions reached earlier, the difference in percentage points between gender appeared inconsequential to justify any significant gender bias, on any of the initial three rankings. Next, when DD was compared to DD(C+R), the percentage of frequency agreement was 38% on the dominant ranking, 62% when the first two rankings were considered, and 74% when the first three rankings were considered. This increase suggests that the verbal protocols may have reinforced the initial scenario rankings.

To conclude, the significance of the retrospective verbalizations will be examined. First, when the dominant dimensions, excluding the bor-

TABLE 4. Agreement involving concurrent & retrospective verbal protocols

	DOMINANT RANKINGS (n = 34)					
Comparison of Dominances	Rank 1 (f)	%	Ranks 1 & 2 (f)	%	Ranks 1, 2, & 3 (f)	%
1. TN vs DD	7	21%	13	38%	17	50%
2. TN vs DDI	10	29%	18	53%	21	62%
3. TN vs DD(C+R)	8	24%	15	44%	21	62%
4. TN vs DD(C+R) males	6	29%	9	43%	13	62%
5. TN vs DD(C+R) females	2	15%	6	46%	8	62%
6. DD vs DD(C+R)	13	38%	21	62%	25	74%
7. DDX vs DD	12	35%	20	59%	27	79%
8. DDX vs DD(C+R)	18	53%	27	79%	29	85%
9. DDI vs DD	15	44%	22	65%	27	79%
10. DDI vs DD(C+R)	31	91%	32	94%	33	97%

Legend:

TN	=	Teacher nomination
DD	=	Profile of Dominant dimension obtained from ranking the scenarios by the student
DDI	=	Prifile of Dominant dimensions including any borrowed characteristics
DDX	=	Profile of Dominant dimensions excluding any borrowed characteristics
DD(C+R)	=	Profile of Dominant dimensions including concurrent and retrospective verbalizations

rowed characteristics (DDX), was compared to DD, the level of agreement was 35% on the first ranking, 59% on the first two rankings, and 79% when the first three most dominant rankings were considered. Likewise, when the retrospective verbalizations were included in the overall calculations, the category rankings were 53%, 79%, and 85%. Then, when DDI was compared to the dominant dimension, involving only concurrent verbalizations, the level of agreement was 44% on the first ranking, 65% on the first two, and 79% on the first three rankings. And finally, when the retrospective comments were added to the overall calculations, the rankings were 91%, 94%, and 97%, respec-

tively. Again, these latter results suggest a pattern similar to previous conclusions, namely, that the borrowed characteristics added stability in determining the dominant dimension of Gardner's intelligences. Of greater relevance for this qualitative study was how the percentages increased when the retrospective verbalizations were included with the earlier concurrent comments. In other words, the three highest rankings of the subjects represented a strong indicator when selecting their overall dominant dimensions.

Graphing intellectual profiles

During the second home visit, the first author presented a graphic profile of the above results to each subject. Due to space limitations, only one profile (see Figure 1) will be shown. The percentages, located over and under the vertical bars, indicate a relative frequency within each intellectual dimension. For example, subject 30 perceived the Solidarity-Intrapersonal dimension (see Appendix B) as the dominant (75%) intelligence; conversely, the Musical-Rhythmic dimension was perceived as the least preferred (-54%) intelligence.
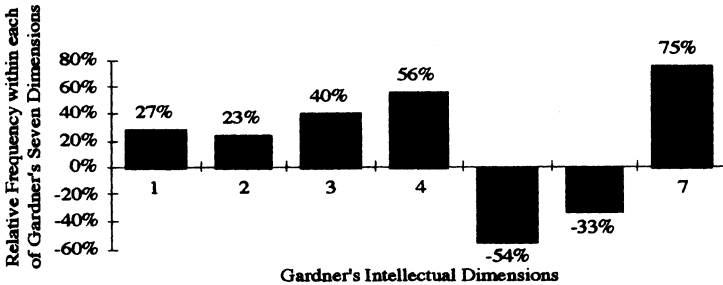

FIGURE I. Intelligence profile of subject 30

DISCUSSION

In this concluding section, four items will be discussed. Following remarks addressing the research question, comments will be offered on the advantages of conducting interviews in the homes of the subjects. Then, some educational implications will be examined. The paper concludes by suggesting additional research in this area.

