**Improving Career Decision Making of Young Workers:
Design of a Randomized Experiment**

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February 2009

A. INTRODUCTION

Over the next decade, students coming out of the education system will be, by far, the primary source of new supply for the labour market, averaging approximately 550,000 new entrants a year over the next decade. Young workers should be well prepared to compete in the labour market and well equipped to fill the increasing demand for a highly skilled and adaptable workforce since the current generation of Canadian young people has, on average, more education than any of its preceding generations.

However, a certain number of highly educated young workers may end up in jobs that require far less education or far fewer skills than they have. A study by de Broucker (2005) using OECD data suggests that a third of Canadian PSE graduates between the ages of 25 and 29 works in low-skilled occupations. This rate is about the same as in the United States but about twice the rates observed in the United Kingdom, Germany, or the Scandinavian countries. According to Li, Gervais and Duval (2006), nearly one out of every five university-educated people in the Canadian workforce are working in jobs that require at most a high school education – a proportion that has grown by nearly one-third between 1993 and 2001. Among this group, younger workers are the most susceptible of being overqualified for their jobs. An even larger proportion of recent graduates are *feeling* overqualified: based on data from the 2000 General Social Survey, Crompton (2002) finds that one third of workers with postsecondary credentials between the ages of 20 and 29 reported they felt overqualified.

Why do so many recent graduates find themselves in a job situation that does not seem to meet their expectations and skills? Since recent graduates are relatively inexperienced at looking for a job, they may be more likely to find themselves in a job they imagined they wanted but realize that the job is not what they had expected nor is it well-suited for them. Some of them may have good knowledge of a narrow range of career opportunities within their fields of interest, but are unwilling or unable to expand their search beyond this limited range of options. If there is low demand for the type of occupation they are searching for, they may perceive that they have no alternative but to take a lower-skilled job. In other cases, young workers may be willing to accept work that is not commensurate with their education, skills, or knowledge because they are in situations where they need to get a job quickly due to financial vulnerability or family responsibilities. Others view this choice as a good investment, hoping that once they acquire more experience in the labour market and in jobs related to their occupation of choice, they will progress to higher level jobs and into their preferred occupation. Others do so simply because they lack the motivation to spend more time looking for the right job.

In any of these scenarios, there may well be an opportunity to improve individuals' labour market competencies by providing them with job search and career planning tools that are specifically tailored to their needs and geared towards making them more skilled at making the appropriate decision for them.

In this paper, we propose an analytical framework for the understanding of job search and career planning behaviour and put forward guiding principles for the design of a Web-based career planning tool to enhance recent graduates' self-efficacy in their career choices.

B. ANALYTICAL FRAMEWORK

Career decisions are among the most important decisions a person has to make. Career choices have important and long-lasting consequences for the individual's overall well-being, health and financial situation. Making a career decision is a complex process: there are often many potential alternatives to select from, considerable amount of information available about each alternative and many factors and aspects to consider when making a choice. The information that is available is generally reliable but can also be false or inconsistent. Moreover, there is a great deal of risk and uncertainty about the extent to which the chosen career path will fit a person's aspirations, preferences and capabilities over the years.

The complexity of the process of career decision-making makes it difficult for most people to take "the best decision", that is to make a well-informed decision that best helps them achieve their goal. The changing nature of the world of work has dramatically modified the context for career decision making. The advent of a global economy has led to greater competition and pressures for productivity and also more opportunities for work in different parts of the world. The information technology revolution means greater emphasis on technological skills and higher needs for continuous learning. The predominance of dual-earner households increases the need for dual career planning and gives rise to new challenges for work/life balance. All these factors contribute to increasing the number and the complexity of career decisions individuals may have to make during their lifetime.

Moreover, traditionally-bounded career paths have shifted towards less defined and predictable career pathways and to greater uncertainty and flexibility. In this new world of work, the need to change jobs or occupations quite frequently over one's career life has become the rule rather than the exception. Careers are now often seen as a sequence of various work roles rather than moving gradually upwards within a hierarchical structure. Consequently, more attention has been paid to adult work-role transitions and the career notion itself is being re-examined.[1]

The social cognitive career theory

The work of Arthur Bandura and, especially, his self-efficacy theory, has greatly influenced the theoretical and empirical research on career development. Bandura (1977) postulates that self-efficacy expectations, our beliefs in our capabilities to engage successfully in a given task or behaviour, are a major mediator of both behaviour and behaviour change. Individuals who have a strong sense of self-efficacy will devote more attention and effort towards resolving a particular situation while exhibiting greater confidence and persistence in seeing a task completed. Conversely, low self-efficacy expectations regarding a behavior (or behavioral *domain*) are postulated to lead to avoidance of those behaviors, poorer performance of those behaviors, and a tendency to give up when faced with discouragement or failure. In postulating the theory,

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[1] See for instance Arthur, M. B., & Rousseau, D. M. (1996) "Introduction: The Boundaryless Career as New Employment Principle" in Arthur, M. B., & Rousseau, D. M. (eds). The boundaryless career: A new employment principle for a new organizational era. New York: Oxford University Press and Briscoe, J. P., Hall, D. T., & Frautschy DeMuth, R. L. (2006). Protean and boundaryless careers: An empirical exploration. *Journal of Vocational Behavior*, *69*, 30-47.

