Journal of Cognitive Psychotherapy: An International Quarterly
Volume 21, Number 4 • 2007

Components of Self-Complexity as Buffers for Depressed Mood

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The self-complexity model (Linville, 1987) predicts that individuals who have numerous self-aspects with little overlap among them will be buffered against the effects of stressful life events and will experience less depression. Despite some evidence to this effect, many replication attempts have failed (cf. Rafaeli-Mor & Steinberg, 2002). The present studies reexamine the self-complexity model, incorporating recent theoretical and methodological critiques of its original formulation (e.g., Brown, Hammen, Wickens, & Craske, 1995; Rafaeli-Mor, Gotlib, & Revelle, 1999). Two prospective studies provide some support for a revised self-complexity hypothesis, which examines separately the effects of differentiation (number of self-aspects) and integration (overlap among them) and considers more carefully the role of stress.

Keywords: self-complexity; depression; diathesis-stress; self-concept

The focus in social-cognitive research on the multiplicity of the self (Cantor & Kihlstrom, 1987; Kihlstrom & Cantor, 1984; Markus & Wurf, 1987) has been accompanied by the development, over the past two decades, of research relating structural features of the self to mood and well-being (e.g., Gara et al., 1993; Linville, 1985, 1987). Specifically, the structure of our knowledge about the self is thought to play an active role in information processing, with previously acquired and organized information driving current perception, judgment, and response; these different patterns of information processing are expected to play a part in affective responses to stress and, by extension, in psychopathology.

Studies of self-structure have examined properties such as *self-concept clarity* (Campbell, 1990), the degree to which different self-aspects are consistent with each other; *self-concept differentiation* (e.g., Donahue, Robins, Roberts, & John, 1993), which is concerned with nonredundancy between aspects of the self; and *evaluative integration* (e.g., Showers, 1992; Showers & Ryff, 1996), the extent to which negative and positive information about the self is either segregated or integrated across different self-aspects. Some of these aspects reflect differentiation or plurality, whereas others reflect integration or unity (for comprehensive reviews of this literature, see Campbell et al., 1996, p. 141; cf. Campbell, Assanand, & DiPaula, 2000, 2003).

The focus of the present paper is on *self-complexity* (SC), as defined and studied by Linville (1985, 1987). This construct has been of particular interest to many researchers because it may speak to both differentiation and integration (Rafaeli-Mor & Steinberg, 2002). Linville's model posits that there are individual differences in the number of aspects or dimensions making up the self and in the extent to which these self-aspects overlap. Linville and others who have sought to replicate and extend her work typically use a trait-sorting procedure, in which participants are asked to use a pile of cards to describe themselves in various aspects of their lives. Each card contains a trait word; traits can be sorted into one, many, or none of the self-created self-aspect categories. According to this model, individuals are more complex to the extent that they generate multiple self-aspects in defining themselves and to the degree that these aspects are independent of each other (i.e., the aspects overlap minimally in the traits with which they are described). Linville (1987) suggested that greater dimensionality serves as a buffer against stress-related illness and depression by providing alternative foci of attention following a stressful event, while greater distinctiveness prevents the spread of activation from one aspect of the self to other aspects: the more distinctive an aspect, the fewer other aspects associated with it through shared attributes. Conversely, low dimensionality and low distinctiveness are seen as risk factors for adverse outcomes in response to stress. Consistent with these predictions, in Linville's (1985, 1987) studies, low-SC individuals had more extreme affective reactions following a failure experience and displayed greater variability in affect over an extended period, whereas individuals high in SC were less prone to respond to stressful events with depression, perceived stress, psychosomatic symptoms, and illnesses.

The SC model has held much appeal to social, developmental, and clinical psychologists. Yet our previous studies (Brown, Hammen, Wickens, & Craske, 1995; Rafaeli-Mor, Gotlib, & Revelle, 1999) and the conclusions of our meta-analysis (Rafaeli-Mor & Steinberg, 2002) suggest that much of the research done on this construct suffers from conceptual and methodological problems and, in essence, fails to test fully the theory itself. In the remainder of this introduction, we review these problems and detail our solution to them. We then present two studies testing this solution.

Review of Empirical Findings Regarding SC

Linville's (1985, 1987) predictions, associating greater complexity with better psychological functioning, diverge from those of other approaches in the area of self and identity. Often, greater complexity had been tied theoretically and empirically to negative rather than positive psychological outcomes (for a brief review, see MacLeod and Williams, 1991). For example, in a study using a Rep Grid procedure stemming from George Kelly's (1955) personal constructs model, MacLeod and Williams (1991) reported a positive association between depression and complexity. Similarly, Gara et al. (1993), using a cluster analytic procedure, reported a positive correlation between the complexity of negative information and the level of depression in a sample of depressed patients.

These findings are based on models operationalizing complexity differently than Linville (1985). In a narrower review, examining only SC studies using Linville's methods, Rafaeli-Mor and Steinberg (2002) found a mixed picture. Some studies supported Linville's predictions, but many others disputed them.

A group of studies (Brown, Hammen, Wickens, et al., 1995; Morgan & Janoff-Bulman, 1994; Woolfolk, Novalany, Gara, Allen, & Polino, 1995) has provided one clue as to what may be driving this divergence of findings. These authors show that complexity of negatively valenced self-knowledge but not of positively valenced self-knowledge is associated with negative outcomes. In other words, they argue that the effects of complex organization of self-knowledge are not uniform across all types of content. Extending this line of investigation, Rafaeli-Mor et al. (1999) recently examined the effect of self-knowledge valence on the SC index. They found that two index scores, such as the ones computed by Morgan and Janoff-Bulman (1994) and

by Woolfolk et al. (1995) based, separately, on positive and negative traits, were not associated. Thus, rather than SC being a unitary construct reflecting the structure of the self-schema, different parts of the self-schema content (e.g., positively and negatively valenced information) were found to be organized quite differently.

Measurement Issues, a Proposed Solution, and a Revised Hypothesis

Another major reason for the uneven findings of SC research emerges from a psychometric examination of the index most often used to operationalize SC, a mathematical index of dimensionality computed on the basis of the self-descriptive trait sort. This measure, which we term *self-complexity dimensionality* (SC-D), has its origins as the entropy value (H) of information theory (Attneave, 1959). Within information theory, this is an index of dispersion that indicates the extent to which observations are distributed in a range of categories rather than being concentrated in any one of them (Wickens, 1989). In its original usage, entropy was calculated for classifications in which a given observation appeared in only one category. However, the use of this index suggested by Linville is taken from Scott's (1962, 1969) extension of entropy to situations in which a given observation can fall into more than one category. An observation included in more than one category is counted as appearing in a new category, called a *group combination,* which includes all observations that appear in the same combination of categories (for a detailed description, see Linville, 1987). AQ1

In recent papers, Brown, Hammen, Wickens, et al. (1995), Locke (2003), and Rafaeli-Mor et al. (1999) critiqued the psychometrics of the SC-D index proposed by Linville and used by most researchers for the past decade. As Brown, Hammen, Wickens, et al. (1995) explained, a major problem stems from the fact that, whereas the SC-D *score* is a *single* value, the SC *model* (Linville, 1985) posits *two* mechanisms that underlie the buffering effects of SC: the number of self-aspects and their overlap. It seems reasonable that separate indices of the two component mechanisms would be in order; indeed, a similar idea was suggested by Linville (1987): "Self-representations may differ in terms of both the number of self-aspects and the degree to which distinctions are made among self-aspects. Two self-aspects are distinct to the extent to which they are represented by different cognitive elements.... Greater self-complexity involves having more self-aspects and maintaining greater distinctions among self-aspects" (p. 664).