Research objectives

This qualitative study involved homeroom teachers who nominated students considered dominant in one of Gardner's seven theorized intelligences. A series of verbal reports, considered as field data, were

gathered as the subjects self-assessed their intellectual dimensions. In short, they compared themselves to a series of scenarios. The scenarios utilized a common framework, presenting seven idealized grade 8 students within the confines of typical school life. An analysis of their out-loud verbalizations suggested that they could produce their intellectual profile, in fact, with considerable ease. They enjoyed and appeared confident when asked about the ranking process; they found the exercise to be quite a challenging task.

An analysis of both concurrent and retrospective out-loud student verbalizations indicated a strong level of agreement between the teacher nominations and the three dominant intelligences as self-perceived by the students. In other words, the homeroom teachers seemed able to pinpoint in their students one of Gardner's intelligences. Verbal protocol analysis appeared to be a meaningful way of assessing intellectual profiles. Or restated as a question, did the retrospective out-loud comments from the subjects reinforce the earlier and concurrent verbal protocols voiced during the home interview? As outlined, an analysis of the field data from the transcripts provided evidence that such retrospective statements seemed to reinforce initial student comments.

Having stated such tentative conclusions, the jury is still out – and may be out for some time – on the complex ways in which student intelligences might be organized within different intellectual domains, and on the interaction between such possible domains. Nevertheless, the attractiveness of Gardner's MI model is that it provides educators, especially classroom instructors, with a theoretical basis for stating something that they may have already hoped would be true: that their students exemplifying different skills, regardless of the frame of mind, be it language or logic, art or sport or music, communication with others or self-reflection, are really exemplifying just one of their "intelligences."

Home interviews

Most subjects commented that they felt privileged to participate in the pilot study. Specifically, they seemed to enjoy solving the ranking problem, in that it was not a test and that, for once, there were "no wrong answers." Some did however state that it was not an easy task to "look inside themselves" as they attempted to self-rank their intellectual profile. Others had difficulty with the "borrowed" characteristics. As was expected, the insertion of additional characteristics forced the subjects to qualify their rankings with additional verbalizations. All subjects expressed a strong interest in this intellectual form of self-analysis. This was the first time that they were ever exposed to this

interview format, or to paraphrase Das (1992), Sternberg (1985a), or Gardner (1987), that they were possibly ever exposed to an intellectual approach beyond IQ.

The parents of the subjects were most interested in the research objectives, and more importantly, quite pleased that this form of intellectual investigation was being conducted at this time. In particular, many mothers and fathers commented on the inferior quality of current state-funded public schooling, and were especially critical of assessment tools used to tap intellectual accomplishments. They questioned service delivery models currently in practice for the intellectually gifted child and were in agreement that Gardner's model showed intellectual "promise". Simply put, it was an enjoyable task for the first author to sit down in the homes of the research subjects and, in many cases, to be present with both parents, in an informal and relaxing manner, responding to their valid cerebral concerns. Of greater interest was the fact that almost all of the parents were pleased to see that something was being done in the line of seeking broader assessment instruments to measure intellectual potential within the educational community.

Twelve parents suggested that they wished they had been permitted to complete a nomination checklist, similar to the checklist completed by their son's or daughter's grade 8 homeroom teacher. They felt that such input might have improved the validity to the overall exploratory project. To sum, the home interview procedure was considered a positive medium for gathering raw field data. Subsequent qualitative studies of this nature would benefit from similar home involvement.

Educational implications

Many students are unaware of their inner talents, skills, competences, or, to coin Gardner's term, "intelligences." They often perceive themselves as educational "washouts." Such "talented" youngsters sometimes fail to realize that they may indeed have a learning strength in, at least, one of Gardner's dimensions. Such students frequently appear discouraged and withdrawn. At times, they even seem to become aggressive and rebellious, perhaps to mask their low self-esteem, due, in part, to their ignorance of their other "intelligences". It seems that, in many cases, public schooling practices tend to focus on the academic weaknesses of students at the expense of developing some of their other strengths, or talents – a process so often witnessed over the years by both authors.

