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Intelligence and Intelligence-related Personality Traits

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Psychologists have searched for personality traits related to intellectual performance for nearly a half century. The greatest success has been obtained with traits that are closely related to intellectual functioning, as opposed to more general personality traits. Intellect-related traits include such characteristics as curiosity, but may also include less studied traits. A 76-item test of intellect-related personality traits was developed, measuring both traditional traits as well as less studied ones such as absorption. The test was administered to a group of 150 individuals, of whom 46 were Gifted children, and the remainder were either part of a chronological- or mental-age comparison group. Three component-based traits were obtained: *Intellectual Absorption, Apathy,* and *Pleasure,* and these were found to be related to intellectual performance.

Psychologists have searched for personality traits related to intellectual performance for more than half a century (e.g., Baron, 1985; Wechsler, 1943, 1950). Some work on the personality–intelligence connection has examined the relation of general personality traits such as extraversion, neuroticism, or locus-of-control with intelligence. A recent series of studies, for example, has examined the relation between extraversion and spatial versus verbal IQ (Robinson, 1985, 1986). Traits such as extraversion and neuroticism have not typically been considered intelligence-related, however, and with the exception of the work by

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Robinson, there has been little success at finding any systematic relations between such general traits and intelligence (Cattell & Butcher, 1968; Middleton & Guthrie, 1959).

A more productive search has examined traits within a gray area between intelligence and general personality, an area so closely related to intelligence that exactly where intelligence ends and general personality begins is unclear. Some of this research has yielded more consistent relations to intellectual performance (Hogan, 1980). For instance, relations are known to adhere between achievement motivation and performance (Atkinson, 1958), and between curiosity, self-confidence, and intellectual performance (Harter & Zigler, 1974; Zigler & Hodapp, 1986).

Still, relations have been modest. Sternberg & Salter (1981) have written that except for very preliminary research on reflectivity, "We have found the literature on cognitive styles generally disappointing, and . . . we would not have been inclined to endorse further research on styles with anything but lukewarm enthusiasm" (p. 13). After a half-century of personality research, the evidence suggests that personality traits have, at best, small relations to intellect and intellectual achievement.

Such a pessimistic outlook should be tempered in view of the fact than an exhaustive examination of all personality traits has yet to be made. Although the research thus far might seem exhaustive of the predictive possibilities, Buss and Craik (1985) suggested that there are personality traits other than those commonly proposed which may each have their own theoretical and behavioral implications; these authors go on to recall an earlier warning by Dahlstrom, that:

> "The fact that the known species in either zoology or botany numbers in the millions serves to shame the pretenses of any behavioral typologist who seeks to employ at most a dozen 'species' of personality organization to account for human behavioral diversity (Dahlstrom, 1972, p. 6)."

It is therefore at least possible that some overlooked trait might yield better results, with candidate traits examined for their logical relation to performance rather than for their widespread usage. One such candidate trait was identified within the hypnosis literature. Hypnosis is a promising domain to examine because hypnotic ability has often been related to such mental abilities as creativity (Bowers & Van der Meulen, 1970; Lynn & Rhue, 1986).

Hypnotic ability, like intelligence, was long thought to be independent of any personality trait. Through a lengthy trial-and-error process, however, a personality trait that predicted hypnosis was found and named absorption (Tellegen & Atkinson, 1974). This trait describes an involvement in internal experience along with a blocking out of the external world. Because such a trait may measure qualities associated with attention and creativity, a recasted version of the trait focusing on *intellectual absorption* may be related to intellect. Further evidence

that such a relation might exist comes from the *intellectual flow* literature (Csikszentmihalyi & Larson, 1984; Getzels & Csikszentmihalyi, 1976). Flow exists when people create a challenge that enables them to maximally channel mental energy into a problem. The resulting experience is accompanied by a perception of an effortless flow of intellectual (or creative) energy that, despite being described from a different conceptual framework, sounds remarkably like absorption.

