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The Self-Directed Search as a Stand-Alone Intervention With College Students

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The Self-Directed Search (SDS; Holland, 1994) is sometimes administered to large student groups outside of counseling to address common career development needs. This study evaluated the effectiveness of the SDS as a stand-alone intervention by comparing a general sample of college students who completed the SDS (n = 39) with a no-treatment control group (n = 41) on several outcomes. Completion of the SDS related to an increase in the number of career alternatives being considered 4 weeks later but did not relate to career exploration, career decision-making self-efficacy, career indecision, and seeking of career counseling services. If the SDS is used outside of counseling with broad student samples, the authors suggest providing additional intervention to ensure that it promotes exploration of any additional careers being considered.

Keywords: Self-Directed Search, vocational interests, career exploration, career decision-making self-efficacy, career indecision

Among the developmental challenges of late adolescence and early adulthood is the need to make decisions about one's educational and career goals (Super, 1953). Although approximately 50% of students indicate they have decided on a career by the time they enter college, over half of those with declared majors change them at least once, suggesting their goals are often still in flux (Kelly & White, 1993). Being uncommitted to a single career choice may reflect a healthy open-mindedness to exploration (Krumboltz, 1992), but because career indecision is associated with distress (Saunders, Peterson, Sampson, & Reardon, 2000), it is not surprising that many college students desire career decision-making assistance (Hannah & Robinson, 1990). In fact, some college and university staff view career decision-making difficulties as sufficiently common concerns that they address them in venues that reach almost all students at their institutions. For example, the Self-Directed Search (SDS; Holland, 1994)—one of the most widely used

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interest inventories (Gottfredson & Johnstun, 2009; Watkins, Campbell, & Nieberding, 1994)—has been integrated into university and major orientation classes to provide students with opportunities to explore their interests and learn how they may be used in career decision making (e.g., Christensen, Gelso, Williams, & Sedlacek, 1975; Collins & Sedlacek, 1972; Micceri & Phelps, 2002).

Based on Holland's (1997) theory of vocational choice, the SDS consists of an assessment booklet and ancillary materials. The assessment booklet prompts users to respond to questions about their occupational dreams, preferences for activities and occupations, perceived competencies, and ability self-estimates. Their responses are used to generate scores that reflect their resemblance to each of Holland's six vocational personality types (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional). Accompanying materials, such as the *Occupations Finder* (Holland, 1996) or *Educational Opportunities Finder* (Rosen, Holmberg, & Holland, 1997), then help users identify occupations or majors that correspond with the personality types they most closely resemble. Finally, the assessment booklet provides recommendations for next steps in career exploration.

Using the SDS to address the career decision-making needs of large groups of students is appealing because it was designed to be self-administered, self-scored, and self-interpreted (Holland, 1971). In fact, Holland (1972) viewed the SDS as an appropriate stand-alone intervention for many students. Such a counselor-free intervention can be easily implemented in classes or workshops and, if it effectively addresses the career decision-making concerns of students, could reduce the load on counseling centers, which often have lengthy wait-lists and limited services because of increasingly tight budgets.

Meta-analyses (e.g., Brown & Ryan Krane, 2000; Whiston, Brecheisen, & Stephens, 2003) have shown that exclusively self-directed career interventions are suboptimal because they have smaller effects than do those involving a counselor. However, findings based specifically on the studies that have involved group test administrations/interpretations have been highly variable (Brown & Ryan Krane, 2000; Whiston et al., 2003). Thus, although these group test interventions would not be expected to produce effects that are as large as those obtained from counselor-involved interventions, the effectiveness of inventory administrations outside the context of counseling needs to be better understood. Because it was created specifically as a self-directed intervention, the SDS is a good candidate for evaluation as a group-administered, counselor-free intervention.