Educators, especially those directly responsible for assessing intellectual performances, must retrain themselves into rethinking that intellectual

functioning in students is not a unitary "frame of mind" as traditionally assumed. Instead, they must intrinsically feel and believe that the minds of their students may have many "frames", or are pluralistic as to domain-specific contents. Then, these educators must continue research studies, more advanced than what was described in this paper. They must, in close collaboration with their classroom colleagues, devise statistically reliable and valid assessment instruments which will measure and train broader forms of intelligences.

CONCLUSION

This investigation was the first, to the knowledge of the authors, to conceptualize Gardner's MI model as the source for a problem-solving activity for grade 8 students and to utilize verbal protocols as a methodology. A thorough search of the literature associated with the above descriptors failed to reveal any research studies similar to what was discussed. Or, to put it another way, the methodology was highly exploratory in nature. Thus any conclusions presented here are highly speculative. They must be treated with extreme suspect, until replication with different samples and other populations have been clarified. Nonetheless, Gardner's conceptualization of intelligence deserves consideration.

The results as outlined might appear to the critical reader simply as bold generalizations. True, they are subject to additional empirical validation. Nevertheless, the above approach represents a step towards profiling student intelligences. Perhaps more important than any formal empirical findings, whether statistically reliable and valid, is that perhaps for the only time in their lives, these grade 8 students were singled out and respected for things they liked doing, their supposedly dominant intelligences (Morris, 1992a, 1992b, 1993a, 1993b, 1993c). Such attention to students in the long run may contribute more to their success in life than equal efforts to remediate their learning limitations (Sternberg, Okagaki, & Jackson, 1990). The qualitative research study outlined in this report represented the initial step in providing students with a chance to see their own possible intelligences. In the words of the late and great Zurich psychologist, Dr. Carl Gustav Jung, "The creative mind plays with things it loves" (Lincoln & Suid, 1986).

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APPENDIX A: TEACHER NOMINATION CHECKLIST

A Verbal / Linguistic Student
- is acutely sensitive to the meaning of words and their order, sounds, rhythms, and inflections
- can freely grasp different functions, phonology, syntax, semantics, and pragmatics of language(s)

A Logical / Mathematical Student
- enjoys responding to inductive and deductive thinking and reasoning exercises
- can easily recognize complex scientific patterns, including abstract mathematical relationships

A Visual / Spatial Student
- uses initial perceptions accurately when perceiving the visual world accurately
- can easily recreate aspects of one's visual experience, even in the absence of relevant stimuli

A Bodily / Kinesthetic Student
- uses the body in highly differentiated and skilled ways, for goal-directed and expressive purposes
- works well with objects needing fine-motor finger and hand movements to gross-motor actions

A Musical / Rhythmic Student
- is most sensitive to melody, rhythm, timbre, and the emotional aspect of sounds
- can easily recognize beats, pitch, tonal patterns, including various environmental sounds

A Social / Interpersonal Student
- knows others well by recognizing faces, voices, and persons; can react quickly to their wants
- reads easily the social signals of others, and comprehends their motives, feelings, and intentions

A Solidarity / Intrapersonal Student
- is most sensitive to one's own feelings, wants, fears, and personal history
- is aware of and can respond to one's strengths and limitations with considerable grace and ease

Note 1: Due so space limitations, the characteristics from the original "Teacher Nomination Checklist" were summarized. Interested readers may contact the first author for the complete list.

APPENDIX B: GARDNER SCENARIO CARDS

Scenario 1   *Verbal / Linguistic*   *Melissa, the Word Player*

Melissa is a grade 8 student in a French Immersion program. She really likes reading and writing about the biographies of famous Canadians. During many of her English classes, she often tells jokes and repeats tricky tongue twisters. <u>She is an excellent piano player who enjoys daily practicing</u> (+5) (see Note 1). Also, Melissa likes to play word games that involve many directions. <u>She does not enjoy playing any kind of sports</u> (-4). Melissa likes to memorize poems and tell long detailed stories. <u>On many occasions, she will not listen to what her teacher tells her to do</u> (+7).