Bandura argued that an individual's degree of self-efficacy will determine whether or not certain behaviours will be attempted, the amount of effort the individual will expend, and the length of time the behaviour will be sustained, even when faced with obstacles.

In addition to postulating the mechanism by which behavioral change occurs, Bandura (1977) specified four sources of information that influence self-efficacy. These sources of information are: (a) performance accomplishments, that is, prior personal experiences of successfully performing the behaviors in question; (b) vicarious learning or modeling; (c) verbal persuasion, for example, receiving encouragement and support from others, and (d) changes in psychological and affective states, such as lower levels of anxiety in connection with the behavior. Thus, the theoretical context of the self-efficacy construct provides not only a means for understanding the sources of information through which self-efficacy expectations are learned, but also how they can be modified.

The application of Bandura's self-efficacy construct to career choices by Betz and Hackett (1981) is considered one of the most significant theoretical contributions of cognitive theory to vocational psychology. For Nancy Betz, a trait-factor psychologist, and Gail Hackett, a cognitive behaviourist, Bandura's recognition of the key role of cognitive appraisals of one's abilities and the malleability of those appraisals represented a useful approach to understanding the career choices of women who avoided math and science careers. Since Betz and Hackett's first exploration of the potential utility of self-efficacy to career choices, this concept has been applied to many aspects of career-related behaviours, including, vocational choices, career decision making and job search processes, and has spawned considerable amount of theoretical and empirical research.

One important application of self-efficacy to the understanding of career choices is found in Taylor and Betz's work (1983) and their development of the Career Decision-Making Self-Efficacy (CDMSE) scale, one of the most widely used instruments of measuring career decision-making self-efficacy in both vocational research and practice.[2] The CDMSE scale measures an individual's belief that he or she can successfully complete a task necessary to making a career decision. Taylor and Betz's conceptualization and measurement of career decision-making self-efficacy involved the integration of John O. Crites' theory of career maturity into the self-efficacy theory. Career maturity refers to the extent to which individuals are able to make career choices independently that is appropriate to their stage of development. The construct of career maturity, which has its origins in counseling-vocational psychology, emphasizes the "readiness" of the individual to accomplish important developmental tasks. Career maturity is especially relevant for individuals in late adolescence or early adulthood where initial vocational choices are made. Crites (1976, 1978) hypothesized that good career decisions are facilitated by the individual's competence in five career choice processes: (a) accurate self-appraisal; (b) gathering occupational information; (c) goal selection; (d) making plans for the future; and (e) problem solving. Taylor and Betz used these five career choice competencies to construct the CDMSE scale.

The original CDMSE scale contained 10 questions on each of the five competencies, for a total of 50 questions. In an effort to reduce the length of the questionnaire, the number of

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[2] An earlier application of Bandura's model to the career domain can be seen in Krumboltz's (1979) social learning theory of career decision making. However, in Krumboltz's theory, the elements of self-efficacy are implicit but not stated explicitly.

questions per competency was reduced to 5 in Betz et al. (1996). The short form version (CDMSE-SF) thus contains five subscales comprising 25 items measuring the five career choice competencies of Crites's model of career maturity. Responses rate items on a 5-point scale ranging from no confidence at all (1) to complete confidence (5). A total score is computed by summing scores for the 25 items; higher scores indicate greater levels of career decision-making self-efficacy. Both the long and the short version of the CDMSE scale have been shown to be psychometrically reliable.[3]

A number of other tools have also been developed and broadly used to assess adaptive career decision making and career exploratory behavior, many of which have grown out of decision theory. For instance, the Osipow et al. (1976) Career Decision Scale (CDS) is an instrument derived from an empirical approach to identify specific sources of career indecision. My Vocational Situation (MVS) developed by Holland et al. (1980) has also been used widely in research to diagnose the difficulties people have in career decision-making that may arise from issues related to vocational identity or the need for occupational information. The Career Thoughts Inventory (CTI), developed by Sampson, Peterson, Lenz, Reardon & Saunders (1996, 1998), assesses the level of "dysfunctional thinking" in career problem solving and decision making. The CTI incorporates a theoretical approach that combines the career decision making model and theoretical underpinnings of cognitive information processing. It hypothesizes individuals who exhibit dysfunctional thinking in either *self-knowledge*, *occupational knowledge*, *decision making skills* or *executive processing* will be impaired in their career decision making process and career problem solving abilities.

Most recently, Gati, Krausz, and Osipow (1996) have developed the Career Decision Difficulties Questionnaire (CDDQ). This 44-item questionnaire has grown out of a theoretical taxonomy of the difficulties encountered in career decision making. Difficulties are divided into those that occur prior to beginning the decision making process and those that occur during the process itself. Those difficulties that occur prior to the process involve a lack of readiness resulting from lower motivation, indecisiveness, or belief in dysfunctional myths about career decision making. Difficulties that occur during the decision making process are subdivided into a lack of information (about the self, about occupations and about ways of obtaining information, and information about the career decision making process itself) and inconsistent information resulting from unreliable sources or internal or external conflicts.[4] The structure of the CDDQ lends itself to the goal of achieving the "differential problem, differential counseling" approach to career counseling.