Some evidence does, in fact, support the use of the SDS as an intervention outside of counseling. When asked to indicate the careers they are considering, high school and college students who have taken the SDS list more alternatives than do students in control conditions immediately afterward (Mau, Calvert, & Gregory, 1997; McGowan, 1977; Zener & Schnuelle, 1976) and 3 weeks later (Zener & Schnuelle, 1976). In one study, high school students who completed the SDS reported less need to see a counselor immediately afterward than did students who did not complete the SDS (Zener & Schnuelle, 1976). Finally, students who completed the SDS reported that they engaged in more career

information seeking (i.e., career exploration) 7 weeks later than did those in a treatment-delayed condition (Krivatsy & Magoon, 1976).

Several other studies, however, have raised questions about the effectiveness of the SDS as a stand-alone intervention. When compared with those in control conditions, high school and college students who completed the SDS showed no significant gains in career maturity immediately after the intervention (McGowan, 1977) or 3 weeks later (Luzzo & Taylor, 1995). College students taking the SDS have also been found not to differ from those in control conditions with respect to vocational identity (Micceri & Phelps, 2002), need for occupational information (Micceri & Phelps, 2002), amount of career knowledge (Healy & Mourton, 1984), and perceived career decision-making competence (Healy & Mourton, 1984).

It seems important to evaluate further whether the SDS promotes beneficial outcomes to determine whether its use as an intervention with large groups of students (e.g., in orientation classes) is justifiable when counselor-involved intervention is not feasible. Currently, the only outcome that has been reliably found across several studies (Mau et al., 1997, McGowan, 1977; Zener & Schnuelle, 1976) is that the SDS increases the number of career alternatives being considered. From the results of single studies, it appears that the SDS as a stand-alone intervention may also increase career exploration (Krivatsy & Magoon, 1976) and reduce the perceived need for counseling (Zener & Schnuelle, 1976), but these findings need to be replicated. Finally, the SDS's effectiveness in promoting other outcomes needs to be evaluated (Luzzo & Taylor, 1995).

Purpose of the Study

The present study aimed to add to the literature on the effectiveness of the SDS as a stand-alone intervention by comparing a sample of college students who completed the SDS with a no-treatment control group on several outcomes. First, we evaluated whether we could confirm the previous findings that the SDS promotes an increase in the number of career alternatives being considered, an increase in career exploration, and a decrease in the perceived need for counseling. Consistent with the earlier findings (Krivatsy & Magoon, 1976; Mau et al., 1997; McGowan, 1977; Zener & Schnuelle, 1976), we hypothesized that compared with those receiving no intervention, students who completed the SDS would subsequently report a greater increase in the number of career alternatives they were considering, a greater increase in the amount of career exploration being conducted, and a decreased likelihood of having sought career counseling after the intervention. An increase in career alternatives being considered would be expected because the SDS is designed to promote a consideration of many careers or majors that are congruent with one's personality, and an increase in exploration would be expected because the recommended next steps in the ancillary materials that accompany the SDS include researching careers and majors of interest. Having a list of options to explore and recommendations for how to do so might also reasonably be expected to reduce the need for counselor help in career decision making.

Second, we evaluated the SDS's effectiveness with respect to two additional outcomes. First, a previous study (Uffelman, Subich, Diegelman,

Wagner, & Bardash, 2004) found that career-undecided college students who completed the SDS with a counselor experienced greater gains in career decision-making self-efficacy than did those in a no-treatment control group; the effect sizes ranged from medium-large to large depending on the degree of interaction with the counselor, although it is surprising to note that those with more counselor interaction evidenced slightly smaller gains. Given that the SDS was designed as a self-directed intervention, we wondered whether the SDS produces self-efficacy gains when used without a counselor altogether. It was also important to assess whether any self-efficacy gains would persist over time, because Uffelman et al. (2004) assessed students' postintervention self-efficacy immediately afterward. Self-efficacy gains following the SDS administration and self-interpretation are plausible because the SDS assessment booklet prompts users to reflect on their scores and create a list of occupations for further consideration and exploration. Having a concrete plan for next steps to take may help students feel more efficacious about decision making (Uffelman et al., 2004).