Scenario 2   *Logical / Mathematical*   *Shawn, the Questioner*

Shawn likes to solve difficult arithmetic problems and figure out complicated designs in geometry. <u>He is not very good in music class, as he can not remember how to sing songs</u> (-5). He is always asking those very difficult questions. He is very good at doing arithmetic in his head, and he is one of the best students in the computer class. In science class, he is often the first student to understand and complete the science experiment. <u>Shawn also likes to draw and sketch scenes</u> (+3). <u>During gym classes, he is known by his classmates and teacher as having strong leadership skills; he is often selected to be a team captain. He seems to have a special way of knowing how to handle the players on his team</u> (+6).

Scenario 3   *Visual / Spatial*   *Chris, the Visualizer*

Chris is the school's chess champion. He often daydreams in class. He appears happiest when his science teacher allows him <u>to go to his own quiet corner</u> (+7) to design and then invent gadgets using construction sets such as "Leggo", "Meccano", or "Gearopolis". <u>He also likes "to express himself" through dance, drama, and movement</u> (+4). Also, he seems to learn best when allowed to sketch or draw cartoon characters. At times, he seems to learn more through visuals, that is, when pictures accompany words, as in the game of "Pictionary". Chris finds it easier to understand the information in a subject when his teacher writes short notes on the chalkboard. <u>He does not like to read books, tell stories, or write short stories</u> (-1).

Scenario 4   *Bodily / Kinesthetic*   *Paul, the Mover*

Paul plays the center position on the school hockey team and the end position on a community football team. He also is good at tennis, skiing, and swimming. <u>He enjoys figuring out how things work with numbers</u> (+2). During a recent Christmas concert, he performed a break dance. <u>However, he does not like to memorize poems. He finds it difficult to discuss out loud any topics in English class; he has problems remembering</u> (-1). A member of the Innovator's Club, he enjoys inventing gadgets by taking apart and reassembling small machines such as food grinders, old clocks, and broken radios. <u>Finally, Paul seems to be able to understand how many of the other students in his class "think"</u> (+6).

Scenario 5   *Musical / Rhythmic*   *Nicola, the Music Lover*

Often referred to by her classmates as a "music lover", Nicola learns best when surrounded by melody and rhythm. She can be found singing, humming, or whistling tunes to herself. <u>She often gets into fights with other grade 8 students; thus, she has a real problem getting along with others</u> (-6). She likes poetry, songs, and composing melodies. <u>She enjoys the printed word, as she loves to read books and play word games such as</u>

<u>Scrabble</u> (+1). She is most sensitive to sounds around her — sounds such as distant bells ringing or crickets chirping. In fact, she often hears things missed by her classmates, and even by her music teacher. <u>She often daydreams in class, pretending that she's a magical being in fabulous adventure stories</u> (+3).

Scenario 6   Social / Interpersonal   Sara, the Socializer

Elected by her classmates as the class president, Sara recently became absorbed with her older brother's <u>computer; she especially loves to experiment with the word processor</u> (+1 & +2). <u>She enjoys many team and individual sports; in fact, she was just selected by her coach as captain of the community's softball team</u> (+4). She seems to be so "street-smart". She loves to be involved in class plays, skits, and classroom planning commit-tees. When someone cries during class, Sara can usually be found at that person's side correctly identifying and soothing her emotions. <u>She does not like to participate in art class, as her sketches, drawings and paintings are usually poorly-formed</u> (-3).

Scenario 7   Solidarity / Intrapersonal   Jeff, the Individual

Jeff is that type of grade 8 student who prefers being left alone to work; however, he is not afraid to ask others for help. He is a quiet student, has few friends, and seems to know himself very well. <u>He enjoys drawing sketches of imaginary characters</u> (+3). <u>He has difficulty figuring out the answers to arithmetic problems</u> (-2). He often dresses, acts, and behaves in his own way. He enjoys a private place to pursue his own personal hobbies and ongoing interests. <u>In fact, Jeff's teacher was amazed when he recently took apart the clock that was not working and put it back together. She was even more surprised when it worked</u> (+4).

Note 1: All underlines and brackets, including positive and negative numerals were not in the version shown to the research subjects. They have been inserted here to show the more interested reader how the process of "borrowed characteristics" was operationalized. For example, in Scenario 1, the "+" in the "+5" indicates that that characteristic was of a positive nature; the "5" in the "+5" indicates that the meaning for that added characteristic was borrowed from Scenario 5.

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