Observations of geniuses, in fact, suggest that they experience absorbed, flowing involvement in their intellectual work. The single-minded absorption of Newton, Michelangelo, and others illustrates this notion (Ashby & Walker, 1968; Clements, 1963, p. 114). So intense and complete was Newton's absorption in his work, for example, that no one knew him well enough to record the rest of his life (Ashby & Walker, 1968). Another example involves the mathematician Feigenbaum and the development of chaos theory. Immersing himself in modeling irregular objects, Feigenbaum took so many plane trips to study the irregular patterns of clouds, that Los Alamos Laboratories was forced to suspend his scientific travel privileges (Gleick, 1987, pp. 1–2).

In the present study, items measuring intellectual absorption and flow were combined into a scale with more traditional intellect-related traits such as curiosity and intellectual self-confidence. These items were subjected to a principal components analysis to determine (a) whether intellectual absorption and flow are the same, (b) whether intellectual absorption and flow differ from general absorption, (c) their relation to other intellect-related traits such as curiosity, and (d) whether they discriminate groups differing in intellectual achievement. To test this last hypothesis, the scale was administered to children who had demonstrated sufficiently high intellectual performance to be labelled gifted, as well as to comparison mental- and chronological-age persons. The mental-age comparison group ensured that group differences were due to rapid *rate* of intellectual growth, and not simply due to a general advanced level of intellectual functioning on the part of the gifted. This mental-age comparison group is by itself an insufficient comparison because it was chronologically older. A second, chronological-age comparison group insured that group differences were not simply due to the gifted group's younger chronological age. Mental-age of two of the groups was estimated using SAT's; thus, the classification system depends upon acquired knowledge as measured by achievement tests. Such measures are appropriate because intellectual giftedness involves not only aptitude and competence, but the manifestation of intelligence in performance and achievement.

METHOD

Subjects

Subjects were 46 gifted students (26 male; 20 female; M age = 13.7; S = 1.1) attending the Duke University Talent Identification Program (TIP) summer pro-

gram. Admission to the TIP summer program is based on a minimum score of 500 on the Verbal and 560 on the Math sections of the Scholastic Aptitude Test, obtained in the seventh grade. The mean scores for those enrolled are 511 Verbal and 562 Math. In addition, 51 Duke University undergraduates comprised the mental age comparison group (20 male; 31 female; M age = 18.2; S = 1.3). In the absence of ability tests, we estimated the ability of this group by referring to the average SAT admissions scores at Duke, which are about 610 Verbal and 683 Math (Cass & Birnbaum, 1985). While this comparison group may be somewhat higher in mental age than the gifted students group, such a difference should make any superiorities among the gifted group more clearly an indication of their rate of development. The chronological-age comparison group was comprised of 53 seventh-and eighth-grade students (25 male; 28 female; M age = 14.4; S = 0.91) from the Durham, North Carolina, school district. Within the school, students were educated in separate MR/LD, normal, and gifted tracks. All control students came from the normal track, and can therefore be assumed to be of average intelligence.

Intellectual Experience Scale

The Intellectual Experience Scale was composed of 76 items describing attitudes about intellectual experience. To develop items that measured intelligence-related traits, unstructured interviews were first conducted with colleagues to determine what it was like for them to think intellectually. Our colleagues who had experience with (or were themselves) gifted individuals were also asked to try to describe what it was like for a highly intelligent person to think. From these interviews, and from the literature cited above, test items indicating the presence or absence of a given trait were generated and then classified into the following domains, with the number of scale items for each domain listed in parentheses:

Intellectual Absorption occurs when people immerse themselves deeply into an intellectual experience and cannot be deflected from it. Absorption items are typically lengthy, so as to capture specific feelings. For example, "Sometimes when I'm thinking about a topic, I'll get so involved in it that I'll really forget about everything. I forget about so much other stuff it's almost frightening." (30 items)

So as to better understand Absorption, the following traits were also examined:

Intellectual Confidence describes the confidence one feels about problem solving (Harter, 1982; Piers & Harris, 1969). People with high intellectual self-esteem were expected to endorse such items as, "I am intellectually confident much of the time." While several of these items are, at least at the level of face validity, asking "how smart" a person is, there is ample evidence that self-

perceptions of intellectual ability are not always in line with the actual level of intellectual performance (see, for instance, Harter, 1982). (9 items)

Intellectual Curiosity involves the motivation to investigate one's surrounding world. Curiosity and daydreaming occur more frequently in the gifted than in the average child (Henderson & Gold, 1983). People high in curiosity were expected to endorse items such as, "When I get interested in something I have to read everything there is on the subject." (12 items)

Intellectual Values and Pleasure may accompany high achievement. People with intellectual values were expected to endorse items such as, "When I'm working on a problem, not necessarily solving it but just understanding it more, it justifies my existence." (19 items)

Intuitive and Insightful Thought may well be an aspect of the intellectually gifted (Sternberg & Davidson, 1983). Intuitive thinkers were expected to endorse items such as, "Often when I first see a problem the answer just occurs to me. Later on if it is important I'll go back and figure out the reasoning behind it." (6 items)

Absorption Marker Variables. To know when absorption was being measured, items known to heavily load on an absorption factor (Tellegen & Atkinson, 1974) were interspersed into our scale. These will be referred to as the Absorption Marker Subscale. (8 items)

Procedure

All subjects were tested in group settings. Instructions for completing the test were contained in the booklet, and requested the subject to indicate how much they agreed with each item on a five-point Strongly Agree–Strongly Disagree scale. There was no time limit for completion of the scale, but most students completed it within 10–15 minutes.

RESULTS

Principal Components

Our first objective was to reduce the scale items into their principal components based on their empirical intercorrelations. Such an analysis was also conducted to reduce the number of tests on mean differences among the groups.

The principal components analysis, excluding the eight Absorption marker items, yielded 27 components with eigenvalues greater than 1.0. There was, however, an unambiguous elbow in the eigenvalues at the third component (the first five eigenvalues were: 10.7, 5.0, 3.1, 2.7, and 2.5). According to the scree criterion, therefore, three components should be the solution of choice. For

clarity of interpretation, this solution was rotated according to a varimax criterion.

Next, component-based scales were developed so as to have a good measure of each component and better understand its content. Although factor loadings are commonly used by researchers to construct scales, the factor score coefficient matrix, based on a regression extraction, was used here because its coefficients best insure orthogonality when varimax rotations are used. A coefficient cutpoint was chosen so as to select about a third of the items loading highest on a given scale (above +/− 0.06). This yielded three scales with means, standard deviations, intercorrelations, and coefficient alpha reliabilities shown in Table 1. The three scales are essentially independent and have quite good coefficient alpha reliabilities between .78 to .81. The component loadings of these items are shown in Table 2.

The scale items clearly define three distinct qualities of intellectual experience. The first component, *Intellectual Absorption* (21 items), describes an ability to become involved and caught-up with the intellectual process, along with flow experiences. The highest loading item on this scale was, "At times, even the most intense concentration seems to require almost no energy at all of me." The second component, *Intellectual Apathy* (18 items), describes a feeling that intellectual thought is distasteful, uninvolving, and difficult. The highest loading item on this scale was, "I wish I could get involved in something, but my mind often wanders from one topic to the next". The third component, *Intellectual Pleasure* (21 items), describes a more pleasurable approach to thinking in which it is also viewed as important, but lacking in "flow" quality. The highest loading item on this scale was, "Sometimes when I'm working on a problem I find myself saying something like, 'Gosh, I like this!' or 'This is really fun.'." Together, the three components explain about 52% of the common variance of the first 10 components of the scale.