Finally, we assessed whether completing the SDS would be associated with a decrease in career indecision. Although it is primarily designed to help students identify careers for consideration, among those who already have a tentative goal, the SDS could validate their choices and, thus, reduce indecision (Healy & Mourton, 1984; Luzzo & Taylor, 1995). Therefore, we hypothesized that students who completed the SDS would experience a greater decrease in career indecision than would those not completing the intervention.

Method

Participants

One-hundred thirty-one undergraduate students from a large, public university in the Midwest participated in the study by attending a session in which they completed a preintervention questionnaire. Those in the SDS treatment condition also completed the SDS and used its ancillary exploration materials during that session, whereas those in the control condition did not. Four weeks later, students in both conditions completed a postintervention assessment.

Of the initial 131 participants, 80 (61%) completed the postintervention assessment 4 weeks later. Our analyses are based on that sample of 80 who provided both pre- and postintervention data. This sample size was sufficient for detecting medium-sized or larger differences (i.e., smaller than those obtained by Uffelman et al., 2004) in the change from preintervention to postintervention across the two groups (Cohen, 1992).

Of the 80 participants with complete data, 41 (51%) were in the control condition, and 39 (49%) were in the SDS treatment condition. Sixty-nine participants (86%) were women, and 11 (14%) were men. Seventy (88%) identified themselves as White/Caucasian, seven (9%) as Black/African American, two (3%) as Asian/Asian American, and one (1%) as Latino(a). Thirty-four (43%) were freshmen, 22 (28%) were sophomores, 17 (21%) were juniors, and seven (9%) were seniors. Seventy (87%) indicated they had a declared major, whereas 10 (13%) did not. The students ranged in age from 18 to 51 years ($M = 19.96$, $SD = 4.83$).

We conducted analyses to determine whether the participants with complete data were representative of those who participated in the initial sessions. Independent-samples *t* tests revealed that completers and noncompleters did not differ significantly with respect to age or the preintervention measures of career indecision, career decision-making self-efficacy, or career exploration (*p*s > .05). Chi-square analyses revealed that participants also did not differ significantly with respect to gender, year in school, race/ethnicity, whether they had a declared major, and whether they had attended the SDS treatment or control session (*p*s > .05). Thus, attrition did not appear to result in a final sample that was appreciably different from the original one.

Measures

In both the pre- and postintervention questionnaires, we asked participants to respond to measures assessing the number of career alternatives being considered, career exploration behaviors, career decision-making self-efficacy, and career indecision. On the preintervention questionnaire, we asked participants to indicate their interest in getting information about careers or career decision making. On the postintervention questionnaire, we asked whether they had sought career counseling in the time since the preintervention assessment.

Number of career alternatives considered. We used responses to the Career Exploration Survey's (CES; Stumpf, Colarelli, & Hartman, 1983) Number of Occupations Considered (NOC) subscale to assess the number of career alternatives participants were considering. The NOC subscale comprises a single item that asks respondents to list the number of occupations they are considering using an open response format. Higher numbers reflect a greater number of careers being considered. This item's validity is supported by findings that its scores are negatively associated with the degree of career focus students report having and positively associated with the amount of career decision-making stress they are experiencing (Stumpf et al., 1983).

Career exploration. We used the CES's (Stumpf et al., 1983) six-item Environment Exploration (EE) subscale to assess the extent of participants' recent career exploration regarding occupations, jobs, and organizations using a 5-point Likert-type response scale ranging from 1 (*little*) to 5 (*a tremendous amount*). Responses to the items are averaged, and higher scores reflect a greater extent of recent career exploration. With a previous sample of college students, the EE subscale scores have been found to have a Cronbach's alpha coefficient of .88 (Stumpf et al., 1983); for the present sample, alpha was .83 on the preintervention assessment and .90 on the postintervention assessment. The EE subscale scores' validity is supported by findings that they are associated with job interview behaviors (Stumpf et al., 1983) and vocational self-concept crystallization and attitudes toward planning (Hamer & Bruch, 1997).