There is ample evidence that the CDMSE scale is related to other indices of adaptive career decision making and career exploratory behavior. For example, research indicates CDMSE is inversely related to career indecision (Betz and Luzzo, 1996). CDMSE has also been shown to be related to high vocational identity associated with more adaptive career beliefs and less fear of career commitment. Other research has found that career decision-making self-efficacy was related to academic persistence in underprepared college students and that it surpassed all other

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[3] Betz, Klein and Taylor (1996) report Cronbach Alpha internal consistency estimates ranging from .73 (self-appraisal) to .83 (goal selection) for the 5-item subscales and .94 for the 25-item total score.
[4] Gati, Krausz, and Osipow (1996) report Cronbach Alpha internal consistency estimates ranging from .70 to .90 for the 3 major categories and .95 for the total CDDQ score.

variables as a predictor of academic and social integration of college students (Paulsen and Betz, 2004).

Scores on the Career Decision Making Self-Efficacy Scale have also been found to be related, although only moderately, to other measures of self-efficacy. For example, Betz and Serling (1993) found statistically significant correlations with the Verbal, Quantitative, and Aesthetic subscales of Osipow and Rooney's Task-Specific Occupational Self-Efficacy Scale (TSOSS). Betz et al. (1996) reported statistically significant correlations between CDMSE scores and mathematics self-efficacy. These findings are consistent with Bandura's postulate that increases in self-efficacy expectations relative to one domain should generalize, to some degree, to other domains.[5]

In the mid 1990s, the introduction of the Social Cognitive Career Theory (SCCT) framework by Lent, Hackett, and Brown (1994 & 1996) served as an important catalyst for an increase in research on the link between self-efficacy and career-decision making. In their work, Lent et al. expand on and incorporate more of the dimensions of Bandura's theoretical work to the understanding of career behavior. Their theory describes how the social or environmental context of the career decision making process – including such aspects as gender, race, culture, family, community, and political context – interacts with the development of self-efficacy, individuals' interests and goals and *outcome expectations* to influence career choices and behaviors. Outcome expectations are the desired results of intentional actions in which individuals choose to engage. According to the SCCT, self-efficacy is hypothesized to determine outcome expectations: individuals engage in actions or behaviours that they perceive will produce positive and desirable outcomes and they expect to achieve positive and desirable outcomes in activities at which they view themselves to be efficacious. In her recent review of twenty-five years of self-efficacy in career assessment and practice, Gainor (2006) suggests there is a "proliferation of empirical support for the usefulness of self-efficacy in understanding the career choices" (p.173). The numerous studies that Gainor surveys provide much support for the usefulness of the analytical framework derived from the SCCT in designing, implementing and evaluating interventions to facilitate career choices.

The social cognitive model of job search behavior

There are a number of career domains that are important to the choice and implementation of any aspect of one's career, and for each of these domains, the concept of self-efficacy can be applied. Career decision-making self-efficacy is the construct that has received the most attention. More recently, job search self-efficacy has received considerable research attention. Job search self-efficacy is the belief that one can successfully perform the task of searching for and obtaining employment.

A number of theoretical frameworks have been proposed to explain job search behaviors. van Ryn and Vinokur (1992) propose a model that combines the social cognitive theory, emphasizing self-efficacy as the primary mediator of behavior change, with Ajzen's (1985) theory of planned behavior (TPB). TPB integrates the construct of self-efficacy into Ajzen and Fishbein's (1980) theory of reasoned action. The theory of reasoned action places *intention* to perform the behavior as the sole direct predictor of behavioral performance. Intention to perform a behavior is seen to

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[5] See Paulsen and Betz (2004) for discussion and references on these issues.

be entirely predicted by *attitude* and *subjective norms*. Attitude towards a behavior depends on the perceived likelihood that the behavior will lead to a given (desirable) outcome and the subjective value that the individual attributes to that outcome; subjective norms refers to the perceived degree to which other people who are important to the person think the behavior should be performed. The TPB places individuals' perception of control regarding performing a given behavior – in other words, self-efficacy – as an independent determinant of intention to perform a behavior and a correlate of attitude and subjective norms toward that behavior.

