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For further details see inside back cover.

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Front Cover Art Design created by David Merkuratsuk. David is from Nain, Labrador and remembers his love of art going back to grade 2.

The Inukshuk... *"These magnificent Stone Cairns show that you should always have hope in where to go because they are the leaders that lead the way to safety which brings food, shelter, and life. All the years that I have been traveling through the barrens, I have always been amazed how these Inukshuks can bring you to your destination and they ask nothing in return."*

David Merkuratsuk

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Editorial

It is my pleasure to welcome you to the Volume 5, Number 2 issue of the Canadian Journal of Career Development/Revue canadienne de développement de carrière.

Within the covers of this issue we have 4 significant articles. Each of these articles is thought provoking in its own right.

I would like to thank the authors for their work in researching and enhancing the theory and practice of career development in Canada and around the world. As with most articles the authors set out to discover some area of interest. It started with a seed that questioned why - and in response - we have before you their findings. I thank each of them for their thoughtful and deliberate work which advances the field of career development.

In turn, I ask those reading these articles to consider your own "What if?" question. The creation of new knowledge is not reserved only for those of us in universities and colleges but across the many sectors of our field. Please consider developing a piece of research that explores a burning question. Partner with a colleague like each of the authors in this issue.

In conclusion, I would like to express my appreciation to the peer review team around the world, Ms. Yvonne Abbott in the Journal office, and Ms. Lisa Russell, our associate editor for your hard work on this issue of the Journal as always.

To the authors whose work is included herein – thank you. You are breaking new ground with each piece of research you conduct. On behalf of the over 2,100 individual subscribers to the journal, I say thank you for the work you do and hope that in some small measure the journal is helping to fuel the fires of current research in career development around the world.

All the Best!

Rob

Robert Shea
Founding Editor

Inukshuk International Award
For Creativity in Career Development

Why develop this award?

The award is developed to support and celebrate creative best practices in community career development throughout the world.

- To celebrate those best practices in community career development which do not necessarily get the recognition they deserve.
- To encourage others to share their best practices.
- To respond to the many requests by our readers for the dissemination of creative community best practices.

What programs can be nominated?

- Programs must have as their central core the provision of career services in the community sector.
- Programs cannot be national programs or micro components of larger national programs.
- Community Career development programs from around the world can be nominated.
- Programs should have been established for no less than 3 years.
- Programs should have had a formal evaluation on the programs impact.

How to nominate a program?

- All nominations must be accompanied by an overview of the program – program name, nature of program, program impact, clients served (Include as much detail as possible).
- Three letters of reference from individuals who can attest to the programs impact.
- All other information that might assist the independent committee that will adjudicate nominations.
- Any individual can nominate a program.

Who will adjudicate?

- An independent international committee comprised of career development practioners.

What is awarded?

- A specially commissioned statue of an Inukshuk. The statue was designed specifically for this award and will be presented in person wherever possible.
- Each program selected for the Inukshuk award will have their program published in the Canadian Journal of Career Development as part of the Journal's ongoing promotion of international best practices in community career development.

Why the Inukshuk statue?

The Inukshuk has been chosen for it's significance to the career development field as it has become the symbol of the Canadian Journal of Career Development. Their role as sign posts in northern climates are well known throughout Canada.

As David Merkuratsuk, a post secondary student from Nain, Labrador writes…

"These magnificent stone cairns show that you should always have hope in where to go because they are the leaders that lead the way to safety which brings food, shelter, and life. All the years that I have been travelling through the barrens, I have always been amazed how these Inukshuks can bring you to your destination and they ask nothing in return."

How often is the award presented?

The award will be presented on a less than annual basis or as nominations dictate.

Nominations should be sent to:

Selection Committee, Inukshuk Award
Canadian Journal of Career Development
Faculty of Education
G. A. Hickman Building, Room E-5036
St. John's, NL
A1B 3X8

The Effects of Context and Experience on the Scientific Career Choices of Canadian Adolescents

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Abstract

This study explored the differential utility of contextual and experiential factors in the prediction of scientific career aspirations. Specific propositions based on the Lent et al. (1994) social-cognitive model of career choice were also examined. Data were obtained from a Canadian national subgroup (n=3,306) of adolescents (13-19 years) who participated in the National Youth and Science Fair Project Study (NYSPS). Multivariate logistic regression analyses indicated that family background, scientific learning experiences, science self-efficacy measures, outcome expectancies, and scientific interests contributed significant unique variance to the prediction of scientific career choice. Results of a final model revealed that students aspiring for a career in the sciences were more likely than their peers to be male, senior students, have higher grades in science, more interest in science, and expect their science courses to be useful to their future career. Scientific self-efficacy and outcome expectancies were found to have direct effects on choice goals. Outcome expectancies also had an indirect effect on choice goals through scientific interests. Scientific interests had a significant direct effect on choice goals. Implications for career development/choice theory and practice are discussed.

Introduction

Advances in theory and a growing body of empirical literature have characterized vocational-counseling psychology in recent years (Lent, 2001). Career process explanations have evolved through the development of new theoretical approaches (e.g., Gottfredson, 1996) and the refinement/expansion of foundational works (e.g., Dawis, 1996; Super, Savickas, & Super, 1996). Investigators have cited the utility of consolidating the various perspectives guiding career development research and practice (e.g., Walsh, 2001). Paralleling this trend has been an increase in cross-domain inquiry both within and beyond the field (Lent, 2001). Research has sought to understand commonalities across the many domains that affect career-related behaviour by incorporating constructs from other areas of social science (e.g., cognitive psychology, sociology). A particularly fruitful trend has been the application of Bandura's (1986) social-cognitive theory to career behaviour. An example is the social-cognitive career development framework proposed by Lent, Brown, and Hackett (1994).

The Lent et al. (1994) framework is one of the most recent and comprehensive career development theories. This model integrates person, background / context and experiential factors as antecedent influences on career-related choice behaviour. It emphasizes one of the most influential periods in terms of career choice and commitment – adolescence and young adulthood – by highlighting mechanisms that may help shape career-related interests and selections. However, occupational choice is a life-long process that starts long before school-leaving age and continues long afterwards (Schoon, 2001). The socio-cognitive processes emphasized as important to career entry are hypothesized to influence subsequent career choices (Lent et al., 1994). Relationships may also be bidirectional at points. A basic version of the social-cognitive career choice model proposed by Lent et al. (1994) is presented in Figure 1.

The Lent et al. (1994) model seeks to explain central, dynamic mechanisms through which young people forge academic and career choices. Person-input variables and background/ context influence the learning experiences of an individual. Person-inputs are comprised of personal characteristics (e.g., gender). Parent and family influences are important contextual features in the model (Lent et al., 1994). The experiential learning sources, such as objective performance and role-modeling experiences, shape and inform career-related self-efficacy (e.g., perceived task competence) and outcome expectancies (e.g., anticipation of certain outcomes, such as self-satisfaction, financial reward). The self-cognition constructs – self-efficacy and outcome expectancies – figure prominently in the formation of interests. Self-cognitions and career-relevant interests, in turn, affect career choice. Choices and performance accomplishments result in subsequent self-efficacy and outcome appraisals, and thus feed back into the model (not shown).

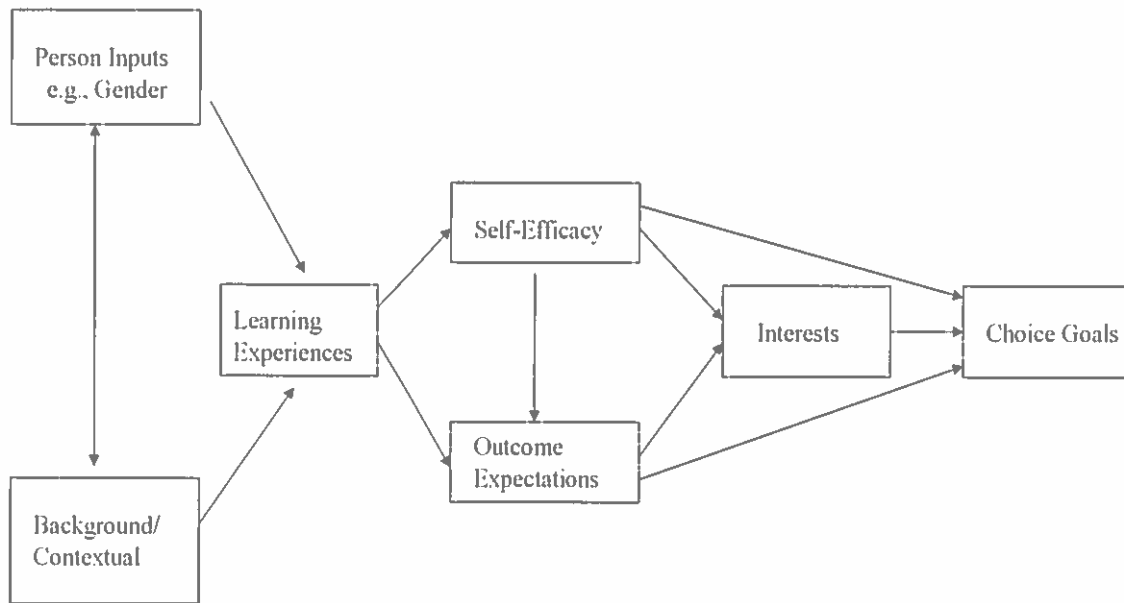This study applied multivariate logistic regression analyses to a partial

Figure 1. *Partial version of the Lent et al. (1994) social-cognitive model of career development*

version of the Lent et al. (1994) model (Figure 1). The differential utility of model constructs in accounting for career choice was analyzed. Examination of the relations between separate constructs and career choice is needed. Prior investigations on social-cognitive theory have tended to focus on self-efficacy beliefs in isolation from other constructs (Lopez, Lent, Brown, & Gore, 1997). There has been relatively less inquiry on the role of the other socio-cognitive mechanisms (e.g., outcome expectations) in the study of educational and career behaviours. Lent and colleagues (1994) have suggested that assessment of their model focus upon content-specific variables. Few studies have examined the theoretical constructs in their model from a domain-specific perspective (Ferry, Fouad, & Smith, 2000) and with samples other than college students. Research on the relations between science education factors and preadolescent/adolescent career aspirations has been limited (Fouad & Smith, 1996; Lopez et al., 1997; Plucker, 1998; Wang & Staver, 1999). The present study builds upon past research by exploring the science domain for a sample of Canadian adolescents.

The primary goal was to examine the added influence of context and experience in the prediction of scientific

career choice (yes/no), beyond the personal characteristics of adolescents. Person-inputs in the present study included gender, grade-level, and primary language (English or French). Contextual factors included socio-economic status (SES – parent occupations), family cohesiveness, family social/scientific communication, family career encouragement, and parent scientific expectations/encouragement. Family cohesion has been found to play a role in the development of academic and career cognitions (e.g., academic self-concept) and choice (Glasgow, Dornbusch, Troyer, Steinberg, & Ritter, 1997; Juang & Vondracek, 2001; Wall, Covell, & MacIntyre, 1999). The remaining measures were domain-related. Students identify parents as the largest influence on career decisions (Bleeker & Jacobs, 2004) especially when choosing careers in science and engineering (Dick & Rallis, 1991). Parent SES was also considered a relevant domain factor. Children's educational and career aspirations are found to be related to parental SES (as measured by parents' income, education, and occupation) (Schoon, 2001; Trice & Knapp, 1992; Wahl & Blackhurst, 2000). Occupations requiring science and math skills also tend to be higher in status (Ferry et al., 2000).

Learning experiences included sci-

ence/math grades, perceptions of science/math teachers, and friends interested in science. These factors reflect the documented influence of objective scientific performance and the school environment on academic and career processes (e.g., Burkham, Lee, & Smerdon, 1997; Plucker, 1998; Schoon, 2001; Wall et al., 1999). The academic competencies of adolescents play an important role in capability beliefs, which contribute to career decision-making (Bleeker & Jacobs, 2004; Ferry et al., 2000; Hackett, 1995; Juang & Vondracek, 2001; Lapan, Shaughnessy, & Boggs, 1996; Lee, 1998; Lent, Lopez, & Bieschke, 1991; Lent, Lopez, & Bieschke, 1993; Nauta & Epperson, 2003). Perceptions of the school environment, peers, and teachers' beliefs may affect a child's self-efficacy and attitudes towards math and science (Burkham et al., 1997; Plucker, 1998; Schoon, 2001; Wang & Staver, 2001). Teachers act as role models by providing students with scientific learning opportunities and encouragement (Burkham et al., 1997). Likewise, it is possible that adolescents who have peers interested in the sciences may engage in scientific activities themselves, and have similar future aspirations. The remaining experiential constructs were self-efficacy, outcome expectations, and interests. Self-efficacy

reflected adolescent perceptions of scientific ability. Outcome expectancies included whether one felt science would be useful to one's future career, and expectations for a scientific occupation. Interests were comprised of interest in scientific concepts, and engagement in extracurricular science activities.

Specific propositions based on the Lent et al. (1994) model were also examined in this study. These included: Self-efficacy beliefs will affect career choice goals both directly, and indirectly through interests (Lent et al.'s Propositions 3A and 3C); Outcome expectations will affect career choice directly and indirectly through interests (Propositions 4A and 4C); and there will be a direct effect of interests on choice goals (Proposition 5A). Research has indicated direct relationships between these experiential constructs with choice goals in the science/math domain (e.g., Ferry et al., 2000; Fouad & Smith, 1996). There is also evidence that the influences of self-efficacy and outcome expectations on choice goals are mediated by interests (Borget & Gilroy, 1994; Ferry et al., 2000; Fouad & Smith, 1996; Lent et al., 1991; Lent et al., 1993; Nauta & Epperson, 2003; Post, Stewart, & Smith, 1991). Investigations of social-cognitive theory have largely focused on the role of self-efficacy (Fouad & Smith, 1996). There has been relatively less examination of the role of scientific outcome expectancies. The current study explores the relations of these three experiential influences – self-efficacy, outcome expectancies, and interests – with scientific career goals.

Method

Sample

Participants were obtained from the National Youth and Science Fair Project Study (NYSPS). The original study sample consisted of 4,034 Canadian students (13-19 years). Eighteen percent (728) of participants were Canada-Wide Science Fair (CWSF) competitors (56% male, 44% female) and 82.0% (3,306), a comparable national sample of students (50% male, 50% female). The present study is based on the comparison subgroup of adolescents.

The science fair participants are a homogeneous sample of high-performing science students. The control sample may be a more typical group of students, or provide better representation in terms of generalizability. Eighty-four percent of these students were Caucasian, 7.0% Native American, 6.4% Asian, and 2.2% represented other racial/ethnic groups (2,430 valid cases). Thirty-two percent were junior-level students, 35.7% intermediate, and 33.2% were seniors (3,185 valid cases). Approximately 76% of the students had English as their first language, and 24%, French (3,079 valid cases).

Procedure

Data collection involved a two-phase, convenience sampling design. In the first phase, the CWSF competitors were invited to participate in the study by completing the National Youth and Science Fair Project (NYSP) survey while in attendance at the fair. The nature of the study was explained to the students by a member of the research team, and participation was voluntary. The second phase involved the administration of the NYSP to the comparison sample of students (attending the same schools as CWSF students) by their teachers during regular classroom sessions.

