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Gifted and Talented Students' Career Aspirations and Influences: A Systematic Review of the Literature

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Kathleen Miller and Greta Cummings

Abstract

The nursing shortage of registered nurses in Canada is expected to worsen, making recruitment a concern for nursing organizations. Also, many reports have outlined the need for improved leadership in nursing. Therefore, the study purpose was to describe the findings of a systematic review of studies examining the career influences and aspirations of gifted high school students and to make recommendations for further research. Results indicate gifted students choose careers that fit their personal self-concept and their perceptions of traits needed to succeed in a profession. Family members, particularly mothers, had the greatest influence on career decision making and these students were more likely to indicate a desire for a profession with high prestige, high levels of education and higher pay. These students were not likely to indicate nursing as a career choice. Efforts to improve the image of nursing with this group of students are needed.

KEYWORDS: career aspirations, career influences, systematic review, gifted high school students, social talent

Nursing in Canada is facing a number of challenges that include, but are not limited to, (a) a worsening nursing shortage that is resulting in nurses' inability to meet the healthcare needs of Canadians and which has led to nursing recruitment/retention issues; (b) changing healthcare environments that require the innovation and creativity of workers in all sectors; (c) the increasing use of technology in healthcare settings; and (d) the shifting roles of all healthcare providers to improve costs and patient outcomes (Canadian Nursing Advisory Committee, 2002). These challenges suggest that the nursing profession needs leaders who are articulate, innovative, bold, politically astute, and capable of finding solutions to these challenges.

Traditionally, the nursing profession was one of only a few careers considered acceptable for women, and it has relied on a steady stream of young women entering the profession to replace retiring nurses or those leaving the profession for other reasons. However, recent opportunities for young women to enter a wider variety of career fields, especially those traditionally dominated by men, has made nursing a less attractive choice, particularly for students who are bright, capable, and motivated. This is not to suggest that *all* students who are considering nursing are less capable; however, a review of the literature suggests that those students who are bright, capable, and motivated (often classified as *gifted*) are, in fact, encouraged to pursue careers in science, math and engineering (SME) because other careers are considered a waste of talent (Whatley, 1998; Wilgosh, 2001).

In the past decade, several studies have examined the working environment of nurses and strategies for improvements. A consistent recommendation is that leadership be improved throughout nursing, from frontline to senior decision-making levels. For example, in its 2002 report, the Canadian Nursing Advisory Committee (CNAC) identified the development of leadership in nursing as key to improving the work environments of nurses, and the American Nursing Association stated that leadership in nursing is so poor that immediate action is needed to remedy the situation (Lemire, 2001). The Academy of Canadian Executive Nurses has stressed that leadership needs to be infused into nursing at all levels to provide better care to patients and prevent crippling burnout among the current nursing workforce (Ferguson-Pare, Mitchell, Perkin, & Stevenson, 2002). Recently, the Canadian Nurses Association (CNA) (2007) distributed a document entitled *Nursing: The Future*, which describes future roles of nurses and stresses the need to "ensure nursing graduates are ready to assume leadership roles within the health system" (p. 7).

Leadership has been extensively studied, and many theories have emerged. Although much discussion has ensued on whether leadership is an innate quality or can be taught, the ideas of what constitutes good leadership are very similar. Kouzes and Posner (1995) defined a leader as someone who can articulate visions, embody values, and create an environment in which things can be accomplished. Other authors have described leadership as the ability to "take charge, make things happen, dream dreams and then translate them into reality" (Nanus, 1992) p. 10); as "communicating to people their worth and potential so clearly that they come to see it in themselves" (Covey, 2004, p. 98); and as a process that involves people, gains their commitment, and energizes them to achieve mutual goals (Hibberd, Smith, & Wylie, 2006). Finally, Warren Bennis (1994) characterized leadership as the capacity to translate vision into reality. Many gifted/talented students possess and demonstrate these qualities of leadership while still in high school, and they would be assets in improving the state of leadership in nursing.

SIGNIFICANCE OF THE STUDY

Whereas the need to help current nurses build leadership skills has been recognized, and many programs have been developed toward this aim, it is also advantageous for the nursing profession to attract students who demonstrate leadership ability during their high school years. Although high school students' perceptions of nursing and other careers have been researched in the past (Cohen, Palumbo, Rambur, & Mongeon, 2004; Hemsley-Brown & Foskett, 1999; Tomey, Schwier, Marticke, & May, 1996), data are lacking on the career perceptions of Canadian students generally, let alone students who demonstrate leadership qualities. For this reason it is important to examine the career aspirations of this unique group of high school students. Additionally, in the past decade extensive media coverage in Canada has highlighted healthcare reform challenges, the poor work environments of nurses, and the escalating shortage of nurses and other healthcare providers. This coverage may have influenced students' perceptions and choice of nursing as a career.

