Toward the Development of a Conceptualization of Gifted Motivation

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ABSTRACT

Whereas perspectives on giftedness have included motivation as a construct related to giftedness, the proposed conceptualization advances a new view that motivation is an area of giftedness in and of itself. Academic intrinsic motivation (i.e., enjoyment of school learning) is the domain focused upon in this conceptualization inasmuch as it has inherent ties to cognition, gifted intellect, and achievement. Research supports the following criteria, advanced as a beginning effort toward the development of a conceptualization of a gifted motivation construct: (a) significantly higher academic intrinsic motivation is evidenced by intellectually gifted compared to their comparison cohort; (b) academic intrinsic motivation is significantly, positively, and uniquely related to academic achievement above and beyond IQ; (c) academic intrinsic motivation evidences substantial continuity from childhood through adolescence; and (d) environment is significantly related to academic intrinsic motivation. The construct of gifted motivation serves heuristic purposes to advance further inquiry and also has implications regarding the development and implementation of giftedness programs. Suggestions are made regarding research needed for further development of a gifted motivation construct.

Perspectives on giftedness have included motivation as a prerequisite for, component of, catalyst of, and even an outcome of giftedness (e.g., Dai, Moon, Feldhusen, 1998; Feldhusen, 1986; Gagné, 2000; Gottfried & Gottfried, 1996; Gottfried, Gottfried, Bathurst, & Guerin, 1994; Lens & Rand, 2000; Renzulli, 1986; Ziegler & Heller, 2000). Whereas these perspectives have contributed to an understanding of the importance of motivation in the realm of giftedness, none has conceptualized motivation itself as a domain of giftedness. Giftedness research and practice have almost exclusively centered on superior intellect, talent, and creativity. Motivation is typically an ancillary construct, a contributor to the development of exceptionality and talent (Gottfried & Gottfried; Lens & Rand; Pyryt, 2000).

PUTTING THE RESEARCH TO USE

Considering motivation as its own form of giftedness provides a more inclusive view of giftedness not restricted to definitions focusing on intellect or talents alone. The Children's Academic Intrinsic Motivation Inventory serves as a means for identifying students with gifted motivation in various subject areas, as well as for school in general. A further advantage of the gifted motivation construct is that motivation contributes to achievement independently of IQ. Thus, students who excel in motivation would benefit by being included in gifted programs based on motivational giftedness.

In addition to identification, there is the issue of program development and nurturing of motivation in order to maximize the potential for excellence in all students. Motivationally oriented curricula and interventions ought to provide an optimal degree of challenge for each child. This will require detailed knowledge of students' motivational profiles across academic domains in order to determine the appropriate level of stimulation for different children. Giftedness in the area of motivation could broaden the recognition and nurturing of giftedness in individuals who must overcome social barriers, such as women or other underrepresented groups.

The construct of gifted motivation is also useful in furthering our knowledge of the realms of giftedness beyond what already exists. Through the advancement of this construct with continued validation of the theory, not only will the interests and needs of gifted children be served, but the richness of theory development will optimally extend into practice.

The purpose of this paper is to advance a new conceptualization of motivation, that is, considering motivation as an area of giftedness in and of itself (Gottfried, 2001). Hence, in this paper, we will propose the development of a new construct: the construct of gifted motivation. Presented below are criteria that provide a beginning foundation toward defining and delineating the construct of gifted motivation and data from a research program studying academic intrinsic motivation, as well as its developmental course in a longitudinal study of children spanning two decades (A. W. Gottfried et al., 1994).

What is a definition of gifted motivation? In the realm of intellect the term *gifted* generally defines those individuals who are superior in ability or an area of talent (Feldhusen & Jarwan, 2000), particularly unusual or extraordinary (Gruber, 1986). In the realm of motivation, we can also say that the term *gifted* would apply to those individuals who are superior in their strivings and determination pertaining to an endeavor. Hence, motivation in the extreme would be considered gifted just as intelligence in the extreme is considered gifted.

The present research and paper focus on this phenomenon within the domain of academic intrinsic motivation, inasmuch as this is a realm that has inherent ties to cognition, gifted intellect, and achievement (A. E. Gottfried, 1985, 1990; A. W. Gottfried et al. 1994). Academic intrinsic motivation is defined as enjoyment of school learning characterized by an orientation toward mastery; curiosity; persistence; task-endogeny; and the learning of challenging, difficult, and novel tasks (A. E. Gottfried, 1985). In previous work, it was proposed that academic intrinsic motivation is inherently tied to the development of intellectual giftedness in a perspective called Potentiality-Enrichment Theory (A. W. Gottfried et al.). In the conceptualization advanced herein, gifted motivation moves beyond this previous perspective by considering academic intrinsic motivation as its own form of giftedness, not simply a component of the development of intellectual giftedness.

The following are criteria proposed in order to provide a beginning foundation for developing a conceptualization of gifted motivation: (a) significant differences exist between the intellectually gifted and their comparison cohort in academic intrinsic motivation; (b) academic intrinsic motivation is uniquely related to academic achievement above and beyond IQ; (c) there is continuity in academic intrinsic motivation from early childhood through adolescence; and (d) aspects of environment are related to academic intrinsic motivation. Academic intrinsic motivation is noticeable by teachers, is related to parents' motivational practices and children's family environments, and can be impacted by the environment.

Academic Intrinsic Motivation

The foundation of the present conceptualization derives from a program of research on academic intrinsic motivation encompassing an extensive longitudinal study of development from infancy through late adolescence. Additional research conducted in other samples also serves to generalize the findings across studies. This research program had as its goals to define the construct of academic intrinsic motivation; measure it; study how the construct relates to children's learning, development, and giftedness; and determine the continuity of the construct (A. E. Gottfried, 1985, 1986, 1990; A. E. Gottfried, Fleming, & A. W. Gottfried, 1994, 1998, 2001; A. W. Gottfried et al., 1994).