The NYSP is a self-report instrument comprised of items assessing general demographic information, achievement/schoolwork, perceptions of education and schooling, parental background, and family information. Items were adapted from the work of Krahn (1988) (Three City Study of the School to Work Transition), Breakwell, Fife-Shaw and Devereaux (1988) (Youth, Science, and Technology), and items developed as part of a study conducted on Canadian high school students in the context of science career choices (Hein & Lewko, 1994). Participants completed the survey based on language of instruction (English or French), with language appropriate forms distributed to all students. Instrument administration required an average of 50-60 minutes.

Measures

Career Choice/Goals. Participants indicated the occupation they expected to attain. An overall structure for classifying occupation according to type of work performed was based on the Standard Occupational Codes Index (Statistics Canada, 1991). Scientific career choice in the present study was reflected in a dichotomous career goal score as: 1 (science career, e.g., natural sciences, mathematics, health sciences); and 0 (non-science). This measure was used as the dependent variable.

Person Input. *Gender; Language –* Language first learned to speak, and still spoken (English or French); and *Grade Level –* Junior (grade 8-9), Intermediate (grades 10-11), and Senior (grade 12+).

Background/Contextual. *Socio-economic Status (SES) –* Paternal and maternal occupation was coded using the SES index developed by Blishen, Carroll, and Moore (1987). A measure of parental occupational status was developed based on the higher index score of either parent; *Family Communication on Social / Scientific Issues –* Ten statements measured the extent to which family members discuss current social and scientific issues (e.g., politics, science). A sample item includes: "How often do you talk to your mother or father about issues involving science or technology?" Responses were rated on five-point scales ("Never" to "Often") and averaged to obtain a single score. The internal consistency reliability (Cronbach alpha) for the scale was .89; *Family Cohesiveness –* Consisted of four items rated on five-point scales ("Very untrue to "Very true") and assessed feelings of "togetherness" and support provided by family members. The reliability for the scale was .78.

Family Career Encouragement measured adolescent perceptions of family encouragement for first choice of career. Students responded to four statements, rated on five-point scales ("None" to "A lot"). Higher scores indicated higher levels of family career encouragement. The reliability was .78; and *Parent Science / Math Expectations and Encouragement –* Perceptions of parental encouragement for, and expectations to excel in science/math were assessed through responses to four, five-point scales ("Never" to "Always"). Items were completed separately for mother and father. Internal consistency coefficients were .91 and

.92, respectively. Responses for both parents were averaged to obtain a single score.

Learning Experiences. *Science/ Math Grades* – Students were asked to indicate on an eight-point scale ("Mostly below D" to "Mostly A") their grades within the subject areas of: English, mathematics, science, and social studies. The average of math and science grades was used in all analyses; *Perceptions of Science/Math Teachers* – Students rated each of 11 items (three-point scales) according to perceived science/math teacher encouragement, and expectations for scientific performance and homework. An item includes: "My science teacher expects me to work hard on science." Higher scores indicated higher levels of teacher encouragement/expectations. The items were completed separately for science and math teachers (alpha reliabilities of .74 and .80), and averaged to obtain a total score; and *Friends Interested in Science / Math* – Students were required to rate how many of their friends were interested in science and math. The scale contained five statements (five-point scales – "None" to "All") and the reliability was .84.

Self-Efficacy. *Science/Math Self-Efficacy* – Consisted of a four-item scale assessing perceived general science and math ability. A sample item is: "I am good at math." Responses were rated on five-point scales ("Strongly disagree" to "Strongly agree"). Reliability of the scale was .81; and *Science Knowledge Confidence* – Assessed confidence in completing a science knowledge test. The items were: "How well do you think you did on this test?" and "How difficult was this test for you?" Five-point response scales indicated increasing confidence in one's science knowledge. Reliability was .77.

Outcome Expectations. *Scientific Career Expectancies* – Nineteen statements on three-point scales measured students' perceptions of a scientific career. Higher scores indicated increasingly positive expectations for having a science-related career. Reliability of the scale was .84; and *Science Course Expectations* – Students rated their science courses in terms of the extent to which they expected them to be useful

to their future career. Higher scores on six-point scales indicated higher expected course usefulness. Science course ratings were averaged.

Interest in Science and Math. *Scientific Interest* – Students rated three statements on five-point scales ("Strongly disagree" to "Strongly agree") according to their level of scientific interest. A sample statement is: "I like to find out how machinery works." Cronbach's alpha was .86; and *Extracurricular Scientific Interest* – Responses to nine (five-point scale) statements ("Never" to "Always") assessed the frequency with which students engaged in extracurricular scientific activities. Responses were averaged and the reliability for the scale was .83.

Results

Descriptive statistics for the measures comprising the five theoretically-based constructs (person input, background/context, learning experiences, self-efficacy, outcome expectations, interests) by science career choice (yes/no) are presented in Table 1. Preliminary analyses were undertaken to assess the univariate properties of the study measures, impact of missing data, and to verify constructs/scales. There were several significant relations among the predictor variables. However, the magnitude of the correlations (.001-459) was not sufficiently high as to pose problems with multicollinearity in further analyses.

Logistic regression analysis was performed to explore the contribution of contextual and experiential factors to the prediction of career choice. Adolescent person-input variables were entered into the model first to determine the unique predictive variance of the separate sets of measures in subsequent models. Table 2 shows the multivariate odds ratios (OR) and 95% confidence intervals for the series of regression models.

Results of the model comprised of person input variables (Model 1) indicated that gender, senior grade-level, and English as a first language were positively associated with the likelihood of a scientific career. Being male increased the probability of a scientific career choice by 23% as compared to

females. Senior-level, and English students had an approximate 50% increased likelihood of choosing a career in the sciences than junior and French students, respectively. Intermediate grade-level was not significantly different from the junior student reference. The overall model was significant (p < .001), with a McFadden's (pseudo) R^2 of 0.01 (Table 2).

The addition of the background / contextual set of measures (Model 2) uniquely contributed to the prediction of career choice (block χ^2 =43.58, df =5, p < .001, R^2 =0.03) beyond that accounted for by the person-input factors. Students were more likely to want a scientific career with increasing family communication on social/scientific issues, and parental encouragement/ expectations to do well in science. The independent effects of gender and grade on career choice held upon adjustment for the contextual influences. Parent SES, family cohesiveness, and family career encouragement had no significant effect on career choice.

A similar pattern for the person input and contextual factors emerged when scientific learning experiences were added to the model (Model 3). Results also showed that students with higher science/math grades and more friends interested in science, were more likely to have preference for a scientific career. Learning experiences significantly added to the prediction of career choice (block χ^2 =44.85, df =3, p < .001, R^2 =0.05). The models with scientific self-efficacy (Model 4) (block χ^2 =13.55, df =2, p < .01, R^2 =0.06), outcome expectations (Model 5) (block χ^2 =122.56, df =2, p < .001, R^2 =0.11), and interest in science/math (Model 6) (block χ^2 =10.88, df =2, p < .01, R^2 =0.12) indicated that these separate sets of measures differentially added to the prediction of career choice over prior models.

The individual effects of self-efficacy, outcome expectancy, and interest measures (Models 4-6) mainly supported the model propositions (Lent et al., 1994) with respect to their influences on career choice. Proposition 3 states that self-efficacy will have a direct, positive relation to choice goals (3A). Self-efficacy will also have an indirect positive effect on career choice, through

Table 1

Descriptive statistics for person input factors, background factors, scientific learning experiences, science/math self-efficacy, outcome expectations, and scientific interests by science career (yes/no) (National Youth and Science Project (NYSP), N=3,306).

| | Science Career | | | | |
	Yes	n[1]	No	n	Total
Person Input	%		%		N
Gender					
Male	42.8	565	57.2	756	1,321
Female	37.1	428	62.9	726	1,154
Grade					
Senior (12+)	45.8	370	54.2	438	808
Intermediate (10-11)	39.0	339	61.0	530	869
Junior (8-9)	35.9	264	64.1	472	736
Language					
English	37.3	684	62.7	1,152	1,836
French	47.9	281	52.1	306	587
Background / Contextual	(Mean(sd))[2]		(Mean(sd))		
Parent Socio-economic Status (SES)	46.25(12.71)	913	44.42(12.74)	1,344	2,257
Family Cohesiveness	3.59(0.91)	918	3.47(0.92)	1,340	2,258
Communication – Social / Scientific Issues	2.43(0.99)	928	2.24(0.97)	1,360	2,288
Family Career Encouragement	3.02(1.09)	988	3.10(1.14)	1,477	2,465
Parent Science / Math Encourage / Expect's	4.18(0.86)	871	3.90(0.96)	1,256	2,127
Learning Experiences					
Science / Math Grades	6.56(1.64)	986	5.79(1.88)	1,452	2,438
Perceptions of Science / Math Teachers	2.21(0.22)	993	2.20(0.24)	1,478	2,471
Friends Interested in Science / Math	2.78(0.69)	910	2.61(0.73)	1,326	2,236
Self-Efficacy					
Science / Math Self-Efficacy	3.88(0.74)	999	3.54(0.78)	1,484	2,483
Science Knowledge Confidence	3.59(0.85)	963	3.43(0.93)	1,410	2,373
Outcome Expectations					
Science Course Expectations	5.30(1.30)	972	4.29(1.86)	1,408	2,380
Scientific Career Expectancies	2.03(0.26)	967	2.05(0.31)	1,411	2,378
Interests					
Scientific Interests	3.94(0.86)	955	3.68(0.95)	1,386	2,341
Extracurricular Scientific Interests	2.08(0.74)	891	1.87(0.71)	1,300	2,191

[1] All n based on valid cases for analyses.

[2] sd=standard deviation; figures for experiential factors are also means and standard deviations.

interests (3C). Proposition 3C specifically suggests that the relation of self-efficacy to choice goals will be reduced, but not eliminated when the influence of interests is controlled. Proposition 4 makes the same predictions regarding the relation of outcome expectations to choice goals. Interests will also directly influence career choice (Proposition 5).

Results of Model 4 indicated that science/math self-efficacy had a significant, direct effect on career goals after controlling for person input, contextual factors, and scientific learning experiences. Scientific outcome expectancies also had a direct relation to scientific

career choice upon addition to the model (Model 5). Students with scientific career goals were more likely to have confidence in their scientific ability, and to expect their courses to be useful to their future career as compared to those with non-science goals. The latter relationship was attenuated but held after adjusting for scientific interests in the final model.

The relation between scientific self-efficacy and career choice (Model 4) was no longer significant after controlling for outcome expectancies, and scientific interests in subsequent models (Models 5 and 6). The effect of the sec-

ond self-efficacy measure – science knowledge confidence – was marginally significant across Models 4 and 5. Scientific career expectancies did not have a significant impact on career choice. The full model (Model 6) indicated a significant, direct effect of both scientific interest measures: Students who wanted a science career were more likely to be interested in scientific concepts and activities. Model 6 supported continued individual effects of gender, grade-level, parent science encouragement/expectations (marginally significant), and objective scientific ability on career goals. The probability of choos-

Table 2

Descriptive statistics for person input factors, background factors, scientific learning experiences, science/math self-efficacy, outcome expectations and scientific interests by science career (yes/no) (National Youth and Science Project (NYSP), N=3,306).

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Person Input						
Gender						
Male	1.23 (1.01-1.49)	1.26 (1.03-1.53)	1.24 (1.01-1.52)	1.38 (1.11-1.71)	1.36 (1.09-1.69)	1.45 (1.16-1.83)
Female	ref.	ref.	ref.	ref.	ref.	ref.
Grade						
Senior (12+)	1.44 (1.12-1.84)	1.49 (1.14-1.93)	1.66 (1.28-2.17)	1.54 (1.17-2.02)	1.88 (1.42-2.50)	1.91 (1.43-2.54)
Intermediate (10-11)	1.11 (0.87-1.41)	1.09 (0.86-1.41)	1.19 (0.92-1.54)	1.14 (0.88-1.47)	1.11 (0.85-1.45)	1.16 (0.89-1.52)
Junior (8-9)	ref.	ref.	ref.	ref.	ref.	ref.
Language						
English	1.48 (1.18-1.86)	1.21 (0.92-1.59)	1.11 (0.84-1.47)	1.13 (0.86-1.50)	1.25 (0.93-1.68)	1.27 (0.94-1.71)
French	ref.	ref.	ref.	ref.	ref.	ref.
Background / Context						
Parent SES		1.00 (0.99-1.02)	1.00 (0.99-1.01)	1.00 (0.99-1.01)	1.00 (0.99-1.01)	1.00 (0.99-1.01)
Family Cohesiveness		0.96 (0.84-1.09)	0.94 (0.83-1.07)	0.94 (0.82-1.07)	0.94 (0.82-1.08)	0.94 (0.82-1.08)
Family Communication		1.16 (1.04-1.29)	1.12 (0.99-1.26)	1.09 (0.97-1.23)	1.06 (0.94-1.20)	1.00 (0.88-1.14)
Family Career Encouragement		0.92 (0.83-1.02)	0.93 (0.84-1.04)	0.93 (0.84-1.04)	0.94 (0.84-1.05)	0.92 (0.82-1.03)
Science Encourage/Expectations		1.39 (1.22-1.58)	1.26 (1.10-1.43)	1.22 (1.07-1.40)	1.15 (1.01-1.33)	1.14 (0.99-1.31)
Learning Experiences						
Science/Math Grades			1.20 (1.13-1.28)	1.12 (1.04-1.21)	1.12 (1.04-1.21)	1.13 (1.04-1.22)
Percept. Of Science/Math Teachers			0.96 (0.61-1.52)	0.92 (0.58-1.47)	1.00 (0.62-1.63)	0.97 (0.60-1.57)
Friends Interested in Science/Math			1.22 (1.04-1.43)	1.18 (1.01-1.39)	1.11 (0.94-1.31)	1.06 (0.89-1.25)
Self-Efficacy						
Science/Math Self-Efficacy				1.30 (1.09-1.55)	1.11 (0.92-1.34)	1.09 (0.90-1.31)
Science Knowledge Confidence				1.12 (0.99-1.27)	1.13 (0.99-1.28)	1.10 (0.97-1.25)

Multivariate odds ratios (OR's) and 95% CI's, continued. [1,2]

Table 2 cont'd.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Outcome Expectations						
Science Course Expectations					1.56 (1.42-1.70)	1.52 (1.39-1.66)
Scientific Career Expectancies					0.72 (0.47-1.08)	0.75 (0.50-1.14)
Interests						
Scientific Interests						1.16 (1.02-1.32)
Extracurricular Scientific Interests						1.22 (1.03-1.45)
Constant	-0.67	-2.09	-3.00	-3.63	-4.49	-4.88
-2 Log Likelihood	2253.54	2209.96	2165.11	2151.55	2029.0	2018.12
Model Chi-Square [df]	25.61[4]**	69.19[9]**	114.04[12]**	127.59[14]*	250.15[16]**	261.03[18]*
Block Chi-Square [df]		43.58[5]**	44.85[3]**	13.55[2]*	122.56[2]**	10.88[2]*
McFadden's (Pseudo) R^2	0.01	0.03	0.05	0.06	0.11	0.12

[1] 95% confidence intervals (CI) in parentheses; significant terms are in bold.
[2] Variable significance was tested by Wald distributed chi-square statistics with 1 degree of freedom (the exception was grade-level, with 2df).
Note: *$p < .01$; **$p < .001$.

ing a science career was about 50% higher for males than females in the final model. Senior students were just about twice as likely to have scientific career aspirations than juniors.