Little literature has addressed the career perceptions of students who demonstrate leadership attributes, but research has been done in the United States (US) with students who are classified as gifted or talented. *Giftedness* and *talent* often refer only to superior academic achievements (Fiebig, 2003; Jacobs, Finken, Griffin, & Wright, 1998; Lee, 1998), but they sometimes include elements of leadership (Battle & Grant, 1995; Lee, 2002; Mendez & Crawford, 2002). Therefore, because of the lack of research that specifically targets leadership in students, a systematic review was conducted on literature that examined

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gifted/talented high school students and their career perceptions as a baseline to gain an understanding of this population. The purpose of this systematic review was to describe the findings from studies in which career aspirations and influences of students whom the school system formally identified as gifted were examined.

METHODS

Inclusion Criteria

Local criteria for identifying these students were accepted by these researchers. Students were identified as gifted/talented by boards of education in the states or provinces where they resided. Students had to be between the ages of 10 and 25. Influences on students' career choices and career preferences had to be addressed in each study. Included were studies that named *specific* careers (such as physician, teacher, or engineer) as students' preferences as well as those that gave students the opportunity to state a preference for a *general* type of career. Only published research using qualitative and/or quantitative approaches was included. There was no restriction on study design; only English-language articles were used in this review.

Search Strategy and Data Sources

Data for this review were collected from 11 electronic databases, including CINAHL, ERIC, PsycINFO, MEDLINE, ABI, EMBASE, HealthSTAR, Academic Search Premier, Child Development & Adolescent Studies, ProQuest Education, and the Cochrane database. Titles and abstracts were limited to those published between January 1995 and November 2006. During that time work environments of all healthcare workers changed. More opportunities for students of both genders to enter careers previously considered unsuitable were available, and healthcare restructuring was ongoing in the past 12 years. These factors would render earlier data on career aspirations and perceptions irrelevant. Manual searches of specific journals such as Gifted Education, The Journal of Secondary Gifted Education, and High Abilities Studies were also completed. Search terms used in the search were gifted high school students AND career selection, career planning, career perceptions, career preparation, and career aspirations, and career choice. These terms were used as either subjects or keywords.

Data Extraction

The following data were extracted from the group included studies: author, journal, definition of *gifted/talented*, theoretical framework, research question/purpose, study design/methods, study participants/sample, instruments used/data coding and analysis, reliability/rigor and validity, significant and nonsignificant results, comments, and recommendations.

RESULTS

The results of the online and manual searches yielded a total of 568 titles and abstracts (Table 1). The first author screened all 568 titles and abstracts for adherence to inclusion criteria. After screening 511 titles did not meet the inclusion criteria, and 23 duplicates were discarded. Thus, 34 papers were retained for in-depth examination based on the inclusion criteria. To establish interrater reliability, a second reviewer evaluated a random sample of 100 articles' (from the original 568) titles and abstracts using the set criteria. This review resulted in 100% agreement. The first author screened all 34 articles using the three inclusion criteria and excluded several because they were not research studies, but reports of programs developed to assist gifted students in making career decisions. Other papers were excluded because they were retrospective studies of adults who looked back on their career preferences as students in the 1980s. The rest were eliminated because they did not meet all three criteria. Eight papers formed the final group of studies included in this report (see Figure 1).

The final set of included studies and their characteristics are presented in Table 1. All eight studies, published between 1995 and 2005, were conducted in the US. Topics of the various studies included the career decision-making of gifted girls in rural areas, the effects of gender-role stereotyping on career goals and aspirations and the effects of peers and career orientation of gifted American and German girls. All included studies also examined career decision influences for students.

