Chapter 23

Detection of Children's Malingering on Raven's *Standard Progressive Matrices**

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Abstract

A formula for detecting faked Raven's *Standard Progressive Matrices* profiles was cross-validated on 44 children and adolescents (ages 7-17). It yielded a false negative rate of 64%. However, a rule using three very easy items (i.e., any of A3, A4, or B1 missed) yielded a hit rate of 95%, with 5% false positive and negative rates. All but two of the participants were able to produce lower scores when asked to fake the test.

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David Faust (Faust, 1996; Faust, Ziskin, & Hiers, 1991) and Richard Rogers (Rogers, Harrell, & Liff, 1993) have documented the need for detection of neuropsychological malingering. To solve the problem, Gisli Gudjonsson and Harriet Shackleton (Gudjonsson & Shackleton, 1986) validated a formula using Raven's *Standard Progressive Matrices* (Raven, 1958). The formula has the distinct advantage of being usable on protocols given in the past, as it requires no special administration procedures. The formula was cross-validated (McKinzey, Podd, Krehbiel, & Raven, 1999) on 46 experimental malingerers and 381 people from the adult standardization sample (Raven, Raven, & Court, 2000). The formula yielded a cross-validated 26% false negative rate and a 5% false positive rate.

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However, the formula was validated and cross-validated on adults, and one does not have to be an adult to fake a psychological test. Faust has also documented the ability of normal adolescents (Faust, Hart, Guilmette, & Arkes, 1988) and children (Faust, Hart, & Guilmette, 1988) to produce abnormal neuropsychological test results that are believable and undetectable by the same methods that are useful in detecting cortically based neuropsychological deficits.

The formula was therefore applied to a sample of children and adolescents.

Method

Participants

All 44 participants came from schools in Vienna, Austria. All were white. Girls comprised 57% of the sample. Age range was 7-17 (M = 12.5, SD = 2.6), with 9 in the 7-10 age range, 27 in the 11-14 range, and 8 in the 15-17 range. Their total score range was 18-59, M = 43.95. Using the US norms (Raven, 2000), their percentile range was 24-99, M = 65.9.

Procedure

Parents signed consent forms. All participants were given Raven's *Standard Progressive Matrices*. The test was administered according to standard instructions (Raven et al., 2000). Then, the same participants were asked to take the test again, this time with the instructions (in German): *We know that some people don't try their best on this test. We'd like to find a way to catch them. To help us, please do as badly on this test as you can, without getting caught.*

The Raven answers were applied to the formula (2A + B) - (D + 2E), where A, B, D, and E refer to the number of correct responses in each of the Raven subsets (Gudjonsson & Shackleton, 1986; McKinzey et al., 1999). The result of the formula is termed the "rate of decay", and is compared to the rate of decay by total score cutoffs (see McKinzey et al., 1999, for details).

Results

In the faking condition, the participants produced total scores (range = 2-59, M = 9.6) and percentiles (range = 1-99, M = 6.3) substantially below that of the normal condition, with a mean difference between the two conditions of 34 ($t = -14.003$; $p < .0001$) and mean intrasubject total score differences of 34 (SD = 15.36, range 1-57). Not surprisingly, using the formula cutoffs validated for adults proved highly inaccurate, with a false positive rate of 7% and a false negative rate of 64%.

The inaccuracy rates were minimally artificially elevated by the participants inability to fake the test. Other studies (e.g., Heaton, Smith, Lehman, & Vogt, 1978; McKinzey, Podd, Krehbiel, Mensch, & Trombka, 1997) have found that some participants are unable to fake a given test sufficiently to produce abnormal results, a problem referred to as a "threat to external validity" (Rogers & Cruise, 1998). Such ineffectual faking attempts are of little consequence in interpretation, since the difference between the true and actual scores will be minimal. However, one of the participants had no difference between the two conditions, and another did one item better! When these two participants were eliminated, the false negative rate dropped by only 2 percentage points. Changing the cutoff points was the obvious next step, but visual inspection revealed a far more obvious (and accurate) method of detecting the participants in the faking condition.

According to the standard instructions, the testee must agree to the correct answers to the first two items. The third item is very easy, and only one of the participants (an 8 year old girl who produced an average Raven IQ score) answered it incorrectly. When these same participants malingered on the test, item A3 was overwhelmingly answered incorrectly. Table 23.1 presents the classification results of the simple rule that a testee getting item 3 incorrect is showing insufficient effort. The hit rate of the rule is 90%, with a false positive rate of 2% and false negative rate of 17%. Combining the item 3 rule and the rate of decay formula decreased the hit rate by 1%.

Using analyses of item difficulty (Raven et al., 2000) as a guide, items A4 and B1 were similarly identified as increasing the hit rate. Table 23.2 presents the classification results, removing the two unsuccessful faking participants. Applying the rule that missing any of items A3, A4, or B1 (all extremely easy items) should be interpreted as showing insufficient effort produces a 95% hit rate, with equal false positive and negative rates of 5%. The two false positives were the 8 year old girl (normal condition total score = 21, 44th percentile) and an 11 year old girl (normal condition total score = 35, 34th percentile). The two false negatives were a 12 year old girl (faking condition total score = 19, down from 34) and a 14 year old girl (faking condition total score = 34, down from 53).

Table 23.1. Item 3 Rule Results

	Formula result		
	Raven faked: *n* (% of row)	Raven not faked: *n* (% of row)	Totals
Malingering condition	35 (83)	7 (17)	42 (100)
Normal condition	1 (2)	41(98)	42 (100)
n	36	48	84

Note. Percentages are rounded. The chi-square statistic is highly significant (Chi-square = 58.37, p <.0001; Fisher's Exact p < .0001). The table does not include the two participants who did not produce malingered scores.

Table 23.2. Item A3 or A4 or B1 Rule Results

	Formula result		
	Raven faked: *n* (% of row)	Raven not faked: *n* (% of row)	Totals
Malingering condition	40 (95)	2 (5)	42 (100)
Normal condition	2 (5)	40 (95)	42 (100)
n	42	42	84

Note. Percentages are rounded. The chi-square statistic is highly significant (Chi-square = 68.76, p <.0001; Fisher's Exact p < .0001). The table does not include the two participants who did not produce malingered scores.

Discussion

There are few methods of detecting faked IQ test results. Other cross-validated methods are available to detect malingering of neuropsychological deficits: for example, the *Test Of Malingered Memory* (TOMM), a commercial product designed to detect neuropsychological malingering, is a stand-alone measure with a 5% false negative rate (Rees, Tombaugh, Gansler, & Moczynski, 1998). The Luria-Nebraska Neuropsychological Battery (LNNB) is a comprehensive neuropsychological test whose within-test malingering formula has a 17% false negative rate (McKinzey et al., 1997). However, neither is an IQ test, and do not have the same place in a battery as the Raven. More importantly, no test, including the TOMM and LNNB, has published malingering measures validated on children or adolescents (as of this writing).

There are many identifiable groups that were not included in this study. For example, there were no neurologically impaired patients, people with tested IQs below 70, or forensic samples. The current subjects are all Austrian, although the Raven is widely used with people speaking a wide range of languages. The faking formula should be cross-validated with such groups in future research, and appropriate interpretive caution employed until such research is done.

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