In order to measure academic intrinsic motivation, the first task in this research program concerned development of the Children's Academic Intrinsic Motivation Inventory (CAIMI; Gottfried, 1986), which was based on the definition of academic intrinsic motivation presented above (A. E. Gottfried, 1985). The CAIMI is differentiated into five subscales, four of them measuring academic intrinsic motivation in the school subject areas of reading, math, social studies, and science, and a fifth subscale measuring academic intrinsic motivation for school in general. These subscales show both unique and shared variance (e.g., A. E. Gottfried, 1985, 1990). The CAIMI is a reliable and valid scale for fourth through eighth graders.

Both a downward extension for children in grades 1–3 called the Young Children's Academic Intrinsic Motivation Inventory (Y-CAIMI; Gottfried, 1990) and an upward extension for high school students called the CAIMI-High School (CAIMI-HS; Gottfried, 1998) have been developed that are also reliable and valid and provide continuous measurement of academic intrinsic motivation from early childhood through adolescence. The downward extension includes fewer items and subscales and a reduced rating response scale for younger children. The CAIMI-HS is identical to the CAIMI as it uses the same items except it refers to "reading" as "English" and "social studies" as "history" to be consistent with the terminology used in high schools.

Longitudinal Research

The body of data regarding this conceptualization of gifted motivation emerges from an ongoing longitudinal investigation known as the Fullerton Longitudinal Study. At the initiation of the study in 1979, the sample consisted of 130 infants and their families. All children who entered the study had been term babies of normal birth weight and had no neurological or visual abnormalities. During the course of the study, children were assessed at 6-month intervals from 1 to 3.5 years, at yearly intervals beginning at age 5 through the end of high school, and were assessed in early adulthood at age 24.

At each assessment, a comprehensive battery of standardized measures was administered to examine development across a broad variety of domains, as well as family environment. The retention rate has been substantial, with no less than 80% of the original sample returning at any assessment. The families represented a wide range of the middle socioeconomic status as measured by the Hollingshead Four Factor Index of Socioeconomic Status (A. W. Gottfried, 1985; Gottfried, Gottfried, Bathurst, Guerin, & Parramore, 2003), and the participants were predominantly European-American, with a small percentage of children of other ethnicities. The sample comprised approximately half girls and half boys. Details regarding the longitudinal study may be found in Gottfried, Bathurst, and Gottfried (1994), Gottfried and Gottfried (1984), and A. W. Gottfried et al. (1994).

Longitudinal trends in intrinsic motivation were analyzed with age-appropriate instruments. Regarding cognitive mastery motivation in infancy and early childhood, the Bayley Infant Behavior Record (Bayley, 1969), consisting of ratings by the examiner of the child's behavior during testing, was used from 1.5 to 6 years. Items identified as a cognitive-mastery cluster (Matheny, 1980) were analyzed. These included attention span (1.5–6 years), goal directedness (1.5–6 years), object orientation (1.5–3.5 years), and stimulus reactivity (2.5–3.5 years). Specific items were included at these ages as psychometrically appropriate (A. W. Gottfried et al., 1994). Young children's academic intrinsic motivation was assessed at ages 7 and 8 years with the Y-CAIMI (Gottfried, 1990; A. W. Gottfried et al. 1994). Academic intrinsic motivation was assessed at ages 9, 10, and 13 years using the CAIMI (Gottfried, Fleming, & Gottfried, 1994, 1998; Gottfried & Gottfried, 1996), and the high school version of the CAIMI (CAIMI-HS) was employed at ages 16 and 17 years (Gottfried, 1998; Gottfried et al., 2001).

Academic Intrinsic Motivation Across Time: Comparing Intellectually Gifted and Cohort Peer Comparison Groups

The present longitudinal study is unique in that the children all entered the study as infants, long before the designation of gifted and cohort peer comparison groups. Hence, the children were not a sample preselected for giftedness.

Analyses were conducted comparing the intellectually gifted with their cohort peer comparison group on academic intrinsic motivation. The full-scale IQ score obtained with the Wechsler Intelligence Scale for Children–Revised (WISC-R; Wechsler, 1974) at the 8-year assessment was used to create the gifted and comparison groups (A. W. Gottfried et al., 1994). Children were designated as gifted if they obtained a score of 130 or greater. This resulted in 20 children who placed in the gifted range, and 87 who did not; these 87 were designated as the cohort peer comparison group. The average IQ score of the gifted children was 137.8, with scores ranging from 130 to 145. The average IQ score of the cohort peer comparison group was 110.9, with scores ranging from 84 to 128.

Across middle childhood through late adolescence, children who emerged as intellectually gifted as early as age 8 had significantly higher academic intrinsic motivation from ages 9 through 17 (Gottfried, 2001; Gottfried & Gottfried, 1996). Moreover, despite the general decline in motivation observed across all students (e.g., Gottfried, Fleming, & Gottfried, 2001), the gifted continued to maintain a higher degree of motivation (Gottfried). Analyses through age 17 indicated that all subject areas showed significant differences in favor of the gifted children, and the largest differences in academic intrinsic motivation occurred in the subject areas of math and science.

In addition to the analyses with the CAIMI and CAIMI-HS, analyses from the cognitive mastery cluster items of the Bayley Infant Behavior Record demonstrated greater motivation among the gifted children from ages 18 through 72 months, as did the Y-CAIMI at ages 7 and 8 years (A. W. Gottfried et al., 1994). Children who were designated as gifted at age 8 showed significantly greater attention span, goal directedness, object orientation, and reactivity in the early childhood years and greater academic intrinsic motivation at ages 7 and 8. Even before the beginning of formal schooling, children who later emerged as gifted evidenced a greater amount of motivation associated with cognitive processing. Thus, from

infancy through late adolescence, children designated as intellectually gifted have greater cognitive mastery and academic intrinsic motivation across their entire childhood. These results are consistent with others' findings on related motivational variables, as well, indicating that gifted children and adolescents have higher curiosity and mastery motivation than their comparison groups (Davis & Connell, 1985; Henderson, Gold, & McCord, 1982; Hom, 1988; Li, 1988; Vallerand, Gagné, Senecal, & Pelletier, 1994).