Relationships Among Intellect-Related Traits

The fact that intellectual absorption and flow were essentially equivalent among these groups was demonstrated by the extraction of a first component that includes them both. Another hypothesis examined was whether the intellectual

TABLE 1
Intercorrelations and Reliabilities for the Three Scales

	Scales			Alpha
Scales:	Absorption	Apathy	Pleasure	Reliabilities
Absorption				.78
Apathy	−.16			.80
Pleasure	.14	−.05		.78
Composite score	.70	−.62	.61	.81

TABLE 2
Items Used in the Final Component-Based Scales and Their Loadings on the Components Above .30[a,b]

	Component		
	Absorption I	**Apathy II**	**Pleasure III**
Items in Component-Based Scale One			
42. At times, even the most intense concentration seems to require almost no energy at all of me.	.63	—	—
16. It is difficult to distract me when I'm thinking hard about something[3R].	.57	—	—
80. Sometimes when I'm thinking about a topic, I'll get so involved in it that I'll really forget about everything. I forget about so much other stuff it's almost frightening.	.56	—	—
66. Sometimes my thinking just seems to flow in the right direction to solve a problem, entirely on its own.	.56	—	—
36. When I'm concentrating it is sometimes as if other people just don't exist.	.55	—	—
28. Sometimes I imagine a problem so vividly that it is almost as if I were living in the midst of it.	.52	—	—
45. I can solve most intellectual problems better and faster than other people.	.50	−.31	—
73. When I'm working on a problem, not necessarily solving it but just understanding it more, it justifies my existence.	.48	—	—
19. When I get interested in something I have to read everything there is on the subject.	.45	—	—
53. Often, when I first see a problem, the answer just occurs to me. Later on if it is important I'll go back and figure out the reasoning behind it.	.44	—	—
85. When I'm working on something that's really interesting, I'm not even aware of other things going on around me.	.42	—	—
37. I know it is impolite, but sometimes when people talk to me my mind is far away, thinking about some intellectual problem that I'm interested in.	.42	—	—
12. There are times when concentrating feels like an effortless flow of energy.	.40	—	—
57. I read a great deal.	.40	−.36	—
17. I get really involved in what I'm doing in the present—so involved that sometimes I don't think very much about the past or future.	.33	—	—
05. (R) My life goals and plans for the future are not very clear to me.	−.25	—	—
Items in Component-Based Scale Two			
27. I wish I could get involved in something, but my mind often wanders from one topic to the next.	—	.64	—

(*continued*)

TABLE 2 (*Continued*)

		Component		
		Absorption I	Apathy II	Pleasure III
61.	"Intellectual" thinking is just a chore; there are more important things in life than that.	—	.60	−.31
20.	I'm not very good at intellectual problem solving.	—	.56	—
02.	I am not interested in abstract intellectual arguments.	—	.56	—
63.	It is difficult to understand how the great thinkers in history kept up their interest in what they were studying.	—	.55	—
65.	I try to do well in school or at work, but there are things I am much more interested in pursuing than debates about issues that have little to do with my life.	—	.54	—
10.	I can solve many problems easily, but few keep my attention for long[1].	—	.51	—
69.	What is most important to think about is how to meet specific goals—not abstract ideas.	—	.47	—
74.	I rarely feel intellectually confident.	—	.46	—
26.	I solve only problems that need to be solved. Thinking about a subject is sometimes important, but it is foolish to build a life-purpose or self-image about being able to solve problems.	—	.46	—
56.	Other people can easily distract me when I'm trying to concentrate[1R,3].	−.42	.44	—
09.	Thinking too much robs you of the rich experiences of life.	—	.42	—
51.	You could say my way of thinking is more intuitive than logical.	—	.40	—
52.	The best thinking always requires an enormous amount of energy[1R,3].	−.35	.39	—
67.	To me, problem solving is nothing more or less than a way of achieving my specific life goals.	—	.37	—
64.	Sometimes when I talk about something exciting that has been interesting to me, I rush through all the basic material to get to the point, and I do it so fast that other people can't understand me.	—	.36	—
77.	When I work on a problem it is purely an intellectual sort of thing and I don't feel either frustration or happiness about it.	—	.36	—
Items in Component-Based Scale Three				
44.	Sometimes when I'm working on a problem I find myself saying something like, "Gosh, I like this!" or "This is really fun."	—	—	.60
34.	When I get into an intellectual discussion about something, I may dwell on the problem for hours, days, or even weeks afterward.	—	−.31	.59