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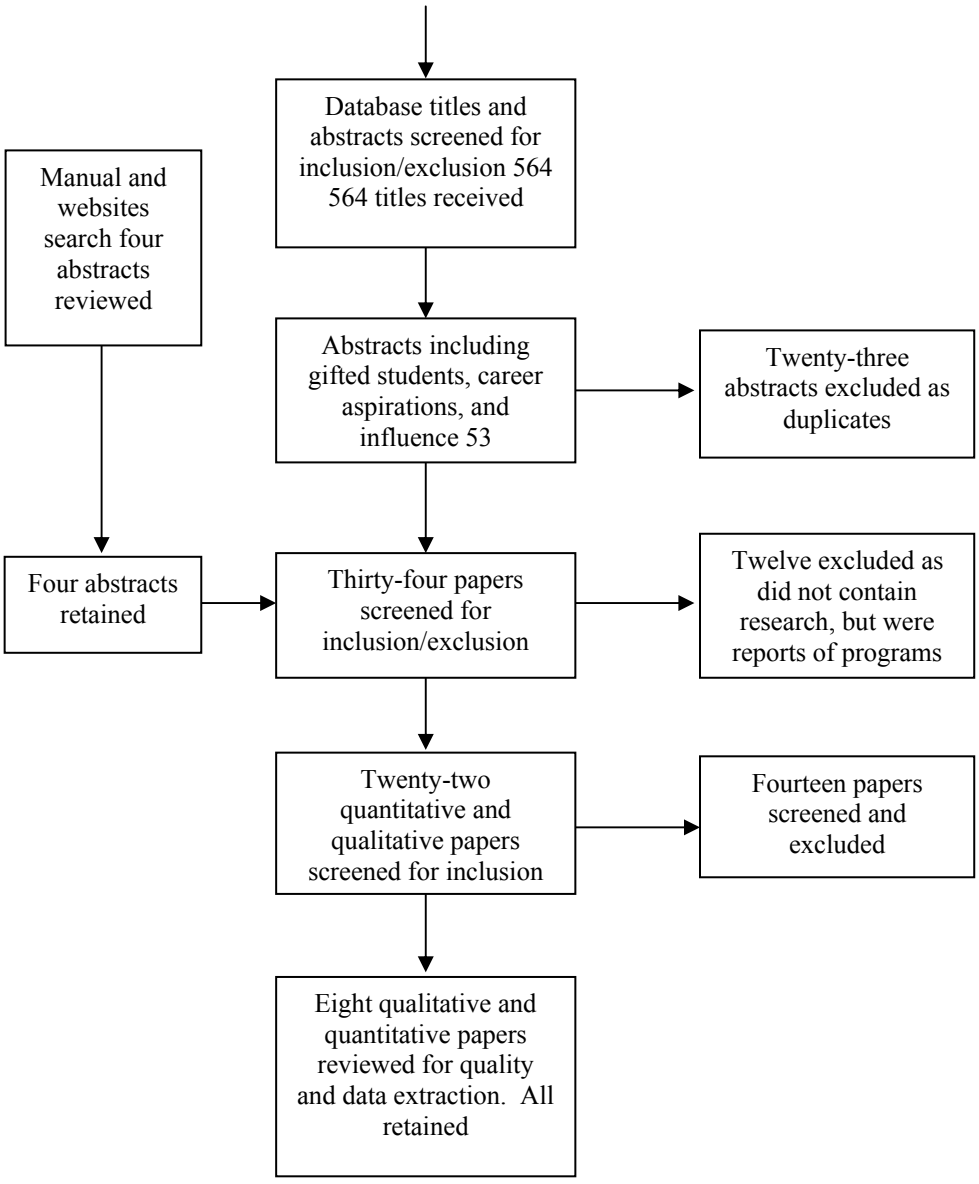

Figure 1. Search and retrieval process.

The eight studies included in this review included five quantitative and three qualitative studies. Of the 1,371 students in the studies, 1,360 were represented in quantitative studies and 11 were represented in the qualitative studies. All students ranged in age from 11 to 25 years and were mostly in elementary and junior high/middle school. Local boards of education had identified all the students as gifted through a variety of standardized testing means such as the American College Testing, the Standard Aptitude Tests, the SRA Achievement Series, Scales for Rating Behavior Characteristics of Students (Learning and Motivation Subscales only), The Torrance Test of Creativity, and IQ scores. The majority of these studies (Battle & Grant, 1995; Fiebig, 2003; Grant, 2000; Jacobs et al., 1998; Lee, 1998; Lee, 2002; Mendez & Crawford, 2002) did not mention specific careers in their data collection, but focused instead on the students' self-concept, their perceptions of attributes of people in certain career types, their interest in general types of careers, their attitudes toward the role of women in society, and their values and role expectations regarding marriage and family. The careers were classified as traditional versus nontraditional careers for women, science and mathematics careers, and health science or physical science careers. Three studies (Battle & Grant, 1995; Grant, 2000; Lee, 1998) briefly mentioned students' plans for specific career choices or college majors, and in only one study (Kher-Durlabhji & Lacina-Gifford, 1997) the students actually rated career desirability.

The data collection occurred in a variety of settings including the students' schools and homes, summer camps geared toward gifted students that universities offered, and the colleges and/or universities that the older students were attending. Three studies examined the career aspirations and influence of both genders (Kher-Durlabhji & Lacina-Gifford, 1997; Lee, 1998; Mendez & Crawford, 2002), and three studies focused on girls only, two of which focused on girls in rural areas (Fiebig, 2003; Grant, 2000; Jacobs et al., 1998). The final study focused on one male student (Lee, 2002). Although the majority of studies provided information about the students only, three studies also provided information about the educational levels and career achievements of the students' parents (Battle & Grant, 1995; Fiebig, 2003; Mendez & Crawford, 2002).

The authors of these eight studies used a variety of theories on career development, adolescents, and giftedness to guide their work. Mendez and Crawford (2002) utilized Gottfredson's (1981) theory of circumscription and compromise, which states that by the time students reach early adolescence, they have ruled out a number of occupations that they believe are inconsistent with their gender role, social class, and/or intellectual abilities (p. 97).