DISCUSSION

This study examined the impact of person input, family, and self-cognitions on the scientific career aspirations of Canadian adolescents. The primary goal was to explore the differential utility of the Lent et al. (1994) theoretical constructs in explaining career choice after adjustment for personal characteristics. Results indicated that family background, scientific learning experiences, self-efficacy measures, outcome expectancies, and scientific interests contributed unique variance to the prediction of scientific career choice. These findings are consistent with the career choice model (Lent et al., 1994) and other work in the area of scientific educational / vocational outcomes (e.g., Borget & Gilroy, 1994; Ferry et al., 2000; Fouad & Smith, 1996; Lee, 1998; Lent et al., 1993; Nauta & Epperson, 2003; Post et al., 1991; Wang & Staver, 2001;). A number of constructs (e.g., context, self-cognitions) were integrated and examined within one theoretical framework. Important, is the generality of the theoretical presuppositions to domain-related areas – namely the science domain in this study.

Findings from the addition of person-input factors to the logistic regression analyses demonstrated the impact of gender, grade-level, and students' primary language on career aspirations. Adolescents wanting a career in the sciences were more likely male, senior-level students, and those with English as their first language. The gender and grade effects held, even after the addition of contextual and experiential influences. These results accord with prior findings (e.g., Fouad & Smith, 1996; Ferry, et al., 2000; Schoon, 2001). Males have traditionally been socialized, or encouraged more than females to pursue science-related majors and occupations (Haines & Wallace, 2002; Gadalla, 2001). Lent et al. (1994) refer to this as one component of the "structure of opportunity" that may drive sex differences in career-related behaviour. The under-represen-

tation of females in high status math and science fields has consistently been identified, and is particularly evident in the physical sciences (Bleeker & Jacobs, 2004; Gadalla, 2001; Jacobs, Finken, Griffin, & Wright, 1998). Multiple causes have been explored, including differences in science course enrollment, science efficacy-beliefs, abilities, and interests (Bleeker & Jacobs, 2004; Nauta & Epperson, 2003). However, there is likely no single reason for the gender gap. A variety of psychological, sociological, institutional, and economic factors may deter females from education and careers within scientific areas (Gadalla, 2002).

The most influential period in terms of career commitment is during adolescence and young adulthood, when important decisions about the future need to be made (Schoon, 2001). Senior high-school students are closer proximally in time to actual career entry and may need to commit to their choice. Here, choice is more immediate for older than for younger adolescents, and can be driven by need (e.g., college, employment). Conventional wisdom suggests that older adolescents have more realistic views of career choices and options (Wahl & Blackhurst, 2000). Despite this suggestion, the career aspirations of adolescents are assumed to be unstable, and to change many times before adulthood (Schoon, 2001). There is also evidence that career development starts well before adolescence (Trice, Hughes, Odom, Woods, & McClellan, 1995). However, choice for the younger students might be more remote and best described as intentions.

Research needs to further explore the nature of the gender and grade-level effects. Examination may reveal additional theoretical mechanisms that could be generating the differences. The development of separate models for males/females, and younger/older students may provide further insight into the measures tested in the current study and elsewhere (e.g., encouragement, interests, science-task efficacy) (Bleeker & Jacobs, 2004; Lopez et al., 1997; Nauta & Epperson, 2003). Fouad and Smith (1996), for example, found a significant negative relationship between age and math/science interests

in their study of middle-school students. This indicated less interest in math and science for their sample of younger children. They suggested the increasing challenge of the math and science curriculum in the middle-school years, and a wider scope of academic content as possible reasons for the decline. These findings highlight the critical role individual difference variables assume within the Lent et al. (1994) model. Career mechanisms may be different for children at particular developmental junctures. Such processes are also likely to depend on gender and other demographic variables such as race-ethnicity (Fouad & Smith, 1996).

Examination of the independent effects of the context measures indicated that family social/scientific communication and parent science encouragement/expectations had significant effects on career choice. Students were more likely to want a scientific career with increasing family discussion and encouragement by parents to do well in science. The findings for these scientific-specific measures coincide with previous research that has documented the strong influence of family and parental "push" on a child's choice of career (e.g., Wang & Staver, 2001). These contextual characteristics have been found to operate through self-capability beliefs, which in turn contribute to career choice (Bleeker & Jacobs, 2004; Ferry et al., 2000; Hackett, 1995; Juang & Vondracek, 2001; Lopez et al., 1997; Wall et al., 1999). The relationship with choice for the family discussion measure was not significant upon addition of further theoretically derived sets of measures. However, the relation for parental encouragement held upon adjustment for personal factors, learning experiences, self-efficacy, and outcome expectations. It also attained marginal significance in the final model (Model 6). The results of this study seem to confirm both direct and indirect relations of encouragement with scientific career choice.

The remaining family context measures did not perform quite as expected. In particular, family cohesiveness and career encouragement were not predictive of scientific career choice at any stage of adjustment for other measures. These variables also had

coefficients/likelihood estimates in a direction that was contraindicative of theoretical expectations. Parent SES was marginally significant across models, but the odds ratios were at baseline. This is somewhat surprising, as those families that are supportive and encouraging tend to promote adolescent decision-making with respect to career choice (Bleeker & Jacobs, 2004; Dick & Rallis, 1991; Glasgow et al., 1997; Lopez et al., 1997; Juang & Vondracek, 2001; Wall et al., 1999). Likewise, children's career aspirations are likely to correspond to their parents' occupational attainment or social status (Trice & Knapp, 1992; Wahl & Blackhurst, 2000). Social background has shown to be a good indicator of the types of learning experiences encountered and interests encouraged in the child, as well as educational achievement and future occupational attainment (Schoon, 2001). Careers requiring expertise in science and math also tend to be higher in status and prestige (Ferry et al., 2000).

The findings for family cohesiveness, career encouragement, and parent SES could indicate more complex relationships between predictors, and/or the effects of these factors on scientific choice may be operating through alternative constructs. They could also be due to the non-scientific nature of the measures. In other words, these variables may influence adolescent career aspirations regardless of whether first choice of career is scientific or non-scientific. Scientific factors may have a stronger role in influencing choice of a career in the sciences. For example, even after adjustment for SES, parent scientific encouragement predicted choice of a career in the sciences. It would be interesting to include specific parent occupations in future studies of the effects of SES and scientific-related factors on adolescent career choice.

Results for the experiential variables showed that students aspiring to a career in the sciences were more likely than their peers to have higher grades in science, more confidence in their scientific ability, more friends interested in science, to expect their science courses to be useful in future, and a larger interest in science themselves. Average science/math grades, expected science

course usefulness, and scientific interests remained significant in the final model (Model 6). These results are consistent with prior research (e.g., Ferry et al., 2000; Lapan et al., 1996; Lent et al., 1993; Nauta & Epperson, 2003; Schoon, 2001; Wang & Staver, 2001), and may offer a path-like explanation for the effects of the experiential factors on scientific career choice. It is possible that the grade effect (learning experiences) on career choice is mediated through self-efficacy. This is reflected in the reduced risk estimate for grades upon addition of efficacy beliefs. But the further addition of scientific outcome expectancies and interests did not appreciably affect the estimate. The final model results may thus suggest a significant direct effect of grades on career choice, and an indirect effect largely mediated through self-efficacy.

The relations between experiential constructs and choice outlined here generally coincide with evidence based on the Lent (1994) model (Borget & Gilroy, 1994; Ferry et al., 2000; Fouad & Smith, 1996; Lent et al., 1991; Lent et al., 1993; Nauta & Epperson, 2003; Post et al., 1991). Ferry and colleagues (2000) found that the effect of grades on science/math goals was mediated through both self-efficacy and outcome expectations. Self-efficacy and outcome beliefs were in turn directly associated with choice goals, with indirect effects on goals also mediated through interests. Results for the model propositions in the current study tended to correspond with the Ferry et al. (2000) results. Findings for Model 4 provided support for Proposition 3 – there was a significant direct relationship between efficacy and scientific career choice (3A). Scientific outcome expectancies also had a direct relation to scientific career choice upon addition to the model (Model 5) (4A). The latter relationship was reduced but not eliminated after adjusting for scientific interests in the final model – this offers support for an indirect effect of outcome expectancies on choice (4C). Evidence for an indirect effect of efficacy on choice through interests according to Proposition 3C was not found. This may suggest that efficacy effects are largely mediated through outcome expectancies. These findings are consis-

tent with studies that have used younger children (Fouad & Smith, 1996).

Limitations

The present study has several limitations. The findings represent associations between each construct/measure and scientific career choice. The cross-sectional nature of the research did not permit for tests of causality. There was also the inability to track changes in scientific career development processes with time. Longitudinal work is necessary in order to confirm or clarify the attempts at effect explanation and test the predictive validity of the current results. Multiple assessments of the constructs in an order (e.g., temporal) that is strictly consonant with the Lent et al. (1994) model is needed in order to answer questions about the presumed causal sequence of the social-cognitive factors over time (Nauta & Epperson, 2003).

Data collection involved a convenience sampling design. This alone presents some question as to the representativeness of the sample and generality of the findings. These issues need to be kept in mind with respect to the self-report nature of the instrument upon which the data are based. There is the possibility of subjective bias in the information obtained – the self-report of data may be subject to inflation or underreport. The specificity of data to particular schools should also be considered. The results are specific to school-attending adolescents 13-19 years, and characteristics of the finite number of schools involved may act as ecological (group-level) confounders that cannot be addressed or adjusted for here. Therefore, caution is needed in generalizing the current findings to other groups of adolescents (e.g., home-schooled).

The findings, for the most part, followed the expected pattern and coincided with previous research concerning key theoretical relations (e.g., Ferry et al., 2000). However, future research should use alternative measures to more fully capture specific aspects of the constructs. A replication of our findings with established measures that are based on the social-cognitive career model (see Fouad & Smith, 1996) would be ideal. The degree of domain

specificity of the measures and criterion should also be considered in further tests. This may involve using more homogeneous predictors (e.g., separate math and science scales) and various groupings of scientific career (Bleeker & Jacobs, 2004; Lopez et al., 1997).

Implications

This study has theoretical and practical implications for career development and practice. The social-cognitive framework is a comprehensive conceptualization of career and academic developmental processes. The usefulness of the model has been demonstrated for a sample of Canadian adolescents in the context of science career choice. The findings confirm and add empirical validity to several theoretical propositions (Lent et al., 1994). The results are also consistent with prior model testing within the science field (Ferry et al., 2000). This may point towards the robustness of the model in explaining career choice across domains of inquiry. Examining the model relations for selected measures and science career choice facilitates knowledge on the types of variables that may or may not be appropriate to use for the science domain. Further empirical comparisons may promote refinement of existing constructs by the addition of alternative measures. This is important by virtue of the multi-dimensional and complex nature of the career choice process.

The present findings highlight several key variables that could be targets for intervention. Science grades may be one such measure. Counselors and educators can design, implement, and evaluate interventions that promote successful scientific performance, and encourage students to participate in science activities (Burkham et al., 1997; Ferry et al., 2000). Such efforts would, in turn, enhance self-efficacy percepts. This may be particularly useful for those groups that have traditionally been under-represented in scientific fields (e.g., females) (Gadalla, 2001). The current research also demonstrates the important influence of parent science encouragement on adolescent career choice. Schools and communities should develop programs that emphasize the education of parents about the important role they may play in their

child's choice of career (Whiston & Sexton, 1998; Wahl & Blackhurst, 2000). Effective training may provide parents with the information they need to foster their children's success in science.

Social-cognitive theory (Bandura, 1986; Lent et al., 1994) suggests that performance accomplishments and family experiences serve as sources of self-efficacy. To the extent that outcome expectancies depend on self-efficacy, interventions that enhance self-efficacy may be appropriate for targeting outcome expectations (Lopez et al., 1997). Other interventions that target outcome beliefs can focus on providing students with scientific role models and information on the positive rewards of a career in the sciences. These methods could further have an impact on the development or maintenance of scientific interests. Early intervention and support of efforts to encourage children in the sciences may facilitate entry into scientific careers.

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Building Career Confidence: Issues and Strategies for Helping Students with Learning Disabilities Attain Career Self-Efficacy

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Abstract

This paper is a general review of issues and strategies pertinent to the delivery of career development services to postsecondary students with learning disabilities. The authors both explore the literature and offer suggestions from clinical practice. Strategies recommended were derived from knowledge of career relevant student attributes, as well as common characteristics of the school environment. Emphasized are the need to focus on student strengths, and corresponding techniques which address affective, cognitive and behavioral domains

As a result of several U.S federal statutes, a growing number of students diagnosed with learning disabilities (LD) are enrolling in universities, creating unparalleled opportunities for this population of young adults in the arena of education. Students with learning disabilities increasingly see college edu-cation as an attainable goal and not just an opportunity reserved for a privileged few (Dipeolu, 2002). The implication is that additional efforts at the college level should be made not only to increase access for such students, but more importantly to help them succeed once enrolled (Madaus, Foley, McGuire, & Rubin, 2001).

Years of research have led to the conclusion that learning disabilities are not just school based disorders (Price & Shaw, 2000). Instead, they are heterogeneous and longitudinal in nature, with accompanying life-long issues which may require on-going support. Students experience difficulties in important areas of functioning, preventing optimal performance at school and work. Many of these problem areas are exacerbated in adulthood by the need to perform increasingly complex tasks, deal with differential environmental demands, and negotiate critical life transitions (Price & Shaw, 2000). The same deficits that created school difficulties can act as barriers to employment, block on the job advancement, and/or complicate overall life tasks and relationships (Reekie, 1995).

Successful transition from adolescence to adulthood is critical for members of any culture. Society expects that during this period, its youthful members will assume the roles and responsibilities of adulthood (Ramasamy, Duffy, & Camp, 2000). For youth with learning disabilities, progression through this process is often hampered by additional personal or societal barriers (Brown, 2003; Powers, Wilson, Matuszewski, Philips, Rein, Schumacher, & Gensert, 1996). In order to receive accommodations in accordance with Section 504 of the Rehabilitation Act (1973; 1998) and the American with Disabilities Act (1990), an individual must self-identify to the postsecondary institution

(Mazurek & Shoemaker, 1997). However, the literature is replete with stories of students with learning disabilities who purposely chose not to self-disclose their disability status once they enroll in college, in order to avoid a repeat of the negative experiences often associated with having a learning disability that were experienced at the K-12 level (Kuykendall, 1994; Markham, 1997).

An important key toward accomplishing this goal is the career development connection (Dipeolu, 2002; Dipeolu, Reardon, Sampson, & Burkhead, 2002). The focus of this article is on career development strategies to help students become more independent and also promote successful functioning beyond the walls of the post-secondary institution. Strategies recommended were derived from knowledge of career relevant student and parent attributes, as well as common characteristics of the school environment. An understanding of these characteristics serves as a foundation for effective implementation of specific work related skills training. This article will identify the work related skills that career counselors should focus on to help students with learning disabilities succeed in the arena of life. Lastly, it should be noted that the following discussion addresses these issues within the context of American legislation. While there may be parallel issues for counselors from Canada and other countries, our review is couched within the framework of current US policy and statutes, particularly at the federal level.

