The Effects of the Online Self-Directed Search on the Career Decision State

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Abstract

An exploratory study examined the effects of a counselor-free career intervention, the online Self-Directed Search Form R Fifth Edition (SDS), with 114 undergraduate students at three levels of career decision state or readiness for career decision making. The effects of this intervention included (a) changes in the career decision state low (d = 1.14), medium, (d = .14), and high (d = .17) over a three-week time period, (b) the extent of engagement in the task of taking the SDS and reviewing the reports, and (c) attitudes regarding aspects of the experience itself. Results showed a significant, positive impact of the online SDS on non-client students who were in a low career decision state (high career uncertainty, high career dissatisfaction, low career clarity) regarding their career goals and aspirations. Regardless of the students' career decision state, the majority of students engaged the opportunity to further explore their interests through the SDS and reacted positively to the experience.

Key Words: career decision-making, Self-Directed Search, career programming/interventions, undergraduates

The present study addresses the use of counselor-free or self-help career interventions by career service providers, a matter of longstanding controversy. Disagreements about the use of self-assessment in vocational guidance began in the early 20th century when some saw individuals having the capability to engage in self-directed career planning. For example, Parsons (1909) used responses to questionnaires and interviews to assess individual characteristics important for career planning; however, this approach was not universally accepted. Other leaders in vocational guidance, such as Hugo Munsterberg and E. G. Williamson, believed that reliance on self-report from individuals was unreliable and naïve (Savickas & Baker, 2005).

Given this historic perspective, we examined the use of a career decision-making readiness assessment to identify more precisely individuals who might benefit from self-help services. In addition, we examined the use of the online Self-Directed Search (SDS; Holland & Messer, 2013) as a tool for providing counselor-free career services.

The issue of whether self-help career interventions are effective is important because counselor-free interventions are less expensive than other interventions that require direct involvement by service providers. In the delivery of career services, practitioners influence the supply of career services through the career theories they utilize and nature of interventions they select, e.g., self-help, brief-staff assisted, or individual case-managed services (Sampson, Reardon, Peterson, & Lenz (2004).

In designing and conducting this study, we begin with a review of the Self-Directed Search, a career interest inventory available in paper, online, and computer-based formats as a self-help intervention. This instrument has been translated into over 30 languages, including Canadian editions in English and French (Bullock, Andrews, Braud, & Reardon. (2009-2010).

The Self-Directed Search Form R (SDS:R)

At the outset, we note that the literature on Holland's RIASEC theory, research, and applications is extensive. Foutch, McHugh, Bertoch, and Reardon (2013) located 1,970 unique reference citations to Holland's theory and applications from 1953-2011, and later, Kennelly, Sargent, and Reardon (2018) found 2,318 published references about RIASEC theory and its applications in practice. Given this extensive literature on Holland's contributions, it is ironic that so few studies have been reported on the self-directed aspect of Holland's Self-Directed Search (SDS; Holland & Messer, 2013). Indeed, after searching these databases we found only three studies that reported use of the SDS as a counselor-free intervention and they are reviewed later in this article.

The SDS can be dissected into its component parts as a simulation of what might typically occur in a career counseling session. The SDS Daydreams section can be scored separately as a measure of

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expressed vocational interests. The Assessment booklet includes four sections that could be topics in a typical counseling session. These include Activities (What things do you like to do?), Competencies (What are you good at?), Occupations (Which ones do you like?), and Self-Estimates (Rate your skills and abilities.). Scores on these sections can be summed to provide a measure of *assessed* vocational interests. Both of these interest measures can be examined in terms of the RIASEC typology and the theory.

The Client Interpretive Report for the online SDS (SDS:R/CIR; Reardon, Messer, & PAR Staff, 2013) used in this study was first published in 1996 and expanded in 2013. In 2014, an SDS Interactive Report was added to the online version of the SDS. Upon completion of the SDS, the two reports are provided to the user. Dozier, Sampson, and Reardon (2013) reported favorable outcomes from students using the online SDS Client Interpretive Report as compared to the paper SDS interpretive materials.

The SDS Form R Fifth Edition (SDS:R5th) is available in a paper format (three booklets), online through the Internet, and through an electronic platform provided by the publisher. The present study used the online SDS as a career intervention per se, not just as an assessment instrument. The SDS:R5th includes 266 items with links to over 1,300 occupations in O*NET (Holland & Messer, 2013). The SDS was normed using 1,739 persons matched with the U.S. population, had internal consistency for SDS summary scales as .88-.93, found test-retest reliability as .96-.82 overall sample (N = 49), short reliability, 2-4 weeks as .98-.78, and long reliability, 2-4 months as .96-.87. Lumsden, Sampson, Reardon, Lenz,

and Peterson (2004) found the three modes of administering the SDS can be considered statistically and practically equivalent measures of the same SDS constructs.

Two studies were located examining the effectiveness of the SDS:R Fourth Edition (Holland, 1994) in a self-help or counselor-free delivery mode. In the first study, Behrens and Nauta (2014) evaluated the effectiveness of the SDS paper version as a stand-alone intervention with students in an undergraduate psychology course. The researchers compared this sample of college students completing the SDS (n = 39) with a no-treatment control group (n = 41) on several outcomes. Completion of the SDS was marked by an increase in the number of career alternatives being considered four weeks later, but was not associated with career exploration, career decision-making self-efficacy, career indecision, or seeking of career counseling services. These findings should be interpreted in light of the fact that these students were not seeking career services.