Based on Brown, Hammen, Wickens, et al.'s (1995) previous work, Rafaeli-Mor et al. (1999) developed and examined such indices. One index reflects the number of self-aspects generated by the participant. This straightforward count is a face-valid index of the first mechanism, in which the affect generated by an activated self-aspect colors our overall affective experience in proportion to this aspect's prominence within the self. In an individual with few such aspects, any activated aspect takes up a large proportion of the self-schema (e.g., a half, when there are two aspects); the more aspects, the smaller the proportion of any particular one. A similar straightforward index was computed by Linville (1987), who found it to be strongly associated to the SC-D index ($r = .72$, $p < .001$).

A second index proposed by Rafaeli-Mor et al. (1999) reflects the degree of distinctiveness or overlap among self-aspects. This measure of overlap is an index of the second mechanism, in which overlapping self-aspects (i.e., ones that share traits in common) are likely to be characterized by a spillover effect. In an individual with overlapping aspects, any activated aspect will lead to activation in overlapping aspects and therefore to a greater impact on the total self-concept.

As we noted earlier, the SC-D statistic is purported to measure both of these mechanisms: the numerousness of self-aspects and the distinctiveness (or lack of overlap) between them. Yet Rafaeli-Mor et al. (1999) found surprising associations between SC-D and the separate indices of the two mechanisms, namely, the expected strong positive association between SC-D and

number of aspects ($r = .71$, $p < .001$, almost identical to Linville's own finding) but a weak positive association ($r = .24$, $p < .01$) rather than a strong negative one between SC-D and overlap. The latter, unpredicted, association held even when controlling for the number of self-aspects. In short, SC-D is a reasonable (though imperfect) index of the number of aspects but is flawed as a measure of distinctiveness or overlap. In addition, they evaluated the effect of the valence of self-relevant information on these two component indices. Recall that SC-D indices computed on negative and positive self-knowledge were found to be unrelated to each other. In contrast, the two component measures of SC had reasonable reliabilities across various split-half partitions of the stimuli, even when these partitions were made on the basis of stimulus valence.

Both the Rafaeli-Mor and Steinberg (2002) meta-analysis and recent work by various authors on the measurement of SC and on the SC model (e.g., Solomon & Haaga, 2003) have reached the same conclusion. All suggest that the basic assumptions of SC theory regarding structural properties of self-knowledge that are independent of content are interesting and worthwhile to examine. However, all also note that SC-D is a poor index that fails to capture the theoretical mechanisms suggested by SC theory. In short, they suggest that these constructs be operationalized using separate measures. This last point is worth emphasizing because, in essence, Linville's full theory has not had an adequate test to this point as a result of the reliance on a quantitative index that does not operationalize the theory in a satisfactory manner. To remedy this problem, we set out to conduct our first study.

Three hypotheses guided this study. First, we expected to replicate the findings of Rafaeli-Mor et al. (1999) regarding the associations among SC-D, the number of self-aspects, and the overlap among them. Second, in agreement with the original SC model, we expected to demonstrate that the association between stressful life events and depressive symptoms is moderated by components of SC. Individuals with more numerous self-aspects and with greater distinctiveness (less overlap) among them were expected to be buffered against developing depressive symptoms in response to stressful life events. As part of our refinement of the SC model, we were interested in examining both the additive and the multiplicative effects of the two components as buffers of stress. It is possible that each of the component mechanisms (numerousness and distinctiveness) has a unique effect but also that they work in tandem. The latter expectation seems consistent with Linville's (1987) model, though that model did not acknowledge the separability of the two components and therefore did not test for the simple (additive) effects. Additionally, unlike earlier tests of the SC model and following the recent work of Solomon and Haaga (2003), we fully probe these interactions to examine whether they truly show a stress-buffering or stress-exacerbation pattern. Third, we expected that the use of the two component processes of SC would lead to superior predictive power over the use of the SC-D measure.

Study 1

Method

Participants. Participants were undergraduates at a large public university on the West Coast of the United States, enrolled in an introductory psychology course. They met the following selection criteria: (a) no previous college-level course work, (b) 18 years old or older, and (c) native English speaker or SAT verbal score > 600 (adopted because of the large proportion of nonnative English speakers in the participant pool who might have had difficulty with the procedure). Seventy-five participants met these criteria. The data from six participants who failed to complete either outcome or diathesis measures were excluded.

Materials

Beck Depression Inventory. The Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979) is a standard self-report scale of depression used widely in a variety of research contexts.

Beck, Steer, and Garbin (1988) reviewed the psychometric properties of the BDI and found reliability coefficients typically exceeding .90 in a wide range of populations. The BDI was modified slightly from the original for the present study by the addition of one item so as to increase the variability of the scale and to afford a better chance of detecting change over the relatively short follow-up period. The added question read, "Over the last week, how has your mood been?" The rating was made on a 9-point scale ranging from 1 ("Worse than I could ever imagine") to 9 ("Better than I could ever imagine"). The midpoint of the scale (5) was labeled "Okay." The BDI items and the additional item were standardized and summed. For the sake of comparability to other studies, the resulting total score was then restandardized to the mean and standard deviation of the original BDI score for that assessment point. Empirical support for including the additional item comes from a reliability analysis in a larger sample (total $N = 163$, including the participants from the present study), in which the mood item had a corrected item-total correlation of .66, the fifth-highest correlation of the 22 items in the analysis, and increased the scale alpha nominally from .89 to .90. Thus, we expect this item to have strengthened reliability of our modified scale.

Self-Descriptive Sorting Task. To obtain both SC-D and component measures of SC, we used a self-descriptive trait-sorting task. This procedure was modeled on Linville's (1985, 1987) but contained several minor though notable adaptations. First, a longer and more balanced list of traits was used. Forty-five traits, divided equally between those with positive, neutral, and negative valence, were used in place of the original list of 33 (mostly positively valenced) traits. The 45 stimulus words were compiled by having students in an introductory psychology course ($N = 25$) provide six positive and six negative adjectives that described them in the context of three situations: at school, in social situations, and with their family. A list of unique adjectives was compiled and supplemented by close synonyms taken from a thesaurus. The resulting list was rated by eight advanced clinical psychology students on a 0–3 scale for their degree of association with negative affect, degree of association with positive affect, and degree to which they were markers of depression. Words rated greater than 1 for being markers of depression were deleted from the list. The rating of association with negative affect for the remaining words was subtracted from the rating of association with positive affect, creating a difference score. The 15 words with the largest negative (positive) difference scores made up the negative (positive) adjective pool. The 15 words centered around a difference score of 0 that did not receive an average rating of more than 1.5 for association with either positive or negative affect made up the neutral word pool. The words were block randomized, with four different randomizations. In addition, the task was broken down into several segments, with separate instructions for each segment. Participants were first prompted to think of all the social roles that they fill in their lives, to list these, and to rate the importance of each role. After listing their roles, participants were instructed to scan the adjective sheet and rate the adjectives that they thought applied to them to any extent. Finally, they used only those adjectives judged as "ever describing them" to characterize themselves in each of the different roles they had listed. Thus, the procedure was equivalent to that of Linville in producing a cross classification of self-aspects and trait adjectives. Participants were asked to take no more than 30 minutes for the entire procedure.