Family Factors

Developmentally, late adolescence is a time when youth struggle to gain independence from their families, with parents gradually decreasing their involvement in their children's decision

making process. However, this is often a more difficult process for young adults with learning disabilities. Although these youth experience a similar desire and need for independence, they typically continue to need their parents' active advocacy and support at a greater level than peers without disabilities (Brotherson, Berdine, & Sartin, 1993; Brown, 2003). This is true with respect to a number of needs, including dealing with academic demands such as homework but also accessing supports within the school and community. Understanding how the presence of a learning disability complicates this development dynamic is important for counselors who work with these students. Career counselors need to see parents as an important ally. Involving parents, siblings, spouses, and close friends in counseling (where possible) only helps to multiply the sources of informed verbal persuasion (Amundson, 1984; Bearg; 1980; Brown, 2003; Young, 1994). Research indicates that an important outcome of this involvement is that parents, along with their children, increasingly envision post secondary education as an appropriate transition from high school. Moreover, parents usually express positive beliefs about their offspring's ability to become competitively employed (Benz & Helpern, 1987; Tilson & Neubert, 1988). While examining career development of young women with learning disabilities, Lindstrom and Benz (2002) found that key elements which seemed to influence the phases of career development included individual motivation and personal determination, family support and advocacy, opportunities for career development, and on-the-job or postsecondary vocational training. To address these needs comprehensively, career development theory typically calls for early program development (even as early as elementary school) to be linked with individual strengths and needs as well as interests of all students (Magnuson & Starr, 2000). A diagnosis of learning disability complicates this and underscores the need to accommodate and/or remediate students' weaknesses. Academic planning and transition should center around these core issues, and individualized for each student.

However, parents of students with learning disabilities may have limited understanding of the range of occupations available for their children, and lack awareness of the children's vocational strengths and weaknesses (Neubert & Taymaus, 1999). These issues, if left unaddressed, could produce unrealistic expectations with regards to attainment and outcome of higher education degrees. Career development professionals should make available reliable occupational information to both students and their families that could help address this area of need. This type of information fosters parental confidence in the system, and students begin to see the value of making career choice around individual interests and strengths. The focus here is to help students move from seeing parents as the sole architect/source of their career decision making efforts, to regarding parents as resources and additional allies in career decision making.

Experiential Barriers to Career Confidence/Self-Efficacy

There is a broad consensus in the literature of several disciplines (e.g., special education, rehabilitation and counseling) that the transition needs of students with learning disabilities are still not being addressed in an effective and efficient manner. This includes preparation for either the postsecondary education or employment settings (Adelman & Vogel, 1993; Blalock & Patton, 1996; Dunn, 1996; Sitlington & Fran, 1990). Career development interventions are a significant transition need, with research indicating that students with learning disabilities often obtain lower scores on measures of career maturity. This is important because a lower degree of career maturity may result in unrealistic job expectations, inappropriate career goals and inability to relate personal strengths and challenges to vocational success (Cummings, Maddox, & Casey, 2000).

Experiences while in school typically teach students with learning disabilities much about their weaknesses (Szymanski, Hewitt, Watson, & Sweet, 1999), and too little about personal strengths. As a result, students often bring to the college environment negative self-concepts developed over time.

Though students may be all too familiar with their challenges, they nonetheless often experience great difficulty articulating their needs and advocating for themselves. An individual who cannot explain his or her disability, foresee possible difficulties, and who lacks strategies to compensate for weaknesses may well have trouble in current/future endeavors, whether in academic or employment settings (Mazurek & Shoemaker, 1997).

Students with learning disabilities may perceive and adopt doubts expressed by their teachers, families and peers concerning their abilities to pursue more challenging careers (Panagos & DuBois, 1999). Despite such discouragement, many students with learning disabilities see their lives in college as an opportunity to wipe off the old slate and start with a new one. Career counseling interventions can be one means of encouraging these efforts. As we know, career counseling interventions by their nature are strength based and not pathology-focused. Therefore, interventions should be shaped in a positive light and capitalize on student strengths, which may act as a catalyst in helping them reframe negative self-talk and concepts (Price & Shaw, 2000)

Implications of Primary and Secondary Characteristics of LD

In order to fully address student needs, counselors need to be familiar with common characteristics of learning disabilities in general, as well as some specifics for learning disabilities in various areas (e.g. written expression, reading comprehension). In addition, it is helpful for counselors to understand primary (e.g. processing deficits) versus secondary characteristics of learning disabilities (such as low self esteem), in that secondary characteristics (which develop as sequelae from primary issues) may be effectively addressed with quality programming and identification. This is important to understand, both in terms of educating others but also as a framework for understanding students' context of presenting problems and how best to deal with them from a counseling perspective (NJCLD, 1994; Rosenberg, 1997).

Primary characteristics of learning disabilities include problems with processing information (slowed or inaccurate information processing difficulty; poor incidental learning), distractibility, impulsiveness, and a discrepancy between intellectual ability (which is by definition average to above average) and student academic achievement in one or more of seven primary areas (written expression, reading comprehension, basic reading skills, math computation, math comprehension, oral expression, and listening comprehension) (Blumsack, Lewandowski, & Waterman, 1997). Primary characteristics are one which are inherent to the learning disability in question, and which typically respond best to early intervention and accommodation or compensation, rather than remediation.

On the other hand, secondary characteristics of learning disabilities include such variables as lowered self-esteem, depression; anxiety, low tolerance for frustration; decrease in (positive) risk-taking behavior; development of inappropriate behaviors as a means of deflecting attention from academic or interpersonal issues; decreased motivation and problems with social skills (initiating and or maintaining relationships with others). Individuals may also attempt to self-medicate by using alcohol or drugs to help lessen the negative feelings resultant from these issues (Blumsack, Lewandowski, & Waterman, 1997; Rosenberg, 1997). Early identification and intervention can be key in helping to lessen the appearance of effects of these characteristics. Again, this means that while this information can be used to proactively educate families in the community, the implication for students who come to counseling without effective prior intervention is that it will likely be more difficult to deal with these long-term issues, but that by virtue of being secondary characteristics, remediation and rehabilitation strategies would be appropriate means of address.

Transition Planning and Relationship to Career Counseling

Best practice in preparing youth with disabilities for adult responsibilities and roles centers around a process of individualized planning in transition-

ing students from the K-12 setting to post-secondary settings and eventual careers/independent living. While these activities by definition should occur prior to students interacting with counselors in the college setting, a brief discussion of elements of that process may be helpful in understanding what is supposed to be happening and also in planning ad hoc interventions.

The individuals with Disabilities Education Act (1997) defines transition as an "...outcome-oriented process that promotes movement from school to postschool activities...is based on the individual student's needs, taking into account the student's preferences and interests...and includes instruction, related services, community experiences, and the development of employment and other postschool adult living objectives." (Wehman, 2001). Current students are most likely to have come through school after the 1997 reauthorization of the law in which the minimum age to begin transition planning was moved from 14 to 16. (As a point of interest, the 2004 reauthorization moved the required age of initiation back to age 16, effective July 2005).

Important aspects of effective transition planning include promoting self-determination and self-advocacy; interagency cooperation and joint planning; strong input and involvement from the family and student; community-based instruction; "person-centered" planning in which the student "drives" the process; vocational assessment and training (including employment experience), and support in accessing postsecondary education, the world of work, and/or independent living options.

With respect to self-efficacy issues, most of the extant literature in the area of learning disabilities focuses on changing self-efficacy and efficacy expectation through environmental or instructional modifications (Schunk, 1989; Wehman, 2001). Several factors may limit acquisition of these perceptions, including overprotectiveness by others; environments that are too structured and limit choice and decision-making by students and lack of self-knowledge about oneself and one's disability. Within transition planning, self-efficacy may be addressed through several means. These include individual

counseling; use of self-determination curricula and instructional model; incorporation of self-advocacy groups; use of student-directed/self-regulated learning strategies, goal-oriented action planning. Although it is certainly hoped that students have had effective transition services incorporating the above elements at the secondary level (or ideally even before!), the postsecondary counselor can still use many of these same tools in assisting students at the post-secondary level.

Occupational Issues

Career service providers are enjoined to assist students in breaking away from the negative associations they may bring with them (Price & Shaw, 2000). Counselors can, in tangible ways, help students translate skills acquired in college and elsewhere to future employment. When academic skills are explicitly linked to job or career skills, students are more likely to transfer and/or generalize academic skills to current or future work performance. This is particularly true for students with learning disabilities, who frequently experience difficulty in generalizing information and behaviors from one setting to another (Mercer & Mercer, 2005).

One means by which students may be helped to reframe past negative experiences is through self-reflection and use of metacognitive strategies. Past experiences can be reframed as lessons for what did or did not work at a particular stage in their lives, and examples of challenges through which students have learned to persevere (Gerber, 1997). The goal is to aid students in generalizing lessons previously learned to current life events, and to learn to use negative experiences in a positive way. Specifically, professionals should ask students to talk or write a few paragraphs by addressing questions such as: "What is your proudest achievement, and why? What would you do over again if you could, and what would you do differently? What have you learned from these experiences, and how might this help you now or in the future?" Responding to these types of questions engages the student in a reflective process which helps them to link difficulties or failures with means for suc-

cess. With the answers to these questions, students will begin to build a more positive base on which to launch their college careers and future job development (Gerber, 1997).

Career development efforts should ideally address a number of needs, including fostering development of a sense of confidence, or self-efficacy. Once confidence is attained, students become more motivated to focus and develop goals. Similarly, they are more able to learn skills required for career exploration, decision-making, and goal setting (Neubert & Taymans, 1989). Building confidence (or sense of self-efficacy, as it is commonly referred to in the literature) can yield positive influence on an individual's decision-making ability, willingness to take initiative, and perseverance in spite of obstacles (Hua, 2002). All these are necessary attributes for success in the world of work, and important if we are to help students develop career confidence.

Strength-Based Strategies

As noted before, despite the problematic issues inherent to a diagnosis of learning disability, college students with learning disorders do embody notable strengths. These students arrive on college campuses with a rich background of experiences which should not be shunted aside, but used as vital clues to unlock their unique learning potential and help build confidence (Knowles, 1970). When existing strengths are reinforced by relevant and age appropriate career inter-ventions, these students are more capable of addressing the academic demands of the college environment. Parallels between school and work should be explicitly linked by the counselor in order to aid students in generalization between the two settings. The career counselors' role then becomes that of facilitator in helping students unlock their potential through strategic, strength-based career interventions.

Career confidence also develops when students engage directly in the work process. Counselors should encourage students to develop a work history. Having a relevant work history is a critical component of a successful outcome for any job candidate (Brown, 2003), especially for students with dis-

abilities. Through hands-on participation, students learn to take ownership of their skills, their strengths and weaknesses. This is important for several reasons. For example, the vocational rehabilitation literature clearly indicates that work experience is one of the most important predictors of future career success (Brown, 2003; Kohler, 1993). However, this is also important in helping to address tendencies towards negative external locus of control common to individuals with learning disabilities (Dipeolu et al., 2002; Luzzo, Hitchings, Retish & Shoemaker, 1999). The act of engaging the world of work means that students learn how their special skills and talents fit in real life, as well as obtaining experiences that better enable them to understand and accept how their own efforts affect eventual life outcomes. The students also have an opportunity to identify those skills that are consistent with their interests, values and personal characteristics.

This process of "doing" (articulating strengths, acquiring information through real-world experience) takes the mystery out of the often elusive task of finding a major/career that is well suited for students' unique characteristics, as well as offering a forum for testing and refining new skills. Young adults learn best when they apply classroom learning to achieve their personal goals through an individualized problem solving approach, and when they resolve genuine problems in their everyday environment (Knowles, 1970). Students then become partners with the counselor, helping to weave and construct their own path to career success.

Paradigm Shift

If students are to attain confidence in the career development area, the orientation of the career development professional may need some reformulation from "fixing" students, to that of professionals who guide them in finding their way through the maze of the college environment (Szymanski, Hewitt, Watson, & Sweet, 1999). Career counselors' interventions with students with learning disabilities should then change the focus of question from "You need to enroll in math or take math class, etc..." to career focused questions such as "What are your strengths and weakness-

es? Where do you want to be in a year from now, five years from now? How can we help you get there? And what is the quality of life you visualize for yourself?"

Betz (2004) advocated that counselors should encourage students to explore areas of behavior where they feel their lack of skills is holding them back from pursuing desired options. By asking these career relevant questions, career professionals help students make the necessary connection between acquired college credits, life/work skills and eventual career and personal satisfaction.

Service Delivery Options

Group format is often not a primary delivery mode in the postsecondary setting, except in the context of workshop, training and/or teaching. Yet, group interventions have consistently been shown to be effective in promoting a wide variety of career outcomes for participants (Lapan, 2004). When students are able to find others who are going through (or have overcome) similar struggles, they are more apt to persist in their efforts toward success. Compared to individual counseling, the group modality is a naturally occurring support system for most individuals (Brotherson, Berdine, & Sartin, 1993). Research indicates that many individuals diagnosed with a learning disability require some type of support to locate and maintain their first job (Neubert & Taymans, 1989). Career counselors are therefore encouraged to use group format as one means by which to provide this needed support.

The focus of the group modality should be to reinforce appropriate job behaviors, discuss job related problems and offer participants a chance to both exchange information and obtain emotional support (Brown, 2003; Neubert & Taymans, 1989). Group format is especially useful for reinforcement, confirmation, and for students to find others who share their particular struggles. Instead of rigidly adhering to one particular modality however, group activities and interventions should be considered in light of each student's interest and need.

Counselors can help to tailor interventions toward helping students with

learning disabilities develop specific skills that will foster career confidence. Specific skill development activities can be addressed in a group setting through a variety of means, including role-playing and video taping of performance. When individuals have had little previous success, an important source of self efficacy for them is to provide opportunities for vicarious experience (Bandura, 1977; Hershenson & Szymanski, 1998). It is through this repeated activity involvement, modeling, and feedback from others that individuals develop self-efficacy beliefs and outcome expectations for academic and career-related tasks (Gore & Leuwerke, 2000). Group format provides the forum to attain to this level of skill refinement and it helps multiply and generalize confidence in skills attainment.

Domain-Based Interventions

Additional specific skills as identified below are helpful to the career development process of students diagnosed with learning disabilities. The attainment of career confidence may be conceptualized as requiring a three prong approach that focuses on cognitive, affective and behavior domains. This means of categorization is similar in tone to the listing presented by Paulsen and Betz (2004), who enumerated efficacy-based interventions incorporating performance accomplishments; vicarious learning, anxiety management and social encouragement. These are separated here into three cluster areas of affective, cognitive and behavioral based interventions.

Affective Interventions

1) **Address dysfunctional emotion:** The first priority is to identify any disabling emotion, and to reduce accompanying symptoms. The existence of severe or moderate anxiety/depression (not uncommon among persons with learning disabilities) will no doubt destabilize efforts to solve career-related problems. Towards this end, a routine screening for psychological problems such as anxiety and depression is recommended. Career counselors should strive to stabilize affect before working on presenting

career problems to maximize the effectiveness of the chosen intervention (Saka, Gati, & Kelly, 2004), with appropriate referrals made (e.g., for medication management) if warranted.

2) **Build self-esteem**: Creating a supportive atmosphere to help students appraise their lack of self esteem as a solvable problem increases internal motivational level that, in turn, contributes to the development of career confidence. According to Goleman (1998), three of the five elements of emotional intelligence are self-esteem, self-awareness, and assertiveness. These are ingredients in the development of emotional intelligence, a critical competency in career attainment. For a number of years a well known saying among employers has been, "IQ gets you hired, emotional intelligence gets you promoted" (Clay, 1999). Thus, elements of emotional intelligence help prepare students for the world beyond the college environment. We as counselors may help them by promoting development of concomitant skills that are important for survival in the world of work. Self identity is another critical building block of self esteem. Career counselors cannot build on sand (Saka, Gati, & Kelly, 2004). They can avoid building on sand by dealing with the issues of self-identity and self-esteem. Students are assisted to identify accomplishments and use it as a building block for strong positive self esteem.