In a second study, Dozier, Sampson, Lenz, Peterson, and Reardon (2015) used the Self-Directed Search Form R Internet Version (Reardon & PAR Staff, 2010) in an experimental study of a counselor-free career exploration. College students (N = 125) in a communications class volunteered to participate in a study of career exploratory behavior. They were randomly assigned to complete either the Self-Directed Search Form R (SDS:R) Internet version or to a control group that did not complete the SDS. Results indicated that individuals who completed the online SDS:R Internet and reviewed the Client Interpretive Report engaged in a greater frequency of exploratory career behaviors over three weeks

and were considering more occupational alternatives than members of the control group. The amount of time spent reviewing the report by members of the treatment group was associated with greater frequency of career exploratory behavior and with an increased number of occupations being considered. Furthermore, vocational identity, as a mediating variable, was inversely associated with the number of occupations being explored (i.e., high vocational identity led to exploration of fewer occupations, ostensibly because these individuals were more settled in their career goals).

Holland, Fritzsche, and Powell (1994) indicated that some of the most promising experimental research with the SDS would be to understand how the SDS actually influences the user in terms of career exploration and decision making. As a continuing investigation of the SDS as a self-help career intervention, the present study examined how online SDS users processed information provided by the career intervention and the outcomes of the intervention. In addition, we sought to explore how readiness for career decision making, as revealed by the status of a user's career decision state, was associated with how users processed the online SDS intervention, as well as their subsequent career exploratory behavior.

Counselor-Free and Self-Help Career Interventions

Sampson et al. (2004, p. 11) defined self-help career services as "self-guided use of self-assessment, information, and instructional resources in a library-like or Internet-based remote setting, where resources have been designed for independent use by individuals with a high readiness for career decision making." Accordingly, individuals

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showing higher levels of readiness for career choice would be better prepared to benefit from career guidance interventions with limited assistance, while those with lower levels of readiness would be less ready to benefit from a career intervention without assistance from a practitioner. This is an important conceptualization because there are always limited funds and resources available to provide career services. Self-help interventions can assist those ready to benefit immediately from such services.

Sampson, Dozier and Colvin (2011) observed that "Career guidance interventions offered on a one-to-one basis are simply more expensive and increasingly difficult to justify" (p. 330). Typically, much career theory used to design and promote career interventions is aimed at individual counseling interventions. A differentiated service delivery model can maximize cost-effectiveness of career interventions using readiness constructs (Sampson et al., 2004). However, as Sampson et al. (2011) noted, "It is not possible to deliver effective differentiated services without a robust self-help career guidance provision" (p. 332).

Previous studies of counselor-free or self-help career interventions indicate mixed or inconclusive results in terms of effectiveness. Whiston (2011) concluded that counselor-free vocational interventions are largely ineffective. In contrast, Craighead, McNamara, and Horan (1984) concluded that the results of self-help in career counseling were generally favorable. Moreover, Gati and Asulin-Peretz (2011) reported that Internet-based self-help interventions have the advantage of being carried out at the time, pace, and place most convenient to the user, are highly structured and

standardized for repeated applications, and may be delivered at lower costs.

Kivlighan and Shapiro (1987) examined used RIASEC high point codes to examine the effectiveness of a self-help career intervention involving the VEIK, a 15-step treatment program consisting of a vocational card sort, the Self-Directed Search (paper version), and an action plan booklet. They found that individuals with Realistic, Investigative, or Conventional high-point codes showed greater changes in vocational identity when compared with participants with Artistic, Social, or Enterprising high-point codes. Studies by Fretz and Leong (1982) and Power, Holland, Daiger, and Takai (1979) suggested that people who needed less support were the ones benefitting the most from self-help. This means that the readiness for career decision making may be a contributing factor in self-help intervention outcomes.

Self-help or counselor-free career interventions reported in earlier studies may not have been theory-based in nature, incorporated the five ingredients of successful interventions identified in a benchmark meta-analytic study by Brown and Ryan Krane (2000), or took into account the person's readiness for career decision making (Sampson et al., 2004). To address these issues, we used the online SDS:R Fifth Edition Internet version which is directly based on RIASEC theory (Holland, 1997) in a self-help delivery system. We believe the online SDS incorporates all five of the essential ingredients for successful career interventions identified in the seminal work by Brown and Ryan Krane (2000). For example, the SDS:R Internet Fifth Edition used in this study included (a) a workbook or written exercises (as provided by the

SDS Assessment booklet), (b) individualized interpretation and feedback (provided by the SDS Client Interpretive Report), (c) information about the world of work (provided by the SDS Interpretive Report with links to O*NET Occupations as well as information about fields of study and leisure options), (d) modeling (provided by the theoretical descriptions of RIASEC types and the SDS as an impersonal, simulated model of career decision-making activity), and (e) environmental supports (SDS Interpretive Report with links to O*Net occupations, fields of study, and leisure activities related to the person's assessed personality code).

Self-help services are intended to maximize the cost-effective use of career interventions by avoiding underserving individuals needing more assistance and over serving those needing less assistance. Self-help services are intended to be an immediate career intervention, limited in most instances to one session of 20-45 minutes, an alternative to brief-staff assisted or individual case-managed career services (Sampson et al., 2004), and provided at limited cost. Self-help resources such as the SDS may be used in this approach. In the following section, the theoretical bases for incorporating readiness assessment used in this study will be described.