Stress Measures. Stress was represented in two ways. First, the score obtained on a midterm examination was used as an objective stress score. As this was the first college-level examination for the participants, poor performance was presumed to be distressing, with poorer grades implying higher objective stress. The second variable was a simple, single-item global stress scale. At the second testing session, participants were asked to choose which of five statements described their current level of stress. These ranged from 1 ("My life has been running smoothly") to 5 ("I've been facing some fairly serious matters recently").

Procedure. Participants were prescreened from an undergraduate participant pool according to the selection criteria listed above. They were contacted by phone, and those agreeing to

participate were scheduled for a pretest session 3 or 4 days before their midterm examination. During this session, students completed the sorting task and the BDI-M. They were notified of their midterm scores 3 days after taking the test and were scheduled for a posttest 1 to 4 days after receiving their test score. Students completed the dependent measure (time 2 BDI-M) as well as the subjective stress measure during the posttest session.

Results

Measures of Structure. Three measures of structural aspects of self-representation—SC-D, number of roles, and overlap—were computed for each participant. SC-D scores in the present study ($M = 3.25$, $SD = 0.75$) were comparable to those reported by Linville (1987) and by Rafaeli-Mor et al. (1999).

Number of roles and *overlap* are indices that represent number and distinctiveness of aspects separately. *Number of roles* is the number of trait groups formed by the participant in the sorting task. The number of roles in the present study ($M = 5.90$, $SD = 1.78$) was comparable to the mean number of feature groups created in the SC sorting task reported by Linville (1987; $M = 6.57$, $SD = 2.16$). *Overlap* is the average overlap between any two trait groups over all possible pairs of groups. The level of overlap in the present study ($M = 0.47$, $SD = 0.14$) was considerably higher than that found by Rafaeli-Mor et al., who had expressed a concern about a scaling (floor) effect in overlap. Clearly, such concern seems unwarranted here.

Simple correlations for all the variables of interest are shown in Table 1. Whereas the correlation of depression (BDI-M) at both time 1 and time 2 with subjective and objective stress (exam score) was in the expected direction, the objective stress correlations were not significant. Further, the two stress measures did not correlate, suggesting that these were two distinct aspects of stress. Consistent with the findings of Linville (1987), Rafaeli-Mor et al. (1999), and others, SC-D had a positive association with number of roles and thus appeared to reflect this element of SC quite well. Also in agreement with the findings of Brown, Hammen, Wickens, et al. (1995) and Rafaeli-Mor et al. but in contrast to the supposition that SC-D will reflect low overlap (high distinctiveness) among roles, the two measures (SC-D and overlap) were unrelated in this sample. Finally, in agreement with Rafaeli-Mor and colleagues, the two component measures of SC (number of roles and overlap) were unrelated.

To test for a possible interaction between number and overlap of roles on the one hand and SC-D on the other, a simultaneous multiple regression analysis was conducted with overlap,

TABLE 1. Intercorrelations Among Stress, Outcome, and Diathesis Variables, Study 1 ($N = 69$)

	1	2	3	4	5	6	7
1. Exam	—	–0.05	–0.09	–0.16	0.23*	0.27**	0.12
2. Stress		—	0.48***	0.58***	0.10	0.02	0.26**
3. BDI-M (1)			—	0.68***	0.31***	–0.07	0.36***
4. BDI-M (2)				—	0.13	–0.07	0.16
5. SC-D					—	–0.09	0.72***
6. Overlap						—	–0.17
7. Number of roles							—

Note. Exam = midterm exam score; stress = subjective stress measure; BDI-M (1) = pretest BDI-M; BDI-M (2) = posttest BDI-M; SC-D = Linville's (1985) self-complexity dimensionality measure; differentiation = Donahue et al.'s (1993) differentiation index.

*$p = .055$. **$p < .05$. ***$p < .001$.

number of roles, and their interaction predicting SC-D. Overlap was again unrelated to SC-D ($\beta = .02$, *ns*), while the number of roles remained a positive predictor of SC-D ($\beta = .69$, $p < .001$). The interaction term (Number × Overlap) was unrelated to SC-D ($\beta = -.08$, *ns*).

The number of roles was related to both subjective stress and time 1 depression scores (its strong correlate, SC-D, was also related to the latter). These findings are consistent with the conclusions of the Rafaeli-Mor and Steinberg (2002) meta-analysis: cross-sectionally, higher levels of SC-D appear to be a liability.

Diathesis-Stress Analyses. To predict residual change in depression, simultaneous multiple regression analyses were conducted. Following the suggestions of Baron and Kenny (1986) and Cohen and Cohen (1983), depression at time 1 was included as a covariate in the analysis. The other terms in each of the regression equations were stress, the self-structural index (or indices), and the interaction terms among these. All predictor variables were standardized before computing interaction terms. In this analysis and all subsequent ones, we performed outlier analyses and found no anomalies in the data. To further probe interaction terms, we plotted the main and interaction effects by choosing values one standard deviation above and below the mean as suggested by Aiken and West (1991).

Each of the analyses described below was conducted twice, once with the subjective stress variable and again with the objective stress variable (exam performance). Because none of the analyses with the objective stress variable were significant, only the results for global subjective stress are reported.

Linville's SC-D. Adjusting for time 1 depressive symptoms, as well as for the main effects of stress and of SC-D, the interaction of SC-D with subjective stress was a significant predictor of time 2 depressive symptoms ($\beta = .222$, $p < .05$). The nature of the interaction was consistent with theory (see Table 2 and Figure 1): SC-D appeared to buffer the effects of subjective stress on residual depressive symptoms (though it also seems that under low levels of stress, SC-D may serve as a liability).

SC Components. To further examine whether either component of complexity is responsible for the stress buffering, we conducted a simultaneous multiple regression analysis jointly using the number and overlap of roles (see Table 3). As noted earlier, we were interested both in the unique (additive) buffering effects of each component and in their combined (interactive) effect. The residual change approach was followed by including depression at time 1 as a covariate in the analysis. The other terms in the regression equation were stress, number of roles, overlap, the three two-way interactions among these variables, and the three-way interaction.

There was no significant three-way interaction between stress, overlap, and number of self-roles ($\beta = -.054$, *ns*). Thus, it appears that the effect of stress on depression does not rise as a function of a combined low number of roles and high levels of overlap among them, as would have been predicted by the SC model, taken in its entirety. As for the two components considered

TABLE 2. Summary of Regression Analysis With SC-D as a Buffer of Depression, Study 1 ($N = 69$)

Variable	*b*	β	*t*	*p*
Constant	–.002	—	0.27	*Ns*
BDI-M (time 1)	.573	.573	6.11	<.001
SC-D	–.052	–.052	–0.63	*Ns*
Stress	.325	.325	3.64	<.05
SC-D × Stress	–.215	.222	–2.80	<.05

Note. $R^2 = .61$, $F = 24.77$, $p < .001$.

