Multigenerational Giftedness: Perceptions of Giftedness Across Three Generations

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The focus of this study was on gifted adults' perceptions of multigenerational giftedness in their families. Participants have been surveyed annually since their high school graduation in 1988. The purpose of the longitudinal study is to gain insight into the career and life development of gifted individuals post-high school. For the present follow-up study, data were collected via the Internet and mailed surveys and analyzed by a 5-member research team. Participants reported their perceptions of whether or not their parents and children were gifted and the areas of giftedness. The number of participants who perceived both parents to be gifted was roughly equal to those stating that neither parent was gifted. Areas of perceived giftedness differed between mothers and fathers. The majority of participants identified at least one of their children as gifted. Specific areas of giftedness perceived in participants' children and parents are described. Implications of the findings are discussed.

The purpose of this study was to learn more about multigenerational aspects of giftedness. Participants were gifted adults who provided their perceptions regarding giftedness in their parents and in their children. Both theoretical literature and prior empirical research suggest that giftedness likely occurs within multiple members of the same family across multiple generations (e.g., Albert, 1980; Jacobsen,

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1999; Landau & Weissler, 1993; Robinson, Lanzi, Weinberg, Ramey, & Ramey, 2002). However, the exact contributions of both genetics and environment to multigenerational giftedness are unknown. It is possible that giftedness is predisposed by a genetic component, but research also supports the assertion that certain environmental conditions nurture the development of giftedness (e.g., Weissler & Landau, 1993). It is likely that people inherit genetic predispositions toward giftedness, and factors in their environments either encourage or inhibit the development of giftedness.

Prior studies have found that intelligence is linked to heredity. Galton (1869) explored the connection between genetics and intelligence in his book *Hereditary Genius* and proposed that intelligence, like any physical trait, is inherited. Galton studied people who had achieved eminence and operated under the assumption that eminence was an indicator of superior intellectual abilities. His method of studying the genetic contributions to intelligence consisted of measuring the frequencies of eminence among relatives of eminent men and comparing that data to the frequency of eminence in the general population (Galton, 1869). Galton found that eminent men had higher frequencies of eminent relatives than did the general population and concluded that intelligence was influenced by heredity. Galton's *Hereditary Genius* was a major influence on conceptions of intelligence and future research on gifted individuals.

Terman (1925) conducted a large-scale longitudinal study of 1,528 California children identified as gifted by the criterion of an IQ score of 135 or greater. Burks, Jensen, and Terman (1930) investigated the IQ scores of 130 siblings of gifted children in the Terman sample and found that the siblings' mean IQ score was 123, which is still more than one standard deviation above the average IQ score of 100. The children in Terman's gifted sample, for comparison, had a mean IQ of 151 when they were originally tested. It is noteworthy that, although the identified gifted children's group had a significantly higher mean IQ score, their siblings' mean IQ score was still above-average. This finding suggests that intelligence has a genetic component. Many years later, Terman and Oden (1947) compared the IQ scores of the original gifted sample with the scores of the sample's own offspring. They found that the mean IQ score of the Terman sample's children was 127.7, which was approximately 23 IQ points below that of their parents (Terman

& Oden, 1947). However, the Terman sample's children still had a significantly above-average mean IQ score, which again suggests that IQ is heritable. Terman and Oden (1947) discussed the discrepancy between the IQ scores of the original gifted sample and their offspring as being due to Galton's law of filial regression, which they stated explained that "only half of one's heredity comes from the two parents while the other half is from more remote ancestry. The regression is about the same as that found for height of offspring from exceptionally tall parents" (p. 236). In follow-up studies in 1939–1940 and 1951–1952, the IQ scores of the Terman gifted sample's offspring were again measured using the Stanford-Binet (Terman & Oden, 1959). At that time, the mean IQ score for offspring was 132.7 (Terman & Oden, 1959). This finding lent additional support to the notion of a hereditary component of intelligence.

Landau and Weissler (1993) conducted a study in Israel that compared the parents of identified gifted children who attended a special school for the gifted to parents of children who had not been identified as gifted. They found that parents of identified gifted children had a high level of academic achievement, had more cognitive interactions with their children, and had more positive attitudes toward their children's intelligence and school achievements. Similarly, Gross (2004) found that most of the parents of Australian students with IQ scores greater than or equal to 160 had high education levels and high-prestige, professional occupations. In Gross' sample, 86% of gifted students' fathers and 50% of gifted students' mothers had at least a 4-year college degree. Many of these parents were recognized as eminent contributors to their fields of employment, such as science, medicine, and literature. In a study of mathematically and intellectually gifted students, Albert (1980) found that both parents and grandparents of mathematically gifted students had higher education levels than the national norms, which suggests that a love of learning and high educational aspirations may be multigenerational family characteristics. In a more recent study of high-achieving third-grade students who were former Head Start participants, researchers found that parents of high-achieving students also had higher education levels than parents of students of average achievement (Robinson et al., 2002). In another study, Weissler and Landau (1993) compared three types of Israeli parents: those with no gifted children, those with one gifted