Readiness for Career Decision Making

A key aspect of the present study was to examine the effects of the online SDS Form R Fifth Edition (Holland & Messer, 2013) on (a) changes in the career decision state over a three-week period, (b) the extent of engagement in the task of taking the SDS and reviewing reports, and (c) attitudes regarding

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aspects of the experience itself for non-client undergraduate students. The impact of engaging the online SDS was analyzed in terms of three levels of participant readiness for career decision making (low, medium, high) assessed at the outset and at the conclusion of the intervention three weeks later.

In this study, we used a recently developed concept of the *career decision state* to examine career decision-making readiness (Leierer, Wilde, Peterson, & Reardon, 2016) and the Career State Inventory (CSI; Leierer, Peterson, & Reardon, 2017-2018; Leierer, Peterson, Reardon, & Osborn, 2017) as a measure it. The career decision state is a subjective state of being or consciousness in the moment regarding a career goal or career aspiration and is composed of both cognitive and affective components. This existential state raises such questions as "Who am I? (Identity), "To what goal am I headed? (Direction)" "What are my feelings regarding my goal?" (Satisfaction, Confusion), and "Do I believe in myself to make an appropriate choice and to attain a goal? (self-confidence, self-efficacy). We assume that when individuals seek career assistance, they are in a subjective state of being referred to as the career decision state.

Additionally, the career decision state is thought of as a condition of being or consciousness, a "snapshot," with respect to one's career goals and aspirations in the present (Leierer et al., 2016). The components of this state are contained within working memory and include (a) a person's self–assessment of occupational preferences or lack thereof, (b) a personal hierarchical assessment of the degree of positive to negative feelings of satisfaction related to the preferences or lack of preferences, and (c)

the strength of a person's vocational identity regarding the career decision-making process. The career decision state for an individual may range from being highly certain, satisfied, clear, and confident in one's choice (first choice, no alternatives), to being completely undecided, dissatisfied, confused, and lacking confidence in making a choice (no choice, no options). This conceptualization builds on the research by Bullock-Yowell, Peterson, Wright, Reardon, and Mohn (2011) and Leierer et al. (2016). Finally, we ask to what extent does one's career certainty, satisfaction, and clarity (i.e., self-confidence and self-efficacy) affect the quality of post-intervention outcomes derived from the self-help SDS? In this study, the effects of engaging in the counselor-free online SDS were observed in a general population of university students.

Three questions guided this study.

1. What is the impact of engaging the online SDS on the career decision state?

2. In what manner did participants process information contained in the online SDS in terms of the number of times reviewing the SDS report, the amount of time reviewing the report, and the choice of reports (client interpretive or interactive) they reviewed?

3. What outcomes are associated with the experience of engaging the online SDS in terms of user attitudes and feelings about the SDS intervention as well as subsequent behaviors?

Method

Procedures and Participants

Career center staff made brief presentations about career services to first and second year university students in English composition classes and invited them to participate in an online study of a career interest inventory. The presentation indicated that participation would include (a) answering a few demographic questions in an initial survey including the CSI, (b) completing an interest inventory (SDS), and then (c) completing a 5-10-minute follow-up survey three weeks later including the CSI. Students volunteering received a paper note showing the website link for participation in the study and an online informed consent to endorse with details of the study procedures. They also completed the online demographic form to provide educational information (gender, age, class standing) and the CSI. Participants were invited to discuss questions about the online SDS and review results with career center staff as needed. The estimated total time commitment for the study was between 40-60 minutes, and those who completed all three activities received a gift certificate to any campus dining facility. Given the high possibility of attrition due to the use of a follow-up survey, undergraduate students who completed all surveys in this study received a certificate that could be redeemed at any dining location on-campus. Support for the study was provided by Psychological Assessment Resources, Inc., publisher of the SDS, and Aramark, the provider of campus dining services.

A total of 219 students in the classes were initially informed about the study. Of these, 170 completed the online initial survey, 140

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completed the online SDS, and 114 students completed the online follow-up survey instruments and were included in the study. Participants were enrolled in a large research university in the southeastern United States and their demographic characteristics included female (76%), male (24%), other (.01%); Caucasian (63%), Hispanic/Latino (18%), Black/African-American (10%), Asian (5%), Other (3%), and prefer not to answer (1%). We do not know the number of international students in our study sample, but we can note that the population of students from which the participants were drawn consisted of 684 international students in an undergraduate enrollment of 32,812, about 2%.

Instruments

The Career State Inventory (CSI). The CSI (Leierer et al., 2017-2018; Leierer et al., 2017) was used as a pretest and posttest. It consists of four components, (a) career certainty, (b) satisfaction, (c) clarity, and (d) a total score. Certainty is measured by the Occupational Alternatives Question (OAQ), satisfaction by a single item (Satisfaction Item), and clarity (Vocational Clarity) by three items from the My Vocational Situation Identity Scale. Certainty, satisfaction, and clarity are treated as independent variables with correlations among them, $r = .575, .350$ and $.562$ respectively on the CSI pretest for the total sample. The three components and the total score are described as follows.