Academic Intrinsic Motivation is Uniquely Related to Achievement Above and Beyond IQ

In order to show that gifted motivation is a construct that is not accounted for by intelligence, it is important to show that it relates to achievement and other performance criteria above and beyond IQ. Hence, if this can be demonstrated, it would provide important evidence for a construct of gifted motivation.

A step in this direction concerns showing the unique contribution of academic intrinsic motivation to achievement above and beyond IQ. Hierarchical regressions were conducted with achievement as the outcome variable and with IQ and academic intrinsic motivation as predictors (Gottfried, 2001). Motivation was entered on the last step to determine if it would contribute uniquely, and significantly, to the variance in the outcome. Analyses were conducted controlling for gender on the first step, as well as a set of analyses conducted without controlling for gender. Results were similar between these analyses, and results for gender-controlled analyses are reported. For virtually all of the regressions, there were no significant effects of gender. The few that emerged were not consistent. Furthermore, gender differences are not characteristic of the findings on academic intrinsic motivation. Hence, the final models presented are as follows: step 1, gender; step 2, IQ (age 8 IQ); and step 3, academic intrinsic motivation. Analyses were conducted at ages 9, 10, 13, 16, and 17 years in order to span the years from childhood through adolescence using the same instrument (i.e., the CAIMI; Gottfried). The motivation score entered was the CAIMI subscale that corresponded to the subject area of the achievement or performance outcome at the particular age being examined. For example, reading motivation was used to predict reading achievement, math motivation for math achievement, and so on. For outcomes that had no specific subject area referenced, the school in general scale was used.[1]

The following achievement measures were included: at each age, reading and math percentiles (children compared with their appropriate grade) of the Woodcock-Johnson Psycho-Educational Battery and the revised version when it became available (beginning at age 11; Woodcock & Johnson, 1977, 1989); parents' ratings (4-point scale on reading and math at each age; social studies/history and science at ages 13, 16, and 17 years) of children's achievement as reported on the parent version of the Child Behavior Checklist (Achenbach, 1991a); teachers' ratings (5-point scale on reading, math, social studies, and science at ages 9 and 10) of children's achievement as reported on the Teacher Report Form of the Child Behavior Checklist (Achenbach, 1991b); and cumulative high school grade-point average (GPA) at age 17.

Analyses thus far conducted have demonstrated that academic intrinsic motivation was a significant positive predictor of achievement beyond the variance attributable to IQ, with higher motivation predicting higher achievement. There were a few trends worthy of note. The first area in which motivation emerged as significant beyond IQ was math at ages 9 and 10. This is consistent with our previous findings of math being a unique subject area in academic intrinsic motivation (A. E. Gottfried, 1985, 1990; Gottfried et al., 2001). Motivation also more consistently predicted outcomes in adolescence compared to ages 9 and 10, corresponding to the findings reported below that the stability of motivation increases during adolescence. Results at the various ages showed that motivation contributed significantly and positively to (a) parents' and teachers' ratings of math performance at age 9; (b) Woodcock-Johnson math achievement and parents' and teachers' ratings of math achievement at age 10; (c) Woodcock-Johnson math achievement and parents' ratings of reading, math, history, and science at age 13; (d) Woodcock-Johnson reading and math achievement and parents' ratings of math, history, and science achievement at age 16; and (e) Woodcock-Johnson reading and math achievement, parents' ratings of social studies achievement, and cumulative GPA at age 17.[2]

Notably, the unique contribution of motivation to a variety of achievement indices is important, inasmuch as they are from different sources, including objective testing (Woodcock-Johnson), teachers' and parents' ratings, and data collected directly from the children's schools (GPA). As children attended many different schools, this relationship to GPA is all the more important as it shows generalization. The amount of variance contributed by motivation was less than for IQ (IQ consistently and significant-

ly predicted achievement across measures). However, the importance of these findings is that, where significant, motivation contributes to achievement independently of IQ and, hence, adds significantly to the prediction of achievement. These analyses support the view that academic intrinsic motivation is an independent construct not accounted for by intelligence. These findings also suggest that motivation has important implications for students' college admissions because it independently adds to the prediction of high school GPA.

Analyses with the Y-CAIMI at ages 7 and 8 revealed similar findings showing that, in the area of math, children's academic intrinsic motivation at age 7 played a significant and unique role in predicting teachers' ratings of student achievement at age 8 beyond IQ; and, at age 7, children's total score on the Y-CAIMI significantly predicted teachers' ratings of reading achievement at that age beyond IQ (Gottfried, 1990). In a study with fourth and seventh graders (A. E. Gottfried, 1985), correlations were conducted between the CAIMI subscales and standardized achievement scores partialling IQ. Both math and reading motivation were significantly correlated with achievement independent of IQ (math with math achievement; reading with language and science achievement).

The present results provide support for the development of the construct of gifted motivation. The results also demonstrate that IQ alone is not responsible for the entire outcome; motivation plays a unique role in achievement outcomes by adding its own unique variance. Along with the findings regarding the higher amount of academic intrinsic motivation displayed by intellectually gifted children, the results for the independent prediction of achievement by motivation strongly suggests that intellectually gifted children are advantaged not only cognitively, but also motivationally, serving to enhance their performance.

Continuity of Academic Intrinsic Motivation

Establishing continuity of academic intrinsic motivation is important for developing a conceptualization of gifted motivation. If academic intrinsic motivation is inconsistent and changeable from one year to the next, then it would be difficult to put forth a coherent view of gifted motivation. If, on the other hand, academic intrinsic motivation is consistent, predictable, and stable over time, then a coherent construct of gifted motivation can be advanced because of persistence of motivation over time.