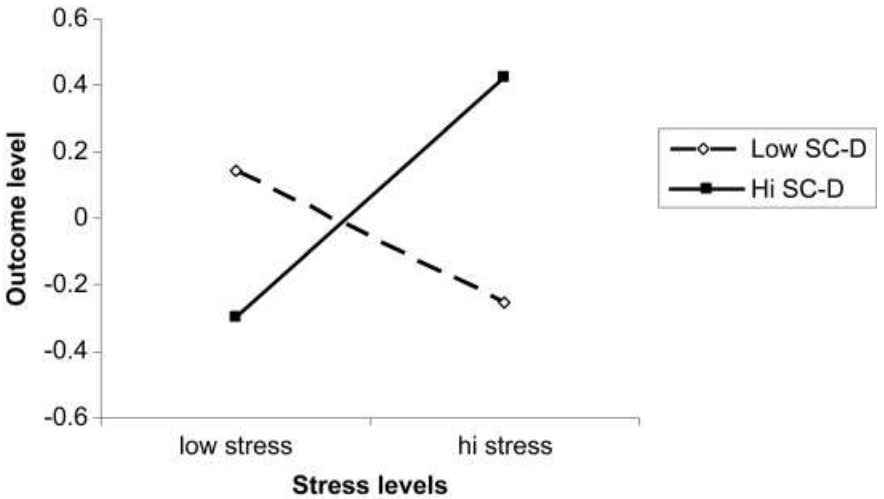

FIGURE 1. The two-way interaction of SC-D and severe stress (study 2).

TABLE 3. SUMMARY OF REGRESSION ANALYSIS WITH COMPONENT INDICES AS BUFFERS OF DEPRESSION, STUDY 1 ($N = 69$)

Variable	*b*	β	*t*	*p*
Constant	.022	—	0.26	*ns*
BDI-M (time 1)	.564	.564	5.90	<.001
Stress	.319	.319	3.11	<.05
Number of roles	–.123	–.123	–1.24	*ns*
Overlap	–.096	–.096	–1.15	*ns*
Stress × Number of Roles	–.191	–.225	–2.09	<.05
Stress × Overlap	–.024	–.024	–0.25	*ns*
Number of Roles × Overlap	–.131	–.109	–1.20	*ns*
Stress × Number of Roles × Overlap	–.057	–.054	–0.50	*ns*

Note. $R^2 = .62$, $F = 12.17$, $p < .001$.

separately, while overlap neither exacerbated nor buffered the effect of stress (β = –.024, *ns*), number of roles did serve as a buffer (β = –.225, $p < .05$). This latter interaction was probed (see Figure 2) and was consistent with the prediction of stress buffering. Using Aiken and West's (1991) suggestions, we examined the slope of the simple regression line for individuals with fewer roles (1 *SD* below the mean), which was 0.51 ($p < .001$). In contrast, the slope of the simple regression for individuals with more roles (1 *SD* above the mean) was 0.13 (*ns*). The results of this analysis thus support characterizing a small number of social roles as a vulnerability factor.

Brief Discussion

This study replicates the findings regarding measurement of SC reported by Rafaeli-Mor et al. (1999). Specifically, the SC-D index did not reflect both theoretical components of SC. SC-D was strongly related, as the theory would predict, to number of self-aspects (quantified separately in

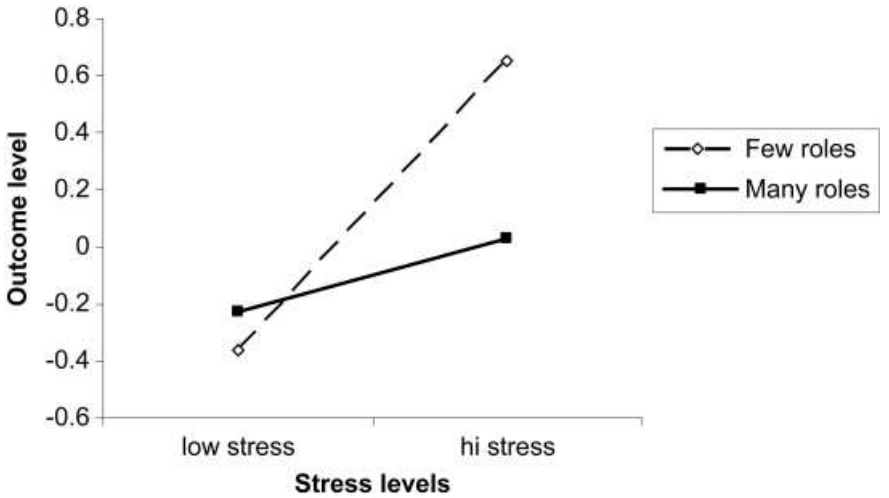

Figure 2. The two-way interaction of number of roles and subjective stress (study 1).

the number of social roles). However, it was unrelated to overlap rather than being negatively related as the theory would predict.

By considering the components of SC separately, this study provides some qualified support for the predictions of the revised SC model. One component of low SC—fewer roles or self-aspects—appears to serve as a vulnerability to increased dysphoria under high stress and predicts decreased symptoms under low levels of stress. Thus, as suggested by Linville (1985), Brown and Harris (1978), Thoits (1983), and others, multiple role involvements appear to provide individuals with psychological "escape hatches" in times when specific roles are beset by stress. Contrary to the prediction of the SC model, no evidence was found that the second component of low SC, high overlap, serves as a vulnerability to greater depressive symptoms in response to stress. In fact, the signs of the coefficients for high overlap (both as a main effect and in its interaction with stress), though far from significant, suggest that overlap is either inert or actually associated with fewer depressive symptoms.

Finally, the finding with SC-D is of a similar nature and magnitude to that found with number of roles. This suggests that any stress buffering obtained by the construct represented by SC-D is driven by this component and not by the overlap component.

One limitation of this study was the use of a modified BDI scale; though its reliability was confirmed in a separate analysis, we were not able to omit the added item, limiting the comparability of this study with others using the original BDI. A more important limitation of this study was the measurement of stress. The naturalistic stressor, examination performance, did not yield significant effects. This type of stressor has been used successfully in similar research (Brown, Hammen, Craske, & Wickens, 1995), but a different framework (used, e.g., by Metalsky, Joiner, Hardin, & Abramson, 1993) may have been superior. In such a framework, we would have obtained *expected* exam scores before the exam and created a difference score reflecting whether the real score fell above or below the expectations. The meeting or frustration of these expectations would have served as a better index of objective stress.

In the absence of such scores, our analyses had to rely on the single-item measure of subjective stress. In the past (e.g., Linville, 1987), subjective stress was used as an outcome rather than as a predictor in diathesis-stress studies. The argument (with which we agree) is that a true test of a diathesis or a buffer would examine its ability to moderate the effect of objective rather than subjective hardship. In choosing to use the subjective stress item, we did find some solace

in contrasting its wording ("I've been facing some fairly serious matters recently") with that of typical items from the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983), a popular measure of perceived stress and the one used by Linville, 1987, as an outcome). The PSS includes items such as "In the last month, how often have you felt nervous and stressed?" or "In the last month, how often have you felt that you were unable to control the important things in your life?" Items such as these directly address coping and subjective feelings, while the single-item index we used simply asks for an evaluation (albeit a subjective one) of one's environment. Nonetheless, both the brevity and the subjective nature of this measure are far from ideal and call for a more adequate measure of stress with which to replicate these results. With this in mind, we designed the next study.