(a) Career certainty was assessed by the OAQ, a career indecision measure that was initially used in Self-Directed Search validity studies of high school students (Zener & Schnuelle, 1976) and revised by Slaney (1980). The OAQ

consists of two parts: (a) List all the occupations you are considering right now; and (b) Circle the occupation that is your first choice (if undecided, write undecided). The OAQ produces one of four scores: 1 = A first occupational choice is listed with no alternatives; 2 = A first choice is listed with alternatives; 3 = No first choice is listed, just alternatives; 4 = Neither a first choice nor alternatives are listed. Lower scores indicate greater career certainty.

(b) The Satisfaction Item, first reported by (Zener & Schnuelle, 1976) and modified by Holland, Gottfredson, and Nafziger (1975), asked the single question, "How well satisfied are you with your first choice?" The Satisfaction Item was rated on a five-point scale in which 1 = well satisfied, 2 = satisfied, 3 = not sure, 4 = dissatisfied, 5 = very dissatisfied. Lower the scores indicate a greater the degree of satisfaction with choice.

(c) Vocational Clarity was measured with three true-false items drawn from the My Vocational Situation (MVS; Holland, Johnston, & Asama, 1993): (a) "If I had to make an occupational choice right now, I'm afraid I would make a bad choice" (MVS #6); (b) "Making up my mind about a career has been a long and difficult problem for me" (MVS #8); and (c) "I am confused about the whole problem of deciding on a career" (MVS #9). These items were selected *a priori* (by reason alone) by the CSI authors as having content validity for the career decision state with respect to vocational clarity regarding a career goal or aspiration. A false response to one of the items is scored "0" and a true response is scored "1." The range of scores on vocational clarity is 0 (all false) to 3 (all true), with a low score indicating a high degree of clarity and confidence in career decision

making, and a higher score indicating decision-making difficulty and confusion.

(d) The total score is the sum of the scores from the three components and ranges from $2 – 12$. The 11-point continuum of the CDS profile ranges from being highly certain, satisfied, clear, and confident in one's choice at one pole (i.e., 2-4), to being completely frozen, dissatisfied, confused, and lacking confidence in making a choice (i.e., 8-12). Mid-range scores (i.e., 5 - 7) may be described as having one or more options but still uncertain about them, having doubts about one's capability to make an appropriate career decision, and tentative in approaching one's career choice.

Leierer et al. (2017) combined data across several studies ($n = 425$) and found this 3-item scale (uncertainty, satisfaction, and clarity) possessed a Cronbach alpha of $r = .74$, inter-item correlations of .63 (OAQ/SAT), .36 (OAQ/Clarity), and .59 (SAT/Clarity). Participant Cronbach alpha for this sample was $r = .687$ with inter-item correlation ranges from .235 to .535. Thus, the CSI possesses a desirable level of commonality across the items as well as independence among them. This measure may also be considered as producing normally distributed scores in college student populations with mean = 6.21, SD = 2.45, median = 6.00, skew = -.004, and kurtosis = 1.33. The standard error of measure (SEM) is 0.12.

We do not report stability or test-retest coefficients because the CSI is designed as a *state measure* as opposed to a *trait measure*. To reiterate, it is a snapshot of one's state of consciousness regarding career goals in the moment along three dimensions (certainty, satisfaction, and clarity) and a total score. Further, as an aspect of stability, we

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also believe the CSI is very sensitive to developmental events that might alter the career decision state in either direction.

In terms of concurrent or convergent validity, Leierer et al. (2017) found the CSI total score significantly ($p < .001$) predicted the total score on the Career Thoughts Inventory (CTI; Sampson, Peterson, Lenz, Reardon, & Saunders, 1996) total score, $R = .63$ and the three subscales (DMC, $R = .63$, CA, $R = .60$, and EC, $R = .42$.)

Self-Directed Search Follow-up Survey. Participant perceptions of the online SDS were measured utilizing the SDS Follow-up Survey, a questionnaire comprised of seven items employing a five-point Likert-type rating scale. Questionnaire items were adapted from the Computer-Assisted Career Guidance Evaluation Form (Peterson, Ryan-Jones, Sampson, Reardon, & Shahnasarian, 1987). Examples of items were, "The SDS report presented appropriate options given my interests," and "The SDS report identified occupations not previously considered." The alpha reliability coefficient of the 7-item attitudinal scale for this sample was $r = .84$. In addition to attitudes, the follow-up survey addressed certain behaviors associated with processing information contained in the online SDS, namely (a) whether participants used one or both of the SDS reports (i.e., the Client Interpretive Report and/ or the Interactive Report), (b) how much time in minutes they spent reading the reports, and (c) how many times they read them.

Research Design and Data Analysis

A pretest-posttest only quasi-experimental design was used to examine the impact of the online SDS on the career decision state. Given access to the population of interest, regular university English courses, we judged this research design to be the most feasible and, hence, did not use a control group. Cook and Campbell (1979) discussed threats to internal validity germane to this design, including history, maturation, testing, and instrumentation. Regarding history, we are unaware of any events over the three-week period of this study that might have affected this study, but we cannot rule out such events in a field-based study. Regarding maturation, testing, and instrumentation, we do not believe these threats exerted an appreciable influence on participant responses to the CSI. For example, the time interval between the pre-post testing and the lack of instrument changes on-line mitigate these potential threats to internal validity.