child, and those with two or more gifted children. They found that parents with a gifted child had more discussions with their children, discussed family issues and problems with the educational system more often with their children, and engaged in more verbal problem-solving activities with their children. Parents of a gifted child also differed in their verbal behaviors: they used more correct grammar, used more analogies and examples in their speech, and used more images and metaphors when communicating with their children. Again, the characteristics of the parents of gifted children mirrored theoretical literature on adult giftedness. Jacobsen (1999) also noted that gifted adults enjoy problem solving, tend to be idealistic and have high standards, enjoy having frequent discussions and debates, and are often highly creative.

In Gross' (2004) longitudinal study of exceptionally gifted children (those with an IQ score greater than or equal to 145) in Australia, the majority of participants who had siblings had one or more siblings who also met criteria for giftedness, with IQ scores ranging from 127 to 175+. The tendency for families to have multiple gifted children makes sense in light of Weissler and Landau's (1993) finding that parents of gifted children tend to provide their children with environments that encourage the development of intellectual abilities. The homes of identified gifted children in Weissler and Landau's study, relative to the homes of nongifted children, contained more "concrete environmental stimuli" such as books, toys, and works of art (p. 145). In addition, parents of gifted children took their children on more family trips. Such early exposure to a variety of stimulating experiences and objects, especially in conjunction with frequent intellectually stimulating verbal interactions with parents, may promote the development of giftedness in all children in a family. However, research into the lives of hundreds of eminent people has found that not all gifted individuals' home environments are havens full of intellectual stimulation (Goertzel, Goertzel, Goertzel, & Hansen, 2004). Goertzel et al. (2004) found that some gifted individuals came from family backgrounds characterized by problems such as emotional strife, alcoholism, family conflicts, and poverty. They concluded that while not all families of gifted people were able to provide their children with concrete environmental stimuli or great emotional sta-

bility, each of the families nurtured giftedness through promoting independence and persistence.

In addition to family history of giftedness and the availability of environmental stimuli, birth order may have a significant impact on the occurrence of giftedness in children. In Gross' (2004) study of exceptionally gifted Australian children, 55.5% of the participants were the oldest children in their families, 20% were only children, and 24.5% were the youngest children in their families. These birth order trends are consistent with studies by Hollingworth (1942) and Silverman and Kearney (1989), who found that the majority of identified gifted children in their respective samples were first-born children. It is possible that the disproportionate representation of first-born children among the identified gifted population may be due to first-born children's greater exposure to interaction with parents and other adults, as well as a greater number of years of undivided attention from parents. Parker's (1998) research into birth order effects in academically talented students found that a significantly higher percentage of gifted students are first-born children than in the general population. However, the percentage of only children is higher in the general population than in the gifted population. Parker found a tendency for gifted individuals to come from smaller families than the average in the general population. Results of an analysis of the relationship between birth order and achievement indicated that when family size is statistically controlled for, birth order does not significantly impact academic abilities as measured by performance on SAT verbal or math scores. Similarly, Robinson et al. (2002) found that families of high-achieving former Head Start students had significantly fewer children and more financial resources than families of students of average achievement levels. It is likely that smaller families have more resources to devote to each of their children, which increases the likelihood that giftedness could be nurtured in their home environments.

Although there is currently no single universally accepted definition of giftedness, federal omnibus definitions of giftedness offer a glimpse of the variety of types of giftedness that an individual can possess. One such prominent definition comes from the 1972 Marland Report to Congress on the effectiveness of the United States educa-

tional system in meeting the needs of gifted students. Marland (1972) stated that:

> Gifted and talented children are those identified by professionally qualified people who, by virtue of outstanding abilities, are capable of high performance. These are children who require differentiated educational programs and/or services beyond those normally provided by the regular school program in order to realize their contribution to self and society. Children capable of high performance include those with demonstrated achievement and/or potential ability in any of the following areas, singly or in combination: (1) general intellectual ability; (2) specific academic aptitude; (3) creative or productive thinking; (4) leadership ability; (5) visual and performing arts; and/or (6) psychomotor ability. (p. 2)

Additionally, Marland stated that, "It can be assumed that utilization of these criteria for identifying the gifted and talented will encompass a minimum of 3 to 5 percent of the school population" (p. 2). The Marland Report's definition of giftedness has informed many state definitions of giftedness, as well as policies regarding the education and identification of the gifted. This definition also emphasizes that giftedness can occur in many domains, and that a person can be gifted in one area, a few areas, or many areas. Our study investigates gifted adults' perceptions of their parents' and children's abilities across many domains, most of which are consistent with the Marland definition. Specifically, our categories included: general intellectual ability; specific academic aptitude (e.g., math and science or reading, language, and writing); creative thinking (i.e., problem solving, critical thinking); artistic abilities; athletic abilities or psychomotor skills; and leadership skills.