STUDY 2

Similar to study 1, this too was a prospective, two-panel examination of SC components as buffers of depression. Its aim was to replicate and extend the results of study 1. In particular, we hoped to improve the measurement of stress. Previous tests of the SC model have made no explicit distinctions between types of stress and have failed to address the possibility that SC plays different roles regarding these types (cf. Rafaeli-Mor & Steinberg, 2002). One exception is the work of Showers, Abramson, and Hogan (1998), who distinguished between minor and major stressors. However, after making this important distinction, the authors report only the results based on major life events, as these were found to be more predictive of mood change.

On the basis of recent suggestions regarding the measurement of stressful life events (e.g., Monroe & Simons, 1991), we sought to examine the role of SC in buffering both severe and more mundane types of stress. Severe and acute stress, involving patently major life events, is thought to have an immediate effect on well-being. The types of coping resources, as well as the types of social-cognitive mechanisms that may be put into place, are likely to differ from those mobilized at times of more mundane stress (cf. Showers et al., 1998). In contrast, more diffuse or mundane stress is thought to have a gradual, cumulative effect on well-being and to require a different coping response (for similar approaches to the study of the effects of stress on depression, see Bebbington et al., 1988; Segal, Shaw, Vella, & Katz, 1992).

A more nuanced reading of the SC model (cf. Solomon & Haaga, 2003) also encourages a different assessment of stress. Specifically, while the SC model posits that the degree of spread of activation following a particular stressor is responsible for the SC effect, many studies (including Linville, 1987) have typically used life event inventories that yield a count of the number of life events one has encountered rather than an index of any specific, particularly pernicious stressors.

We were interested in comparing the buffering role played by SC with such diffuse stress scores versus more acute and severe stressors. Thus, we retained the first and third hypotheses listed earlier (that SC-D will not accurately reflect both components and that a separate examination of the components could be more informative with respect to the mechanisms of SC). We augmented our second hypothesis to allow for the possibility that various forms of stress (namely, severe and acute vs. mundane and diffuse) would interact differently with the SC components.

Method

Participants. Participants were 70 introductory psychology students at the Hebrew University in Jerusalem, Israel, who participated in the study as part of their course requirement. One participant did not follow the instructions of the complexity task, and her data were excluded from the analyses.

Measures. All measures used were Hebrew translations of the English versions of these instruments. Translation followed the recommended practice (e.g., Brislin, 1993) of backward translation by two different bilingual translators.

Depression. The measure of depressive symptoms was the Center for Epidemiological Studies–Depression Scale (CES-D; Radloff, 1977), a 20-item, self-report instrument with items scored on a scale of 0–3. The scale inquires about mood and other symptoms experienced in the past week. The reliability estimates of the CES-D from the present sample were $\alpha = .91$ and $\alpha = .90$ for the first and second administrations, respectively.

Stressful Life-Events. The Adolescent Perceived Events Scale (APES–Older Adolescent Short Version; Compas, Davis, Forsythe, & Wagner, 1987) was used as a measure of stress and modified for use with Israeli participants. The APES is an inventory of stressful daily and major events. Respondents are asked to indicate whether the event in question occurred in the specified time frame and to note the desirability of the event on an 8-point scale from –4 (very undesirable) to +4 (very desirable). The original instrument was developed by reducing a list of events generated by 18- to 20-year-old American college students. Most of the events of the original scale were maintained in the Hebrew translation, but some were deleted and others added. The modification was done through consultation with a panel of five experts (three psychologists, a sociologist, and an anthropologist). The panelists were asked to generate additional items deemed appropriate for a measure of stressful events for Israeli college students and to note which of the existing items were irrelevant or needed modification. Examples of added items included "being called for reserve duty in the military" and "immigrant relatives arriving." An example of a deleted item included "attending my prom." Some of the items of the scale appeared to be positive events (and were perceived as such by the participants); for example, 68 of the participants endorsed the item "went out with friends," and all rated it as desirable. Contrary to earlier formulations of the effects of life events (Holmes & Rahe, 1967), current approaches to life-stress measurement (cf. Monroe & Simons, 1991) note that only undesirable events exert an influence on well-being. It was therefore important to limit the stress scores gleaned from this instrument to reflect only undesirable events. To determine the desirability of the events, the subjective ratings provided by the participants themselves were used; an event was deemed undesirable if a majority of participants who had experienced it rated its desirability as lower than a certain threshold, described below. After determining which events met these criteria and in order to minimize the possible confounding of depression and reporting of stress (Monroe & Simons, 1991), a simple count of stressful events was used as the stress measure. Two different threshold criteria were used, reflecting a stringent and a lax definition of undesirability. To meet the lax criterion, an event needed to be rated at least as mildly undesirable (–1 or lower) by at least 50% of those who experienced it. Fifty-one events met this threshold, and all participants were given a *mundane stress* score based on the number of such events they experienced in the relevant time period. To meet the stringent criterion, an event needed to be rated as very negative (–3 or –4) by more than 75% of those who experienced it. Five events met this criterion and included three related to death, one to the arrest of a relative, and one to the experience of violence in the home or the neighborhood. As is customary with such major life events, the participants were given a *severe stress* score reflecting a dichotomy of whether they experienced *any* of these stressors or none of them.

Based on the suggestions regarding the measurement of stressful life events (e.g., Monroe & Simons, 1991), the *mundane stress* score was obtained from the APES collected at time 1 with the 4-month frame of reference. The *severe stress* score was obtained from the APES collected at time 2, with reference to the preceding 2 weeks only. Since severe stress is thought to have an acute and immediate effect on well-being, the recent 2 weeks prior to the measurement of the outcome (time 2 depression) were considered an appropriate time frame. To account for a possible effect of a response bias on the severe stress score, the score used was the standardized residual of the recent 2 weeks after adjusting for the previous 2 weeks' presence of severe events.

In contrast, since general mundane stress is thought to have a cumulative effect, the aggregation of such events over a longer period (in this case, the prior 4 months) was chosen as an appropriate time frame.

Self-Descriptive Sorting Task. This procedure was again modeled on that of Linville (1985, 1987) and contained several adaptations that made it consistent with study 1. In this task, the participant was first asked to think of and write down the name (or a made up code) of each role he or she enacts. A sheet with 20 blanks was provided for this purpose, and participants were encouraged to request additional sheets if needed. In a subsequent step, they were asked to scan a list of 45 adjectives and decide, for each role, which adjectives seem applicable or self-descriptive to any extent. They were told that each adjective could be used in none, one, or more of the roles. As in study 1, the list of words was obtained from an undergraduate sample drawn from the same study population. Again, the words generated by the pilot sample were screened (by advanced clinical graduate students) to eliminate markers of affect and to maintain a balance of positive, neutral, and negative words.

Procedure. Each participant attended two sessions. The first session included completion of the self-descriptive sorting task, the APES, and the CES-D. Participants were tested in small groups. For consistency with study 1, to control for the possible effect of self-focus on the self-descriptive sorting task and to minimize the effect of attending to one's depressive mood on the ratings and recollection of life events, the self-descriptive sorting task was administered first, followed by the APES and the CES-D. Participants were instructed to report the occurrence and impact of events (on the APES) with two time frames in mind: the past 2 weeks and the past 4 months.

At a second session, conducted exactly 2 weeks after the first one, only the APES and the CES-D were administered. At this session, the APES was completed only with respect to the preceding 2 weeks.