The posttest occurred three weeks following the intervention. Process variables (i.e., time spent on task and the number of reviews) and the attitudinal variables were assessed only at the posttest. All variables of interest were analyzed in terms of high, medium, and low levels of the career decision state as measured by the CSI total scores at pretest, with scores 2 – 4 as high ($n = 43$), 5 – 7 medium ($n = 36$), and 8 – 12, low ($n = 35$). A three by two mixed-effects repeated measures MANOVA with three levels of career decision state and pretest and posttest with three dependent variables, certainty, satisfaction, and clarity, served as the omnibus test for the impact of the intervention on the career decision state. The MANOVA test was followed by univariate ANOVA tests and dependent t-tests to ascertain pretest-posttest differences within the three levels of the career decision state (low, medium, high). One-way ANOVA with three levels of career decision state was used to compare means among the three CSI groups on all other process and outcome variables of interest.

A power analysis was conducted for a repeated measure within factors. The following parameters were set: effect size = .25, alpha = .05, power = .95, groups = 3, means = 3, and correlation among repeated means = .35. The desired sample size reported was 57, so the current sample size of 114, is well beyond the recommended minimum.

Results

Examination of the CSI pretest total scores revealed no statistically significant differences for participants in terms of gender, ethnicity, year in school, or age.

SDS Impact on Career Decision State

The low career decision state group members (total score on CSI 8 – 12, $M = 9.09$) had options only or were undecided on the OAQ, were not sure about their state of satisfaction with their certainty ($M = 2.91$), and endorsed 2 or 3 of the clarity items as true ($M = 2.51$). Members of the medium group (total CSI 5 – 7, $M = 5.92$) tended to have a first choice with options or options only on the OAQ ($M = 2.42$), agreed or were not sure if they were satisfied with their state of certainty ($M = 2.11$), and endorsed at least one clarity item as true ($M = 1.39$). Members of the high CDS group (total score on CSI 2 – 4, $M = 3.21$) tended to have an OAQ score $M = 1.81$ indicating they had a first choice only or at least a first choice with options, agreed they were

Table 1

Career State Inventory pretest and posttest means, standard deviations, t-ratios, and effect sizes for low, medium, and high levels of the career decision state (N = 114)

Levels of CDS	Pretest		Posttest		t	d
	Mean	SD	Mean	SD		
Certainty [a]						
Low (n = 35)	3.66	.73	3.14	1.03	2.65*	.59
Medium (n = 36)	2.42	1.08	2.58	1.08	-.798	.15
Hi (n = 43)	1.81	.39	1.84	.53	-.24	.07
Satisfaction [b]						
Low	2.91	.51	2.34	.68	4.35***	.48
Medium	2.11	.79	1.92	.77	1.31	.24
Hi	1.19	.39	1.30	.51	-1.40	.24
Clarity [c]						
Low	2.51	.74	2.06	1.08	2.68*	.50
Medium	1.39	1.20	1.22	1.12	1.29	.15
Hi	.21	.47	.23	.57	-.33	.04
Total						
Low	9.09	.85	7.57	1.85	4.85***	1.14
Medium	5.92	.87	5.72	1.94	.67	.14
Hi	3.21	.60	3.37	1.27	-.93	.17

Note: Low (n = 35), Medium (n = 36), Hi (n = 43)
*p < .05
**p < .01
***p < .001
[a] 1 = First choice, no options, 2 = First choice plus options, 3 = options only, 4 = blank
[b] Satisfaction with certainty; 1 = Strongly Agree, 2 = Agree, 3 = Not sure, 4 = Disagree, 5 = Strongly Disagree
[c] Three T - F items; 3 = all true, 0 = all false

satisfied (M = 1.19) with their level of certainty, and tended to answer all three clarity items as false (M = .21). We delineated three clearly different career decision state groups with 35 (30.7%) of the participants in the low group, 36 (31.6%) in the medium group, and 43 (37.7%) in the high readiness group.

Preliminary assumption tests for MANOVA were conducted including checks for normality such as skew and kurtosis. No violations beyond acceptable parameters were noted (West, Finch, & Curran, 1995). The results of the multivariate analysis of variance (MANOVA) analysis of the impact

of the online SDS intervention on the three career decision state groups (low, medium, high) indicated that there was a significant multivariate main effect for pretest-posttest differences for all three components of the CSI, certainty, satisfaction, and clarity (Wilks = .869, F = 5.495, df = 3, p = .001), as well as a significant multivariate interaction effect (Wilks = .788, F = 4.601, df = 6, p < .001). The significant interaction effect indicates that the effect of the SDS intervention was not the same for the respective three career decision state groups. Follow-up univariate ANOVA tests for pretest-posttest differences among the three career decision state groups revealed significant differences for satisfaction (F = 9.705, df = 1, p = .002), and clarity (F = 7.777, df = 1, p = .006), but not for certainty (F = 1.257, df = 1, p = .265). However, there were significant interaction effects among the three career decision state groups for all three CSI components, certainty (F = 4.384, df = 2, p = .015), satisfaction (F = 8.353, df = 2, p < .001), and clarity (F = 3.836, df = 2, p = .024). Finally, follow–up dependent t-tests revealed that the significant (p < .05) differences between pretest and posttest within each of the three career decision state groups (low, medium, high) occurred exclusively in the low career decision state group, thus portraying the interaction effect in all three components of the CSI as well as the total CSI score (see Table 1).