When applied to job search behavior, job search intention is postulated to be the most immediate predictor of job search behavior; job search intentions are predicted by job search attitude, subjective norms and job search self-efficacy. van Ryn and Vinokur's model is illustrated in Figure 1.
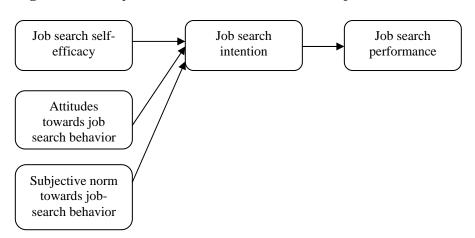
Figure 1: van Ryn and Vinokur (1992) model of job search behavior

There is evidence that job search intention is a significant predictor of job search intensity and that it mediates the relationships between job search attitudes, subjective norms and job search self-efficacy and intensity.[6] There is also empirical evidence that higher levels of job search self-efficacy have positive impacts on job search outcomes. For instance, in their large, longitudinal experimental study, van Ryn and Vinokur (1992) found job search self-efficacy to have mediating effects on job search behavior. More specifically, they found that an intervention designed to promote quality reemployment among recently unemployed adults affected participants' abilities to engage in job search activities to the extent that participants felt efficacious about their job search abilities. Eden and Aviram (1993) found that providing training to unemployed adults to increase their job search self-efficacy led to increased job search activity and greater re-employment. Saks and Ashforth (2000) examined student job search behavior as they moved from being in school to after graduation 4 months later. They found that students with higher job search self-efficacy reported more frequent job search behavior, had lower levels of job search anxiety and had a higher number of job offers. In their meta-analysis, Kanfer et al. (2001) report that job search self-efficacy is related to job search behavior and outcomes such as the likelihood of engaging in job search, the duration of search and the number of job offers

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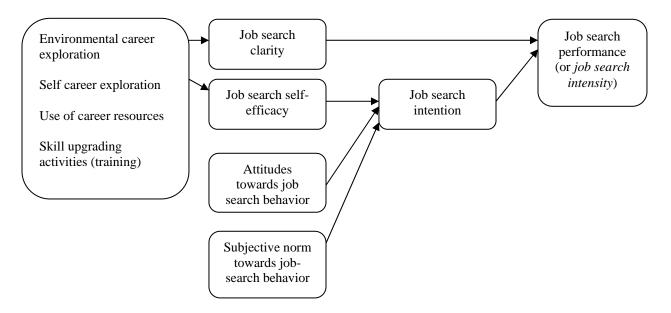[6] See for instance Vinokur and Caplan (1987) and Wanberg et al. (2005).

received. Saks and Ashforth (2000) found that self-efficacy is an even greater predictor of actual job search behaviour than individuals' self-esteem levels and sense of control.

Zikic and Saks (2009) extend van Ryn and Vinokur's framework and suggest a *social cognitive theory model of job search behavior*. Drawing on TPB, they hypothesize that an individual's intention to engage in job search is the most *immediate* predictor of job search performance or what they referred to as *job search intensity*. In their model, the constructs of TPB are interpreted within the social cognitive theories that explain behavior in terms of the interaction between three main factors: behavior, cognitive and other personal factors and environmental events. Job search intention is hypothesized to be influenced by cognitive and personal factors, such as job search self-efficacy and job search attitudes, as well as environmental factors, such as subjective norms or support from others to engage in job search.

Zikic and Saks' model assumes that the extent to which job seekers have clear job search objectives acts as a correlate to job search intention to predict job search intensity. They build on Wanberg et al. (2002) who first hypothesized that *job search clarity* can influence job search intensity by directing a person's attention and effort towards activities pertaining to their job search. Wanberg et al. (2002) define job search clarity as the extent to which job seekers have clear job search objectives and a clear idea of the type of career, work, or job desired. It is hypothesized that job seekers who lack job search clarity may spend more time exploring different options and contemplating the future, thus reducing the intensity of their job search. On the other hand, high job search clarity might better direct job seekers' attention and effort towards more targeted activities pertaining to job search resulting in greater job search intensity. In Zikic and Saks' model, job search clarity represents a goal mechanism in Bandura's theoretical work which identifies individuals' goals and interest as major determinants of behavior.

In addition, Zikic and Saks hypothesize that job search self-efficacy and job search clarity can be affected by four types of what they call *career-relevant activities* that job seekers can engage in prior to their job search: environmental and self career exploration, career resources, and training. Zikic and Saks' model is illustrated in Figure 2.

Figure 2: Zikic and Sacks (2009) social cognitive theory model of job search behavior

Environmental career exploration Self career exploration Use of career resources Skill upgrading activities (training)	Job search clarity	Job search performance (or *job search intensity*)
	Job search self-efficacy	
	Job search intention	
	Attitudes towards job search behavior	
	Subjective norm towards job-search behavior	

Zikic and Sacks (2009) test their model using survey data collected at two points in time using self-report questionnaires which were administered online using a link from HRSDC's job search and career website. The baseline survey measured career-relevant activities (self and environment career exploration, career resources, and training), job search self-efficacy and job search clarity, as well as job search attitudes, subjective norms, and intention to search. The follow-up survey, administered 8 months later, measured job search intensity. Based on regression analysis, Zikic and Sacks found that job search self-efficacy, job search attitude, and subjective norms were positively related to job search intention, and that job search intention predicted job search intensity. They also found that job search clarity was a significant predictor of job search intensity along with job search intention. While previous research has found that job search intention and job search clarity predict job search intensity independently, this is the first study to include them both simultaneously in the prediction of job search intensity. Their results also indicate that job seekers who spent more time in career exploration used more career resources and attended more training programs reported higher job search self-efficacy and higher job search clarity. However, because career-relevant activities and job search self-efficacy and clarity were all assessed at the same time (baseline), the authors acknowledge that no causal connection can be made from these results.