Data from several studies support the continuity of academic intrinsic motivation over time. Within the longitudinal study, Gottfried, Fleming, and Gottfried (2001) conducted structural equation modeling to determine the stability of individual differences of academic intrinsic motivation from ages 9 through 17 years. Two different models were analyzed, one for General-Verbal Academic Intrinsic Motivation (reading, social studies, science, and general) and one for Math Academic Intrinsic Motivation. Results demonstrated that academic intrinsic motivation displays substantial stability from ages 9 through 17 years in both the General-Verbal and Math domains. Further, the degree of stability increased during adolescence. Therefore, academic intrinsic motivation is a construct yielding substantial individual-difference rank-order stability that increased significantly in the adolescent years. By age 9, a substantial degree of academic intrinsic motivation had developed, in which each prior age served to predict the subsequent age. Academic intrinsic motivation appears to undergo cumulative development inasmuch as each previous age not only directly predicts the next age, but also impacts motivation throughout the entire age range through indirect effects. The individual's relative position with regard to level of academic intrinsic motivation becomes more predictable over time.

In addition to these findings regarding continuity of academic intrinsic motivation in children from ages 9 through 17 years, there were previous analyses likewise indicating stability of academic intrinsic motivation from ages 7 through 9 years using the Y-CAIMI at ages 7 and 8 years and the CAIMI at age 9 (Gottfried, 1990). The results revealed that academic intrinsic motivation at ages 7 and 8 years using the Y-CAIMI show consistency with academic intrinsic motivation at age 9 years using the CAIMI. Children who had higher academic intrinsic motivation at ages 7 and 8 years tended to have higher motivation at age 9 years, as well. These relationships tended to increase in magnitude from ages 8 to 9 compared to ages 7 to 9, a finding consistent with those reported above regarding the increase in continuity over the age range of 9 through 17 years.

Regression analyses with early childhood indices of cognitive mastery motivation on the Bayley Infant Behavior Record as described earlier (Gottfried & Gottfried, 1994; A. W. Gottfried et al., 1994) showed that infancy mastery motivation (18 + 24 months) significantly predicted preschool mastery motivation (30 + 36 + 42 months); preschool mastery motivation significantly predicted school-age mastery motivation (60 + 72 months); and school-age mastery motivation significantly predicted

age 9 academic intrinsic motivation (measured with a General-Verbal composite). These findings indicated that cognitive mastery motivation measured as early as infancy is an early correlate and developmental precursor of future academic intrinsic motivation.

To summarize, continuity of the academic intrinsic motivation construct provides support for developing a construct of gifted motivation by demonstrating that academic intrinsic motivation is consistent, predictable, and stable. Stability of academic intrinsic motivation has been established from childhood to late adolescence, with early developmental precursors of mastery motivation demonstrating stability, as well. The stability of academic intrinsic motivation increases during adolescence. Further, these findings for academic intrinsic motivation are consistent with findings involving other psychological constructs such as personality (Roberts & DelVecchio, 2000), temperament (Guerin & Gottfried, 1994; Guerin, Gottfried, Oliver, & Thomas, 2003), competence beliefs (Wigfield et al., 1997) and intelligence (Asendorpf, 1992).

Aspects of Environment

Academic Intrinsic Motivation is Noticeable by Teachers

In two studies, teachers were asked to rate the degree of academic intrinsic motivation of each of their students to determine if teachers' ratings would be related to students' own reports of academic intrinsic motivation using the CAIMI (A. E. Gottfried, 1985, 1990). In the first study, the students were fifth through eighth graders, and teachers rated students' motivation in reading, math, social studies, science, and school in general. In the second study, teachers rated the academic intrinsic motivation of their first, second, and third graders in the areas of reading, math, and school in general (these are areas on the Y-CAIMI). Across both studies, teachers' ratings of motivation were positively and significantly correlated with students' own ratings on the CAIMI and Y-CAIMI, with the most pervasive significance occurring for teachers' ratings of general academic intrinsic motivation. The greatest subject area specificity occurred for teachers' and students' ratings of math motivation for the fifth through eighth graders. Since student motivation is noticeable and measurable by teachers, students with gifted motivation are likely to be recognized. These findings also provide a basis for intervention to support the development of outstanding motivation in students because teachers are able to recognize the elements of academic intrinsic motivation, so they may be able to implement educational practices to develop giftedness in motivation.

Parental Motivational Practices and Home Environments

Environments impact academic intrinsic motivation, as well, and this may be a key to developing higher levels of motivation, or gifted motivation. Further, we have previously proposed that gifted children exert more pressure on their parents for certain types of cognitive enrichment, and this may be a part of their special motivational advantage.

In two previous studies, we have examined two aspects of the child's environment. Gottfried, Fleming, and Gottfried (1994) used structural equation modeling to test the theory that children's academic intrinsic motivation is greater when their parents use task-intrinsic motivational practices, that is, practices that encourage curiosity, inquisitiveness, and task engagement. On the other hand, we predicted that children's academic intrinsic motivation would be inversely related to parental use of task-extrinsic motivational practices, that is, the use of external consequences contingent on children's performance, such as providing money or toys when children did well and removing privileges when they did poorly. This was a longitudinal study in which we measured mothers' motivational practices at age 9 and children's academic intrinsic motivation at ages 9 and 10, as well as their achievement at age 10. Results supported the hypothesis. Parental motivational practices had significant direct effects on children's academic intrinsic motivation, with task-intrinsic practices having a positive impact and task-extrinsic practices having a negative impact. Children had significantly greater academic intrinsic motivation when task-intrinsic practices were used and, conversely, had lower academic intrinsic motivation when task-extrinsic practices were used, as indicated by the significant paths. Further, academic intrinsic motivation was positively and significantly related to subsequent motivation and achievement 1 year later. Parental practices not only directly impacted motivation contemporaneously at age 9, but also, a year later, indirectly impacted both motivation and achievement at age 10 through age 9 motivation. Therefore, academic intrinsic motivation had a long-term impact on itself and on achievement, and parental motivational practices bore significant indirect relations to subsequent motivation and achievement through contemporaneously measured motivation. This was true for both the composite General-Verbal and Math models. These find-

ings provided clear evidence that parents socialize their children's academic intrinsic motivation through the encouragement of curiosity, persistence, and mastery of school-related tasks. On the other hand, parental practices that emphasize external controls such as provision of rewards or pressure-oriented practices are detrimental to children's academic intrinsic motivation and academic achievement. Here is one obvious route for intervention to help support gifted motivation through encouragement of parents' use of intrinsic strategies.