Career decision-making self-efficacy. The 25-item Career Decision-Making Self-Efficacy Scale–Short Form (CDSES-SF; Betz, Klein, & Taylor, 1996) assesses participants' confidence in their ability to complete career decision-making tasks: engaging in accurate self-appraisal, obtaining

accurate occupational information, engaging in goal selection, planning for the future, and engaging in problem solving. Participants answer each item using a 5-point Likert-type scale, with responses ranging from 1 (*no confidence at all*) to 5 (*complete confidence*). We calculated CDSES-SF total scores by averaging the responses across all 25 items; higher scores reflect greater career decision-making confidence. Previous research has revealed an internal consistency reliability estimate for CDSES-SF total scores of .94 (Betz et al., 1996). In the present sample, alpha was .91 and .94 on the pre- and postintervention assessments, respectively. The CDSES-SF total scores' validity is supported by negative associations with career indecision and positive associations with career decidedness (Betz et al., 1996).

Career indecision. To assess career indecision, we used the Career Factors Inventory (CFI; Chartrand, Robbins, Morrill, & Boggs, 1990). The CFI's 21 items are rated on a 5-point Likert-type scale. The labels for the endpoints of the Likert scale differ by item, but they are scored such that higher responses reflect greater career indecision. Although scores for four factors (Career Choice Anxiety, Generalized Indecisiveness, Need for Career Information, and Need for Self-Knowledge) can be calculated, it is also possible to use total scores (the sum of responses to all items) as a measure of overall career indecision (with higher scores reflecting greater career indecision). For parsimony, we used the total scores in analyses because it seemed theoretically possible that the SDS intervention could reduce any or all components of career indecision, and we wished to minimize the number of analyses being conducted.

In previous research, the CFI's scores have been found to have 2-week test–retest reliability coefficients ranging from .76 to .84 and Cronbach's alpha reliability coefficients ranging from .82 to .90 (Chartrand et al., 1990). Among the students in the present study, the CFI scores' Cronbach's alpha reliability coefficients were .88 and .91 on the preintervention and postintervention assessments, respectively. The CFI scores' validity is supported by findings they correlate negatively with measures of career decidedness (Chartrand & Robbins, 1997) and positively with measures of anxiety, self-esteem, and goal instability (Chartrand et al., 1990).

Interest in career decision making. On the preintervention survey only, we asked participants to indicate, using a 5-point Likert-type scale (1 = *not interested at all*, 5 = *extremely interested*) the answer to the question, "How interested are you in getting more information about possible careers or career decision-making?"

Seeking career counseling. On the postintervention survey only, we asked participants to indicate, using a yes/no response format, the answer to the question, "Have you visited a counselor or the career center for career counseling purposes in the past 4 weeks?"

Procedure

Students signed up for the initial session using the psychology department's participant pool, which draws students from nearly all campus majors. The initial sessions were conducted with groups of approximately six to 10 students. Sessions were randomly designated as either no-treatment

control sessions or SDS treatment sessions. Thus, all students who attended a given session were either in the SDS treatment condition or the no-treatment control condition.

Regardless of the session type, when students arrived at the study location, they first learned of the general purpose of the study (i.e., to assess students' career decision-making attitudes and behaviors at two time periods), after which they read and signed a consent form. They then completed the preintervention questionnaire, which included demographic items, the question about interest in information about career decision making, the CFI, the CES, and the CDSES-SF. On a supplemental consent form, they were also asked to supply their e-mail address for the purpose of being contacted for a follow-up Internet survey.