In their review of the literature, Moynihan et al. (2003) point out that although job search self-efficacy has been consistently found to be positively related to employment or reemployment status and positively related to the number of offers received by job seekers, the relationship between job search self-efficacy and specific types of job search activities has yielded mixed results. Job search self-efficacy appears to be most consistently related to measures of *preparatory* search behaviors, such as gathering information to identify potential job leads (e.g., reading the help wanted ads or talking with a friend about possible job leads). There is little evidence however, that job search self-efficacy is related to measures of specific, active

search behaviors that typically occur relatively later in the job search process, such as the number of job applications or number of job interviews.

Moynihan et al. (2003) propose and test a model to explain this lack of evidence. They postulate that job search self-efficacy interacts with the number of job interviews to influence job seekers' effectiveness in converting job interviews opportunities to job offers. They suggest that the relationship between number of interviews and number of offers will be stronger among job seekers who have higher job search self-efficacy for two reasons. First, job seekers with high self-efficacy beliefs are likely to be more effective in converting interviews to offers as a result of their greater confidence (leading to better performance) in job interviews. Second, because greater job search self-efficacy leads to greater participation in preparatory search behaviors such as information-gathering activities, it should enable job seekers to better assess their fit with an organization prior to the job interview. Therefore, high self-efficacy job seekers are more likely to effectively assess or prescreen the employers with whom they interview so that there is a higher likelihood of mutually perceived fit going into the interview.

Moynihan et al. (2003) test their model using survey data collected from participants among graduating students from a major US university who were actively searching for full-time employment following graduation. A longitudinal study design was used to investigate the proposed relationships among job search self-efficacy, number of interviews and employment outcomes. Student job seekers completed a baseline survey assessing job search self-efficacy. The survey was administered to student respondents as part of a larger study on recruitment and job choice. Current resumes were also collected from respondents at baseline. Thereafter, respondents were contacted every other week via the university email system to check on whether a job offer was received and/or an acceptance decision had been made. Based on regression analysis, they found empirical evidence to support the hypothesis that job search self-efficacy is not positively related to the number of interviews participated in by job seekers, which is consistent with the notion that those with high self-efficacy may feel less need to cast a wide net, and as a result, are more efficient in their search. As postulated, job search self-efficacy interacted with number of interviews to influence the number of job offers received by job seekers: the relationship between number of interviews and number of offers received was much stronger among job seekers with high job search self-efficacy.

C. THE EFFECTIVENESS OF CAREER INTERVENTIONS

Career interventions can be widely defined as "any treatment or effort intended to enhance an individual's career development or to enable the person to make better career-related decisions" (Spokane and Oliver,1983). Hartung and Blustein (2002) trace the origins of career interventions back to Parson (1909) who advocated a three-step approach for helping individuals improve their career prospects: (a) using testing to help individuals understand their own traits and characteristics; (b) giving them information about occupational prospects; and (c) utilizing "true reasoning" to make appropriate matches between the two.[7]

While counseling may have dominated early career interventions, there have been novel theoretical contributions related to vocational psychology that have come to the fore in recent decades, influenced by empirical evidence of the efficacy of various approaches as well as important advances in technology. Career interventions therefore encompass a broad range of activities which not only include career counseling, but can also involve career training classes and workshops and a number of self-administered activities, including computer-based applications.

Meta-analyses published over the last two decades have shown quite clearly that effects of career interventions are real, yet of moderate magnitude (Brown and Ryan Krane 2000, Oliver and Spokane 1988, Whiston et al. 1998). Despite demonstrating the effectiveness of career interventions, these meta-analyses have yielded inconsistent results, however, with regards to relative effectiveness of various delivery modes – e.g. individual or group counseling, career workshops, computer-based interventions, or self-directed interventions. They also have consistently failed to identify what works best and for whom.

Gainor's (2006) review of 30 studies that evaluate the effectiveness of various programs or interventions that implemented some combination of Bandura's four sources of efficacy expectations finds that career interventions that focus on career decision-making self-efficacy and academic and/or occupational choice self-efficacy were quite effective in increasing career-related self-efficacy. She concludes that overall, participants whose career development has been stalled by low confidence in the career decision-making process and/or specific occupational areas may benefit from career interventions designed to improve the participants' efficacy beliefs.

With regard to delivery models, Oliver and Spokane (1988) found class interventions to be the most effective, Whiston et al. (1998) found that individual counseling had the largest effect size, followed by group counseling and computer-based interventions, while Brown and Ryan Krane (2000) found group counseling to be the most effective. With respect to computer-assisted guidance, all three meta-analyses suggest that this type of intervention is more effective than "counselor-free" interventions. They also found that once the length of intervention is controlled for and effect sizes are calculated *per hour of treatment*, the relative rank of computer-based interventions improves. And there is evidence to suggest that the effectiveness of computer-

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[7] According to Gati (2008), "true reasoning" was never elaborated by Parsons; decision-making under risky conditions is probably the modern equivalent of true reasoning.

based interventions is further improved when combined with counseling. Whiston, Brecheisen and Stephens (2003), for instance, undertake a series of pair-wise comparisons between different delivery methods and find that the mean effect sizes of computer-based interventions increases when a counselor is added.