Therefore, participants using the online SDS with CSI total scores in the 8 – 12 range (low readiness) exhibited significantly lower scores on the posttest as compared to the pretest on all three CSI components as well as the total score. There were no significant pretest-posttest differences in any of the respective CSI components and total score in

either the medium or high career decision state categories. The respective treatment effect sizes (Cohen's d, Cohen, 1988) regarding the online SDS intervention indicate that this treatment appears to induce a considerable impact on the career decision state of individuals who began the intervention in the group with high states of uncertainty regarding career goals (ES = .59), dissatisfaction with their uncertainty (ES = .48), lacking clarity of goals (ES = .50), and total (ES = 1.14).

Processing the SDS Intervention

The second research question alluded to the manner in which the participants processed the information contained in the online SDS. To address this question, we examined the (a) number of times participants reviewed the reports over a three-week period, (b) the number of minutes reviewing the reports, and (c) which particular report the participants reviewed (i.e., the full report or the interactive on-line report). The three respective information-processing behaviors were analyzed with respect to three career decision state levels (low, medium, high). Descriptive data regarding the number of times and the amount of time spent reviewing the report are presented in Table 2. Skewness did not exceed .15, which does not violate the normality assumptions.

The first finding was that there were no significant (p < .05) differences among the three levels of career decision state at the posttest with respect to all three information-processing behaviors. Thus, the extent to which the participants engaged in processing the information contained in the task was independent of the level of career decision state at the outset. Although 25 participants (21.9%) did not review

any of the reports, 89 participants reported reviewing the report once (M = 1.32, Mdn = 1), and spent 10 to 20 minutes reviewing it (M = 18.78, Mdn = 15). The maximum number of times students reviewed the report was 15, and the maximum amount of time spent reviewing the report was 120 minutes. Since the distributions were highly skewed, the respective mean, median, and maximum frequencies are presented in Table 2. Regarding the choice of report reviewed, 7.8% reviewed the full client interpretive report only, 38.3% the interactive report only, 47.8% both, and 6.1% neither. Therefore, almost 80% of the study participants spent an average of more than 18 minutes reviewing the reports, and generally preferred access to both of them.

Outcomes of SDS Intervention

The third inquiry question addressed the outcomes of the online SDS experience in terms of resultant behaviors, attitudes about the intervention, and feelings going forward from the experience. Regarding behaviors, one question on the Follow-up Survey was, "In the past 3 weeks, I met with the following individuals, academic advisor, other, or none." There were no significant differences among the three levels of CSI scores in terms of frequency of occurrence (X^2 = 4.27, df = 2, p > .05). For the total participants, 38.6% met with an advisor, 14.0 % met with an "other," and 47.4% met with "none." A second question was, "My need for additional career services in terms of intensive, brief, self-directed, or none." Again, there were no significant differences among the levels of CSI scores in terms of frequency of endorsement of need (X^2 = 8.21, df = 6, p > .05). In terms of total

Table 2

Information processing behaviors by level of career decision state (CDS)

Behaviors	***M***	***SD***	**Median**	**Range**	***F***
Times Reviewed SDS Report					
Low CDS (*n* = 35)	1.71	2.96	1	0 - 15	
Medium CDS (*n* = 36)	.97	.91	1	0 - 4	1.466
High CDS (*n* = 43)	1.30	1.51	1	0 - 10	
Total CDS (*n* = 114)	1.32	1.84	1	0 - 15	
Minutes reviewing SDS Report					
Low CDS	19.74	14.66	15	0 - 60	
Medium CDS	19.88	22.11	10	1 - 120	.303
High CDS	17.12	15.96	10	0 - 75	
Total CDS	18.78	17.76	15	0 - 120	

*p < .05

participants, 19.2% felt the need for intensive services, 43.9% brief assistance, 19.3% self-directed, and 17.5% none. Therefore, regarding outcome behaviors over the span of 3 weeks, over half of the participants met with someone to discuss career goals, and 82.5% felt a need for further career assistance.

A brief survey of attitudes regarding the online SDS experience revealed that these non-client participants generally viewed the experience positively (see Table 3). The first finding in the examination of attitudes is that there were no significant (*p* < .05) differences among the three levels of career decision state (low, medium, high) with respect to any of the seven survey items or in terms of total scores on the 7-item summative rating scale. Thus, the extent to which the participants viewed the experience positively or negatively was not related to one's career decision state at entry. In general, the participants agreed they would recommend the online SDS to someone for educational and career planning (*M* = 2.20) and that the report materials helped confirm occupations already being considered (*M* = 2.42). They disagreed that it was a waste of time (*M* = 3.54), or that it left them confused and uncertain about what next to do (*M* = 3.32). Using a reverse scale where 1 = strongly disagree to 5 = strongly agree, participants neither agreed nor disagreed that they felt anxious about their career concern (*M* = 2.96), but generally agreed they know next steps needed to attain their career goals (*M* = 3.68) and were confident they can take the next steps to attain their goals (*M* = 3.84).

Discussion

SDS Impact on Career Decision State (CDS)

The impact of the online SDS experience is discussed in terms of the three levels of the career decision state at entry (i.e., low, medium, and high).