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Table 1
Characteristics of Included Studies: Quantitative and Qualitative

Quantitative Studies

Author(s)/ journal	Framework	Subjects	Instrument	Scoring	Reliability	Validity	Analysis
Fiebig J. N (2003) *High Ability Studies*	Rainey & Border (1997) Model of Mother-Daughter Relationships	37 American & 26 German girls age 11-14 identified as 'gifted' & their mothers.	*Inventory of Parent and Peer Attachment* – 25 items for each mother, father and peer subscale.	5-point Likert Scale	α =0.96 for American girls & 0.91 for German girls	Not Reported	Structural Equation Modeling (Path Analysis)
			Psychological Separation Inventory – 138 items.	5-point Likert scale	α =0.87 for American girls and 0.82 for German girls	Not Reported	As above
			Short Ben Sex-Role Inventory – 30 items.	7-point Likert scale	α =0.76 for American girls; 0.85 for American mothers; 0.91 for German girls and mothers	Not Reported	As above
			.				As above

(table continues)

Author(s)/ journal	Framework	Subjects	Instrument	Scoring	Reliability	Validity	Analysis
			The Attitudes Towards Women Scale for Adolescents – 12 items	4-point Likert scale	α for Americans daughters=0.59 and mothers 0.76; α for German girls=0.73 and mothers 0.69	Not Reported	
			The Parent Nomination Form – use by mothers to assess their daughters' abilities.	Not reported	α for American girls=0.64 and German girls 0.73	Not reported	
			Career Aspiration Scale – 10 items Occupational Checklist	5-point Likert scale			
Jacobs. J. E., Finke, L. L., Griffin, N. L., & Wright, J. D. (1998) *American Educational Journal*	No framework	220 girls (9th-12th grade) in NSF-founded programming for rural girls talented in science	*Adolescent Questionnaire*	7-point response scale	Not reported	Not reported	Regression Analyses
			Mother Questionnaire	7-point response scale	Not reported	Not reported	

(table continues)

Author(s)/ journal	Framework	Subjects	Instrument	Scoring	Reliability	Validity	Analysis
Kher-Durlabhji, N. & Lacina-Gifford, L. J. (1997) *The Journal of Secondary Gifted Education*	Noframework	Four groups of students age 13-15. 113 in gifted programming 69 just missed qualifying for gifted programming 46 rated as creative 189 in a control group	Written questionnaire consisted of a list of professions students were asked to rank; two open-ended questions requesting information about 3 jobs students would most and least like to have; and scale rating which adults and peers would support their choice of teaching career	5-point Likert scale	Not reported	Not reported	
Lee, J. D. (1998) *Social Psychology Quarterly*	Structural Symbolic Interactionism on Self & Identity	433 students from 9^{th}-12^{th} grade participating in summer camp for gifted High School students to foster interest in SME	Participants rated themselves & others on a scale measuring semantic meanings of words that are opposite; asked to rank interest in becoming scientists & other careers; and a social encouragement scale to assess the effects of social support by adding the scores from 3 questions	7-point Likert scale	Not addressed Not reported	Not reported Not reported	

Author(s)/ journal	Framework	Subjects	Instrument	Scoring	Reliability	Validity	Analysis
							(table continues)
Mendez, L. M. R, & Crawford, K. M. (2002) *The Journal of Secondary Gifted Education*	Gottredson (1981) Theory of Circumscription & Compromise	227 students age 11-14 participating in gifted programming	*Parent Questionnaire* – 17 items	To determine child's ocioeconomic status nd whether mother's areer was traditional			
			Revised Occupational Checklist (Brooks, Holahan & Galligan, 1985)	0 occupations, 20 emale dominated score= 1); 20 neutral (score= 2); 0 male dominated score= 3). Educational levels equired for each ccupation given a core of 1=high chool dress or less; =at least a college degree; 2= requiring t least a graduate degree.	Two-week, test-retest reliability by item agreement 85%	Not reported	MANOVA
							(table continues)

Author(s)/ journal	Framework	Subjects	Instrument	Scoring	Reliability	Validity	Analysis
			Duncan Revised Socioeconomic Index of Occupational Status.	Prestige score calculated in same manner as educational levels 4-point Likert scale			
						Not reported	
			Personal Attributes Questionnaire (Spence & Helmreich, 1978) – 8 items in each realm of masculinity, femininity and masculinity/ femininity.		α=0.85 for masculinity scale; 0.82 for femininity scale; and 0.78 M-F scale		
			Attitudes Toward Women Scale for Adolescents – 12 items.	4-point Likert	α=0.72 for girls and 0.78 for boys	Not reported	
							(table continues)

Author(s)/ journal	Framework	Subjects	Instrument	Scoring	Reliability	Validity	Analysis
Kher-Durlabhji, N. & Lacina-Gifford, L. J. (1997) The Journal of Secondary Gifted Education	No framework	Four groups of students age 13-15. 113 in gifted programming 69 just missed qualifying for gifted programming 46 rated as creative 189 in a control group	*Work & Family Orientation Questionnaire*	4 categories measured—work, mastery, competition and personal unconcern. Higher scores indicate higher achievement motivation	α for work, master & competitiveness range from low0.60 to mid .070. A revised scale for personal unconcern α=0.83.	Not reported	