One important lesson from these analyses is that the format of a career intervention may be less important than what is done within the intervention itself. From their meta-analysis, Brown and Ryan Krane (2000) suggest that there are a number of critical treatment ingredients that are important to include in any intervention in order to improve its effectiveness, regardless of its delivery mode. The five components they find to increase treatment effectiveness are:

- *Workbooks or written exercises*: The use of workbooks, logs, and other materials that require participants to record in writing their goals, future plans and occupational analyses.

- *Individualized interpretations and feedback*: The provision of opportunities to receive individualized feedback on test results, goals, future plans and occupational analyses.

- *World-of-work information*: The provision of in-session opportunities to gather information on the world of work and on specific career options.

- *Vicarious learning experiences*: The exposure of clients to models who have attained success in the process of career exploration, decision-making or implementation.

- *Attention to building support*: Activities designed to help participants build support for their career choices.

Brown and Ryan Krane (2000) conclude that the effectiveness of career choice interventions – regardless of whether they are conducted in individual, group, class, or self-directed formats – can increase if these five critical components are built into them. It is interesting to note that these five key components overlap in many ways with Bandura's four sources of self-efficacy information. They also echo what other researchers have identified as necessary for deliberate and active processing of information (as opposed to passive receiving of information) and the importance of engaging participants in self-directed problem solving that is consistent with their goals and values, allowing them to integrate new information with their prior knowledge. To be effective, learning interventions should embrace participants' unique strategies, approaches and capabilities for learning (Natter & Berry, 2006, Stern, 2003 and Saliterman and Sheckley, 2003).

Brown et al. (2003) present additional meta-analytic data that further reinforce Brown and Ryan Krane's (2000) analyses and discuss specific strategies by which the five key ingredients listed above might be implemented in interventions designed to help people make better career choices. Based on results from various studies, they put forward a number of *reasonable but clearly speculative* hypotheses that should be rigorously tested, some of which refer to the use of computer-guided interventions. For instance, one hypothesis that stems from their review of empirical findings is that the effects of computer-guided interventions on career choice outcomes will be larger if a counselor contacts clients *after* the computer work is completed (as opposed to before or during computer work). They also hypothesize that the effectiveness of computer-guided interventions would be even larger if, after computer work is done, the counselor helps clients engage in future planning by requiring them to write their goals and plans and gives each client receives individualized feedback on their goals and plans. Another hypothesis they put

forward is that computer-guided interventions are more effective when participants are required to use computer modules that are specifically designed to provide occupational information (e.g. "learning about occupations") as opposed to giving participants total latitude to choose the modules they wish to work with.

Brown et al. emphasize the need for qualitative and quantitative research that attempts to untangle components of career interventions that are "truly unnecessary from those that are necessary but not sufficient." They also stress the importance of knowing not only what interventions work best but why and how they work. They conjecture that careful attention should be given to the following objectives in designing career interventions:

- Help clients develop written goals for their future, post-intervention career work that are accompanied by reasonable implementation intentions and individualized counselor input.

- Provide clients with opportunities, *in-session*, to gather and process occupational information and promote the search for, and use of, occupational information *outside of sessions* (e.g. through written implementation intentions)

- Provide opportunities to compare, in writing, occupations or fields of interest and, especially, to consider the support that is available for different options.

- Offer individual consultations for problematic assessment results.

- Show models who have successfully coped with career exploration and choice-making difficulties.

Web-based career interventions

The delivery of career guidance over the Internet is certainly the latest step in the evolution of career guidance. Despite the rapid proliferation of web sites that deliver career, educational and employment information, little is known about their effectiveness on career decision-making. In fact, most evaluations of computer-assisted programs were carried out before the Internet became a part of our information environment. These include the CHOICES program (Computerized Heuristic Occupational Information and Career Exploration System), which was developed by Employment and Immigration Canada; DISCOVER, an American College Testing Program; CIDS (Computer Information Delivery System); SIGI (System of Interactive Guidance and Information); GIS (Guidance Information System); and CVIS (Computerized Vocational Information System). According to Savard et al. (2005), evaluations of the effectiveness of these programs demonstrate that computer-based interventions have positive effects on clients' occupational decision-making; however it should also be noted that the evaluations of computer-based guidance systems to date have almost always involved students and therefore may have limited applicability to employed and unemployed adults who are looking to improve their employment prospects.

Ten years ago, Sampson (1999) was pointing out several potential benefits resulting from the use of the Internet in delivering career guidance services. With the Internet, individuals who are not well served with existing resources – e.g. they live in geographically remote areas or have physical disabilities – have access to a wider range of specialized expertise. Also, the anonymity made possible by the Internet may encourage some individuals who would not otherwise engage

in a career development process. For many, the Internet provides an expanded array of options for the general population. However, not everyone possesses the required technical skills to browse the Web and gather relevant information. Moreover, certain strata in society continue not to have access to the Internet which may, to some extent, be perpetuating social inequity.