After completing the preintervention assessment and supplemental consent form, students attending the no-treatment control sessions were given documentation of their research participation and information about their university's career and counseling centers and were dismissed. Those attending the SDS treatment sessions were given an SDS (4th ed., Form R) assessment booklet. They followed the self-guided instructions and stopped once they had responded to all the items. The researcher (either an undergraduate or graduate student who had received training on scoring and using the SDS) then asked the participants to complete the SDS self-scoring and briefly explained how to do so. We did this because the monitoring of scoring and availability for questions regarding scoring have been shown to reduce scoring error rates (Christenson et al., 1975) and because it seems likely that the instructor in orientation classes would assist students in this manner.

Next, the researcher distributed *Occupations Finders* and referred students to information in the assessment booklet about how they could use their SDS summary codes to identify occupations that might be of interest to them. Students were then instructed to explore the *Occupations Finders* independently and to write occupations corresponding to their personality types in their assessment booklets. This continued until all students were finished; in the typical session, this exploration took approximately 10 minutes. Finally, the researcher gave students a blank sheet of paper each and asked them to spend approximately 5 minutes writing about how they could use information gleaned from their SDS assessment in making decisions. This latter process was designed to mirror the sort of discussion or writing assignment that likely occurs when SDS assessments are integrated into orientation courses. Finally, as with the no-treatment control participants, students in the SDS treatment sessions were given documentation of their participation and information about their university's counseling center and career services center and were dismissed. They were allowed to keep their SDS assessment booklets.

Four weeks after completing their initial session, all participants who provided contact information were sent an invitation to complete the postintervention follow-up Internet survey. The last page was a debriefing screen that again provided information about how students could receive career counseling services at their university.

Results

Because participants were not randomly assigned to treatment conditions (rather, sessions were randomly designated as either control or SDS

conditions), we evaluated the degree to which the treatment and control participants with complete data were similar to each other at the outset. Independent-samples *t* tests revealed that they were not significantly different from each other with respect to age and preintervention assessment CFI, CES, and CDSES-SF scores (*p*s > .05). Chi-square analyses showed that participants also did not differ with respect to gender, race/ethnicity (collapsed into White/Caucasian vs. minority categories to meet minimum cell size expectancies), year in school, and whether they had a declared major (*p*s > .05).

Table 1 shows the means, standard deviations, and intercorrelations among the measures on the pre- and postintervention assessments for the total sample. Table 2 shows the means and standard deviations for participants in the SDS treatment and control conditions separately. To determine whether those in the SDS treatment and control conditions differed significantly from each other on the degree of change on the measures, we created indices of pre- to postintervention change for the CFI total scores, the CES-EE and CES-NOC subscale scores, and CDSES-SF total scores. We created the change scores by regressing each measure's postintervention scores onto the preintervention scores and saving the residualized change estimates (see Griffin, Murray, & Gonzalez, 1999). These residualized change scores may be interpreted as the degree to which participants achieved gains or losses on the postintervention measures that were above or below the scores that would have been predicted based on their preintervention scores.

Because our participants were not seeking career assistance, low motivation among some might have affected their response to the intervention. To explore this possibility, we conducted analyses while controlling for degree of interest in obtaining information about careers or career decision making. However, because participant interest was unrelated to the

TABLE 1

Means, Standard Deviations, and Correlations Among the Measures

Measure	1	2	3	4	5	6	7	8
Preintervention								
1. CFI	—							
2. CES-EE	−.18*	—						
3. CES-NOC	.14	.15	—					
4. CDSES-SF	−.45**	.41**	−.11	—				
Postintervention								
5. CFI	.68**	−.24*	.21	−.46**	—			
6. CES-EE	−.26*	.66**	.15	.24*	−.17	—		
7. CES-NOC	.04	.05	.82**	−.13	.14	.16	—	
8. CDSES-SF	−.50**	.40**	−.19	.77**	−.52**	.33**	−.17	—
N	131	131	127	131	80	80	78	80
M	64.15	2.75	2.13	3.81	63.65	2.73	2.22	3.85
SD	13.04	0.91	1.15	0.52	14.16	0.89	1.20	0.51

Note. CFI = Career Factors Inventory total scores; CES = Career Exploration Survey; CES-EE = CES Environment Exploration subscale scores; CES-NOC = CES Number of Occupations Considered subscale scores; CDSES-SF = Career Decision-Making Self-Efficacy Scale–Short Form total scores.
*$p < .05$. **$p < .01$.