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Qualitative studies

Author(s)/journal	Framework	Subjects	Data collection	Rigor	Analysis
Battle, D. A., & Grant, D.F. (1995) *Roeper Review*	Study of adolescence & giftedness	3 gifted females age 18-19 from rural US	Case study	In-depth engagement with subjects over time 'Member checks' with participants	Data classified Content analysis for relevant themes
Grant D. F. (2000) *Roeper Review*	Theories associated with developmental career theories, gender role expectations and giftedness	7 gifted females age 18-25 from rural US	Questionnaire on demographics In-depth structured interviews	Used multiple researchers, multiple data sources and the use of structured interviews and questionnaires.	Consistent themes to identify influences, patterns & trends over time
Lee, S. (2002) *The Journal of Secondary Gifted Education*	No framework	One gifted male age 12.	Semistructured interviews Observations Review of documents	Multiple contacts with subject in varied settings	The constant comparative method, consisting of three levels of coding, was used to analyze the data

Fiebig (2003) used Rainey and Borders' (1997) theory on how the mother-daughter relationship will affect career orientation and career aspirations among early adolescent rural females (p. 166). Lee (1998) based his study on three theories: (a) Stryker and Serper's (1982) theory of structural symbolic interactionism on self and identity, which states that people make behavioral choices consistent with salient identities formed through interactions with others (p. 201); (b) Burke's (1991) identity control theory; and (c) Heise's (1979) affect control theory. These theories employed cognitive and affective dimensions of meaning (p. 201).

Grant's (2000) qualitative study was grounded in theories and research associated with developmental career theories, gender-role expectations, and giftedness. He used primarily the work of Zunker (1998), who viewed career development as a lifelong process that occurs in stages that include career maturity and the development of self-concept. He also incorporated Super's (1990) theory that purports that career-related decisions result from an ongoing learning process that includes the interaction of multiple influences across the lifespan (p. 252). Battle and Grant (1995) stated simply that their study had a theoretical framework that evolved from research on both adolescents and giftedness (p. 33). The other authors (Jacobs et al., 1998; Kher-Durlabhji & Lacina-Gifford, 1997; Lee, 2002) did not report using a theoretical framework.

The data collected from these eight research studies cover a range of topics related to the career choices of gifted students, including their self-concept and perceptions of attributes of people in certain careers, the influences on career decision making, and the actual ranking of desired careers. Each of these topics is discussed below.

Self-Concept

Students' self-concept was the main area for examination in the studies included in this systematic review. It is evident through the results that students' self-concept is related to their career aspirations, and that one of the greatest determinants of self-concept is gender.

One study (Lee, 1998) reported that students are most likely to choose disciplines in which their perceptions of the personality attributes of people in that discipline are most similar to their own self-concepts and that students' identity acquisition tends to narrow their educational choices, which results in fewer career opportunities. Lee identified a gap between girls' and boys' self-concepts and their perceptions of the characteristics of people in the SME disciplines. Both

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boys and girls reported that individuals in these disciplines have strong masculine traits such as competitiveness, independence, and object orientation. However, girls perceived that they *themselves* have more feminine traits such as cooperativeness, other orientation, and emotions rather than the masculine traits prominent in SME careers. In these studies the girls were less likely to express an interest in SME careers than boys.

Mendez and Crawford's (2002) findings substantiated this viewpoint in their study in which students completed several scales that measured personality attributes, attitudes toward women, and work and family orientation. Girls were found to be more liberal in their attitudes toward the rights and roles of women in society and were more likely to consider a wider range of traditional, non-traditional, and neutral careers than were boys.

On the other hand, boys in gifted programs identified more with other science students than with other males and tended to choose mainly male-dominated careers that were more likely to require higher levels of education, were ranked higher on the prestige scale, and earned higher incomes. Boys chose careers that reinforced their own self-concept of being masculine and scientific, while girls were more likely to choose careers that matched their interests and personalities regardless of whether those careers were neutral, male, or female dominated. Girls who believed they possessed more masculine personality traits were more likely to choose male-dominated career paths. However, despite this apparent belief that they could choose any careers they wanted, the female science students believed that they had more in common with other girls than with other science students, and still tended to indicate more interest in careers that allowed them to express their feminine qualities.

Mendez and Crawford also found that girls were more likely than were boys to rate family orientation and the ability to combine family and work life as important to choose a career. To a lesser degree, other studies in this review also looked at the role of self-concept with regard to career aspirations and demonstrated the same results (Battle & Grant, 1995; Fiebig, 2003; Grant, 2000; Jacobs et al., 1998).

Influences on Career Decision-Making

Influences on the career decision-making of gifted students are tied closely to their self-concept and perceptions of the characteristics required to compete and be successful in a career. In two studies, the role of mothers in shaping the self-concept of gifted girls was examined. Mothers had a significant impact on

how the girls perceived their own abilities and on what constituted an appropriate career. Jacobs et al. (1998) found that mothers' attitudes toward women in science were the most significant factor in whether their daughters would consider a science career regardless of the girls' science GPA, extracurricular activities, or peer support. The mothers had a great influence on the career choices of their daughters because they transmitted their belief that their daughters have the talent and ability required to take on a science career.