Web-based career resources also present a number of advantages over other career guidance systems. One of the largest benefits is their low marginal cost in delivering the information to large numbers of people. Additionally, they have the ability to store large amounts of information and let the user retrieve this information at their own pace and on the computer of their choice. This information can be updated relatively easily compared to paper-based delivery mechanisms. Also, the computer can easily administer and tabulate the results of self-assessment exercises and quizzes (Gati et al, 2001 and Harris-Bowlsbey, 2002).

However, there are also a number of limitations and disadvantages to the Internet as an information medium for career guidance services. Since the Web is an open system that is relatively uncontrolled from the quality standpoint, virtually anyone can create a site that contains career information, and some of this information may be misleading, false or inaccurate. As well, the "one-size-fits-all" feature of Web-based career resources does not account for individuals being unique in terms of their career path and their decision-making process and of the problems they face and the guidance needs they may have. Finally, some tools created with a view to being used with the assistance of a career development professional were not initially developed for use on the Internet and so do not function as well in an online context.

Beyond the question of whether such tools are effective in assisting people making career decisions, there is also the question of how best to design such tools. Sampson et al. (2003) propose a very comprehensive review of strategies and guidelines for the design of career guidance websites. They emphasize that websites development efforts should be based on fulfilling the information needs of specific users. This general objective can be best achieved by, first, providing easy access to relevant, high quality information that users will know how to use and secondly, promoting the effective use of relevant information as opposed to delivering a comprehensive access to all possible sources of information and resources.

The vast majority of existing career guidance websites are *resource-based* websites: they usually contain an exhaustive list of resource and/or external links which users must match to their self-perceived needs with little instruction or assistance to help them do so. Resource-based websites are less intensive in terms of time, staff and development costs to produce them. This kind of website is appropriate for expert or experienced users who, presumably, are able to clearly identify their needs and link them with the appropriate resources. They are not well-suited for users who have difficulties in selecting resources, information, links and services that meet their needs. Given the limited contextual information that accompanies resource or link descriptions, some users may be less likely to accurately predict the outcomes of using one resource versus another (Offer, 2004, Offer et al. 2004, Sampson et al., 2003).

Need-based websites, on the other hand, are designed to achieve an effective use of the resources available. Need-based websites are typically organized on the basis of relating resources and links to identified needs for specific categories of users. This kind of website involves a three-part hierarchy. First, potential types of users are listed; then, for each type of user, various potential needs are identified; finally, for each user need, there are one or more

resources identified to potentially meet the need. A *need* is defined as the gap between what users know and what they should know in order to solve their problems or make decisions.

Good need-based websites should promote learning by clearly identifying learning outcomes that users can expect by following a given resource or link, and by making the information readable, browsable and searchable. One way to enhance user learning is to provide users with specific learning outcome statements associated with each resource or link so that users understand how a link can benefit them. For example, a learning outcome statement for an "Interview for jobs" link would be "Schedule and prepare for an interview with employers". Providing such learning outcome statements helps identify the circumstances where users may need to be directed to other resources in order to meet their need. Users who do not reach the expected learning outcome should be presented with other possible courses of action, including the use of another link or even consultation with off-line resources (e.g. consultation with a career counselor or use of other career services). This approach not only promotes learning but also enhances users' motivation and confidence.

Other aspects of website design that contribute to an effective use of information are related to content, design and navigation tools. For example, having a consistent design for each page, having a navigation bar at the top of each page so that the user always knows what stage of the career development process they are on, limiting the amount of text on each page and appropriate use of white space are efficient ways to enhance user efficiency and improve content readability (Prince et al, 2000, Sampson et al., 2003).

D. PROPOSAL FOR A WEB-BASED CAREER INTERVENTION

Proposed model

Our proposed model of job search and employment behavior integrates elements from the social cognitive career theory – in particular, Taylor and Betz's (1983) application of the theory leading to the development of the Career Decision-Making Self-Efficacy (CDMSE) scale – with Zikic and Sacks' social cognitive model of job search behavior.

Drawing on the Zikic and Sacks' model, we postulate that the extent to which job seekers' engage in job search activities – their *job search intensity* – is influenced by individuals' job search clarity as well as their intention to engage in job search, and that job search intention is influenced by cognitive and personal factors, such as job search self-efficacy and job search attitudes, as well as environmental factors, such as subjective norms or support from others to engage in job search.

We also postulate that the construct of career decision-making self-efficacy is foundational for both job search clarity and job search self-efficacy. Two reasons motivate this decision. First, the construct of career decision-making self-efficacy – and its associated CDMSE scale – is one of the most widely used and most reliable instruments of assessing individuals' abilities and competencies in making well-informed career decisions. There exists considerable evidence to support the notion that individuals with high career decision-making self-efficacy will be more certain about the type of career, work and job they want and know better how to search for and obtain that job. The second reason is that the construct of career decision-making self-efficacy provides for the identification of specific career-relevant type of activities that are thought to enhance self-efficacy in job search. Since the CDMSE scale builds upon Crites' work, it can be hypothesized that career-relevant activities that are thought to improve individuals' competencies in key areas will improve job seekers' self-efficacy in career decision-making and job search.