3) **Self-awareness skills**: This includes the identification of personal characteristics, including personal strengths and weaknesses. In order to make career related decisions, students need to learn about themselves, the world and people around them. Self knowledge is necessary for good career decision making because limited awareness of one's personal strengths and weaknesses could lead to unrealistic expectations (Sampson, Reardon, Peterson, & Lenz, 2004).

4) **Interpersonal/relational skills:** The results of a metaanalysis across 152 studies indicate that

75% of students with learning disabilities have social skill deficits (Forness & Kavale, 1996). Jones (1996) identified several foundational social skills needed by students entering the work force, which included interpersonal skills. This includes communication, negotiation, leadership skills, ability to work as a team member, and ability to function in a multicultural setting. No two students will be alike. Because each student may be lacking in different social skills, the first task is to identify the area of need. This is done through an inventory of social skill attainment of each student. However, regardless of the area of need of each student, volunteerism and/or service learning is a good place to begin. Volunteering involves connecting with and contributing to the welfare of another person (Clay, 1999). There are different ways we learn to connect through service to others. If anything, the volunteer begins to move from self focus to other focus, a necessary starting point to learning how to relate comfortably to others.

5) **Job satisfaction**. Since work is one of the central components of life activities for most adults therefore, it is easy to assume that satisfaction derived from work is an important determinant in an individual total life satisfaction (Brown, 2003). A key element of job satisfaction is to create the awareness early. Needless to say, job satisfaction is a by-product of successful acquisition of the above skills. The development of these skills will then lead to readiness for job advancement, hence job satisfaction.

Cognitive Interventions

6) **Screening for negative cognition**. The presence of dysfunctional cognition affects one's ability to make decisions and proceed in the career counseling process, because it distorts reality and sets up a false basis on which individuals may make inferences. It helps to expose students' negative career-related beliefs, in order to alter or reduce them. Reed, Reardon, Lenz, and

Leirer (2001) indicated that the reduction of negative career thoughts enabled students with higher levels of negative thoughts to more effectively participate in the career counseling process. Identifying dysfunctional beliefs and showing students how these may be reframed or countered will help to focus efforts, facilitate change and give direction to the career counseling process (Sampson, Reardon, Peterson, & Lenz, 2004).

7) **Occupational and/or career information**. Research suggests individuals with learning disabilities may be confused by information they receive regarding the world of work, along with lack of opportunity to see and imitate work-related behavior (Smedley, Levinson, Barker, & DeAngelis, 2003). The effectiveness of any career decision making is to a large measure dependent on the nature and extent of career information on which the decision is based. Limited awareness of employment opportunities and information is often cited as a problem area for students with learning disabilities. Students with disabilities are not alone here; in that many clients who come for career counseling lack information about careers (Brown, 2003). Brown, Minor, and Jepsen (1991) indicated that 25% of a national sample of adults reported that they had never used any source of occupational information in preparing for work or in obtaining a job.

Consequently, the counselor can help by initiating career information gathering process. We suggest a focused but intense information gathering process, including utilizing several resources such as career center libraries, career-related Internet sites, public libraries, etc. Useful career information sources include: The *Dictionary of Occupational Title (DOT)*, the *O*NET*, the *Occupational Outlook Handbook* (OOH) and the *Guide for Occupational Exploration (GOE)* and program such as *DISCOVER* or *SIGI*. These resources contain information about occupations, training time, and work situation environmental conditions, necessary information to consider in the career decision making process.

8) **Career exploration.** Occupational exploration opportunities should be provided early in college to allow enough time for students diagnosed with learning disorders to make adequate gain. We suggest that career development professionals offer their expertise during a student's first year of school by providing workshops tailored to encourage career exploration, with follow up of attendees. This is best accomplished through collaboration with the university disability office. Since students with learning disabilities have multifaceted needs, they are best addressed using a multidisciplinary team working in the interest of the student. This includes collaboration with other offices/centers and professionals from other disciplines who may also interact with these students, within student affairs and even at the academic department level.

9) **Decision making skills**. Decision making skills should be built on a crystallized identity. Unless there is a solid self schema on which to base the career decision, indecisiveness, and indecision would tend to be present (Saka, ati, & Kelly, 2004). Among several available decision making schema is the Cognitive Information Processing decision-making model. Its theoretical underpinning is consistent with the processing deficit model proposed to explain learning disabilities. Additionally, the approach is relevant to career problem solving and decision making and has been used effectively with students diagnosed with learning disabilities (Dipeolu et al., 2002). However, in the final analysis, the choice should be based upon what would best meet the need of each student, after evaluation of individual students' characteristics and needs.

Behavioral Interventions

10) **Setting relevant and appropriate career goals.** In order to help students set career goals, they are given weekly homework assignment to set academically related goals, and encouraged to keep a journal of daily activities for a week. Homework assignments should be specific about what it is to be done and generally for the purpose of extending the learning process began in the counselor's office (Brown & Brooks, 1991; Hay & Kinnear, 1998; Salend, Elhoweris, & vanGarderen, 2003). This is a means of tracking students' efforts to accomplish set goals. The emphasis here should be on identifying obstacles to goal accomplishments and helping students assess the extent to which their goals are realistic. At the end of the week, students meet with their counselors to examine if the goals were accomplished. If goals were not accomplished, this then becomes an opportunity to examine obstacles in this process. The materials derived from this meeting then become a powerful tool used to help students personalize the goal setting experience. Because the experience is relevant to their college needs is based on here and now situations, subsequent insights may be more easily extrapolated to tackling career related goals.

11) **Linking personal characteristics to job or career goals.** This may be accomplished by encouraging students to make a list of their strengths prior to embarking on work based experience. Once the identified strengths are in place, students are then encouraged to keep a journal of their work-related activities. At the end of the day, students are asked to identify work activities that complement each listed strength. The idea is to help students identify strengths and celebrate those, as well as make the connection between personal characteristics and job characteristics. By so doing, students learn how personal characteristics relate to their eventual duties in the work environment.

12) **Job Hunting.** Job hunting activities include teaching students how to sell their skills, participate in

interviewing, write resumes, conduct self-assessment of skills and how to obtain information relevant to searches, such as salary data (Yates, 1987). Rife and Belcher (1993) found that workers who had the greatest degree of social support for their job-hunting activities spent more hours searching for jobs and generated more employer contacts. For students with learning disabilities, college work experience in the community may also be necessary to help overcome stereotypes (Jones, Ulicny, Czyzewski, & Plante, 1987).

13) **Job interviewing**: Many job applicants, especially first-timers, may also be unaware of how interviews are influenced by variables such as personal grooming; appropriateness of attire; eye contact; proper grammar and self-expression; poise; posture, and composure. The ability to explain what individual can bring to a job and what each expects in return is equally crucial (Atkins & Kent, 1988; Riggion & Throckmortton, 1987). Role playing and practice interviews are the most common techniques for sharpening these skills (Brown, 2003). Therefore, students are greatly helped to acquire these skills through these means and others, including simulated interviews in which students practice answering potential employers' questions.

14) **Development of appropriate work habits.** This includes behaviors such as on-time and regular attendance; appropriate interaction with persons in authority, and ability to follow directions. Helping students to identify what constitutes a desirable work ethic is the first step toward helping them develop one. This should be followed by helping them to identify areas they might need to develop these skills. The emphasis here is to show students that when they are able to be on time to classes, turn their assignments in on time, prepare for examination, receive feedback, and succeed in spite of their disabilities, they are developing important skills that are transferable to the work setting.

15) **Relevant work site experience/mentorship**: Short-term job trials, part-time work and internships are probably the best ways for a future worker to gain knowledge about an occupation (Brown, 2003). Students should be exposed to several opportunities to engage in work related experience such as internships, part-time work positions, co-ops and work-study programs. Allowing students with learning disabilities the opportunity to have face to face contact with workers is an approach to gathering information that is preferable to less direct methods because of the level of real-world applicability.

An important but often overlooked aspect of work site experience is the role of mentors. Students should not just be provided with opportunities to work, but they should also be connected with a mentor. For students, mentors serve as experts in a given area and wear an aura of credibility that even the career counselor with many years of significant experience is unlikely to match (Brown, 2003). Mentors also serve to provide direction and motivation, instill values, promote professionalism, and help students develop leadership skills. Without their intervention, students may remain on the same career path, perhaps continuing a horizontal progression through their career and personal lives (Burgstahler & Cronheim, 1996).

16) **Assertiveness and self-advocacy skills**. Role playing with the counselor or within a group using vignettes of various work related problems is a recommended approach to help students develop effective self-advocacy and problem-solving skills. This provides students with the opportunity to receive feedback, validation of appropriate behavior, and the opportunity to practice newly developed skills in a safe and non-judgmental environment. A combination of didactic and experiential activities guide students in learning how to achieve increased levels of awareness of both their disabilities and other attributes, including strengths and skills (Satcher, 1995).

17) **Job advancement skills.** This is a necessary component of lifelong career planning that will result in self-sufficiency as well as contribute to job satisfaction. Savickas (1991) noted that it is essential to the career planning process that students have a future orientation that is optimistic. This includes building and activating a wide support system at work and home. Within the work environment, this is usually done through work-based experience where students are assigned to a specific mentor, whose role it is to provide students with the opportunity to ask questions clarify essential elements of their jobs and understand the nature of the job, including advancement prospects and paths for career growth.

18) **Accessing Accommodations:** At the post-secondary and employment levels, a dominant issue is learning availability of and how to of accessing supports (such as assistive technology), and who pays for what. This becomes a significant concern on job sites where employers will question the readiness or suitability of potential employees who request specialized equipment and or other supports. Counselors can assist in this area in several ways; providing students information on community resources(e.g. Vocational Rehabilitation, Assistive Technology Centers) that may help; expanding advocacy activities as mentioned above to include learning how to clearly and effectively articulate needs. An additional but critical issue lies in evaluating when to disclose a disability and request accommodations. Although both the Rehabilitation Act and Americans with Disabilities Act entitle persons with documented disabilities access to accommodations, the reality is that many potential employees (e.g., students or graduates) are wary of disclosing disabilities or requesting accommodations for fear that this may adversely affect their chances

of obtaining or keeping a job. Again, counselors can help by referring the student to community resources familiar with this issue (e.g., Vocational Rehabilitation, Workforce Development Centers) and by helping the student learn decision-making steps to help review considerations in making an informed choice as to whether (or when) to request accommodations.

In closing, employment success in the 21st century requires that students with disabilities possess career maturity and personal flexibility (Ochs & Roessler, 2004). Assisting students with learning disabilities to develop relevant skills will help prepare them to transition well from college into the world of work (Madeus et al., 2001). The preceding clusters of affective, cognitive and behavioral based career interventions are recommended on the premise that awareness is a necessary first tool for addressing these problems, with subsequent follow-up with activities to address each area of importance.

Certainly not all difficulties will be eliminated simply through awareness alone. However, this is a starting place in creating the confidence that students with learning disabilities will need to continue making necessary adjustments beyond the university environment. When students make a successful transition to the world of work, they are well on their way to sustaining the career confidence they have worked hard to attain while in college.

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Youth with Fetal Alcohol Spectrum Disorder: Suggestions for Theory-Based Career Practice

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Abstract:

Fetal Alcohol Syndrome Disorder (FASD) in youth is increasingly recognized as a disability that has critical implications for career development. The readiness skills needed for successful transitions to adulthood may be delayed by several years and these youth will require ongoing support. Youth with FASD require modified career counselling services and career interventions. However, there is a clear lack of attention to advancing career theory and practice to persons with disabilities particularly for individuals with neurological impairments. The goal of the present article is to encourage practitioners to use Social Cognitive Career Theory (SCCT) as a means to develop appropriate transition planning and career interventions for young people with FASD.

Introduction

Yesterday Eric learned how to tabulate and record the number of items sold at the local craft store where he was employed. Yet today Eric clearly can not remember the steps involved in completing the task. When his employer gave him notice, Eric seemed unable to understand the consequences of not fulfilling his agreed upon duties.

The scenario offered above gives insight into the impact of alcohol use during pregnancy and its complex effect on behavioural and cognitive functioning of affected individuals. The continuum of disabilities that are experienced as a result of brain damage caused by prenatal exposure to alcohol is referred to by the umbrella term, Fetal Alcohol Spectrum Disorder (FASD). FASD is a life-long disability that affects an esti-mated 9.1 per 1000 live births in the United States (Chudley et al., 2005). Currently no national statistics are available on the rates of FASD in Canada. The effects of alcohol exposure vary by individual depending on amount, timing, and frequency of exposure (Chudley et al., 2005). FASD is a largely invisible disability, characterized by cognitive, neurological, social, and/or emotional challenges (Streissguth, 1997). The effects of prenatal alcohol exposure carry heavy costs for the individual, their family, and society (Premji, Serret, Benzies & Hayden 2004). Youth with FASD and their caregivers require appropriate career counselling services and career interventions. However, there is a clear lack of attention to advancing career theory and practice to persons with disabilities (Cummings, Maddux, & Casey, 2000), particularly those with neurological impairments.

In this article we apply concepts from Social Cognitive Career Theory (SCCT; Lent & Brown, 1996; Lent, Brown, & Hackett, 2000) to potential career counselling interventions for youth with FASD who are making the transition to adulthood. The recent literature that has sought to understand the connections between individuals with neurological disabilities and career options has tended to focus on the barriers that negatively influence their career development (Cummings et al., 2000; Ettinger, 1996; Levinson, 1998). For example, some challenges include low self-esteem, difficulties in establishing routines, challenges related to information processing, and a tendency toward passive learning styles. Other contributions have sought to expand our understanding by emphasizing strengths and resources (Malbin, 2002). Following the idea of building on the strengths of young people with FASD, we use SCCT (Lent & Brown, 1996; Lent et al., 2000) to provide a conceptual framework for understanding how personal attributes, the environment, and overt behaviours can be harnessed to awaken the potential and strengths that are within the reach of this population. As such, the goal of the present article is to encourage practitioners to use SCCT as a means to develop appropriate transition planning and career interventions for young people with FASD.

FASD: An Invisible Disability

The leading cause of developmental disability among Canadian children is Fetal Alcohol Syndrome (FAS) (Public Health Agency of Canada, 2005). The umbrella term, Fetal Alcohol Spectrum Disorder (FASD), is used to depict a range of disabilities as well as the diagnoses related to prenatal exposure to alcohol including Fetal Alcohol Syndrome (FAS), partial FAS (pFAS), Alcohol-Related Neuro-developmental Disorder (ARND), and Alcohol-Related Birth Defects (ARBD).

The effect of prenatal alcohol exposure varies greatly among individuals, but the specific neurological impairments all impact abilities related to adapting to daily living as adolescents and adults (Streissguth, 1997).

> ... affected people exhibit a wide range of expression, from severe growth restriction, intellectual disability, birth defect and characteristic dysmorphic facial features to normal growth, facial features and intellectual abilities but with lifelong deficits in several domains of brain function (Chudley et al., 2005, S1).

Alcohol-related central nervous system dysfunction includes memory impairment, attention deficits, specific

learning difficulties (e.g., mathematics or verbal reasoning), difficulty in abstracting, and difficulty with impulse control, all of which have implications for education and career planning. Difficulty in tasks that involve planning and following through with goal-directed action is a particularly common issue (Olson, Feldman, & Streissguth, 1992).