Results

Measures of Structure. The SC-D scores in the present study ($M = 2.98$, $SD = .94$) were comparable to those reported by Linville (1987) and by Rafaeli-Mor et al. (1999). The number of roles listed by participants ($M = 5.70$, $SD = 2.63$) were comparable to those found in study 1 and also to those found by Linville and Rafaeli-Mor et al. The average level of overlap ($M = .39$, $SD = .16$) was slightly lower than that found in study 1 but still higher than found by Rafaeli-Mor et al.

To test the associations between the SC-D measure and the two component measures of number and overlap of self-aspects proposed by Rafaeli-Mor et al. (1999), zero-order correlations (reported in Table 4) were computed. The SC-D was positively related to number of roles—a finding consistent with Linville's (1987) expectation and similar in magnitude to that found in study 1 as well as in Rafaeli-Mor et al. Consistent with Rafaeli-Mor et al. but not with the original SC model, SC-D was also *positively* related to overlap. Finally, as in study 1, the number of roles and the overlap among them were unrelated. To ascertain if the relation of overlap to SC-D remains positive even when controlling for number of roles as well as to test for a possible interactive relationship between number and overlap of roles on the one hand and SC-D on the other, a simultaneous multiple regression analysis was conducted with overlap, number of roles, and their interaction as predictors and SC-D as the predicted variable. Overlap and number of roles each uniquely accounted for variance in SC-D above and beyond the effect of the other (overlap: $\beta = .34$, $p < .001$; number of roles: $\beta = .69$, $p < .0001$). The interaction term (Number × Overlap) was unrelated to SC-D ($\beta = .08$, *ns*).

Diathesis—Stress Analyses

Linville's SC-D. To predict residual change in depression, simultaneous multiple regression analyses similar to those in study 1 were conducted. Time 1 depression again served as covariate. The other terms included were stress, SC-D, and their interaction. As noted above, both lax and

TABLE 4. Intercorrelations Among Stress, Outcome, and Diathesis Variables, Study 2 ($N = 69$)

	1	2	3	4	5	6	7
1. Mundane stress[a]	—	.18	.38***	.32***	.39***	.14	.23*
2. Severe stress[b]		—	25**	.24**	–.01	–.11	.05
3. Depression (time 1)			—	.74****	.08	.00	.18
4. Depression (time 2)					.09	–.05	.12
5. SC-D[c]					—	.33***	.69****
6. Overlap						—	.02
7. Number of roles							—

[a] Mundane stress = the number of mild-moderate events in the 4 months prior to time 1. [b] Severe stress = dichotomous occurrence of major life events in the 2 weeks before time 2, controlling for the response bias. [c] SC-D = Linville's (1985) self-concept dimensionality measure.

*$p = .057$. **$p < .05$. ***$p < .01$. ****$p < .001$.

stringent criteria were used to obtain stress scores; these criteria yielded measures of *mundane stress* (for the 4 months ending 2 weeks before time 1) and *severe stress* (for the 2 weeks between times 1 and 2). Each stress index was examined in a separate regression model.

Mundane stress (Table 5). Adjusting for time 1 depressive symptoms as well as for the main effects of mundane stress and of SC-D, the interaction of SC-D with mundane stress was not a significant predictor of time 2 depressive symptoms ($\beta = .02$, *ns*). Significant unique prediction of time 2 depression was made only by time 1 depression ($\beta = .73$, $p < .001$).

Severe stress (Table 6). Adjusting for time 1 depressive symptoms as well as for the main effects of severe stress and of SC-D, the interaction of SC-D with severe stress was a significant predictor of time 2 depressive symptoms ($\beta = .21$, $p < .05$). The same probing procedure detailed in study 1 was used to explore this interaction. As can be seen in Figure 3, the shape of the interaction indicates that it was low SC-D rather than high SC-D that served as a buffer from depression. Indeed, high SC-D served as a diathesis or vulnerability factor.

SC Components. To further examine whether either component of SC is responsible for stress buffering, we conducted two simultaneous multiple regression analyses (one for each stress index) using the SC component indices (number and overlap of aspects). As in the previous

TABLE 5. Summary of Regression Analysis With Mundane Stress and SC-D as a Buffer of Depression, Study 2 ($N = 69$)

Variable	*b*	β	*T*	*p*
Depression (time 1)	.73	.73	7.89	<.001
Linville's SC-D	.02	.02	.21	*ns*
Mundane stress	.04	.04	.37	*ns*
SC-D × Stress	–.01	–.01	–.06	ns

Note. $R^2 = .55$, $F = 19.65$, $p < .0001$.

TABLE 6. Summary of Regression Analysis With Severe Stress and SC-D as a Buffer of Depression, Study 2 ($N = 69$)

Variable	*b*	β	*T*	*p*
Depression (time 1)	.70	.70	8.47	<.001
Linville's SC-D	.06	.06	.75	*ns*
Severe stress	.08	.08	.96	*ns*
Stress × SC-D	.28	.21	2.55	<.05

Note. $R^2 = .59$, $F = 23.50$, $p < .0001$.

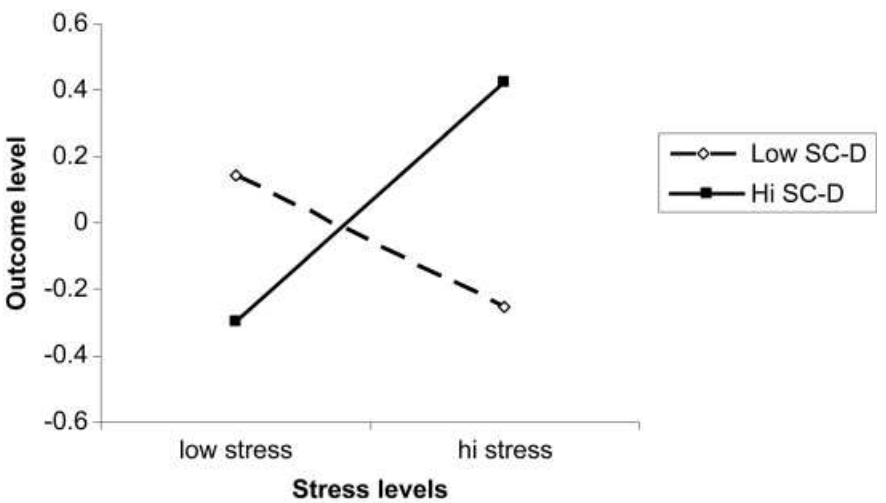

Figure 3. The two-way interaction of SC-D and severe stress (study 2).

analyses, the residual change approach was followed by including depression at time 1 as a covariate in the analysis. The other terms in the regression equations were stress, number of roles, overlap, the three two-way interactions among these, and their three-way interaction.

Mundane stress (Table 7). There was no evidence of a three-way interaction between mundane stress, overlap, and number of aspects (β = .00, *ns*). Thus, it appears that the effect of stress on depression did not rise as a function of a combined low number of aspects and high levels of overlap among them, as would be predicted by the SC model, taken in its entirety. Next, we examined the two-way interactions of mundane stress with each of the two components of SC. The interaction of mundane stress with number of roles was not a significant predictor of residual depression (β = –.05, ns). However, the interaction of stress with overlap was negative and did approach significance (β = –.18, $p < .06$). This latter interaction was probed (see Figure 4) and indicates that *greater* overlap is a buffer of mundane stress. Following Aiken and West's (1991) suggestions, we examined the slope of the simple regression line for individuals with greater overlap among roles (1 *SD* above the mean), which was –.14 (*ns*). In contrast, the slope of the simple regression for individuals with greater distinction among roles (1 *SD* below the mean) was +0.22 ($p < .10$). The results of this analysis support characterizing *high* overlap as a buffer of high levels of mundane stress (but as a vulnerability factor under low levels of such stress). Note that this is contrary to the predictions of the SC model, which posits that high overlap would be a vulnerability factor under greater levels of stress.