Another study concerned the impact of an intellectually stimulating home environment on academic intrinsic motivation from ages 8 through 13. Gottfried, Fleming, and Gottfried (1998) used structural equation modeling to test the hypothesis that home environment positively predicts academic intrinsic motivation over this period. A latent variable was used for environment consisting of a composite of items measuring cognitively stimulating home environment (e.g., stimulating activities and materials) from the HOME Scale (Bradley, Caldwell, Rock, Hamrick, & Harris, 1988); Family Environment Scale (Moos & Moos, 1994), and our Home Environment Survey (A. W. Gottfried et al., 1994), all of which had been measured at age 8. Academic intrinsic motivation was measured at ages 9, 10, and 13 years. Results supported the hypothesis showing that a stimulating home environment had a significant, positive direct path to subsequent academic intrinsic motivation at age 9, which in turn impacted motivation in subsequent years. These results were consistent for both General-Verbal Motivation models, as well as the Math model. Significant indirect effects were also obtained between environment and motivation over the time span, indicating that environment influenced motivation through age 13 via earlier motivation. Hence, to the extent that cognitive stimulation is present in the home, academic intrinsic motivation can be expected to be higher. Gifted motivation may well be related to the types of home environments provided. Supporting this suggestion is the fact that, in the Fullerton Longitudinal Study, the home environments of the intellectually gifted children were significantly more stimulating than those of the comparison children (A. W. Gottfried et al., 1994). Stimulating environment should serve to enhance academic intrinsic motivation through exposure to learning-oriented academic opportunities and activities and enhancement of children's orientation toward enjoyment of learning through engaging in and valuing such activities. Hence, children whose family environments have higher cognitive stimulation are those who develop greater curiosity, desire to explore, and, hence, enjoyment of the learning process and desire to master. These are aspects of gifted motivation, and teaching parents how to provide such stimulation can be considered an intervention.

In earlier work (A. W. Gottfried et al., 1994), it was hypothesized that intellectually advanced children would be more persistent in requesting extracurricular stimulation and making demands on parents to provide additional activities. When children were 8 years old, parents reported on the number of lessons, sports, clubs, and hobbies their children had requested. Gifted children requested significantly more activities than comparison children in the areas of lessons, clubs, and hobbies, but not sports. This reveals that gifted children seek out more environmental stimulation than do other children and provides further support for the gifted motivation construct inasmuch as greater intrinsic motivation would be expected to enhance children's stimulus seeking. In a recent study, Raine, Reynolds, Venables, and Mednick (2002) similarly found that stimulation seeking in preschool children was related to enhanced cognitive ability in later childhood, and these researchers suggested that behavioral exploration may be a marker for curiosity, which further supports our work.

Conclusions

Based on the conceptual analysis of gifted motivation presented herein, including the evidence, we propose that motivation be considered as a type of giftedness itself, not simply an augmentation of intellect, but as a separate process in its own right that needs to be identified as early in life as possible and nurtured by stimulating and task-endogenous home and school environments. Further, we propose that gifted motivation is a developmental process, emerging as early as infancy. Children who find task engagement enjoyable at an early age are more likely to continue to immerse themselves in cognitive tasks that provide enhanced levels of stimulation (Gottfried & Gottfried, 1996). Academic intrinsic motivation is a separate construct that can also facilitate the development of giftedness in other domains, as children who are more motivated will more enthusiastically engage themselves in the learning process from infancy through adolescence.

The following is a summary of motivational features supporting a foundation for developing the construct of gifted motivation:

1. Intellectually gifted children show superior motivation from infancy through late adolescence. From

infancy through adolescence, children who are identified as intellectually gifted evidence superior persistence, attention, curiosity, enjoyment of learning, and orientation toward mastery and challenge.
2. Above and beyond IQ, academic intrinsic motivation bears a unique, significant, and positive relationship to a variety of academic achievement indices throughout childhood, including standardized achievement test scores, teachers' and parents' ratings of achievement, and cumulative high school GPA.
3. Academic intrinsic motivation is a stable construct over time that increases in stability during adolescence.
4. Aspects of environment relate to academic intrinsic motivation. Teachers are able to detect academic intrinsic motivation, which relates significantly to students' own ratings. Academic intrinsic motivation is impacted by the type of motivational practices used by parents, as well as the stimulation of the home environment. It is positively impacted by task intrinsic practices and home environments high in cognitive stimulation. Gifted children are also more likely to seek out stimulation.

Considering the Implications of Gifted Motivation

This conceptualization of gifted motivation is meant to serve as a heuristic—to propose the development of a new construct to stimulate further inquiry as to how motivation is an area of giftedness. Hence, this paper represents an initial effort. Whereas the present conceptualization has focused on academic intrinsic motivation, it is important to study its generalization to other areas of motivation to determine the breadth and depth of this construct. It is important to generalize the work beyond academic intrinsic motivation in order to advance a more general construct. Additionally, some related motivational theories that focus on personal talent and determining life goals (Moon, 2000, 2002) or volition (Corno, 1993; Corno & Kanfer, 1993) may be relevant to examine, particularly with respect to turning extremely high motivation toward action. Hence, we recommend that other researchers seek to examine this conceptualization across motivational domains to determine its generalizability.

Another area of generalization concerns the subject populations to which a construct of gifted motivation applies. This construct must be replicated and generalized to other populations varying in socioeconomic status, ethnicity, ability, and area of talent, for example, to determine the generality of such a construct. Gifted motivation in such areas as art, music, or sports would be important, as well.