Purpose of This Study and Research Questions

The purpose of the present study was to learn about gifted adults' perceptions of gifts and talents in their parents and in their children in order to better understand their perceptions regarding multigenerational giftedness. This information can help provide a deeper

understanding of giftedness across generations for counselors, educators, or others who work with gifted individuals. The research questions were as follows:

1. Will participants perceive one or both of their parents as gifted, and if so, in what areas?
2. Will participants perceive any of their children to be gifted, and if so, in what areas?

Method

Participants

Participants were 89 gifted adults (34 male, 55 female) who have participated in an ongoing longitudinal study of academically talented students who graduated high school in 1988. At the time of data collection, participants' ages ranged from 35 to 38 (M = 36.73, SD = .62). Most participants were employed full-time outside the home (85%), whereas 11% were full-time homemakers, 1% were full-time students, 1% were looking for work, and 2% did not provide information regarding employment status. In terms of family roles, 83% of participants were married, 9% of participants were single, 5% responded that they were divorced, and 3% of participants indicated that they were living with a partner. Most participants had children (78%). There were 22% of respondents with no children, 12% had one child, 43% had 2 children, 21% had 3 children, 1% had 4 children, and 1% had 5 children. In terms of educational level 20 years post-high school, 33% of participants had completed a bachelor's level degree, 5% had completed some graduate school, 37% had completed a master's level degree, and 25% had completed a doctoral level degree.

Procedures

Participants were initially recruited by asking all school counselors at private and public high schools in a Midwestern state to identify the top two graduates in schools graduating less than 250 students, and the top five graduates in schools graduating more than 250 students.

In addition, National Merit scholars and the two students in each school with the highest ACT scores were asked to participate and to complete surveys. Annual follow-up studies have been conducted since 1989.

For the present follow-up study, data were collected via two different methods. Individuals who had provided their e-mail addresses in the previous year's survey were asked to complete surveys online. Specifically, participants were electronically mailed an introductory letter with a hyperlink to an electronic version of the survey. Data were collected individually via the Internet from each participant by administering surveys online using InQsit, which is a survey service at the authors' university. In the introductory letter, participants were given a choice to complete the survey online or to have a paper copy mailed to them. If participants indicated a preference for mailed surveys, they were mailed paper surveys and asked to return them in the stamped, addressed envelopes provided. Additionally, for those participants who had not provided their e-mail addresses in the previous year's survey, we mailed surveys via the postal service. We sent 71 e-mails and received 60 electronically completed surveys (85% response rate). Additionally, we mailed 35 surveys via the postal service and received 27 paper copies (77% response rate).

The survey consisted of a demographic information page and four open-ended items: (1) Were either or both of your parents identified as gifted when they were children and/or did you notice any signs of giftedness in either of your parents?; (2) If you perceive your parents as gifted, in what areas are they gifted?; (3) For those of you who have children, have you seen any signs of giftedness in your children or have they been identified as gifted by others? If so, please describe; and (4) Please indicate the age at which you first noticed your child or children had advanced abilities and in what areas. Participants responded in a narrative format.

Data Analysis

A research team consisting of a psychologist, three doctoral students, and two master's students analyzed responses to open-ended questions using Miles and Huberman's (1994) qualitative method of organizing data into categories. The first step of this method is to

discuss the purpose of the analysis, which in this case was to identify major themes among responses to questions about giftedness in participants' parents and children. The next step is for at least two researchers to independently generate categories and meet to determine consensus. In the present study, the six researchers generated categories of responses independently and then convened to determine specific categories based on consensus among members. The last step is assignment of data to categories. The researchers each independently assigned responses to categories and then met to determine consensus of assignment to categories.

Results

Participants were asked if either or both of their parents were identified as gifted or if they had noticed signs of giftedness in either parent. Thirty-seven percent of participants stated that neither of their parents were gifted, 34% stated that both parents were gifted, 14% reported that only their mother was gifted, 14% reported that only their father was gifted, and 1% said they were unsure if either parent was gifted. This is interesting because the number of participants who thought neither of their parents were gifted was roughly equal to the number of participants who thought both their parents were gifted; and the number of participants who thought only their mother was gifted was exactly equal to those who thought only their father was gifted. However, participants perceived their mothers and fathers to be gifted in slightly different areas.