TABLE 2

Means and Standard Deviations on the Pre- and Postintervention Measures for Self-Directed Search (SDS) Treatment and Control Participants

	SDS Treatment (n = 39)				Control (n = 41)			
	Preintervention		Postintervention		Preintervention		Postintervention	
Measure	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
CFI	61.99	14.24	58.99	14.17	65.23	13.99	61.08	15.54
CES-EE	2.77	0.92	3.59	1.11	2.69	0.87	3.61	0.83
CES-NOC	2.09	1.24	2.68	1.55	2.36	1.16	2.19	1.39
CDSES-SF	3.94	0.51	3.86	0.55	3.75	0.51	3.69	0.65

Note. CFI = Career Factors Inventory total scores; CES = Career Exploration Survey; CES-EE = CES Environment Exploration subscale scores; CES-NOC = CES Number of Occupations Considered subscale scores; CDSES-SF = Career Decision-Making Self-Efficacy Scale–Short Form total scores.

change scores, the pattern of results was identical whether this variable was controlled for or not. For simplicity, we therefore report only the results of the analyses that did not include this variable.

Independent-samples t tests revealed that the control participants and the SDS treatment participants did not differ significantly from each other with respect to residualized change scores for the CFI, $t(76) = 0.05$, $p = .96$; the CES-EE subscale, $t(73) = 0.34$, $p = .73$; and the CDSES-SF, $t(73) = 0.64$, $p = .53$. They did, however, differ significantly with respect to residualized change scores for the CES-NOC subscale, $t(45) = 2.11$, $p = .04$. Thus, although the SDS intervention did not appear to be associated with changes in career indecision, career exploration behaviors, or career decision-making self-efficacy, it was associated with an increase in the number of occupations being considered.

To test the hypothesis that the SDS intervention results in a decreased need for career counseling, we conducted a chi-square analysis to compare the proportion of students in the SDS treatment (19%) and control (37%) conditions who visited their university's counseling center or career services center for career counseling purposes in the 4 weeks following the intervention. This analysis was not significant, $\chi^2(1) = 2.76$, $p = .10$, suggesting that the likelihood of seeking career counseling was independent from the treatment condition.

Discussion

Because tight budgets constrain the scope of services that colleges and universities can offer, counselor time is at a premium. Staff may consider counselor-free interventions for common developmental concerns, such as career decision-making difficulties. The purpose of this study was to explore whether the SDS, when administered to college students outside the context of counseling, can serve as an effective stand-alone intervention in addressing these students' career concerns.

Consistent with previous research (Mau et al., 1997; McGowan, 1977; Zener & Schnuelle, 1976), we found that compared with students receiving no intervention, students who completed the SDS reported a greater

increase in the number of occupations they were considering 4 weeks later. Because this finding now extends across several studies using follow-up intervals of varying lengths, it seems reasonable to conclude that, for many students, the SDS, even when used outside the context of counseling, will prompt a consideration of more career alternatives.

Unlike the findings of Krivatsy and Magoon (1976), we found that completion of the SDS was not associated with a significantly greater degree of subsequent career exploration. Our inability to detect small treatment effects may account for this difference. It is also possible that the discrepant findings are a function of the nature of the samples. Whereas the participants in Krivatsy and Magoon's study responded to an advertisement for vocational counseling assistance, our sample comprised students who were not necessarily seeking career services. On one hand, examining the effectiveness of the SDS in meeting the needs of students who request career intervention services as Krivatsy and Magoon did is clearly important. On the other hand, because the SDS is sometimes administered to broad student groups, evaluating its potential effects with those not necessarily seeking services is also useful. Our findings suggest that, among a general student population, the SDS may not prompt much additional career exploration.