A considerable range of intellectual dysfunction is found among individuals with FASD. While organic brain damage does create particular cognitive and behavioural issues for individuals with FASD, individuals may have normal IQ scores (Streissguth, 1997). The effect of the brain damage is such that individuals' ability to access and utilize their intelligence is impaired. Unfortunately, standardized test scores in the normal range may mean that those individuals do not qualify for special educational and vocational services that use mental retardation as their qualifying criterion (Streissguth, 1997).

Impairments that develop or become evident over the course of the individuals' lifespan are referred to as secondary disabilities. These secondary disabilities associated with FASD may be more debilitating for the individual than the primary disability (Fast & Conry, 2004; Streissguth, 1997). Mental health issues, drug and alcohol addiction, trouble with the law, and difficulty with employment and life management are commonly cited (Famy, Streissguth, & Unis, 1998; Streissguth, Barr, Kogan, & Bookstein, 1997). Early diagnosis of FASD is in itself a protective factor, as this allows the individual to receive appropriate services and support from a young age (Streissguth et al., 1997). However, many young adults living with the disorder may have no formal diagnosis because they do not meet the out-dated criteria for a formal diagnosis or are unable to access limited diagnostic services (Premji et al., 2004). Those individuals with less severe symptoms are often at higher risk for secondary disabilities due to lack of understanding of the source of their behavioural problems (Streissguth, 1997). In addition, the most common secondary disability – mental health issues – may further complicate the presenting situation for these individuals. Comorbid conditions including depression, anxiety, and sub-

stance use highlight the need for practitioners to be sensitive to this combination of disability and mental health problems. These clients are neither solely organically brain-damaged nor solely emotionally disturbed (Streissguth & O'Malley, 1997).

Given the gaps and limitations of the current FASD career literature; there is a clear need for theory-based career development interventions that will address the unique needs of alcohol-affected individuals. In addition to the challenges that these young adults face, they also have strengths and abilities upon which to build. These strengths include good visual memory and verbal skills, persistence, commitment, success in low-stress, structured situations, a strong sense of fairness, and success in learning with hands-on tasks (Malbin, 2002). By recognizing and building on these strengths, suitable systemic transition planning can be engaged in for young people with FASD.

Transition to Adulthood

During the period from ages 18 to 25, referred to as emerging adulthood (Arnett, 2001), young people face a multitude of new opportunities and responsibilities that require the addition of new information, knowledge, and skills (Arnett, 2001; Mortimer, Zimmer-Gembeck, Holmes, & Shanahan, 2002). Successful transitions to adulthood appear to rest on a number of "readiness" factors and include objective and psychological aspects (Phillips, Blustein, Jobin-Davis, & White, 2002; Solberg, Howard, Blustein, & Close, 2002). Readiness is acquired objectively by engaging in work-based learning and exploration and through the instrumental and emotional support of adults who can orient youth to the world of work. Additionally, readiness is acquired through internal psychological contexts, for example, facilitative attitudes of curiosity and sustained attention, confidence about one's future plans, and flexibility in responding to challenges and obstacles (Blustein & Flum, 1999; Phillips et al., 2002).

FASD is a condition that children do not outgrow. Biological, adoptive, and foster parents have noted that raising children with FASD to adulthood is full of uncertainty for a number of rea-

sons. Individuals with FASD lag behind developmentally when compared to other youth their age. Therefore, the readiness skills needed for successful transitions to adulthood may be delayed by several years and these youth will require more support between the ages of 18 and 25 years compared to their counterparts (Malbin, 2002). Additionally, adolescents with FASD are likely to display poor judgement, difficulty in perceiving social cues, and failure to understand the consequences of one's actions (LaDue, Schacht, Tanner-Halverson, & McGowan, 1999). In the transition to adulthood, lack of social skills may affect the ability of those with FASD to gain positive work-based learning experiences. However, emotional and instrumental support may be provided by caregivers and professionals. Although the majority of children diagnosed with FASD are being cared for in foster or adoptive homes (Hess & Kenner, 1998), foster and adoptive caregivers tend to be highly committed to maintaining long-term, stable, and nurturing environments for their children (Streissguth et al., 1997).

Social Cognitive Career Theory and FASD

Traditional career models imply that individuals have the ability to choose a preferred career based on values, interests, and abilities, and to plan and implement their choice. For individuals with FASD, this is not the case. However, little is known about how these individuals can successfully navigate life-career pathways. In essence, "the people who are in greatest need of assistance with career development are the ones about whom the least is known" (Harmon as cited in Chartrand & Rose, 1996).

Effective support of alcohol-affected youth requires that practitioners appreciate the impact of social environment, as well as the effects of the brain damage (Streissguth & O'Malley, 1997). The appropriate career development model must therefore take into account the individual's abilities and disabilities as well as family, school, and other socio-cultural factors or contextual affordances that have influenced the individual's development up to this point, and may continue to influence

the success of any intervention. A life-span approach is also called for, as individuals with FASD will need strategies and support to manage their disability throughout their lives.

Social Cognitive Career Theory (SCCT), an evolving model of life-career development, provides a conceptual framework for understanding how individuals develop interests in educational and career areas, make choices, and implement these choices with varying levels of success. SCCT incorporates Bandura's triadic reciprocal model of causality which assumes individual characteristics, environmental/contextual factors, and behaviour interact and influence each other throughout this process. Self-efficacy beliefs, outcome expectations, and personal goals are highlighted within this model of reciprocity and can be conceptualized as a developmental-contextual model made up of environmental layers, where the individual (with her/his personal characteristics) is embedded within their immediate family system, and within consecutively larger layers of context (Lent et al., 2000). Developmental-contextualism emphasizes the dynamic interaction that occurs between individuals and their environments (for example: community, sociocultural context, educational environment, and family situation). In this model, neither contextual factors nor individual characteristics (e.g., ability) are sole determinants in the life-career development process. Rather, individuals are able to exercise agency within the dynamic relationships that exist (Patton & McMahon, 1999). An individual filters and interprets information from the environment, which in turn affects self-perception and perceptions of the environment.

Personal resilience factors identified in the literature on disabilities include attainment of clear goals, ability to reframe the disability to recognize strengths, and the development of strategies and techniques to enhance performance (Dolyniuk et al., 2002; Garber, 2001). Environmental factors which foster positive interactions include supportive social environments, mentors who teach and guide performance, and the goodness of fit between the individual and their job or career (Garber, 2001; Hurlbutt & Chalmers, 2004).

Status variables such as disability affect individuals, not through the meaning or fact of the disability itself, but through the intrinsic effect of responses from the sociocultural environment with regards to the disability (Fabian, 2000). Attitudes based on myths, stereotypes, or on a lack of knowledge are likely to create substantial barriers including physical barriers, policy and procedural barriers, and attitudinal barriers. If, on the other hand, an individual's disability is not recognized, as is often the case, responses to behaviour cannot be interpreted through that lens of understanding. Individuals with alcohol-related effects as a result of maternal alcohol exposure are likely to experience frustration and low self-esteem, contributing to secondary disabilities. The relationship between an individual and his/her environment is seen as directly influencing life-career decision-making, which has important implications in planning career development programs.

The emphasis on the individual-contextual relationship is a departure from traditional models, which tend to place greater emphasis on values and aptitudes. In SCCT, values and aptitudes are seen as only one aspect of an individual. Individual characteristics influence career choices and behaviour through self-efficacy beliefs, outcome expectations, and personal goals. Self-efficacy beliefs are a dynamic combination of beliefs about oneself, linked with performance experiences (Lent & Brown, 1996). Outcome expectations are beliefs about projected results of behaviours. A type of outcome expectation that is particularly relevant to this discussion are those in relation to one's view of the environment – specifically, barriers to employment (Lent et al., 2000). Contextual affordance, or how environments may promote or obstruct one's ability to translate personal strengths into life-career possibilities (Patton & McMahon, 1999), is an important area to address in career counselling, as unaddressed barriers will hamper any progress that is made on the individual level, negatively affecting self-efficacy beliefs.

For individuals with FASD, self-efficacy beliefs, outcome expectations, and contextual barriers to employment may have an especially

strong influence on personal goals. Self-efficacy beliefs are formed through "(a) personal performance accomplishments, (b) vicarious learning, (c) social persuasion, and (d) physiological states and reactions" (Lent & Brown, 1996, p. 311). Given that alcohol-affected individuals may be operating on experiences of failure, are easily influenced by others, and have difficulty in managing difficult emotions, self-efficacy beliefs may be particularly low for these individuals. Improving self-efficacy beliefs is a key step in career development, as negative self-beliefs may lead to avoidance behaviour (Lent, Hackett, & Brown, 1999). The importance of realistic self-appraisals must also be stressed as unduly negative or unrealistically optimistic self-appraisals will have detrimental effects on progress in forging life-career pathways.

In terms of occupational choice, SCCT proposes a linear progression in which self-efficacy and outcome beliefs influence life-career interests, which in turn are translated into career choice goals, and result in motivation and action towards the goals (Lent & Brown, 1996). While the first part of this process – the influence of self-efficacy and outcome beliefs on interests and goals – is likely to hold true for individuals with FASD, translating goals into action will likely require support and advocacy on the part of the counsellor. Novick and Streissguth (1996) found that although clients often spoke about their situation as though resolution of problems would be easy to accomplish, "in reality they are often unable to follow through in obtaining services on their own behalf" (p. 21) and "memory problems, attentional problems, and poor organizational skills make these patients dependent on a strong infrastructure" (p. 21). Premji and colleagues (2004) highlight the need for structure and consistency in all areas of life for individuals diagnosed with FASD, particularly in regards to transitions, which should be gradually structured so as to ease anxiety and behavioural problems.

Counselling Strategies and Implications

The following recommendations represent a combined understanding of the spectrum of FASD, drawing on existing practical applications for career counselling with individuals diagnosed with other neurobehavioural disorders (e.g., Cummings et al., 2000; Hutchinson, 1995; Reekie, 1993; Schmucker, 1997) and from the personal experience of the first author in working with this population. Additionally an extensive review of peer-reviewed and grey literature databases by Premji and colleagues (2004) further inform the ideas presented in this paper. A broad understanding of career development is taken and includes psychological, social, educational, and physical factors that shape the career of an individual over their life-span (Herr & Cramer, 1996).). Suggestions include strategies for relationship building and assessment, identifying and building on individuals' strengths, and creating structure and support. It is essential that these suggestions be instituted in accordance with a prior multidisciplinary assessment of the individual's executive functioning, neuromotor or motor and sensory impairments, emotional functioning, medical treatment including diagnosis, and speech/language function usually undertaken by a team of health professionals.

Relationship Building and Assessment

General strategies for working with youth with FASD involve observing patterns of behaviour which reflect developmental stages in different life arenas; eliciting clients' understanding of what it is like to live with FASD; reframing their behaviour as a neuro-developmental disorder; establishing concrete routines in the counselling sessions to avoid client frustration and to increase retention; preparing clients for transitions by posting activities to engage in during the session with time allotments; modeling positive interpersonal behaviours and providing feedback on body language and facial expressions; using visual aids; providing simple instructions using concrete examples from a multi-sensory approach; and making certain that the physical environment is organized, low in sensory stimuli, quiet and comfortable; and providing templates and examples of written components such as resumes (Malbin, 2002; Reekie, 1993; Stade, Clark, & D'Agostino, 2004).

An individualized approach is mandatory, as individuals with FASD will have varying abilities and disabilities (Burgess & Streissguth, 1992; Olson, 1994). Rather than expecting the client to fit the intervention, the intervention should be designed to be flexible and adaptable to meet the unique and changing needs of the affected youth (Burgess, 1994; Olson, 1994). If a client does not identify as having a diagnosis of FASD, and the counsellor suspects that this could be an issue, the possibility of diagnostic testing should be discussed (Premji et al., 2004). Although testing can be expensive and difficult to access, for individuals with more severe symptoms on the spectrum, obtaining an accurate diagnosis may help individuals to access available services. Particularly helpful would be an individual support worker who can help to co-ordinate the various supports that the individual may need, for example, ongoing therapy, housing, job coaching, transportation, and financial assistance (Novick & Streissguth, 1996). Although an individual's IQ may fall within the average range, other features associated with alcohol-related birth disorders may affect the individual's ability to function at that level (Burgess, 1994; Premji et al, 2004.). While superficially youth with FASD may present as more competent than they actually are, when expectations are too high, they may show signs of disintegration (Coe, Sidders, Riley, Waltermire, & Hagerman, 2001; Dyer, Alberts, & Niemann, 1997). Positive correlations were found between IQ and symptoms of moodiness, depression, aggression, inattentiveness, and hyperactivity of alcohol-affected individuals and high IQ (Coe et al., 2001), suggesting greater susceptibility among this group. In any case, a comprehensive evaluation "which identifies areas of strength and need, is critical to develop realistic expectations, secure appropriate supports, and develop effective interventions" (Premji et al., 2004, p. xii).

Involving an individual's family in the career counselling process is an asset as sustaining progress in behaviour change is heavily dependent on the individual's receiving adequate understanding and support from their family (Novick & Streissguth, 1996; Premji et al., 2004). Most foster or adoptive parents of a youth with FASD want information in order to understand the physical, intellectual, and behavioural concomitants of their diagnosis (Brown & Bednar, 2004) and to use this information to develop reasonable expectations and to assist in the planning process. Biological parents, on the other hand, may first need support in working through possible feelings of guilt and shame before they will be able to provide support to their youth (Chudley et al., 2005). In family sessions, clients can receive comments on FASD traits that affect their performance, for example, how rigid and inflexible thinking gets in the way of learning new skills. Family members can be involved in counselling sessions, either as supportive observers, or actively, in eliciting strengths and resources, in teaching functional skills, and in interviewing or self-advocacy skills role-plays.

Sources of Self-Efficacy and Outcome Expectations

From a strengths-based perspective it is important to include an appreciation of strengths in our work with these youth. Rather than an exclusive focus on the challenges faced by alcohol-affected youth in the transition to adulthood, solutions may be found in the unique experiences, strengths, resources and skills of the youth, their caregivers, the family, and even the community in which they live (Prenji et al., 2004). Such strengths-based information provides indications of the solution that is likely to best fit the youth's unique circumstances. This is particularly true in working with youth who have experienced a history of school failure and early drop-out, social isolation, and behavourial problems (Reekie, 1993). The shift from exploring the nature of problems and how they affect clients to exploring how clients have responded and coped with these problems in the past can be empowering in that it assumes an active coping response on

the part of the client (Wade, 1997). Efforts to teach new skills must build on areas of strength, as memory impairments and other issues impact the ability of individuals with FASD to maintain new learning.

Many alcohol-affected youth are tactile and visual learners. They benefit from "hands-on" activities and enjoy moving while they are learning. Their visual learning style encourages the use of "to-do" lists and day planners that also provide them with the structure and routine that is so critical to their well-being. Amundson (2003) suggests the use of chart paper to map out activities in the counselling session, for example, in goal setting. Concrete representations might be particularly useful in helping to retain new knowledge by accessing visual memory. Audio/visual playback is another technique suggested by Amundson, where audio or video is used to record parts of sessions, which may then be reviewed as a memory aid. This might be useful for rehearsing behaviours, and also in tracking client progress to provide concrete proof of progress.

Structure and consistency provided by caregivers or professionals is known to positively impact the performance of youth with alcohol-related disabilities. Timler and Olswang (2001) suggest applying Vygotsky's theory of the zone of proximal development to youth with FASD. According to this theory, the adult gradually moves the youth to more complex levels of performance while structured support is provided and then faded out. Scaffolding, the term used to describe the manner in which an adult adjusts or modifies the support to the youth, could be used by career counsellors to best facilitate career-related behaviours, for example, conducting a follow-up call by telephone.