Those participants who saw their parents as gifted were asked to describe the areas in which their parents were gifted. The research team, using the method described above, arrived at 10 categories of giftedness among participants' responses. These areas were: math and science; exceptional memory; mechanical or spatial ability; interpersonal skills; language and writing; problem solving and critical thinking; athletic ability; leadership, business, or organizational skills; creative or artistic abilities; and general academic abilities. Of the participants who reported their mothers were gifted, the three most frequently cited areas of giftedness for mothers were creative or artistic abilities (22%), language and writing (20%), and general

academic abilities (15%). In contrast, the most frequently cited areas of giftedness for fathers were math and science (25%), mechanical or spatial ability (17%), and in third place was a three-way tie (10% in each category) for interpersonal skills, creative or artistic skills, and general academic abilities. A side-by-side comparison of percentages of responses for each area is provided in Table 1.

When asked about giftedness in their children, 70% of participants identified at least one of their children as gifted whereas 30% did not identify giftedness in their children. Of those who did not identify giftedness in their children, a few of them noted that their children might be too young (e.g., 4 months old) to be able to determine giftedness. For those parents who identified giftedness, we asked in what areas they perceived them to be gifted. The team classified participants' responses regarding giftedness in their children using similar, but slightly modified, categories as those used in Table 1. These were: math and science; exceptional memory; mechanical or spatial ability; interpersonal skills; reading, language, and writing; problem solving and critical thinking; athletic ability; early achievement of developmental milestones; creative or artistic abilities; and quick learner or general intelligence. The three most commonly cited areas of giftedness noted in participants' children were: reading, language, and writing (28%); math and science (21%); and quick learner or general intelligence (16%). The percentages for all 10 categories can be found in Table 2.

Finally, participants were asked the age at which they first noticed their child or children had advanced abilities and in what areas. The team used the categories that were determined for the previous question (see Table 2) and reviewed the data to determine the ages and areas of giftedness for participants' children. In Table 3, the age that parents first noticed giftedness in their children and area of giftedness for each age is reported. The frequency of responses is listed below each age.

Discussion

This study was designed to gain a deeper understanding of giftedness across generations. In particular, there were four questions we sought

Table 1

Participants' Perceptions of Areas of Giftedness for Their Mothers and Fathers

Area/*Examples*	**Mothers**	**Fathers**
Math and science "*Both parents have scientific minds and are strong in math and science.*" "*My mother shows signs of giftedness in math.*"	11%	25%
Exceptional memory "*My father has always had an exceptional memory, which I inherited.*" "*My father has a sharp memory and can memorize almost every phone number he comes across.*"	2%	3%
Mechanical or spatial ability "*My father can repair anything. He is good at taking things apart, determining how they work, and putting them back together.*" "*My father is gifted in the mechanical area.*"	0%	17%
Interpersonal skills "*Both my parents are gifted socially. They are very kind and caring.*" "*My mom is very in tune to others' thoughts, feelings, and perspectives.*"	11%	10%
Language and writing "*They are both excellent with vocabulary, reading, and writing skills.*" "*My mom is very bright linguistically.*"	20%	8%
Problem solving and critical thinking "*My father is gifted in his ability to solve problems and work through anything.*" "*My mom is gifted in her critical thinking skills.*"	3%	7%
Athletic ability "*My mother is gifted athletically.*" "*My dad is gifted at sports.*"	2%	2%
Leadership, business, or organizational skills "*My mother is an excellent leader. As my father puts it 'your mother goes to a meeting and comes home president.'*" "*My mom is gifted in entrepreneurism.*"	14%	8%
Creative or artistic abilities "*My mother is very musically versatile. She played accordion when she was young, adapted to the piano, and played clarinet well.*" "*My dad is gifted at creativity.*"	22%	10%
General academic abilities or intelligence "*My mother was in the upper 10% of her high school class.*" "*My father was valedictorian of his graduating class.*"	15%	10%