Our findings were also contrary to those of Zener and Schnuelle (1976), who found that completion of the SDS among high school students was associated with a decreased need for counseling immediately afterward. Our SDS completers did not differ significantly from the no-treatment control participants in terms of their likelihood of having sought career counseling services in the 4 weeks afterward. Perhaps this discrepancy is a function of the way in which the need for counseling is operationalized. Whereas Zener and Schnuelle asked participants about the urgency of their need for counseling, we used a behavioral indicator (self-reported actual career counseling use). At any rate, our findings provide little reason to expect that the SDS is likely to result in a substantially decreased demand for career services.

Although Uffelman et al. (2004) had found that career-undecided college students completing the SDS with a counselor experienced more gains in career decision-making self-efficacy than did those in a control group, we did not obtain the same findings with our counselor-free SDS intervention with a more general student sample. For our participants, SDS completion was not associated with an increase in career decision-making self-efficacy. As the results of meta-analyses (Brown & Ryan Krane, 2000; Whiston et al., 2003) have confirmed with career interventions overall, counselor involvement may be needed for the SDS to produce substantial effects on self-efficacy.

Finally, although the SDS is primarily designed to help respondents identify possible careers for consideration (Holland, 1994), we had thought it might also serve to validate the career choices of those who had tentatively selected career goals. This did not appear to be the case; rather, our control and SDS intervention groups did not differ significantly with respect to later career indecision. To our knowledge, this is the first study to investigate whether completing the SDS is associated with changes in career indecision. Thus, it would be useful to see if this finding replicates with other samples.

In summary, the one outcome that appears to be consistently associated with the completion of the SDS outside of counseling is an increase in the number of career alternatives being considered. Considering a greater number of occupational alternatives is certainly a desirable outcome if better person–occupation fit is achieved as a result of students' increased search behavior (Lent, Brown, & Hackett, 2000). However, if the increase in careers being considered is not accompanied by an increase in the exploration of those occupations, as in the case with our participants, then it is of less clear value.

Perhaps the largely null treatment findings from this study are not surprising given that counselor-free career interventions as a whole have been shown to have more modest effects than those involving a counselor (Brown & Ryan Krane, 2000; Whiston et al., 2003). Our sample size only permitted us to detect treatment effects that were of medium or larger size, so we cannot rule out the possibility of small gains for those who completed the SDS. Overall, however, it appears that SDS's use as a stand-alone intervention outside of the context of counseling may be of more limited value than Holland (1972) envisioned.

Implications

If the goal of administering the SDS is to prompt students' consideration of a greater number of career options, our findings and those of other studies (Mau et al., 1997; McGowan, 1977; Zener & Schnuelle, 1976) suggest that doing so with broad students' groups outside the context of counseling may be one avenue for efficiently assisting students. This form of intervention would seem to be most useful with students in fairly early stages of career development (i.e., Super's [1953] growth or early exploration stages), when the goal is to encourage students not to overlook careers that are congruent with their personalities (Holland, 1997).

Our findings suggest that SDS completion alone may not encourage much additional career exploratory behavior. We believe, therefore, that if the SDS is used with broad student groups outside the context of counseling, facilitators may need to incorporate more explicitly some of the treatment ingredients identified by Brown and Ryan Krane (2000) as being present in the most effective career interventions. For example, although we asked students to reflect on their scores in a writing exercise, which is one of the critical ingredients, a facilitator might assign more detailed written reflection exercises and hold students accountable for completing them. Although the SDS assessment booklet provides some recommendations for next steps in career decision making, facilitators may need to make information about the world of work (another critical treatment ingredient) more accessible by accompanying students to career centers or helping them explore electronic resources on-site. The critical treatment ingredient of modeling could be addressed in orientation classes by having advanced students visit as guest speakers to discuss their career decision-making processes and successes (Brown & Ryan Krane, 2000). If the advanced students had found the SDS to be a useful intervention, they might be invited to discuss how they had used the results in subsequent career exploration. Finally, facilitators might implement building support by