In her study of American and German gifted females, Fiebig (2003) found that mothers' views on traditional versus non-traditional careers and their opinions of their daughters' scientific talents were strong indicators of the type of career their daughters would consider. The mothers' attitudes also influenced whether their daughters aspired to achieve levels of leadership in their chosen career.

Further to these studies on the effects of mothers on daughters, in the remaining studies students indicated that family support for a given career was the primary factor in their consideration of a variety of occupations (Battle & Grant, 1995; Fiebig, 2003; Grant, 2000; Jacobs et al., 1998; Kher-Durlabhji & Lacina-Gifford, 1997; Lee, 2002). This does not necessarily mean that these adolescents would choose careers that were similar to those of their parents, but rather that they would choose careers that their parents and families felt were appropriate, achievable, and of value to society. Other influences on career decision-making include teachers, principals, and school counselors (Grant, 2000; Kher-Durlabhji & Lacina-Gifford); involvement in a variety of extracurricular activities, including (but not limited to) science clubs, church, babysitting, 4H clubs, language studies, cultural studies, and sports (Battle & Grant; Jacobs et al.; Lee), and, to a much lesser degree, peers (Jacobs et al.; Kher-Durlabhji & Lacina-Gifford; Lee).

Ranking of Careers

Some researchers asked students to report their preferences for a general type of career, whereas others asked students to report a preferred field of study or to actually rank specific careers in order of preference. The studies that looked at general types of careers divided the occupations into male-dominated, neutral, and female-dominated. These studies classified female-dominated careers as having 70% or more females in the workplace, neutral careers as having 30%-69% female workers, and male-dominated careers as having fewer than 30% female workers (these percentages were based on data from the US Bureau of the Census). Jacobs et al. (1998) and Lee (1998) reported that when the gifted girls in

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their studies indicated a preference for male-dominated professions, they usually chose professions that would still allow them to act upon their feminine qualities. In considering science careers, girls were much more likely to choose health-science professions than physical-science professions. Gifted girls sought general truths about life and preferred careers orientated toward 'others,' whereas gifted boys looked for practical answers and wanted careers orientated toward 'things' (Jacobs et al.; Lee). For example, whereas medicine and law were once considered male-dominated professions, they were also classified as helping professions in which girls could feel that they were contributing to society and helping the less fortunate. Thus, more girls preferred medicine and law as career options and were beginning to outnumber men in these professions. Boys continued to gravitate towards engineering and mathematics, which are still very much male-dominated professions, because these careers deal with concrete facts and machines (Jacobs et al.; Lee).

The findings of the studies on general career types were in keeping with the findings of the studies in which students were asked to indicate a study major or rank career desirability. Grant (2000) conducted a qualitative study with seven gifted rural females to determine the influences on their precollege and career-related decisions. These girls were asked to indicate career preferences as they entered postsecondary education. Their career aspirations included medical doctor (three girls), politician, retail entrepreneur, elementary teacher, and biomedical engineer. In their qualitative study, Battle and Grant (1995) also found that the three gifted girls aspired to be a medical doctor, a teacher, and a genetics engineer. The girls in both studies wanted to make a difference in the lives of others and to better society. The one qualitative study that examined the career aspirations of a gifted male used a participant/observer approach and was less conclusive in determining a specific career path. The male in this study indicated a desire to become a rock star, a career that could be considered neutral (Lee, 2002).

In only one study were students asked to rank careers in order of preference. Kher-Durlabhji and Lacina-Gifford (1997) conducted a survey of gifted and talented students in junior high school and divided them into four groups that consisted of *academically gifted; smart,* students who just missed the cut-off for gifted programming; *creatively gifted,* and a control group of regular junior high and high school students The students were given a list of common careers and asked them to rank them. All three groups of gifted/smart students rated physician or scientist as their first choice, and the control group of regular students chose lawyer. The second choice for the two academic groups was lawyer, whereas the creative group ranked actor or artist as their second choice,

and the control group ranked physician as their second choice. Other rankings for the academically gifted students included accountant (4), banker and manager (5), nurse and actor (10), and artist, salesperson; and teacher (11). After their first two choices, the smart students ranked the rest of the careers as follows: manager (4), actor (6), artist (7), banker (8), nurse (9), salesperson and teacher (11). The creative students (group 3) chose lawyer (5), nurse (7), manager (8), accountant (9), and banker, salesperson, and teacher (11). Finally, the students in the control group (4) rounded out their list with actor (3), nurse (4), banker (5), manager (6), accountant (7), scientist (8), artist (9), salesperson (10), and teacher (11). These results are similar to those of the other studies in the systematic review in that these gifted/talented students chose careers that are generally considered high status and high prestige in society. Study outcomes are summarized in Table 2.