Novick and Streissguth (1996) indicate that cognitive-behavioural approaches are most effective for individuals with FASD, as these interventions may be designed so as to take into account the executive functioning challenges faced by many of these youth including storage and retrieval of information, interpretation of information, and utilization of information (Premji et al., 2004). As individuals may be unable to generalize skills learned in

counselling sessions to other settings, it may be more effective to teach the consistent use of rules of behaviour that can guide and structure behaviour across multiple situations (Novik & Streissguth, 1996). Premji et al. (2004) also emphasize the need to focus on developing an individual's functional skills through concrete learning experiences and cognitive rehabilitation approaches. One successful cognitive career-related education program for individuals with learning disabilities (Hutchinson, 1995) focused on increasing participant's awareness of self and of career areas through the use of an interactive computer program. Employability skills that address the vocational, social, and emotional skills necessary to enter a training program included listening, problem exploration, goal setting, and decision making. Interpersonal skills including cognitive rehearsal, imagery, and stress testing experiences were also taught. Programs for individuals with FASD could build on such a model, modifying it to include more behavioural strategies, modelling, and practice in implementing basic life skills in real life situations, for example, filling out a job application, keeping a job, interacting socially, managing time, and decision-making.

Promoting Supportive and Structured Environments

The relationship between self-efficacy beliefs and success proposed by the SCCT model illustrates the need for training and work experience situations in order to provide individuals with opportunities to improve life-work skills and enhance feelings of self-efficacy through positive experiences. Volunteering, 'take your child to work' initiatives, job shadowing, and structured, supervised work situations where outcome measures are adjusted to a realistic and attainable success level, are some practical work experience suggestions (Mader, 2004). In order to assist alcohol-affected youth to make successful transitions to adult roles, community leaders can redesign jobs to accommodate the capabilities and limitations for persons with FASD. Youth with alcohol-related disabilities need job duties, responsibilities, expecta-

tions, and rules clearly described ahead of time (Stade et al., 2004). Receiving positive feedback during such experiences enhances feelings of self-efficacy, which will in turn influence success. Group counselling settings are recommended for youth with learning disabilities (Hutchinson, 1995). This may also be beneficial for youth with FASD. Job clubs, for example, may provide opportunities for positive social experiences and skill development which will enhance self-efficacy beliefs as alcohol-affected youth require learning in multiple settings to increase transferability (Prenji et al., 2004).

As the disabilities are not going to change or go away, modifications to the environment to accommodate disabilities are essential (Schmucker, 1997). The provision of a personal tutor, mentor, or job coach may be necessary to help them learn skills and to maintain the job. Potential employers or mentors may need to be educated about FASD, and education, training, or work situations may need to be modified to accommodate the individual's particular strengths and limitations. For example, neuromotor impairments may manifest as sensory sensitivities which may necessitate changes to workplace temperature, lighting, and noise levels (Premji et al., 2004) or modifications to productivity demands based on client's capacity for speed and efficiency may need to be made. Advocacy may form an important component of the counselling relationship. Counsellors may need to exert pressure on community agencies and to orchestrate a variety of people, resources, and services to meet the needs of their clients and caregivers.

Conclusion

Youth with FASD encounter specific obstacles in their career development that are often due to a lack of awareness and sensitivity on the part of educational institutions, employers, and the public. Providing effective career development interventions requires practitioners to possess the requisite knowledge, skills, and awareness for addressing the career needs of alcohol-affected youth. The overarching recommendation for career counsellors is to keep in mind that each client with FASD has a unique combination of strengths and disabili-

ties, which must be understood within that individual's life context. A thorough neurobehavioural assessment can highlight assets and challenges in executive functioning, neuromotor and sensory areas, and speech/language. SCCT provides one possible framework for identifying barriers and building on strengths of youth with prenatal alcohol effects. However, there is an acute need for research and theory to inform career counselling practice that accounts for the individual's special needs as related to the specific experience of FASD, and the complex contextual factors which influence the life-work success of these individuals.

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The Role of Career Development in the Process of Psychosocial Adaptation to Cancer: Re-visiting the Task Model Approach

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Abstract

In recent years, advances in medicine and improved treatments have extended the length of survival of cancer patients. Given such developments, cancer is increasingly perceived as a chronic illness. Therefore, it is important to study how cancer survivors adapt over the course of their lives to this transition. This article proposes a theoretical model of adaptation to chronic illness referred to as the "task model." This model embodies a phenomenological perspective that focuses on a person's subjective perceptions. Additionally, the task model provides us with a perspective from which we can gain a better understanding of how individuals who are diagnosed with life-threatening illnesses like cancer reconstruct their existence by completing tasks such as physical, psychological, social, and spiritual. However, given that cancer patients are living longer and leading relatively normal lives, this article not only underlines the importance of work and career development in this particular process, but also recommends the addition of the aforementioned to the current task model.

The word cancer still evokes fear. For a large segment of the population, cancer is synonymous with suffering, grief, and death (Cunningham, 2002). These perceptions are comprehensible since cancer continues to be one of the leading causes of premature death in our society. In Canada, the overall prevalence of cancer is increasing, impacting a major segment of the population. Canadian cancer statistics indicate that an estimated 139,900 new cancer cases will occur in Canada in 2003 (Canadian Cancer Society, 2002-03).

In recent years, however, improved detection and screening have resulted in increased survival among individuals diagnosed with cancer. Moreover, improved medical practices have notably extended the length of survival for many patients and improved their quality of life. Statistical information from the Canadian Cancer Society for the year 2003 suggests that the prognosis for long-term cancer survivorship is good. The survival rate (i.e., proportion of people diagnosed with cancer who are still alive five years after the onset of the disease) for all ages and cancers combined is at present 51% (Canadian Cancer Society, 2002-03).

However, the survival rate for different categories of cancer can fluctuate significantly. According to the Canadian Cancer Society, the most frequently occurring cancers continue to be breast, colorectal, and lung for women, and lung, prostate, and colorectal for men. Data suggests that lung cancer remains the primary cause of cancer death for both men and women in 2003. Lung cancer accounts for approximately one-third of the cancer deaths in men, and an estimated one-quarter of the cancer deaths in women (Canadian Cancer Society, 2002-03).

Conversely, the prognosis for other types of cancer is excellent. This is particularly true of breast and prostate cancer. The Canadian Cancer Society reports that death rates amongst women diagnosed with breast cancer and men diagnosed with prostate cancer have dropped by nineteen and ten percent respectively. In summary, while some cancers are responsible for a higher proportion of deaths, other types of cancer are successfully treated (Canadian Cancer Society, 2002-03).

Medical advances and improved treatments have not only necessitated a rethinking of the traditional view of cancer as a life-threatening illness, but also represent inducements to individuals striving to adapt in order to prolong their life. While some cancer patients struggle with the disease, others manage to cope, adapt, survive, recover, and lead meaningful and productive lives (Hounshell, Tomori, Newlin, Knox, Rundhaugen, Tallman, M., et al., 2001; Muzzin, Anderson, Figueredo, & Gudelis, 1994; van der Wouden, Greaves-Otte, Greaves, Kruyt, & van Leeuwen, 2001).

Consequently, it has become crucial that researchers gain a better understanding of the process of adaptation to the experience of cancer, given that increased survivorship has become a familiar consequence in the lives of patients. While much of the literature reviewed to date identifies some potentially useful coping strategies for those who have been diagnosed, there is little discussion on theoretical approaches that may be useful in gaining a better understanding of the overall process of adaptation to chronic illness. One theoretical approach that can help us to better understand the process of adaptation to chronic illness is the task model. (Cohen & Lazarus, 1979; Corr, 1991-92; Doka, 1995-96; Moos & Tsu, 1977).

The task model has been revised numerous times in the thirty years since its introduction. Moos and Tsu (1977) and Cohen and Lazarus (1979) posited models which comprise an array of tasks. Their representation of tasks, however, is too fragmented and ambiguously demarcated. It is Corr (1991-92) who presents the most systematic and comprehensive account of task adaptation. His model is divided

into four distinct areas of coping; these are as follows: (a) Physical; (B) Psychological; (c) Social; (d) and Spiritual.

As previously noted, none of the previously mentioned authors include the role of work and career development in their models. Given the fact that cancer patients are living longer and leading relatively normal lives, a serious diagnosis is not inevitably predictive of major disruptions in the work life and career development of chronically ill persons. In other words, despite their illness, individuals may continue to be engaged in their careers and feel that they can keep working. Consequently, we believe that the vocational task should be considered within the domain of the task model. The final section will consider the limitations of the current research and suggest potential questions for further study in this subject (Brown & Tai-Seale, 1992; Samson & Zerter, 2003).

Task Model Approach: Phenomenological & Holistic Aspects

The task model posits a dynamic model which introduces a phenomenological perspective. The model recognizes individual differences, and underlines each person's unique capacity for adapting to the demands and pressures of the chronic illness. Central to this theme is the notion that individuals' subjective perceptions of their disease allow them to construct their own reality. Chronic illness, therefore, does not affect individuals in a uniform way because the experience of illness is a function of each individual's perceptions, interpretations, and understanding of what is happening to him/her (Cohen & Lazarus, 1979).

The task model also represents a holistic system that focuses on the process of reconstruction of a person's existence. The model does not prescribe a specific path towards reconstruction; rather it offers a framework that portrays the fundamental aspects of human existence, which are referred to as "tasks." The tasks central to this model are physical, psychological, social, spiritual, and vocational. The completion of the tasks is usually hindered by a diagnosis of cancer, but it is foundational in

regard to the process of reconstruction. Through such a process, individuals may make lifestyle changes, seek out social support, or search for meaning and purpose in his/her experience and life.

The process of adaptation, therefore, means that a person rebuilds his/her life. It is an ongoing phenomenon, characterized by constant and sometimes difficult changes. Individuals may confront theses changes in gradual increments or simultaneously. Frequently, the completion of one task establishes a solid foundation from which other tasks are realized. As well, tasks are continuously prioritized and re-evaluated by individuals as a means of developing a manageable hierarchy. This process contributes to the chronically ill patient's ability to cope with the non-stop changes successfully (Corr 1991-92; Doka, 1995-96).

Trajectory of the Illness and Subjective Perception

As previously mentioned, the task model places emphasis on the individual's subjection perceptions of an event (i.e., phenomenology). In other words, the patient's subjective perceptions of an event not only determine the trajectory of the illness, but also provide the impetus for the adaptation process. In other words, the patient's experience is shaped by his/her unique insight. Implicit in this view is the notion that there are many ways to construe a situation, and each viewpoint is likely to produce consequences that may facilitate or impede the process of adaptation (Cherny, Coyle, & Foley, 1994; Cohen & Lazarus, 1979).

The process, as described in the preceding paragraph, results in different ways of conceptualizing and dealing with the impacts of the chronic illness. For example, those who are not overwhelmed by their fears may worry less about the effects of the disease on their lives. Paradoxically, for others, the experience of cancer is a great stressor that causes profound fear and distress. The intensity and variations of these emotional expressions is determined by the process of cognitive appraisal or subjective perceptions. These processes, can, generally speaking, elicit a crisis

reaction in which the implications of a serious illness like cancer are seen as potentially dangerous and deadly. This phenomenon is fully articulated in what is commonly referred to as the *initial crisis* (Cherny et al., 1994; Lazarus & Folkman, 1984; Samson & Zerter, 2003).

The Initial Crisis

As stated above, the news of a serious diagnosis often provokes what is commonly referred to as the *initial crisis*. The essential idea that is conveyed by this concept is that under the impact of traumatic events, individuals understandably develop a crisis reaction because their circumstances are considered overwhelming or insurmountable. For example, persons may wonder whether or not they have adequate resources to deal with their new and painful reality. Consequently, numerous individuals feel very shocked by the diagnosis.

Thus, it is not uncommon, when the news of a diagnosis is first received, for individuals to feel sullen, vulnerable, and helpless. Other reactions could include fear of dying, anguish, despair, anger, and denial. In terms of career development, many who were looking forward to fulfilling some of their dreams, career ambitions or plans, instead view these as lost ambitions or opportunities. To some extent, one's hopes and ambitions are subject to the unpredictable nature of the outcome of the life-threatening illness, which can lead individuals to wonder and worry about the future (Muzzin et al., 1994; Samson & Zerter, 2003; Thomas, 1995).

Gradually, even if one is confronted with the possibility of death, the diagnosis usually loses its menacing countenance, and the confusion, uncertainty, and paralysis initially felt slowly lose their hold on the affected individual. As patients gain more insight into their illness, they begin to interpret its consequences as less imposing (Cohen & Lazarus, 1979).

In accordance with this awareness, a more differentiated view of the illness emerges. As pointed out earlier, the degree to which the patient is able to adapt or adjust to the various demands and processes surrounding his/her ill-

ness is determined by the patient's cognitive appraisal and subjective perceptions of his/her circumstances. Over a period of time, the individual's cognitive appraisal or subjective perceptions of what is happening to him/her slowly change, and the emotional reactions, natural after the initial disclosure of a life-threatening illness, appear somewhat less severe (Kangas, Henry, & Bryant, 2002; Turnquist, Harvey, & Andersen, 1988).

Therefore, the disease is progressively perceived as less menacing or dangerous, and its consequences alternatively re-conceptualized as challenging rather than as threatening. Accordingly, the illness is gradually assimilated into the life and identity of the chronically ill patient. In this situation, individuals slowly get over the crisis period and begin to see themselves as more able to cope with the anticipated hurdles. In short, this phenomenon represents not only a turning point in the way patients conceptualize their illness, but also a critical variable in aiding the process of adapting to the new situation.

With the passing of time, then, persons come to terms with the diagnosis. They begin to diminish its impact and seek constructive ways to deal with the difficulties, restrictions, and demands the illness imposes on their lives (Taylor, 1983). The emphasis in this process, therefore, is on carrying on with life and relinquishing the past. This provides perspective and gives individuals an opportunity to rebuild their lives, alter their self-image, strengthen old relationships, and establish new social networks (Schlossberg, Waters, & Goodman, 1995).

Description of Adaptive Tasks

A diagnosis of cancer is a life-changing experience, and its influence on the lives of individuals is often profound and lasting. Such an event represents a period during which individuals begin to question their dreams, aspirations, goals, relationships, and even their existence.

While nearly everyone exposed to a life-threatening illness will experience some sort of initial crisis, not all will continue to be negatively impacted by their situation. With time, the shock of

the diagnosis is absorbed; its impact is gradually accepted and integrated into the life of the affected individual. Accordingly, individuals slowly begin to reconstruct their lives (Kurtz, Wyatt, & Kurtz, 1995).

The task model helps us to better understand how individuals reconstruct their lives in spite of their illness. The process of adaptation in Corr's task model is divided into four major tasks. These are as follows: (a) Physical; (B) Psychological; (c) Social; (d) Spiritual. The authors suggest the addition of the Vocational task to the current task model. Let us now consider each of these tasks.

The Physical Task: Supervision of Health

One of the first important steps in task adaptation is coping with the physical impacts of the illness. This process calls for individuals to take whatever means are necessary to increase their chances of survival. The manner in which this will progress will depend largely on the individuals and his/her circumstances (Cohen & Lazarus, 1979; Corr 1991-92; Moos & Tsu, 1977).

Cancer often results in the appearance of symptoms such as severe pain, lack of appetite, lack of energy, headaches, gastrointestinal distress, sleep disturbance, dizziness, vomiting, weight loss, weight gain, and others (Canadian Cancer Society, 2002-03; Cherny et al., 1994).