Another area of future research would focus on individuals with extremely high motivation and examine their developmental/educational histories and future outcomes. We have begun to examine such trends in our own long-term longitudinal research (Cook, Morris, Gottfried, & Gottfried, 2003; Gottfried, Gottfried, Cook, & Morris, in press).

The significance of identifying gifted motivation as a construct encompasses applied concerns, as well. The possibilities include providing a means to enhance or support giftedness using motivational strategies to increase children's motivation. Considering motivation a form of giftedness provides another avenue for identification and programming, a suggestion proposed earlier (Clinkenbeard, 1996; Gottfried & Gottfried, 1996). It provides a more inclusive view of giftedness, one not restricted to definitions focusing on intellect or talents alone. Hopefully, educators will develop programs for both gifted and regular education that emphasize motivational interventions, such as providing the optimal degree of challenge for every child. It is intended that such interventions will stimulate students' enjoyment of the learning process and their mastery strivings, and hence their academic intrinsic motivation. Regular education, as well as programming for the gifted, is mentioned because there are many gifted children who are in regular education classes because of limited programs and resources in their schools. Further, some children may not have reached their gifted potential, and providing for motivational enhancement in regular education will ensure that they have that opportunity. Early provision of motivation enhancement for all students may help to prevent underachievement, including among the intellectually gifted.

Asking schools to increase the realm of identification of giftedness to include motivation requires a practical means to achieve this. Perhaps the use of appropriate instruments, such as the CAIMI, direct observations of student behaviors, knowledge of prior motivated accomplishments, or portfolios of accomplishments could be used to identify students with gifted motivation. This is an area of challenge in which researchers and educators will need to develop identification methods. School districts may seek to develop their own local reference norms that also might vary according to the content domain of interest. Giftedness in the area of motivation could broaden the recognition and nurturing of giftedness in individuals who

must overcome social barriers, such as women (Noble, Subotnik, & Arnold, 1999) or other underrepresented groups. Hence, broader access to educational opportunity may result.

The manifestation of gifted motivation across the lifespan has been anecdotally presented in the news media, and real-life examples of individuals overcoming adversity or achieving through persistence and striving seem to abound. For example, a homeless man ultimately earned his college degree where he was "distinguished by . . . an all-consuming commitment to his studies" (Leovy, 1999, p. A28). A high school student with a passion for math published a book of math problems and donated these to schools, stating that "It's my passion, my love. . . . When I wake up in the morning there's nothing I'd rather do than pursue math theory" (Gale, 1998, p. B2). A 102-year-old medical doctor continued to work. He also held four doctorates, developed the Sunderman Sugar Tube, and played violin on a 1694 Stradivarius to celebrate his 100th birthday. "If I didn't do this, what else would I do?" he asked (Martin, 2001, p. B1). Amateurs have contributed scientific discoveries beyond those of professionals, and "their passionate will to know, intense concentration, and fresh perspectives can make up for lack of specialized training . . . amateurs may be more motivated than many professionals" (Cole, 1998, p. A14). A career advisor told Jane Goodall that her plan to travel to Africa to study wildlife was inappropriate. Rather than heed this advice, she pursued her passion with determination. "I never, ever thought about giving up. . . . I just tackled each difficulty one by one" (Vaughn, 2000, p. W4).

Superior motivation can apply to the social and political realm, as well, such as the resolve and tenacity of our leaders to forge contemporary changes in our society such as the civil rights and women's rights movements. Anecdotally as well, at the Nobel Laureate Symposium (October, 2001) during the meeting of the California Nobel Prize Centennial, the common theme underlying the experience of the Nobel Laureates was a passion or doggedness to solve puzzles of nature above all else. The prize was secondary. These provide real-life examples of gifted motivation in a variety of ways, from the well known to the everyday experience. So, in a common sense and logical way, we accept and discuss gifted motivation, but it has never been studied as a scientific domain.

By developing and including the construct of gifted motivation, it is hoped that the conception of giftedness is expanded beyond ability to enable children to develop their special gifts. By intervening to enhance motivation at an early age, we may be able to make a difference in the lives of all children. Teaching the desire to learn may be as important as teaching academic skills.

References

Achenbach, T. M. (1991a). *Manual for the Child Behavior Checklist/4-18 and 1991 Profile*. Burlington: University of Vermont, Department of Psychiatry.

Achenbach, T. M. (1991b). *Manual for the Teacher's Report Form and 1991 Profile*. Burlington: University of Vermont, Department of Psychiatry.

Asendorpf, J. B. (1992). Continuity and stability of personality traits and personality patterns. In J. B. Asendorpt & J. Valsiner (Eds.), *Stability and change in development: A study of methodological reasoning* (pp. 116–142). Newbury Park, CA: Sage.

Bayley, N. (1969). *Bayley scales of infant development*. New York: Psychological Corporation.

Bradley, R. H., Caldwell, B. M., Rock, S. L., Hamrick, H. M., & Harris, P. (1988). Home observation for measurement of the environment: Development of a home inventory for use with families having children 6 to 10 years old. *Contemporary Educational Psychology, 82*, 58–71.

Clinkenbeard, P. R. (1996). Research on motivation and the gifted: Implications for identification, programming, and evaluation. *Gifted Child Quarterly, 40,* 220–221.

Cole, K. C. (1998, March 11). Beating the pros to the punch. *Los Angeles Times*, pp. A1, A14.

Cook, C., Morris, P., Gottfried, A. W., & Gottfried, A. E. (2003, April). *Educational characteristics of highly academically motivated adolescents: A longitudinal analysis*. Poster session presented at the biennial meeting of the Society for Research in Child Development, Tampa, FL.

Corno, L. (1993). The best-laid plans: Modern conceptions of volition and educational research. *Educational Researcher, 22,* 14–22.