Table 2

Participants' Perceptions of Areas of Giftedness for Their Children

Area/*Examples*	**Percent of responses**
Math and science "*My first grader is doing fifth-grade math.*" "*He is taking advanced classes in math and science.*"	21%
Exceptional memory "*My daughter remembers words to stories and books after hearing them one time and memorizes movies.*" "*He has an ability to recall statistics—especially football or sports related information.*"	3%
Mechanical or spatial ability "*He has exceptional eye-hand coordination.*" "*He has good spatial abilities and likes puzzles.*"	2%
Interpersonal skills "*She has a remarkable ability to connect with people, particularly children with special needs. She intuitively knows what they need and how to interact with them.*" "*Our oldest daughter appears to be very socially intelligent and empathic.*"	3%
Reading, language and writing "*Our oldest was saying several words clearly by 6 months and knew a few hundred by 1 year.*" "*My son is gifted in reading. He has been place in advanced reading program by his teacher.*"	28%
Problem solving and critical thinking "*She demonstrates unique problem-solving skills. She will figure out a way to get what she wants, even if it is not the conventional method.*" "*My daughter has advanced reasoning skills for her age.*"	8%
Athletic ability "*He has been throwing balls the correct way since age 2 and loves just about every sport.*" "*My son is a very gifted athlete.*"	3%
Early achievement of developmental milestones "*Early walking and language development.*" "*She started walking at 9 months.*"	5%
Creative or artistic abilities "*My son has an artistic streak and his drawings and sculptures seem advanced.*" "*My daughter is gifted in her musical abilities.*"	11%
Quick learner/general intelligence "*My two older children are strong students all-around.*" "*The concepts, topics, and answers to questions in the classroom come easy for her.*"	16%

Table 3

Age That Parents First Noticed Giftedness in Their Children and Area of Giftedness for Each Age

	Age That Signs of Giftedness Were First Noticed in Area									
Area	< 1	1	2	3	4	5	6	7	8	9
Math and science	–	–	–	2	3	5	7	1	2	1
Exceptional memory	–	–	2	–	–	–	–	–	–	–
Mechanical or spatial ability	–	1	1	–	–	–	–	–	–	–
Interpersonal skills	–	–	–	2	2	–	–	–	–	–
Reading, language, and writing	2	9	10	2	5	7	4	–	1	–
Problem solving and critical thinking	–	4	3	–	–	1	–	1	–	–
Athletic ability	–	1	–	1	1	–	–	–	–	–
Early achievement of developmental milestones	2	5	–	–	–	3	–	–	–	–
Creative or artistic abilities	–	1	5	–	2	1	–	1	–	–
Quick learner/general intelligence	–	2	1	1	1	3	2	1	–	1

Note. Frequency of responses listed below age.

to answer with our study. Interestingly, we found that the categories of ability that we developed on the basis of participants' responses concerning their parents' and children's areas of talent had substantial overlap with the areas of giftedness identified in the Marland Report (1972). The first area of giftedness identified by Marland was "general intellectual ability," and we derived a "general academic abilities or intelligence" category from participants' descriptions of their parents' areas of giftedness and a "quick learner/general intelligence" category from participants' descriptions of their children's areas of giftedness. Marland also listed "specific academic aptitude" as an area of giftedness, and our participants described their parents and children as having giftedness in the specific academic areas of math and science, exceptional memory, mechanical or spatial ability, and language and reading. Marland's third area of giftedness was "creative or productive thinking," and from our participants' responses, we developed a

category for "problem solving and critical thinking" for both children and parents. Marland's area of "leadership ability" was echoed in our category of "leadership, business, or organizational skills" giftedness in participants' parents. Marland's fifth area of giftedness, "visual and performing arts," corresponded to our category of "creative or artistic abilities" that participants described their parents and children possessing. Finally, Marland's sixth area, "psychomotor ability," was echoed in our category of "athletic ability" in participants' parents and children. The similarity of our categories of giftedness derived from participants' responses and the categories of giftedness described in the Marland Report suggests that gifted adults in the general public (a) may believe that giftedness can occur in a variety of areas and (b) believe they can detect the expression of above-average abilities in several domains in people with whom they have frequent contact.

Through our analysis, we found that around one third of participants indicated that either both of their parents were gifted or both parents were not gifted. Furthermore, an equal number of participants (14%) reported that only their mother or only their father was gifted. Underestimation of abilities could be one potential explanation of why some participants did not view their parents as gifted. Just as teachers sometimes underestimate and fail to identify gifted children (Hodge & Kemp, 2006), participants may have not effectively identified either of their parents' area(s) of giftedness. Additionally, gifted adults are less frequently identified as gifted than are children (Perrone, Perrone, Ksiazak, Wright, & Jackson, 2007). An early study could provide clarification for the reason some participants viewed both of their parents as gifted. As previously mentioned, Weissler and Landau (1993) found that parents with gifted children tend to discuss more problems with their children and help children solve problems in a step-by-step manner; parents asked more questions and gave extensive answers to their questions; and provided more examples and analogies. It is possible that our participants' parents demonstrated a greater openness in conversations and used a more complex language style that provided participants with information about their parents being gifted. We did not ask about the amount or quality of interaction that participants had with their mothers or fathers, but based on traditional gender roles it is likely that participants spent more time with their mothers in the home. Thus, more interaction with

their mothers than their fathers throughout childhood would likely have provided opportunities for participants to observe their mothers demonstrating their giftedness, which may explain why some participants viewed their mothers as gifted but not their fathers. This could also provide a plausible explanation for the specific domains of giftedness participants perceived in their mothers. Comparing families with multiple gifted children to families with only one gifted child, fathers with more than one gifted child showed a greater tendency to provide explicit answers and encourage children to seek out sources of information so they could learn more about the subject (Weissler & Landau, 1993). This may provide some insight as to why some of our participants only viewed their fathers as gifted.