TABLE 2 (*Continued*)

		Component		
		Absorption I	**Apathy II**	**Pleasure III**
40.	I get chills down my spine when I'm really excited by an idea, my voice rises, and other people can often sense my excitement[2].	—	—	.58
50.	After I've gotten an insight into a really difficult problem I feel very good about it.	—	—	.56
18.	At times when I'm thinking about a subject and I get an insight, I experience a rush—I breathe faster and my pulse goes up in a pleasurable way.	—	—	.53
15.	(R) Intellectual discussions never solve anything and are usually boring and a waste of time[1].	—	.42	−.52
29.	Thinking about something I'm really interested in is something I really enjoy.	—	—	.52
83.	When I get interested in something, time goes by really fast.	—	—	.51
54.	When I get into an intellectual argument about something with a close friend, I sometimes want to continue the argument over a period of days.	—	—	.50
07.	When I understand what I'm studying, it makes me understand more about the subject, and I also understand more about myself.	—	—	.45
70.	I feel most intellectually able when I'm deeply involved in a problem.	—	−.30	.43
46.	(R) I don't let my ideas run my life; I wouldn't go out of my way to write them down or tell others about them.	—	—	−.43
59.	Sometimes I gasp and suddenly realize that I've gotten a new insight and have really been involved.	—	—	.43
14.	If I can come up with a new way of thinking about something, it makes me feel really good—closer to nature. It is like a religious experience to me.	—	—	.40
22.	I like to work on something until I get it perfect—to do the very best I can.	—	—	.34
60.	I try to set aside definite periods of time for thinking about things that interest me.	—	—	.34
79.	(R) The business person and the engineer are more important to society than are the artist or scientist[1].	—	—	−.32
24.	Thinking about your life is really important.	—	—	.30
Common Variance Explained of the First Ten Components:		30%	14%	8%

[a]Scale construction is based on the factor score coefficient matrix, not on component loadings, and therefore the scales are not directly determined by the loadings shown in this table. (See text)

[b]Items used on more than one scale are footnoted (see footnotes 1, 2, and 3, below); "R" denotes reverse scoring.

[1,2,3]These superscripts indicate items that load on scales in addition to their primary scale. A "1" indicates that the item also loads on scale one, a "2" in indicates that it loads on scale two, a "3", on three.

absorption component as measured here was the same as Tellegen & Atkinson's (1974) general construct of absorption. This possibility was contradicted by the correlation between the first component and the absorption marker scale of r (149) = .46, despite the good reliabilities of each scale (.81 and .78, respectively). Therefore, although general and intellectual absorption share some variance in common, the disattenuated correlation of .58 indicates their substantial independence. Intellectual Absorption was relatively pure; for example, only one item (of seven loading above .50 on absorption) came from a different item set (intellectual confidence). The second component, Intellectual Apathy, contained a number of the negatively phrased curiosity items, which can be thought of as reflecting boredom (e.g., item 27 "I wish I could get involved in something, but my mind often wanders from one topic to the next"). In addition, there were a number of pseudo-intellect items. For instance, one confidence item (item 10, "I can solve many problems easily, but few keep my attention for long") might better be seen as reflecting avoidance rather than intellect. Two other items (item 69 "What is most important to think about is how to meet specific goals—not abstract ideas"; see also item 26) espouse concrete over abstract thinking. The third, Intellectual Pleasure, component encompassed the majority of confidence and curiosity items, as well as intellectual values and pleasure items, suggesting that these sorts of traits are more similar to one another than initially conceived.