Corno, L., & Kanfer, R. (1993). The role of volition in learning and performance. In L. Darling-Hammer (Ed.), *Review of research in education* (pp. 301–341). Washington, DC: American Educational Research Association.

Dai, D. Y., Moon, S. M., & Feldhusen, J. F. (1998). Achievement motivation and gifted students: A social cognitive perspective. *Educational Psychologist, 33*, 45–63.

Davis, H. G., & Connell, J. P. (1985). The effect of aptitude and achievement on the self-system. *Gifted Child Quarterly, 29,* 131–136.

Draper, N. R., & Smith, H. (1998). *Applied regression analysis*. New York: Wiley.

Feldhusen, J. F. (1986). A conception of giftedness. In R. J. Sternberg (Ed.), *Conceptions of giftedness* (pp. 112–127). New York: Cambridge University Press.

Feldhusen, J. F., & Jarwan, F. A. (2000). Identification of gifted and talented youth for educational programs. In K. A. Heller, F. J. Mönks, R. J. Sternberg, & R. F. Subotnik

(Eds.), *International handbook of giftedness and talent* (2nd ed., pp. 271–282). New York: Elsevier.

Gagné, F. (2000). Understanding the complex choreography of talent development through DMGT-based analysis. In K. A. Heller, F. J. Mönks, R. J. Sternberg, & R. F. Subotnik (Eds.), *International handbook of giftedness and talent* (2nd ed., pp. 67–79). New York: Elsevier.

Gagné, F., & St. Père, F. (2002). When IQ is controlled, does motivation still predict achievement? *Intelligence, 30,* 71–100.

Gale, E. (1998, November 11). The formula for math mirth. *Los Angeles Times,* p. B2.

Gottfried, A. E. (1985). Academic intrinsic motivation in elementary and junior high school students. *Journal of Educational Psychology,* 77, 631–645.

Gottfried, A. E. (1986). *Children's academic intrinsic motivation inventory.* Odessa, FL: Psychological Assessment Resources.

Gottfried, A. E. (1990). Academic intrinsic motivation in young elementary school children. *Journal of Educational Psychology, 82*, 525–538.

Gottfried, A. E. (1998, April). *Academic intrinsic motivation in high school students: Relationships with achievement, perception of competence, and academic anxiety.* Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.

Gottfried, A. E. (2001, August). *Gifted motivation.* Esther Katz Rosen Lecture on Gifted Children and Adolescents presented at the annual meeting of the American Psychological Association, San Francisco.

Gottfried, A. E., Bathurst, K., & Gottfried, A. W. (1994). Role of maternal and dual-earner employment status in children's development: A longitudinal study from infancy through early adolescence. In A. E. Gottfried & A. W. Gottfried (Eds.), *Redefining families: Implications for children's development* (pp. 55–97). New York: Plenum.

Gottfried, A. E., Fleming, J. S., & Gottfried, A. W. (1994). Role of parental motivational practices in children's academic intrinsic motivation and achievement. *Journal of Educational Psychology, 86,* 104–113.

Gottfried, A. E., Fleming, J. S., & Gottfried, A. W. (1998). Role of cognitively stimulating home environment in children's academic intrinsic motivation: A longitudinal study. *Child Development, 69,* 1448–1460.

Gottfried, A. E., Fleming, J. S., & Gottfried, A. W. (2001). Continuity of academic intrinsic motivation from childhood through late adolescence: A longitudinal study. *Journal of Educational Psychology, 93*, 3–13.

Gottfried, A. E., & Gottfried, A. W. (1994, August). *Continuity of intrinsic motivation from infancy through early adolescence.* Paper presented at the annual meeting of the American Psychological Association, Los Angeles.

Gottfried, A. E., & Gottfried, A. W. (1996). A longitudinal study of academic intrinsic motivation in intellectually gifted children: Childhood through adolescence. *Gifted Child Quarterly, 40,* 179–183.

Gottfried, A. W. (1985). Measures of socioeconomic status in child development research: Data and recommendations. *Merrill-Palmer Quarterly, 31,* 85–92.

Gottfried, A. W., & Gottfried, A. E. (1984). Home environment and cognitive development in young children of middle-socioeconomic-status families. In A. W. Gottfried (Ed.), *Home environment and early cognitive development: Longitudinal research* (pp. 57–115). New York: Academic Press.

Gottfried, A. W., Gottfried, A. E., Bathurst, K., & Guerin, D. W. (1994). *Gifted IQ: Early developmental aspects.* New York: Plenum.

Gottfried, A. W., Gottfried, A. E. Bathurst, K., Guerin, D. W., & Parramore, M. (2003). Socioeconomic status in children's development and family environment: Infancy through adolescence. In M. H. Bornstein & R. H. Bradley (Eds.), *Socioeconomic status, parenting, and child development* (pp. 189–207). Mahwah, NJ: Erlbaum.

Gottfried, A. W., Gottfried, A. E., Cook, C., & Morris, P. (in press). Educational characteristics of adolescents with gifted academic intrinsic motivation: A longitudinal investigation from school entry through early adulthood. *Gifted Child Quarterly.*

Gruber, H. E. (1986). The self-construction of the extraordinary. In R. J. Sternberg & J. E. Davidson (Eds.). *Conceptions of giftedness* (pp. 247–263). New York: Cambridge University Press.

Guerin, D. W., & Gottfried, A. W. (1994). Developmental stability and change in parent reports of temperament: A ten-year longitudinal investigation from infancy through preadolescence. *Merrill-Palmer Quarterly, 40,* 334–355.

Guerin, D. W., Gottfried, A. W., Oliver, P., & Thomas, C. (2003). *Temperament: Infancy through adolescence.* New York: Kluwer Academic/Plenum.

Henderson, B. B., Gold, S. R., & McCord, M. T. (1982). Daydreaming and curiosity in gifted and average children and adolescents. *Developmental Psychology, 18,* 576–582.