To further understand the specific domains of giftedness, we examined the areas of perceived gifted abilities that participants reported in their parents. Previous research supports our view that giftedness can occur in many forms or areas (e.g., intellectual, social, artistic, athletic), which provides a more complex multitrait view of giftedness (Bélanger & Gagné, 2006). However, we found that of the 10 categories identified to describe giftedness, almost half (42%) of parental giftedness fell into two categories for each parent. Participants described their mothers as gifted primarily in either creative/artistic abilities or language and writing, while they described their fathers' giftedness primarily in either math and science or mechanical/spatial ability. These four categories are consistent with Gardner's theory on multiple intelligences that include eight areas: linguistic, logical-mathematical, musical, spatial, bodily kinesthetic, naturalistic, interpersonal, and intrapersonal (Gardner & Moran, 2006). A conceivable explanation for the categories that participants viewed their parents' areas of giftedness could be based on their parents' career decisions. On the basis of gender roles, women report more artistic and social learning experiences and men report more realistic, investigative, and enterprising learning experiences (Tokar, Thompson, Plaufcan, & Williams, 2007), which often lead toward occupational pursuits in the corresponding areas. This is consistent with our findings that participants found their mothers to be gifted in creative/artistic abilities and language/writing abilities, while participants found their fathers gifted math/science abilities and mechanical/spatial abilities.

As noted earlier, we were interested in the generational trends of giftedness. Therefore, after examining giftedness with participants' parents, we investigated participants' perceptions of giftedness in their children. One interesting finding was that nearly half (49%) of the participants' children were gifted in one of the two categories of (1) reading, language, and writing or (2) math and science. These two categories were also the most commonly identified areas of giftedness for participants' mothers and fathers. If you account for overall parental giftedness by combining both parents of the participants, the top four categories are: math and science; language and writing; creative or artistic abilities; and general academic abilities or intelligence. One finding that is relevant to generational trends is that these four categories of parental giftedness are the same top four categories that participants also identified as gifted abilities in their children. This finding can be partially explained with the emergenic-epigenetic theoretical model (Simonton, 2005). This model assumes the manifestations of giftedness do not depend on the inheritance of just one trait; rather, it consists of multiple traits that are inherited (Simonton, 2005).

Considering that the area of mechanical or spatial abilities was the second highest category of giftedness that participants identified in their fathers, it was surprising that the same category was the least identified gifted area in the participants' children. However, individuals who are gifted in the area of spatial abilities are often missed in identification of giftedness (Webb, Lubinski, & Benbow, 2007). Perhaps a more plausible explanation of our finding is that the area of the brain that represents and executes mechanical or spatial abilities and complex cognitive functioning, the prefrontal cortex, does not fully develop until closer to puberty (Teeter-Ellison, 2005). The latest age of giftedness that our participants identified among their children was 9; therefore, it is likely that these areas have not fully developed for gifted identification in our participants' children.

The emergenic-epigenetic model considers giftedness as a dynamic process in which individuals' gifted areas are continuously developing throughout childhood, adolescence, and early adulthood (Simonton, 2005). This dynamic process provides an understanding for and explanation of why participants have noticed signs of giftedness in their children at various ages. Only a few participants identified their child as gifted before the age of one. However, a longitudinal study on

infant giftedness first identified giftedness in 8-, 10-, and 11-month-olds who subsequently achieved IQ scores above 130 when the children were tested at the age of 4 (Morelock, Brown, & Morrissey, 2003). Similarly, in the Fullerton longitudinal study of giftedness, a cohort of 130 one-year-old infants and their parents were studied for 24 years (Gottfried, Gottfried, & Guerin, 2006). Mothers reported significantly higher early advancement in intelligence, verbal, and social functioning between the ages of 1 and 3.5 years for the 19% of children in the Fullerton study who were identified at age 8 as having IQ scores greater than or equal to 130 on the Wechsler Intelligence Scale for Children-Revised than for the control group of children who were not identified as gifted at age 8 (Gottfried, Gottfried, Bathurst, & Guerin, 1994). Additionally, nearly all of the children who were identified as gifted at age 8 had developmental index scores of 130 or higher at the ages of 1.5 or 2 years on the Bayley Scales of Infant Development (Gottfried et al., 2006). Children in the control group, those who were not identified as gifted at age 8, were not reported by parents to have early advancement, and they had significantly lower developmental index scores. This suggests that early advancement is predictive of later identifiable giftedness. Findings from the Fullerton study also support the notion that evidence of giftedness can be observed in infancy and early childhood.