Low CDS group. This group was characterized by high scores on the Career State Inventory and low readiness for career decision making. The results suggest that the SDS experience was particularly effective in altering the career decision state of participants in this group by helping them increase their levels of certainty regarding their career goals as well as becoming more satisfied with their newly acquired level of certainty. Over half of this group listed no occupations (*M* = 3.66 on the OAQ) being considered at entry, but finished formulating occupational options (*M* = 3.11). They also increased satisfaction with their first occupational choice from *M* = 2.91 to *M* = 2.34, and they increased their

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Table 3

Attitudinal outcomes of the online SDS experience (n = 114)

Item	Mean	SD
The SDS as an Intervention [a]		
1. I would recommend SDS to someone for educational and career planning	2.20[a]	.89
2. The SDS was a waste of time	3.54	1.04
3. The SDS report materials helped confirm occupations I was already considering	2.42	1.18
4. After reading my SDS report materials, I am so confused that I am uncertain about what to do.	3.32	1.12
Going Forward [b]		
5. I feel anxious about my career concern	2.96[b]	1.15
6. I feel I know the next steps needed to attain my career goals	3.68	1.04
7. I feel confident that I can make the next steps to attain my career goals	3.84	.97

[a] Items 1 – 4: 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree
[b] Items 5 – 7: 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree

level of clarity regarding their career goal going from a mean of 2.5 items to a mean of 2.1 items. Lack of clarity entails being fearful of making a bad choice, difficulty in making a decision, and confusion regarding the choice process. The effect sizes of certainty, satisfaction and clarity were .59, .48, and .50 respectively, indicating a strong effect on all three dimensions. The effect size for the CSI total score was particularly strong, 1.14. Most of those in the low career decision state group spent about 20 minutes ($M = 19.74$) reviewing the report at least once (see Table 2). Therefore, given the amount of effort in completing the online SDS career intervention, these positive gains in the career decision state or career readiness are particularly noteworthy. Of course with this group, one must be mindful that these participants had the most to gain in all three dimensions. Finally, their attitudes regarding their experience were mainly positive.

We were somewhat surprised by these findings for the low career decision state group, given that earlier reports (Kivlighan, & Shapiro, 1987; Fretz & Leong, 1982; Power et al., 1979) suggested that those needing less support or in a high career decision state would benefit the most from self-help. These results indicate this might not be the case, at least with the online SDS.

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Medium CDS group. Collectively, the SDS experience for participants in the medium group did not significantly result in career decision state changes. They entered and exited the experience with a first choice with options or options only, generally agreed they were satisfied with their state of certainty, and endorsed between 1 and 2 clarity items. The effect sizes, although not statistically significant, were -.15, .24, and .15, respectively, for certainty, satisfaction, and clarity. The effect size of the total score was .14. As with the low group, this group also spent about 20 minutes ($M = 19.83$) reviewing the reports at least once, and their attitudes regarding their experience were rated as positive. Thus, the effect of the online SDS, for those in the medium group, would appear to be a mixture of individuals exploring new career possibilities and others confirming existing ones with pretest-posttest means on the OAQ at the 2.5 level. Nevertheless, the participants in this group, as in the low group, generally rated their SDS experience positively in the follow-up survey.

High CDS group. Those in the high range in their career decision state remained at that level. Their CSI pretest scores were not significantly different from their posttest scores on the CSI and the effect sizes were .07, .24, and .04, respectively, for certainty, satisfaction, and clarity with total score .17. In terms of certainty, they were between a first choice and no alternatives and first choice with options. They either strongly agreed or agree with their state of certainty and they endorsed between 0 and one item in clarity. As with low and medium groups, these members also spent almost 20 minutes ($M = 17.12$) reviewing the report at least once and

rated their SDS experience as positive. We speculate that members of this group viewed the SDS experience mainly as confirming their choice of occupation with OAQ scores around 1.8, satisfaction 1.2, and clarity .22, and that they were pleased to have had to opportunity to engage the SDS for such a purpose.

These findings regarding the positive impact of the online SDS in a self-help delivery mode may be viewed in relation to the report by Whiston (2011) that counselor-free vocational interventions are largely ineffective. Indeed, these results for a non-client population demonstrate that the SDS can have a strong, positive impact on the career decision state, especially for those who are less career decided, satisfied, and clear.

Processing the SDS Intervention

The second research question concerned the manner in which the participants processed information contained in the online SDS intervention. There were no differences between high, medium, and low career decision state groups with respect to the number of times they reviewed the report, the minutes reviewing the report, or preferences regarding version of delivery (i.e., interactive online, full report, both or neither). The "bottom line" is that collectively, the participants reviewed the reports 1.3 times for approximately 20 minutes, and preferred access to both interactive and full client interpretive report delivery options. There were wide ranges in individual differences with reviewing the reports, and the extent to which the online SDS captured attention and interest in career exploration varied widely.

Outcomes of the SDS Intervention

An important outcome of any career or intervention involves the attitudes individuals take away from the experience. Going back in the literature, attitudes may, in fact, be the most lasting effect (Edwards, 1957; Seeleman, 1940.) In this study, we examined attitudes concerning the online SDS intervention, and how it contributed to further career exploration (see Table 3). There were no significant differences among the three career decision state groups regarding their responses to any of the attitudinal items. Regarding the experience itself, the participants generally agreed they would recommend the SDS to someone for educational and career planning ($M = 2.2$). Responses were somewhat mixed ($M = 2.4$) regarding the question, "the SDS materials helped confirm occupations they were already considering." Some individuals likely viewed the SDS experience as confirmatory, whereas others used the SDS as a vehicle for career exploration. A review of Table 3 indicates that most of the participants found the online SDS experience positive and worthwhile.