Table 2
Summary of Study Outcomes

Influences	Source	Relationship	Career choices
Self-concept/ identity & perceptions of attributes needed in general career types	Lee (1998)	Discrepancies between self concept/identify & perception of attributes needed for career significantly impact career choice	Girls—physician, biologist & psychologist Boys—engineer, physicist & mathematician
	Mendez & Crawford (2002)	Girls—Moderate positive correlation between career choices & personal attributes (masculine scale) as well as work & family orientation	Girls chose significantly career choices—female, neutral and male dominated
		Boys—Moderate negative correlation between career choice and personal attributes (feminine scale)	Boys chose male dominated careers significant number of times
	Jacobs et al. (1998)	Girls' interest in biology significantly related to career in health sciences Lower science GPA significantly related to interest in human services career	Girls more likely to choose health science career rather than physical science career
		Participation in science activities & science GPA significantly related to physical science career	

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Influences	Source	Relationship	Career choices
Family—particularly mothers	Fiebig (2003)	Mother-daughter relationship significantly influences career orientation & aspiration Mothers' gender role attitudes significantly affect daughters' career orientation & aspiration	Not specified
	Jacobs et al. (1998)	Mothers' attitude toward value of science significant toward choosing any science career & choosing health science career	Girls more likely to choose health science career
	Kher-Durlabhji & Lacina-Gifford (1997)	Parents strongly encourage career in teaching	Physician/scientist/lawyer #1 or 2 & teacher as #11 of 11 choices
	Battle & Grant (1995)	Girls rate family as #1 influence in career decision making	Medicine, teaching, genetic engineer
	Grant (2000)	Girls rate family as #1 influence in career decision making	Medicine, politician, genetic engineer, teacher (2), psychiatrist, entrepreneur
Other adults (teachers & counselors); peers	Lee (2002)	Male subject states peers helpful in choosing career	Rock star
	Kher-Durlabhji & Lacina-Gifford (1997)	Teachers, counselors, principles likely to offer encouragement to consider teaching; peers unlikely to offer encouragement	Physician/scientist/lawyer #1 or 2 & teacher as #11 of 11 choices

DISCUSSION

Students' career choices are most often tied to their own self-concept and their perceptions of the personality traits required for general career types. Influences on career choice include parents, particularly mothers; teachers; principals; and peers. This review reveals that these gifted students generally aspire to careers that they and society consider prestigious. Because of the nature of available research on gifted and talented students and the lack of research that specifically targets students with leadership ability; the following discussion examines how these two may be different. The discussion also addresses the focus of current research on gifted girls and the perceived need to encourage them to

consider careers in SME and concludes with a discussion on the image of nursing and how it may explain the findings of the systematic review.

Academic Giftedness versus 'Social Talent'

The majority of the studies in this review examined academically gifted students. Although students can be gifted and/or talented in areas other than academics, little to no research has been conducted on students outside the academic realm. For example, students who might not achieve the high standards set for entrance into official academic programming may possess other important skills such as leadership, communication, organization, or critical thinking. However, it is difficult to find this separation between academic giftedness and social talent in the literature. Generally, students who are academically gifted are assumed to also demonstrate these other talents; and in many cases they do, but not always. This is a shortcoming in this area of research. Currently, no theories regarding 'social talent' exist in the literature, as we coined this term. We also believe that concept of social talent is similar to the theory of emotional intelligence as a basis for leadership attributes put forward by a number of researchers (Cadman & Brewer, 2001; Charbonneau & Nicol, 2002; Cummings, 2004; Montes-Berges & Augusto, 2007). Discussion of this theory and its relation to social talent is not the focus of this paper, but our findings suggest that more research in this area would be beneficial.

Research Focus

Much of the literature on gifted students and careers has focused on encouraging these students, particularly girls, to choose careers in the SME fields. Because these fields are traditionally male dominated, a large amount of the research has centered on girls and why they do or do not choose careers in them. It seems a foregone conclusion that gifted students should pursue careers in SME and that any other career choice is not sufficiently challenging (Whatley, 1998; Wilgosh, 2001). This is particularly true if girls indicate an interest in a profession that is traditionally female dominated. It is unfortunate that female-dominated professions tend to be rated as low status, low prestige, and low pay or are viewed as holding these female students back from achieving their full potential. Little consideration seems to be given to the girls' own stated preference for a balance between work life and personal life and the need to follow their own self-identify.

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Image of Nursing

Nursing is viewed as a female-dominated profession, which often means that it is not considered a suitable career for gifted students of either gender. In some of the research studies included in this review, the discussion focused on students who are choosing health-science rather than physical-science careers. However, no explanation was given for what constitutes a health-science or a physical-science career. Therefore, it is possible that nursing can be included in the health-science career category in which students are indicating an interest. A more explicit description of these science careers would make it easier to determine whether these students might, in fact, consider nursing as a career option.

RECOMMENDATIONS

To further advance the knowledge about gifted/talented students', we propose recommendations related to leadership students' career aspirations, the influences of family and the image of nursing, and perceptions of the nursing profession. These recommendations are as follows.