In actuality, there may have been more children in our study who displayed signs of giftedness prior to the age of one without the participants recognizing their children's gifted abilities. As the recognition of giftedness can be difficult, participants may have underestimated their children's abilities, particularly in the early years. Research has confirmed the difficulty of identifying gifted children, as one study found less than a 60% effectiveness rate of teachers' identification of giftedness in their students (Hodge & Kemp, 2006). Accurate identification of gifted traits may be particularly difficult for parents who are not familiar with characteristics of giftedness.

Giftedness seemed to be more easily recognized by our participants as their children aged. By the age of 2, participants identified numerous areas of giftedness in their children. The area of reading, language, and writing was the most frequently noticed area of giftedness in participants' children. Our finding is consistent with another qualitative study that assessed parental identification of multiple areas

of giftedness in children. In particular, Hodge and Kemp (2000) found early advanced language and interest in words to be the two areas of giftedness in children that were most often identified by their parents. The results of our study further aligned with the findings of Hodge and Kemp. By excluding the categories of mechanical/spatial ability and athletic ability, the remaining eight categories of identified giftedness in our participants' children were very similar to Hodge and Kemp's categories or characteristics of identified giftedness in their participants' children. Across studies, there appears to be consistency in parental identification of the areas or categories of giftedness in their children.

Implications for Counselors and Educators

The findings of the present study add to the body of knowledge for the study of multigenerational giftedness in a few important areas, which have specific implications for both counselors and educators. As mentioned above, the accuracy of identification by teachers has been found to be less than 60% (Hodge & Kemp, 2006). This rate might be improved if counselors and educators consider the multigenerational link suggested by the present findings and use this information as a point of potential identification of giftedness.

Second, the results of this study indicated a high percentage of multiple individuals from within the same family were perceived by participants as showing signs of giftedness (i.e., the parents and/or children of the participants) or were previously identified as gifted (e.g., the participants were identified by guidance counselors based on their achievements). Once again, this multigenerational link should be considered when working with children who come from families with gifted parents and/or grandparents. To the same degree, as a counselor working with an adult who has been identified as gifted or whose partner or partner's parents were identified or believed to be gifted, it may be helpful to educate the individual on the multigenerational link so that the individual's child(ren) might be assessed for giftedness.

Finally, although the research has been limited in the area of multigenerational giftedness, this study has helped pave the way for

more qualitative and quantitative data to be gathered. Counselors and educators should be aware that specific questions have yet to be answered before much can be said about the multigenerational aspect of giftedness. Counselors and educators alike can be confident from the present findings that there is a link—whether genetic or environmental has yet to be determined—that should help guide their work in counseling and in the classroom.

Limitations

One limitation of the study is the moderate sample size of participants, which could impact the generalizability of the results. Further, the participants were all recruited from a Midwestern state so there was only one geographic area sampled. Additionally, this study relied on participants' perceptions and self-report. The participants may have overestimated or underestimated the giftedness of their parents and children, which could impact the results of the study. In addition, the majority of participants had children under age 9. The participants' children may be too young to notice signs of giftedness. Conducting a follow-up study to see if parents notice more signs of giftedness as their children grow older would further our understanding of multigenerational giftedness.

Future Research

Future research is needed to establish generalizability of the findings from the present study to larger and more diverse populations. Future research could also directly survey children and parents of gifted individuals instead of relying on individual's perceptions of their family members. Future research could examine the amount of time that participants spent with each parent and the quality of interaction with that parent. A limitation in the gifted literature is the lack of strong empirical scales available to identify adult giftedness, which could have been used to improve the identification of the participants' parents. Therefore, further research is needed in the development of adult gifted scales. Subsequently, by having such measures more

sophisticated analysis could be performed, which would help quantify the experiences and characteristics that our participants described. Further research could also explore how participants communicate or share their gifted characteristics with their children. This may impact their children's knowledge and recognition of areas of their parents' giftedness. Investigating giftedness among participants' spouses is another area of research that could enhance our understanding of relationships among gifted individuals. Additionally, examining gifted characteristics among extended family members and possibly among social networks would add to the literature base on multigenerational giftedness.

References

Albert, R. S. (1980). Exceptional gifted boys and their parents. *Gifted Child Quarterly, 24,* 174–179.

Bélanger, J., & Gagné, F. (2006). Estimating the size of the gifted/talented population from multiple identification criteria. *Journal for the Education of the Gifted, 30,* 131–163.

Burks, B. S., Jensen, D. W., & Terman, L. M. (1930). *The promise of youth: Follow-up studies of a thousand gifted children: Genetic studies of genius, Vol. III.* Stanford, CA: Stanford University Press.