A second important attitudinal outcome of the online SDS concerns how individuals projected their experience into the future. Participants tended to respond neither agree nor disagree to the item, "I feel anxious about my career concern," but with a wide variation. Thus, some appeared to be very concerned while others were not. The participants were between neither agree nor disagree and agree ($M = 3.68$) with the item, "I feel I know the next steps needed to attain my career goals." The responses to this item with a mean of 3.65 (between neither agree nor disagree and agree) but with a standard deviation

of 1.04 suggest there are many who responded in the neutral or disagree categories and thus could profit from further assistance in career planning. Here, the online SDS could help individuals form a goal, but they would require further assistance in developing a plan to attain it. The participants tended to agree ($M =$ 3.84) with the item, "I feel confident that I can make the next steps to attain my career goals." In spite of the average or above level of confidence for many, with a standard deviation of .97, there are some who lack self-assurance going forward. The responses to these items suggest that some in this non-client sample felt anxious, lacked self-confidence, and did not know how to move forward.

Students participating in this study found the online SDS to be interesting and confidence-building regarding educational and career planning even though counselors were not involved in the intervention. The majority of participants would recommend the SDS to others for career planning and the interpretive reports helped them confirm occupations already being considered. This happened across all three levels of career readiness assessed with the CSI, although only the group with the highest CSI scores (least ready for career decisions) demonstrated significant differences between pretest and posttest on the CSI. These findings lend support to the use of the SDS as a counselor-free, self-help career intervention for all students regardless of readiness for career decision making.

Limitations

Given the nature of the quasi-experimental design and the absence of an experimental control group, we cannot conclude that the online SDS intervention caused the significant change in the career decision state for those who were in a low state of certainty, satisfaction, and clarity at the outset. In addition, maturation and testing effects were also possible threats to internal validity with this design. Nevertheless, repeated-measures statistics were employed to offset the problem of correlated errors when using the same instrument for both pretest and posttest. Of the students initially informed about the study, 140 completed the SDS, and 114 students completed all surveys including the follow-up survey instruments.

There was also a potential limitation of demand characteristics in that the 114 participants knew they were taking part in a research study. However, given the responses to the attitudinal items and the fact that nearly every participant responded to open-ended questions such as "what was most helpful about your SDS report materials?" and "what was least helpful about your SDS report materials," our belief is that the participants were more concerned about the results of the SDS, the meaning of their scores, and the implications for their career choices than they were about the researchers conducting the study. Regarding external validity, the use of lower division students enrolled in an introductory English course at a large public research university represents a unique population from which to draw a sample of participants, which may limit generalizability to other college environments and populations. Nevertheless, the background characteristics in this study (e.g., gender, ethnicity, and year in school) were comparable to this university population.

Implications for Practice

In 2001, the Organization for Economic Cooperation and Development (Professional Users Guide OECD, 2004) began to study career guidance policies in 14 OECD countries (OECD now has 34 member states). It looked at how the organization, management, and delivery of career guidance can help to advance important public policy objectives. The cost-efficient delivery of career guidance was viewed as having important national and international ramifications. The service delivery model described in article seeks to address that need. Conceptualizing career interventions based on a limited, carefully circumscribed counseling relationship flies in the face of the current myopic obsession in the profession shared by many narrative-based approaches and the life-design model promoted by Savickas (2012) and others. Holland (1974) suggested that vocational interventions did not need to be personal or provided in a person-to-person situation. He concluded, "In short, there is ample evidence to support more impersonal approaches for the solution of vocational problems" (p. 10). Holland's observation questioning the need for a personal relationship in a career intervention remains highly relevant in 2019.

With regard to implications for the practice of assisting individuals in career exploration and decision making, the CSI could be included in an intake assessment for career counseling. Individuals low in certainty, satisfaction, and clarity may immediately profit from the use of the online SDS in helping them improve their career decision state and readiness for career decision making. Since the processing of information from the SDS and the

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attitudinal outcome acquired from it are independent of the career decision state at entry, this study reveals that any individual may profit from the online SDS intervention. Those with a low career decision state and low career readiness may use the SDS for exploration of career possibilities, whereas those with a higher career decision state may use the results of the SDS to confirm a choice with which they are certain, satisfied, and confident. Thus, the online SDS would appear to be useful in self-help service delivery. Moreover, the CSI, coupled with the SDS, may assist counselors and advisors in identifying those who may find additional staff advising support or individual counseling helpful.

Implications for Research

The findings of this initial field-based study raise some challenging questions that could lead to further research on the use of the CSI and SDS. For example, would an experimental study of the online SDS and a control group show similar CSI results as this study? Do individuals benefit from this kind of online self-help service? Do they like it? Which individuals benefit and which ones do not? Do counselors "buy in" to this type of service delivery model? Research could examine how individuals with a low career decision state use the information from the online SDS to gain higher levels of career certainty, satisfaction, and clarity? Related to this, how do individuals at a medium or high level of career decision state use the information from the SDS? Are there moderator variables that may influence the impact of the SDS on the career decision state, such as depression, anxiety, work history, or academic standing?

Summary and Conclusion

In conclusion, our procedures and findings are congruent with Holland's observation that impersonal approaches for the solution of vocational problems are not harmful (Holland, 1974). In this instance, we would add the online SDS to Holland's observation. These findings demonstrate the positive impact of the online SDS in a self-help mode on non-client students who were in a high state of uncertainty, dissatisfaction, and clarity regarding their career goals and aspirations. Regardless of one's career decision state, the majority of participants engaged the opportunity to further explore their interests through the online SDS and reacted positively to the experience.

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