TABLE 7. SUMMARY OF REGRESSION ANALYSIS WITH MUNDANE STRESS AND COMPONENT INDICES AS BUFFERS OF DEPRESSION, STUDY 2 ($N = 69$)

Variable	*b*	β	*T*	*P*
Depression (time 1)	.73	.73	7.88	<.001
Overlap	–.03	–.03	–.36	*ns*
Number of roles	–.03	–.03	–.32	*ns*
Mundane stress	.04	.04	.42	*ns*
Stress × Overlap	–.20	–.18	–1.95	<.06
Stress × Number of Roles	–.06	–.05	–.57	*ns*
Overlap × Number of Roles	.16	.15	1.56	*ns*
Stress × Overlap × Number of Roles	.00	.00	.03	*ns*

Note. $R^2 = .59$, $F = 10.70$, $p < .0001$.

FIGURE 4. The two-way interaction of role overlap and mundane stress (study 2).

Severe stress (Table 8). Significant unique predictions of residual depression were made by the two-way interaction of severe stress and overlap (β = .19, $p < .05$) and marginally by the three-way interaction of Severe Stress × Overlap × Number of Roles (β = –.18, $p < .08$). There was no evidence for an interaction of number of roles with severe stress (β = –.02, *ns*).

The two sizable interactions were probed (see Figures 5 and 6, respectively). As can be seen in Figure 5, *low* overlap served as a buffer for depression at times of high severe stress, while *high* overlap served as a vulnerability to depression at such times. The slope of the simple regression line for individuals with greater overlap among roles (1 *SD* above the mean) was positive (.26, $p < .05$). In contrast, the slope of the simple regression for individuals with less overlap (greater distinction) among roles (1 *SD* below the mean) did not differ significantly from zero (–0.11, *ns*), indicating stress buffering. Thus, unlike the results obtained with mundane stress, these results with severe stress are consistent with the SC model.

A test of the complete SC model involves examining the number of roles in unison with the overlap among them as buffers of stress. This three-way interaction is depicted in Figure 6.

TABLE 8. SUMMARY OF REGRESSION ANALYSIS WITH SEVERE STRESS AND COMPONENT INDICES AS BUFFERS OF DEPRESSION, STUDY 2 ($N = 69$)

Variable	*b*	β	*T*	*p*
Depression (time 1)	.75	.75	8.57	<.001
Overlap	–.01	–.01	–.10	*ns*
Number of roles	–.03	–.03	–.33	*ns*
Severe stress	.08	.08	.86	*ns*
Stress × Overlap	.19	.19	2.15	<.05
Stress × Number of Roles	–.03	–.02	–.20	*ns*
Overlap × Number of Roles	.00	.00	.01	*ns*
Stress × Overlap × Number of Roles	–.27	–.18	–1.81	<.08

Note. $R^2 = .60$, $F = 11.28$, $p < .0001$.

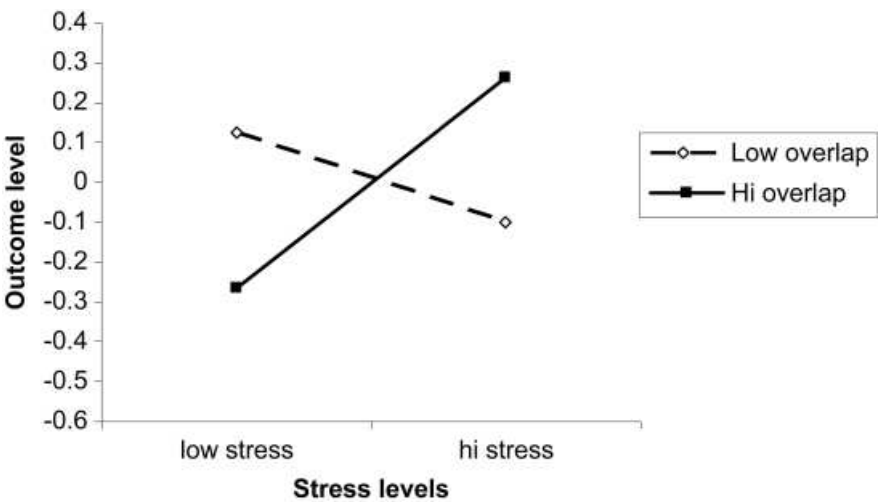

FIGURE 5. The two-way interaction of role overlap and severe stress (study 2).

Although only approaching significance, the results suggest that individuals with few and overlapping roles experienced elevated depression when facing severe stress but lower depression when not facing such stress. Thus, in the presence of severe stress, low overlap and more numerous roles had the predicted interactive buffering effect for depression.

Brief Discussion

This study again replicated Rafaeli-Mor et al.'s (1999) findings regarding measurement of SC. Specifically, the SC-D index failed to reflect both theoretical components of SC. Consistent with the theory, SC-D was strongly related to number of self-aspects; however, in contrast to the theory, SC-D was positively and significantly related to overlap.

Low overlap among self-aspects and the interaction of low overlap with a high number of aspects interacted with the report of *severe* life events such that individuals with more numerous and distinct roles experienced less depression. The interactive effect of overlap on severe stress