Galton, F. (1869). *Hereditary genius: An inquiry into its laws and consequences.* London, England: Macmillan.

Gardner, H., & Moran, S. (2006). The science on multiple intelligences theory: A response to Lynn Waterhouse. *Educational Psychologist, 41,* 227–232.

Goertzel, V., Goertzel, M., Goertzel, T. G., & Hansen, A. M. (2004). *Cradles of eminence: Childhoods of more than 700 famous men and women* (2nd ed.). Scottsdale, AZ: Great Potential Press.

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

Gottfried, A. W., Gottfried, A. E., & Guerin, D. W. (2006). The Fullerton longitudinal study: A long-term investigation of intellectual and motivational giftedness. *Journal for the Education of the Gifted, 29,* 430–450.

Gross, M. U. M. (2004). *Exceptionally gifted children* (2nd ed.). London, England: RoutledgeFalmer.

Hodge, K. A., & Kemp, C. R. (2000). Exploring the nature of giftedness in preschool children. *Journal for the Education of the Gifted, 24,* 46–73.

Hodge, K. A., & Kemp, C. R. (2006). Recognition of giftedness in the early years of school: Perspectives of teachers, parents, and children. *Journal for the Education of the Gifted, 30,* 164–204.

Hollingworth, L. S. (1942). *Children above 180 IQ, Stanford-Binet: Origin and development.* Yonkers-on-Hudson, NY: World Books.

Jacobsen, M. E. (1999). Arousing the sleeping giant: Giftedness in adult psychotherapy. *Roeper Review, 22,* 36–42.

Landau, E., & Weissler, K. (1993). Parental environment in families with gifted and nongifted children. *Journal of Psychology, 127,* 129–143.

Marland, S. P., Jr. (1972). *Education of the gifted and talented: Report to the Congress of the United States by the U.S. Commissioner of Education and background papers submitted to the U.S. Office of Education,* 2 vols. Washington, DC: U.S. Government Printing Office. (Government Documents Y4.L 11/2:G36)

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage.

Morelock, M. J., Brown, P. J., & Morrissey, A. M. (2003). Pretend play and maternal scaffolding: Comparisons of toddlers with advanced development, typical development, and hearing impairment. *Roeper Review, 26,* 41–51.

Parker, W. D. (1998). Birth-order effects in the academically talented. *Gifted Child Quarterly, 42,* 29–38.

Perrone, K. M., Perrone, P. A., Ksiazak, T. M., Wright, S. L., & Jackson, Z. V. (2007). Self-perception of gifts and talents among adults in a longitudinal study of academically talented high-school graduates. *Roeper Review, 29,* 259–264.

Robinson, N. M., Lanzi, R. G., Weinberg, R. A., Ramey, S. L., & Ramey, C. T. (2002). Family factors associated with high academic competence in former Head Start children at third grade. *Gifted Child Quarterly, 46,* 278–290.

Silverman, L. K., & Kearney, K. (1989). Parents of the extraordinarily gifted. *Advanced Development, 1,* 41–56.

Simonton, K. (2005). Giftedness and genetics: The emergenic-epigenetic model and its implications. *Journal for the Education of the Gifted, 28,* 270–286.

Teeter-Ellison, P. A. (2005). School neuropsychology of Attention Deficit/Hyperactivity Disorder. In R. C. D'Amato, E. Fletcher-Janzen, & C. R. Reynolds (Eds.), *Handbook of school neuropsychology* (pp. 460–486). Hoboken, NJ: Wiley & Sons.

Terman, L. M. (1925). *Mental and physical traits of a thousand gifted children: Genetic studies of genius, Vol. I.* Stanford, CA: Stanford University Press.

Terman, L. M., & Oden, M. H. (1947). *The gifted child grows up: Twenty-five years' follow-up of a superior group: Genetic studies of genius, Vol. IV.* Stanford, CA: Stanford University Press.

Terman, L. M., & Oden, M. H. (1959). *The gifted group at mid-life: Thirty-five years' follow-up of a superior group: Genetic studies of genius, Vol. V.* Stanford, CA: Stanford University Press.

Tokar, D. M., Thompson, M. N., Plaufcan, M. R., & Williams, C. M. (2007). Precursors of learning experiences in social cognitive career theory. *Journal of Vocational Behavior, 71,* 319–339.

Webb, R. M., Lubinski, D., & Benbow, C. P. (2007). Spatial ability: A neglected dimension in talent searchers for intellectually precocious youth. *Journal of Educational Psychology, 99,* 397–420.

Weissler, K., & Landau, E. (1993). Characteristics of families with no, one, or more than one gifted child. *The Journal of Psychology, 127,* 143–152.