helping students explore how to involve their parents and peers in their career decision making (Brown & Ryan Krane, 2000). One idea would be to facilitate a discussion of how others in their lives might be used to help students as they attempt the next steps recommended in the SDS assessment booklet.

Although its self-administered, self-scored format makes the SDS appealing as a tool for addressing the career concerns of large numbers of students, our findings do not provide evidence that its use with broad samples will substantially reduce the subsequent need for career counseling services. Thus, when choosing settings in which to administer the SDS to student groups, we believe that university staff may wish to attempt to identify those with career concerns and target them for intervention specifically. The SDS's effects with those seeking vocational services appear to be more robust (Krivatsy & Magoon, 1976; Uffelman et al., 2004) compared with our more general sample. In orientation classes, a screening tool might be used to identify those with significant career decision-making concerns, and the SDS could be administered selectively in a group format to those clearly in need of intervention. Our results suggested that changes associated with completion of the SDS were not related to student motivation as assessed by our question about interest in careers or career decision making, so the screening tool may need to be fairly sensitive in identifying students with significant distress.

Limitations

Some limitations of our study are worth noting. First, we were only able to conduct analyses with those students who provided both pre- and postintervention data. The modest size of the final sample was sufficient for detecting intervention effects of the magnitude revealed by Uffelman et al. (2004), but it was not sufficient for revealing small effects. Future research with larger samples may reveal SDS effects with student groups outside of counseling that we failed to detect, although one might question whether any differences of the observed magnitude would have practical significance.

Second, our sample was largely Caucasian and female. Although we are not aware of theoretical reasons to expect that the SDS's effects would differ on the basis of gender or race/ethnicity, it is imperative to use caution when generalizing the results of our study to all college students.

Third, because we were interested in assessing the SDS's effects with broad groups of students who resemble those in orientation classes, we did not limit participation to those who had identified career development assistance needs. Motivation did not contribute uniquely to effect-size variability in Ryan's (1999) meta-analysis of career interventions overall, and interest in obtaining information about careers or career decision making was unrelated to change scores in our study, so we do not believe this fully accounts for the largely null intervention effects. Nevertheless, further evaluation of the SDS's effects with larger samples of students with diverse career assistance needs would permit a more thorough examination of the role of motivation in career intervention effectiveness.

Finally, our follow-up interval of 4 weeks may have been insufficient for detecting some changes following the SDS administration. It is

possible, for example, that some students who completed the SDS and were considering a greater number of career alternatives were contemplating engaging in additional career exploratory behavior but had not yet done so. In additional studies of the SDS's effects, it would be useful to include follow-up assessments after varying time intervals to explore the possibility of both more immediate and delayed effects.

Conclusion

We wish to be clear that our study does not raise questions about the value of the SDS overall. When used with students who are seeking vocational counseling services, there is reason to believe the SDS promotes beneficial outcomes, including increased career exploration (Krivatsy & Magoon, 1976) and increased career decision-making self-efficacy (Uffelman et al., 2004). Rather, our goal was to evaluate the SDS's effects with a broad student sample outside the context of counseling, because it is sometimes administered on a widespread basis to such students as part of orientation classes or workshops. Our findings suggest that the value of the SDS as a stand-alone intervention with a general student sample may be limited. Although it may increase the number of career alternatives being considered, if the SDS is administered to a general student sample, facilitators may need to take additional steps to increase the likelihood that it also results in greater exploration of those careers, greater career decision-making self-efficacy, or decreased career indecision.

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