Group Differences

The next question is whether these three component scale scores differed among groups of different intellectual ability. The means and standard deviations for each group are presented in Table 3. As can be seen, there were statistically significant differences among the groups on two of the three scales. A Group × Sex MANOVA using the three component scales as dependent variables yielded highly significant Group effects (Hotelling's $F(6,278) = 10.43, p < 0.001$). The gifted students were highest on the Intellectual Absorption component scale ($M = 65.8$), followed by the Durham school children ($M = 61.9$) and the Duke University students ($M = 56.2$; univariate $F(2,142) = 6.62, p < .001$). The gifted group's higher level of absorption may be due, in part, to their youth. This was indicated by the fact that both the gifted and school-aged children were significantly different than the Duke students, and that the gifted students showed a nonsignificant trend of being higher in absorption than the school-aged controls. Given the suggestive difference between the gifted and school-aged groups, however, age may not entirely account for differences among groups. Although one could argue, for example, that imaginative involvement generally decreases with age, when *general* absorption (which should reflect such imaginative involvement) was controlled for across groups in an analysis of covariance, a significant difference in intellectual absorption was still found across groups ($F(2,141) = 8.1, p < .001$).

TABLE 3
Means and Standard Deviations of the Three Groups On the Component-Based Scales*

	Intellectual:							
	Absorption		Apathy		Pleasure		Composite	
Participant Group	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Gifted	65.8[a]	11.6	48.6[a]	10.7	69.3[a]	10.3	86.5[a]	22.7
Chronological age	61.9[a]	8.5	56.0[b]	7.5	66.6[a]	9.1	72.5[b,c]	15.5
Mental age	56.2[b]	9.5	47.2[a]	8.9	70.9[a]	10.0	79.9[a,c]	17.8
Univariate *F*	6.62		13.60		2.79		7.35	
df	2,142		2,142		2,142		2,142	
p	<.001		<.001		<.07		<.001	

Note. *Column means that do not share superscripts are significantly different at the .05 level by a Tukey Honestly Significant Difference post-hoc test.

Intellectual Apathy was highest among the school-age students ($M = 56.0$), with the gifted and college students at lower and roughly equivalent levels ($M = 48.6$ and 47.2, respectively; univariate $F(2,142) = 13.6, p < .001$). Finally, the gifted students ($M = 69.3$) were tied with the college students ($M = 70.9$) on Intellectual Pleasure, and the school children scored lower ($M = 66.6$), with the differences approaching statistical significance (univariate $F(2,142) = 2.79, p < .07$). Thus, all three groups differed on these dimensions, and the gifted students were always at the optimal or roughly tied at the optimal level of each scale.

The same MANOVA reflected a significant main effect of sex (Hotelling's $F(3,140) = 3.02, p < .03$). None of the three components obtained significance individually, and univariate analyses indicated that there were virtually no differences on Apathy ($F(1,142) = 0.8, p < .40$), with men scoring slightly higher than women on Absorption ($M = 62.8$ versus 59.5, $F(1,142) = 2.0\, p < .17$) and with the reverse pattern on Pleasure (for women, $M = 70.4$ versus 67.2 for men; $F(1,142) = 3.4, p < .07$). However, neither the MANOVA nor individual followup tests indicated the presence of any Group × Sex interaction (Hotelling's $F(6,278) = .40, p < .88$).

Because each of the components had a direction clearly interpretable as facilitating intellectual ability and performance, we combined them by summing items from Absorption and Pleasure and subtracting those from Apathy. The composite scale discriminated significantly among the three groups ($F(2,142) = 7.4, p < .001$), with the Gifted scoring highest ($M = 86.5$), then the college group ($M = 79.9$), followed by the school children ($M = 72.5$). There was no main effect for sex, nor was there a significant Group × Sex interaction.

DISCUSSION AND CONCLUSIONS

The present study was conducted so as to describe the internal experience of intellectual achievement, and also to determine whether there were differences in such internal experiences among groups differing in intellectual ability. The principal components analysis distinguished among three distinct intellectual experiences: Absorption, Apathy, and Pleasure. Of these, the gifted were highest, or approximately tied for highest on Absorption and Pleasure, and lowest on Apathy.