Hom, H. (1988, March). *Motivational orientation of the gifted student, threat of evaluation, and impact on performance.* Paper presented at the biennial meeting of the Society for Research in Child Development, New Orleans, LA.

Lens, W., & Rand, P. (2000). Motivation and cognition: Their role in the development of giftedness. In K. A. Heller, F. J. Mönks, R. J. Sternberg, & R. F. Subotnik, (Eds.), *International handbook of giftedness and talent* (2nd ed., pp. 193–202). New York: Elsevier.

Leovy, J. (1999, May 14). Skid Row's *El Estudiante* is now a scholar. *Los Angeles Times*, pp. A1, A28.

Li, A. K. F. (1988). Self-perception and motivational orientation in gifted children. *Roeper Review, 10*, 175–180.

Martin, D. (2001, January 14). To be old, gifted and employed is no longer rare. *The New York Times,* pp. B1, B12.

Matheny, A. P. (1980). Bayley's Infant Behavior Record: Components and twin analysis. *Child Development, 51,* 1157–1167.

Moon, S. M. (2000, May). *Personal talent: What is it and how can we study it?* Paper presented at the fifth biennial Henry B.

and Joycelyn Wallace National Research Symposium on Talent Development, University of Iowa, Iowa City.

Moon, S. M. (2002, November). *Personal talent.* Paper presented at the annual meeting of the National Association for Gifted Children, Denver, CO.

Moos, R. H., & Moos, B. S. (1994). *Family Environment Scale manual.* Palo Alto, CA: Consulting Psychologists Press.

Noble, K. D., Subotnik, R. F., & Arnold, K. D. (1999). To thine own self be true: A new model of female talent development. *Gifted Child Quarterly, 43,* 140–149.

Nobel Laureate Symposium. (2001, October). Symposium conducted at the meeting of the California Nobel Prize Centennial, San Francisco, CA.

Pyryt, M. C. (2000). Talent development in science and technology. In K. A. Heller, F. J. Mönks, R. J. Sternberg, & R. F. Subotnik (Eds.), *International handbook of giftedness and talent* (2nd ed., pp. 427–437). New York: Elsevier.

Raine, A., Reynolds, C., Venables, P. H., & Mednick, S. (2002). Stimulation seeking and intelligence: A prospective longitudinal study. *Journal of Personality and Social Psychology, 82,* 663–674.

Renzulli, J. S. (1986). The three-ring conception of giftedness: A developmental model for creative productivity. In R. J. Sternberg & J. E. Davidson (Eds.), *Conceptions of giftedness* (pp. 53–92). New York: Cambridge University Press.

Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin, 126,* 3–25.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics.* Boston: Allyn and Bacon.

Vallerand, R. J., Gagné, F., Senecal, C., & Pelletier, L. G. (1994). A comparison of the school intrinsic motivation and perceived competence of gifted and regular students. *Gifted Child Quarterly, 38,* 172–175.

Vaughn, S. (2000, September 17). Sheer determination carried Jane Goodall on her unlikely path. *Los Angeles Times*, pp. W1, W3.

Wechsler, D. (1974). *Manual for the Wechsler Intelligence Scale for Children*. San Antonio, TX: Psychological Corporation.

Wigfield, A., Eccles, J. S., Yoon, K. S., Harold, R. D., Arbreton, A. J. A., Freedman-Doan, C., et al. (1997). Changes in children's competence beliefs and subjective task values across the elementary school years: A 3-year study. *Journal of Educational Psychology, 89,* 451–469.

Woodcock, R. W., & Johnson, M. B. (1977). *Woodcock-Johnson psycho-educational battery.* Allen, TX: DLM Teaching Resources.

Woodcock, R. W., & Johnson, M. B. (1989). *Woodcock-Johnson psycho-educational battery–Revised.* Allen, TX: DLM Teaching Resources.

Ziegler, A. & Heller, K. A. (2000). Conceptions of giftedness from a meta-theoretical perspective. In K. A. Heller, F. J. Mönks, R. J. Sternberg, & R. F. Subotnik, (Eds.), *International handbook of giftedness and talent* (2nd ed., pp. 3–21). New York: Elsevier.

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End Notes

1. Preliminary regressions were run on a few selected variables to determine whether transforming variables for significant, negative skewness and, in some instances, outliers would alter outcomes. Comparing the results of these analyses with analyses not using such data alterations showed the results for the contribution of motivation to achievement to be similar across analyses, albeit some of the magnitudes of prediction (R, beta) were higher in the transformed analyses, and in only one instance motivation became significant after transformation (parent reported science achievement at age 17). Results for IQ and gender were similar across transformed and nontransformed analyses, as well. Since analyses on transformed variables apply only to that variable and not the original metric (Draper & Smith, 1998; Tabachnick & Fidell, 2001), and in view of the predominantly similar results for motivation and all other variables even with skewness and outliers included without transforming variables, we decided to run all regressions on the original metrics, as was true of all CAIMI and longitudinal study analyses reported. We felt that using the original metric provided more authentic support for gifted motivation. Further, because there were well over 17,000 variables in the study, we felt there would be problems in interpretation if we applied transformations to some variables and not others.

Results for ages 9, 13, and 17 years were reported at the Esther Katz Rosen Lecture (Gottfried, 2001). Analyses at ages 10 and 16 were conducted for the present paper, as were teachers' reports of social studies and science achievement at age 9.

2. Whereas the present findings indicate that intrinsic motivation predicts achievement independently

of IQ, a study by Gagné and St. Père (2002) did not find that their measure of intrinsic motivation predicted achievement beyond ability, although student- and parent-reported persistence did show independent prediction. However, the Gagné and St. Père study was based only on a sample of eighth-grade girls of high ability attending a selective private school. The authors themselves noted that results for the predictive power of motivation may have differed in a sample with more variance in ability and motivation. Furthermore, the Gagné and St. Père study was not longitudinal over an extensive time period, nor were the measures distinguished by subject areas, which may have prevented a more precise analysis.