Study Populations

As noted, the majority of literature on gifted students focused on students who demonstrate strong academic skills. It is important to expand the understanding of how students who demonstrate other talents, either in conjunction with or separate from academics, are making decisions about careers and which occupations are attractive to them. Having a strong academic background does not necessarily mean that a person will be an effective leader, a clear communicator, or a skilful negotiator. However, these are necessary skills for nurses to possess to achieve the quality and scope of nursing practice that nursing leaders envision and to improve the work environments of nurses (Baumann et al., 2001; Canadian Nurses Association, 2007; Patrick & White, 2005). More research needs to be conducted with students who have demonstrated, or are learning, skills such as leadership, as well as with Canadian students to help build their knowledge of nursing as a career choice in Canada. Because little information is available about this cohort of students in Canada, sound quantitative and qualitative studies are needed to offer an encompassing view of these students.

Image of Nursing

A common theme throughout this literature review was the classification of careers as female dominated, neutral, or male dominated. Researchers have used well-known scales to rank careers as high or low status, high or low paying, and high or low prestige. Female-dominated professions, including nursing, are categorized as low status, low paying, and low prestige. It has been well documented that nursing suffers from an image problem (see, e.g., Al-Kandari & Lew, 2005; Cohen et al., 2004; Erickson, Holm, Chelminiak, & Ditomassi, 2005), and people who have been shown to influence students in their career choices generally do not understand the work that nurses do (Blasdell & Hudgins-Brewer, 1999; Mignor, Cadenhead, & McKee, 2002). They do not recognize the level of critical thinking, leadership, and decision-making ability required to be effective and successful in the nursing profession. Students in the studies in this review, as well as students talented in other areas, may possess the attributes required to make them excellent nurses. It is incumbent on national and provincial nursing associations across Canada to make it a priority to improve the image of nursing, particularly with this special group of high school students. These students, their parents, and their high school advisors need to learn about the wide range of career opportunities available to nurses and the potential for leadership positions throughout the healthcare system. If nursing is successful in attracting this type of student, it may in turn improve the status and prestige of the nursing profession. This will then make the profession more attractive to students.

Recruitment of Students

Many faculties in colleges and universities actively recruit students whom they would like to see attend their institution. Faculties of nursing need to follow this trend to attract students who demonstrate personal and intellectual abilities that will enhance the profession (Tomey et al., 1996). A report that the CNA commissioned revealed that most nursing education programs in Canada turn away hundreds of applicants each year due to classroom quotas (Paul, Day, Bowman, McBride, & Idriss, 2005), and representatives from two of the largest nursing programs in western Canada confirmed that this is true (S. Bookhalter, personal communication, April 24, 2007; P. Paul, personal communication, Feb 21, 2006). This suggests that recruitment into nursing in Canada is not a problem. However, currently, schools of nursing choose applicants from those who apply rather than targeting their recruitment towards specific gifted and talented students. Faculties need to work with high schools across Canada to identify students who have demonstrated superior abilities and present these students with incentives such as scholarships, mentoring, and relocation assistance. These

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students could be invited to special information receptions where they will have the opportunity to meet with nursing leaders, frontline nurses, faculty, and employers to increase their knowledge of and appreciation for the nursing profession. This strategy may yield surprisingly effective results.

LIMITATIONS

This review has two limitations. First, although these studies include information on how students view careers generally, little data are available on their specific career goals and aspirations. Therefore, it is difficult to determine how students rate the desirability of specific careers. It is also challenging to ascertain what students know about the realities of working in specific careers. Second, a reporting bias may exist as only published studies in English were included in this review, and all of these studies were conducted in the US . It is unfortunate that more studies in other countries have not examined this question, as this would add more cultural diversity to the results. However, it may be that other countries do not classify their gifted students in the same manner as the US and/or do not provide such extensive programming for these students. This may be the reason that no studies were found from other countries and might explain the difficulty of conducting research on these students in other countries. However, gifted and talented students in other countries may have different self-concepts from those of their American counterparts or may feel freer to choose a variety of types of careers.

CONCLUSION

Research on the career aspirations and influences of gifted and talented students has focused on the areas of education and psychology and has generally looked at the need to increase the participation of these students in the SME fields. All reviewed studies, with the exception of one that also included a cohort of German students, were conducted with American students, which makes it difficult to determine whether students in other countries have the same ideas about career desirability and opportunities. Students' career choices are most often tied to their own self-concept and their perceptions of the personality traits required for general career types. Influences on career choice include parents, particularly mothers; teachers; principals; and peers. Gifted girls tend to be more flexible in their career choices, whereas gifted boys indicate an interest in male-dominated professions that require higher education and carry greater social prestige. Similar studies need to be done with students who display a variety of gifted attributes other than academics. The image of the nursing profession needs attention, and schools of nursing would benefit from targeting recruitment

strategies to specific gifted and talented students. It would be beneficial to help both gifted girls and boys to recognize the variety of career opportunities available in nursing beyond the stereotypical, traditional roles. As parents, teachers and other adults are shown to have great influence on the career choices of these students, it is also important to demonstrate changes in nursing that have occurred over the years targeted on these people. Public education regarding nursing roles should be intensified.

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