The Principal Components Structure

The first result of interest is the Absorption, Apathy, and Pleasure distinction of the principal components analysis. The current psychological literature distinguishes Absorption from other sorts of intellectual experiences, but the present scale is the first to demonstrate that intellectual absorption can be empirically distinguished from both general absorption and a Pleasure component by principal components. It is also the first to suggest that absorption and flow may be the same construct. A careful examination of the items loading on Absorption versus Pleasure indicates a subtle but clearly present difference between them. Absorption appears to involve an effortless quality of energy expenditure, involvement in a problem, and concomitant dissociation from external stimuli. Pleasure, on the other hand appears to involve a valuing—both intellectual and physical—of the thought process. Once again, the principal components analysis unifies many intellectual variables such as interest and confidence that have not been viewed as possibly unitary before. The Apathy component is a heterogeneous one involving everything from anti-intellectual values, to boredom with thinking, to low intellectual self-esteem.

The present three-component solution is also a functionally important one. No component by itself is sufficient to distinguish among each group from each of the other two. Only on Absorption, for instance, can the gifted be distinguished from the college-age group; only on Apathy can the gifted be distinguished from the school-age students.

Absorption, Pleasure, and Apathy Across Groups

It is of particular importance that the gifted students are at optimal levels for each of the three factors, that is, highest in both Absorption and Pleasure, and lowest in Apathy. Such a result suggests that Absorption and Pleasure may be enhanced if one is gifted, perhaps because one encounters more success at intellectual tasks (and is then publicly labeled and recognized as gifted), with such pleasures in turn enhancing one's giftedness. Alternatively, there may be biological concomitants to giftedness that include greater absorption and lower apathy.

The results for absorption are particularly interesting. If it turns out that intellectual absorption enhances or correlates with intellectual performance, it

may begin to explain the intensity with which exceptional minds, such as those described in the introduction, approach intellectual problems. It is also of interest that intellectual absorption tends to decline with age, and it would be revealing to examine the factors which lead to this decline.

Absorption, Apathy, and Pleasure together might well be considered one measurable outcome of schooling. A school that keeps pleasure and absorption high among students, and apathy low, may be more successful than one that teaches slightly more intellectual content, but at the cost of high apathy among its students. A disturbing finding in this light is the relatively higher Intellectual Apathy level among school-age children, compared to both gifted and college-age students. It is unclear what causes the higher level of apathy among the schoolchildren. Perhaps apathy declines in college because the high-apathy students in grade school don't go on to college. Or, perhaps it is caused by some qualities of grade school as an institution.

Further Work in Intellectual Experience

Absorption, Apathy, and Pleasure may not be fixed, and if the present results hold, and they are causal, they may also be manipulable. For example, a colleague of one of the authors, a chemistry professor, follows his most dramatic in-class demonstrations with the words, "And then a chill goes down your spine," and reports that his students echo back those same words throughout the course, perhaps even learning the physical response (C. Parravano, personal communication, November 1, 1987). Absorption, too, may be taught by assisting students to carefully match their abilities to the difficulties of a problem (Getzels & Csikszentmihalyi, 1976).

Although we have claimed to study traits related to giftedness, it is important to note that "giftedness" is not a unitary construct. Some researchers, for instance, have distinguished between "high-IQ" giftedness and eminence or creative giftedness (e.g., Siegler & Kotovsky, 1986). We have focused solely on the former, high-IQ type of giftedness, but it would be of interest to know whether Intellectual Absorption was related to the latter type as well. Certainly the anecdotal evidence regarding geniuses which was discussed earlier suggests that absorption is one characteristic of eminent individuals. The research on the relation of hypnotic susceptibility to creativity (Bowers & Van der Meulen, 1970) also lends support to the possibility that Intellectual Absorption is related to intellectual creativity or eminence.

CONCLUSION

By identifying three intellect-related personality traits: Absorption, Pleasure, and Apathy, and demonstrating that they differ across groups, new experiential aspects of giftedness have been identified. These experiences collectively define

the internal intellectual environment, whether it be good, bad, or different (in the case of the gifted).

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