The most common modalities of treatment for cancer include radiation, chemotherapy, surgery, and pharmacology. At times it is difficult to decide whether the benefits of the treatment are being obscured by its side effects. Some of the physiological symptoms that are common to many cancer patients receiving chemotherapy include loss of hair, nausea, and fatigue. As well, the use of drugs can have numerous unwelcome side-effects. Medications such as buserelin, which is used to treat cancer of the prostate gland, can cause a decrease in sexual desire, impotence, and sudden hot flashes as side effects (Canadian Cancer Society, 2002-03).

Understandably, the symptoms of the disease and the side-effects of available treatment interventions can cause

enormous distress in patients. Exposure to this may evoke concerns about one's own efficacy in life. Individuals may feel, for example, that their ability to perform everyday tasks is severely diminished. This can influence the degree to which one feels in control over his/her destiny. As well, aggressive treatments such as surgery and chemotherapy may result in frequent side-effects which sometimes can make the patient feel sicker than before. These factors, taken together, may negatively influence the task adaptation process, making it difficult for the cancer patient to enhance the quality of his/her daily existence and move towards a healthier and happier life (Cunningham, 2002).

How can patients, then, adapt to the physical aspects of their illness and reconstruct their lives? According to research, the patient's pro-active supervision of his/her health becomes critical in generating an outcome that is more likely to be positive and progressive. Patients, in other words, have to become actively involved in the maintenance of their health. The way in which this process takes shape will depend on each individual's situation, and grouping and severity of symptoms.

This "taking charge" approach usually entails going to regular medical appointments, collaborating and co-operating with physicians, and complying with physicians' therapeutic interventions. It is also usually helpful for patients to deepen their knowledge base of their illness and possible treatments via information gathering. This awareness may allow patients to better assess their situation and to generate more realistic and effective coping strategies (Cohen & Lazarus, 1979; Doka, 1995-96; Moos & Tsu, 1977).

Most significantly is the fact that as patients become more actively involved in their medical treatment, they begin to develop a sense of control over their life and illness. In summary, the patient's efforts are combined with treatment recommendations from physicians, pharmacological, and other therapeutic interventions. Thus, both the patient and physician are involved in assessing what is going on and deciding what to do. This relational dimension not only provides a means by which the

negative symptomatology may become less prevalent, but also plays a constructive role in aiding the recovery process.

Furthermore, recurrence of the disease remains a continuous possibility. Such a possibility can provoke feelings of uncertainty and helplessness. A readjustment of lifestyle, therefore, is preferable. A recognition and discontinuance of lifestyle risk factors or cancer-causing habits, for example, may become a preferred coping strategy. This may involve dietary modification, the addition of regular exercise, monitoring sleep habits, and the avoidance of stressors. Injurious behaviours, such as smoking and taking illegal drugs that are not amenable to continued good health may eventually be discarded (Canadian Cancer Society, 2002-03).

These lifestyle changes are repeatedly tested, re-evaluated, and prioritized as a means of developing the necessary coping mechanisms for dealing with the day-to-day problems characteristically associated with chronic illness, and, as well, as a means of reducing the threat of recurrence. Most significantly, perhaps, is the fact that developing and adopting new behaviours gives patients a sense that they still have some measure of control over their lives (Samson & Zerter, 2003).

The Psychological Task: The Maintenance of Emotional Equilibrium

The diagnosis of a chronic illness often affects the emotional equilibrium of the affected individual for many reasons. Firstly, an illness like cancer is characterized by pathologies that are potentially deadly and often difficult to treat. The diagnosed individual is confronted with the possibilities of a shortened life span and the eventual degradation of his/her health.

Secondly, the threat of recurrence remains a frightening prospect. With the passing of time, the patient may find himself/herself facing more malignant and virulent forms of the disease. Such a possibility threatens one's sense of safety and security. Patients may feel helpless and extremely distressed. Eventually, these emotions may grow stronger and shift the individual's attention to a repetitive anguish about the possibility of the disease rearing its

ugly head once again. In short, then, the deterioration of a patient's condition after recovery is an ever-present possibility, which can generate much worry and stress-it almost always has a deep and lasting effect on the chronically ill individual (Kornblith, 1998; Samson & Zerter, 2003).

Thirdly, a disease like cancer can negatively influence or alter a person's self-image. It is difficult to come to terms with the realization that a once strong and vital person has been weakened and incapacitated by a serious illness. This reality is disconcerting and painful for the patient who perceives his/her physical disintegration as an attack against his/her self-image. The individual may begin to feel different, undesirable, or inferior. Perhaps more damaging to the individual's psychological health is the fact that he/she perceives that others feel the same way. This emotional turmoil takes its toll on the patient. The patient recognizes that he/she has changed, but not for the better. The effects of such a narcissistic wound on the individual are often exacerbated by others who view him/her in a negative manner (Cohen & Lazarus, 1979; Corr, 1991-92; Moos & Tsu, 1977; Taylor, 1983).

Individuals who perceive themselves as passive victims of their disease may feel powerless and despairing about the future. This sort of thinking may ultimately undermine the individual's capacity for action in the face of the challenge. Conversely, a proactive stance in which the individual perceives himself/herself as capable of exerting some control over his/her situation represents one of the most efficacious ways of sustaining emotional health (Cella, Mahon, & Donovan, 1990; Kornblith, 1998). For example, for those diagnosed with cancer, confronting the uncertainties of the disease and the possibility of recurrence can be more of an impending threat to psychological health than the initial diagnosis. In these instances, therefore, it is important to see oneself as having power and control over the situation. Taylor (1983) places a lot of emphasis on cognitive skills in this process. Indeed, she demonstrates that via causal attribution, a person is likely to comprehend and predict what will happen to him/her.

Additionally, the implementation of new lifestyle practices may be beneficial to maintaining psychological well-being. This may involve dietary modification and the addition of regular exercise, for example. Equally important is the fact that incorporating such strategies into daily routines can give an individual a sense that he/she still has some measure of control over his/her illness (Samson & Zerter, 2003).

The Social Task: The Importance of Adequate Social Support

Chronic illness often imposes a certain form of marginalization. This is because the affected individual is eventually cut off from his/her regular social support system. In effect, the experience of a life-threatening illness often results in the discontinuance of a life that is conducive to the development of social relationships. The individual may not be able to go to work or go out for a period of time. He/she may engage in fewer professional, cultural or leisure activities; often patients abandon these altogether. In short, the patient experiences a loss of social attachments as a result of his/her illness (Cohen & Lazarus, 1979; Corr, 1991-92; Moos & Tsu, 1977; Muzzin et al., 1994).

Generally speaking, the affected individual is treated by others as a sick person, and as such, is considered as an unfit member of society. This tendency highlights the stigma commonly associated with illnesses like cancer. The impact of stigma often makes it difficult for cancer patients to rely upon the usual avenues of support to work through the recovery process (Cohen & Lazarus, 1979; Corr, 1991-92; Moos & Tsu, 1977). Eventually, they may begin to feel like they are no longer part of society. Moreover, instead of feeling like contributing members of society, cancer patients often feel like they have become a burden to it.

Thus, persons with cancer can be affected by society's response to the disease. The particular type of cancer can carry with it a form of social stigmatism which further isolates the chronically ill individual (Shaw, Segal, Polatajko, & Harburn, 2002). Persons diagnosed with lung cancer, for example, are vulnerable to the negative reactions of society. There is a tendency in

our society to characterize the lung cancer patient under the general stereotype of smoker. There are noticeable prejudices and negative judgments prevalent in our current society about people who smoke, which are difficult, if not impossible, to change. This negative conditioning can produce feelings of shame, unworthiness, and guilt in the affected individual. These feelings, in turn, can prompt him/her to withdraw from others, which eventually contribute to social isolation (Kunkel, Bakker, Myers, Oyesanmi, & Gomella, 2000).

Finally, serious illness creates profound fear in the minds of many people. The awareness of a life-threatening condition is sufficient enough to evoke fears of dying and suffering amongst those who are healthy. The mere presence of a seriously ill person and the acknowledgement that he/she may die can remind those who are well that they too may one day have to accept the same reality. While the person who is seriously ill may adapt to the reality that he/she may not survive, others may be unwilling to accept the fact of death. This potential confrontation with death and suffering may prove to be too strong for those who represent the closest supports to the sick individual. Accordingly, the person with cancer may feel isolated and open to fears of being rejected.

As we have just seen, the experience of a life-threatening illness can lead to social isolation. It is crucial for the patient to seek comfort and support from people who are willing to be with her/him and to listen intently and respectfully, and who are sensitive to the emotional and physical stresses associated with their condition. Whether or not this is found amongst friends, family, or clergy, patients need people with whom they can openly discuss their experiences and express their feelings. Finding the needed support may be difficult, but it is essential. According to research, individuals with strong supportive social networks deal much more successfully with a serious diagnosis and its aftermath than those without support (Muzzin et al., 1994).

Similar to the physical task, the patient's proactive participation plays a crucial role in the process. It is incumbent on the patient, then, to find the required supports as necessary within his/her community. Research indicates that belonging to a support group comprising of peers constitutes an excellent social support system. Another way individuals can benefit from social support is through volunteerism. In short, the patient needs to take active steps in finding a social support system which can provide nurturance, acceptance, and kindness. The task of achieving this can be relatively effortless, but it can also be very difficult for some as it implies increased dependency on others (Muzzin et al., 1994).

The Spiritual Task: The Vital Breath

The diagnosis of life-threatening illness can promote in a person a desire to find new meaning and purpose in his/her experience and life. Finding meaning and purpose in life are tasks often associated with the domain of spirituality. Yalom (1980) has long emphasized the importance of spirituality in the lives of those affected by cancer. According to him, those who come face-to-face with their own mortality are more likely to ascribe a new meaning to the value of life. This in itself represents a major milestone for those who are affected. Priorities are re-organized. The quest for material wealth seems less attractive and interpersonal relationships, living for the moment and the simple things in life are placed at the pinnacle of the priorities' list.

But what does spirituality mean? It is necessary to start with looking at the etymology of the noun itself. The roots and meaning of the word are derived from the Greek word *pneuma*. For the ancient Greeks, pneuma represented the invisible but vital breath that nourished human existence by providing sense of meaning and purpose. In that manner, all persons are imbued with spirituality and capable of drawing from it as a means of influencing their destiny (Ingersoll, 1994). This mysterious and intangible reality has been ignored by many researchers who believe that things that cannot be measured do not exist. Conversely, other researchers have shown that spirituality is central to the existence of the individual (Pargament, 1997).

For cancer patients, spiritual involvement seems to play a vital role. In effect, spirituality can become an important element of a person's life context within which more adaptive strategies can be developed. It has often been associated with improved psychological functioning and an increased capacity for coping with one's stressful life circumstances. For example, spirituality can be particularly helpful in alleviating anguish and facilitating well-being and coping with pain (Georgesen & Duncan, 1996; Jenkins & Pargament, 1995).

As well, spirituality can provide sources of meaning and significance to life. By making sense of what has happened, individuals can reinterpret their situation in a more positive light. Those who are unable to find meaning in their experience may find themselves struggling with coming to terms with their reality (Corr 1991-92; Samson & Zerter, 2003).

Spirituality can also furnish patients with new sources of meaning and purpose in life through relationships beyond the self to others (e.g., a counsellor) and/or to a supernatural power. These types of relationships can provide energy, motivation, and hope, and remind individuals that they are not alone and that they are capable of regenerating themselves and rebuilding their lives (Rohr, 2001; Yalom, 2003). Most significantly perhaps is the fact that only spirituality can make sense of what is essentially absurd, that is, suffering and death (Samson & Zerter, 2003).

Vocational Task: The Development of the Career

It is easy to justify the addition of work and career development to the current task model since work life in general and the concept of career represent a central focal point in human experience. Firstly, work plays an important part in the lives of individuals. Secondly, a career helps define individual aspects of identity or personality, ensures a certain measure of autonomy and financial independence, and provides a mechanism for social interaction (Hoffman, 1997).

According to Riverin-Simard (2002), individual identity was in the

past fashioned by his/her culture; however, that is no longer the case. She maintains that it is the career which provides the individual with his *raison d'etre,* his/her identity or personality, and an opportunity for social interaction. Of course, this process is interspersed with periods of preparation, re-integration, and constant adaptation.

Often, the diagnosis of a chronic illness has a major impact on a person's work life. For example, employers may question whether or not the individual is capable of maintaining his/her previous work performance level. Also, the individual may be considered to be less of an asset and more of a burden to the employer. In short, the medical consequences related to the chronic illness can prevent an individual from applying himself/herself fully and effectively to day-today work activities and tasks. Under these circumstances, individuals must often undergo a continuous process of career re-orientation and re-adaptation (Hoffman, 1997; Roessler & Rumrill, 1998).

A meta-analysis conducted by Brown and Ming Tai-Seale (1992) indicates that cancer survivors often confront numerous obstacles when they return to work. The dominant theme that surfaces from their research is certainly that of discrimination. The stigma often related to potentially deadly diseases like cancer can inhibit efforts to secure new employment, extinguish one's hopes of promotion or vocational training, or quite simply lead to lay-off. However, individuals with little education and from lower socioeconomic strata are often more affected by discrimination in the workplace than those who are highly educated and privileged.

Despite these obstacles, the career can help individuals to maintain their emotional equilibrium and important interpersonal relationships, to improve their self-image, and to rebuild their existence (Roessler & Rumrill, 1998). Often, chronic illness adds a new dimension to life by giving those afflicted a new set of values; the career can become the conduit for the expression of these values. Individuals tend to appreciate more important things in life as opposed to material wealth, financial success, and accomplishments. Accordingly, they demonstrate their

concern for others in vulnerable circumstances as never before through volunteer work. In this setting, the career can become a way for individuals to recharge their energy and come alive again.

The preceding comments point to the important role of the career in the process of rebuilding the lives of chronically-ill individuals. While much of the literature reviewed to date identifies some of the challenges commonly associated with chronic illness, there is often little or no discussion on the role of career development in the adjustment process. Further research is needed in order to develop a better understanding of this.

Nevertheless, our review of the literature has allowed us to discover the importance of career development in leading chronically ill persons to move ahead in their lives. As pointed out earlier, the vocational task provides the individual with a means to express his/her *raison d'etre,* his/her identity or personality, and an opportunity for social interaction.

Conclusion

In this paper, we have posited a theoretical model which helps us to better understand the process of psychosocial adaptation to chronic illness.

As noted earlier, the task model represents a holistic system that is derived from the major dimensions of life. The model recognizes the interaction of psychological, physical, psychosocial, spiritual, and vocational factors in the lives of individuals. As well, the task model acknowledges the centrality and primary importance of subjective perceptions in the adaptation process. Moreover, the addition of the vocational task to the current model allows us to consider and appreciate the relationship between the individual's career development and work environment and his/her ability to adapt more effectively.

As previously mentioned, the completion of one task establishes a solid foundation from which other tasks are accomplished. For example, our research indicates that an adequate social support system and the proactive maintenance of health can promote positive cognitive adaptation and emotional

equilibrium. The task model, in other words, affirms the principle that viewing the situation as a whole instead of dividing each task into a separate compartment is an essential component of an individual's psychological performance.

Finally, the present research also underscores the need for researchers to further study the importance of the vocational task in the process of adaptation in individuals diagnosed with chronic illness. Greater knowledge in this area may lead to better interventions that will foster optimal adaptation in individuals.

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