In addition, our model extends the social cognitive job search behavior model by adding elements from Moynihan et al. (2003) that emphasize the mediating role of job search self-efficacy in the relationship between job search behavior and employment outcomes. The key employment outcome of interest is job offers. We postulate that, all else being equal, job seekers with greater job search self-efficacy will be more likely to be offered a job. Furthermore we hypothesize that job seekers with greater job search self-efficacy will be more likely to prescreen job opportunities for better matches and this will in turn lead to more job offers from preferred employers. Given the added efficiency in converting interviews to offers from preferred employers, those with greater self-efficacy may require fewer interviews to obtain a successful job offer.

Based on our proposed model, the following specific research hypotheses may be made, which are shown graphically in Figure 3.

> H1. A Web-based career guidance intervention designed to improve key career competencies will increase participants' career decision making self-efficacy.
>
> H2. Career decision making self-efficacy is positively related to job search clarity.
>
> H3. Career decision making self-efficacy is positively related to job search self-efficacy.

H4. Job search attitude is positively related to job search intention.

H5. Subjective norms towards job-search behavior are positively related to job search intention.

H6. Job search self-efficacy is positively related to job search intention.

H7. Job search clarity is positively related to job search intensity.

H8. Job search intention is positively related to job search intensity.

H9. Job search intensity is positively related to improved employment outcomes.

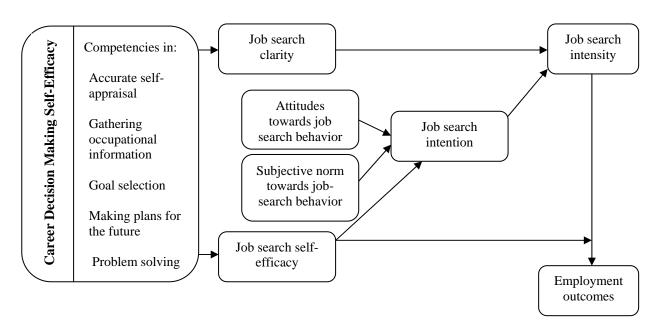H10. Job search self-efficacy mediates the relationship between job search intensity and employment outcomes.

Figure 3: Proposed model of job search and employment behavior

Key components of a web-based career intervention

In designing the intervention itself, our review of the literature points to a number of key elements that should be included in a web-based career intervention:

Career choice competencies. There exists considerable evidence that individuals with high career decision-making self-efficacy will be more certain about the type of career, work and job they want and know better how to search for and obtain that job. Therefore, our proposed web-based career intervention would be designed to improve individuals' competencies in five key areas thought to improve career-decision making self-efficacy: (a) accurate self-appraisal; (b) gathering occupational information; (c) goal selection; (d) making plans for the future; and (e) problem solving.

Key components for effective career interventions. One important lesson from the literature is that the format of a career intervention may be less important than what is done within the intervention itself. There are a number of key of critical treatment ingredients that are important to include in any intervention in order to improve its effectiveness. Therefore, our proposed web-based career intervention would be designed to provide opportunities for: (a) personal experiences of successfully performing a career decision; (b) vicarious learning or modeling; (c) building support from others; (d) lowering levels of apprehension and anxiety in connection with making a career decision; (e) workbooks or written exercises; (f) individualized interpretations and feedback; (g) gathering and processing of occupational information and promote the search for, and use of, occupational information; (h) having follow-up through counselor contact following the exposure the web-based intervention where the counselor help users engage in future planning.

Need-based website design. Our proposed web-based career intervention would be designed to promote effective uses of the information and resources provided and enhance learning as opposed to delivering a comprehensive access to all possible sources of information and resources.

Evaluation design

The relationships described in Figure 3 will be empirically tested using the experimental design proposed for this study. Participants randomly assigned to the treatment group will be provided with access to a website designed to improve key career competencies while the control group will serve as a counterfactual. On each of the outcomes of interest, treatment and control groups will be compared thereby determining the effect of the intervention. Each of the outcomes of interest will be measured using existing validated psychometric scales rather than author-composed scales. The scales will be administered using online surveys completed by participants before the intervention, immediately after the intervention, and 4 weeks following the intervention. All of the surveys will be completed over a Web-based application. The second follow-up survey will be self-completed by participants off-site. A second phase of the research could attempt to track longer-term outcomes, using a third follow-up survey.

Target population

Potentially eligible participants from the designated population of interest will be recruited through broad outreach.The designated target group of participants for the project is recent post-secondary education (PSE) graduates who believe they are overqualified for their most recent or current job. Eligible participants would be: aged between 25 and 39; holding a degree, diploma, or certificate from a Canadian PSE institution (either at the college or university level), obtained more than 12 months ago but less than 5 years ago; currently in the labour force, either working or unemployed and looking for work (not full-time students); and under-employed, in that their current or most recent occupation is in work for which they believe they are over-qualified.

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