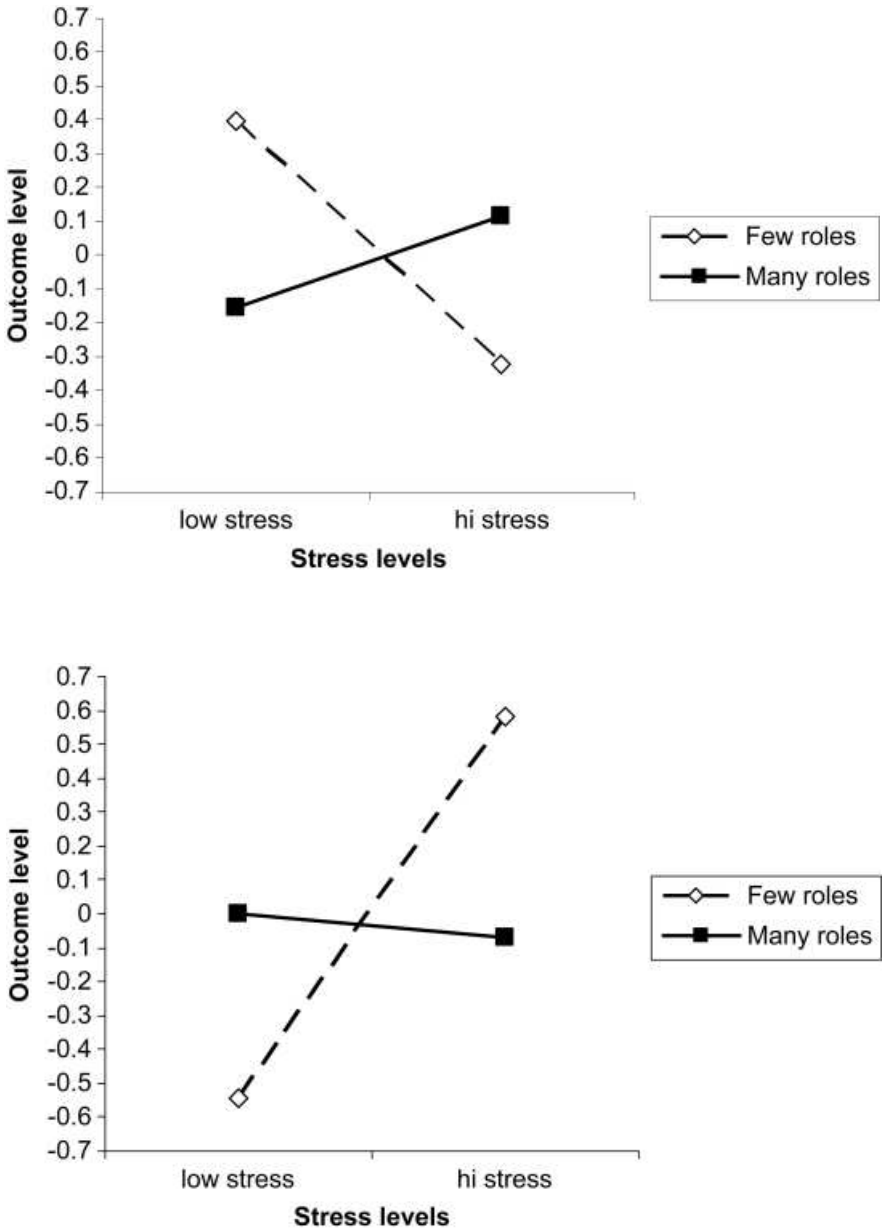

FIGURE 6. The three-way interaction of role overlap, number of roles, and severe stress (study 2). (a) Low overlap. (b) High overlap.

as well as of overlap and number of aspects (interactively) on stress were predicted both in the reexamined SC model (Rafaeli et al., 1999) and in the original formulations of the model (e.g., Linville, 1987). Complex individuals, namely, ones with strong distinctions among their self-aspects, appeared to be more resilient and less susceptible to the deleterious effects of loss or victimization, the events that made up the severe stress index.

The second component of SC (number of roles) did not prove to be a buffer of severe stress in its own right. Instead, it interacted with the overlap component to buffer depression. One

possible conclusion is that low overlap and not the numerousness of roles is the sine qua non of SC. Low overlap featured both as a buffer in its own right and as part of the three-way interaction. In particular, it seems that individuals with low overlap (especially those with few roles) are somewhat resilient, while individuals with high overlap (again, especially those with few roles) are particularly vulnerable to stress.

This study illustrates the need to specify the types of stress for which SC serves (or does not serve) as a buffer. The results support the buffering role of SC in the presence of severe stress. In contrast, a different pattern of relationships emerges in the presence of mundane stress (i.e., events that are aversive but weaker in severity or scope) for which no buffering was found. In fact, low overlap actually exacerbated depressive symptoms following mundane stress.

General Discussion

Two studies were conducted to reexamine the SC model (Linville, 1987) that posited SC as a buffer of the effect of stress on depression. The reexamination involved a novel measurement approach to SC that allows for a better test of the mechanisms thought to make up SC. The results of the study provide at least cursory support to the hypotheses of the reexamined model and its three basic premises.

First, our results support deconstructing SC into its two components. In both studies, these components were unrelated to each other. The first component (a simple count of self-aspects) was strongly related to the often-used SC-D index. In contrast, the second, an index of overlap among self-aspects, was either unrelated or actually positively related to SC-D. Thus, consistent with Rafaeli-Mor et al. (1999), we found SC-D to be a decent (though imperfect) index of the number of aspects component and to be utterly flawed in taking into account the distinctiveness or overlap of aspects. In agreement with our findings, Campbell et al. (2000, 2003) reported on a series of studies in which SC-D was found to be unrelated to several other indices of unity (or, in our terms, overlap). Similar results were also found by Gramzow, Sedikides, Panter, and Insko (2000).

A recent investigation by Rothermund and Meiniger (2004) reached similar conclusions and illustrated the need to distinguish between the SC components. In a pair of studies using the Rafaeli-Mor et al. (1999) component indices, these authors found that only the number of aspects (and not the overlap or distinctiveness among them) served as a buffer of stressful life events in samples of German college students. These authors go on to present an interesting alternative model for the role of SC in self-regulation. According to this alternative, high SC (and, in particular, a high number of roles) allows flexibility in self-regulation strategies in response to negative events. In contrast to Linville's (1985) prediction, the alternative model suggests that positive events will not be buffered by SC: since there is no need to down-regulate them, individuals will not need to engage the regulation process at all.

This alternative model resonates with our second hypothesis, which was that the role of the SC components will vary in response to different forms of stress or life events. When using the component measures, we found a complicated pattern of stress exacerbation *and* buffering, depending on the stressor being studied. In study 1, we found individuals with a greater number of roles to be somewhat resistant to the effects of subjective stress during their first semester in college. The second component of SC, low overlap, did not buffer the effects of stress (and seemed to be either inert in its effect or actually somewhat of a liability). In study 2, we found the low overlap component to be such a liability but only in the context of elevated levels of *mundane* stress. In contrast, in the context of elevated levels of *severe* stress (such as loss or victimization), individuals with low overlap were indeed buffered from experiencing depression, particularly if they had only few roles. In fact, those with both components of low SC (i.e., few roles *and* high overlap) were at greatest risk for increased depression.

Third, the findings using the traditional SC-D index were generally not supportive of the SC model and were less informative than those obtained with the component scores. Although SC-D did buffer the effects of subjective stress in study 1, this finding is likely to simply reflect the action of one SC component (the number of roles). The pattern of relationships (Figures 1 and 2) for SC-D and for this component is identical. In other words, SC-D adds little information beyond the simple count of self-aspects. Moreover, in study 2, we found SC-D to be a vulnerability rather than a buffer for severe stress and to have little effect on mundane stress (though, again, the sign of the effect suggests poorer response to stress for those high on SC-D).

SC Components Put in Context

Recognizing that SC reflects (at least) two components ties this concept to its historical roots in research on *differentiation* and *integration* (cf. Rafaeli-Mor & Steinberg, 2002), two features that characterize the organization of knowledge in a particular domain. Differentiation refers to the degree to which a domain contains a multiplicity of distinct elements, while integration refers to the degree of coherence, interrelatedness, or unity in the domain. We think it is important to situate the components of SC within the literatures exploring differentiation and integration to which they offer a useful addition.

We begin by discussing *differentiation.* Extensive research on social roles, pre-dating the cognitive study of the self-schema, has considered the possible psychological implications of individual differences in the number of distinct role involvements (e.g., Stryker, 1987; Thoits, 1983). For example, Thoits (1983) reported a positive psychological effect of such multiple involvements. Similar conclusions emerge from George Brown and colleagues' work on the social origins of depression (e.g., Brown & Harris, 1978). Several theoretical articles from the past two decades (e.g., Champion & Power, 1995; Dance & Kuiper, 1987; Oatley & Bolton, 1985) have drawn on Brown's work and suggest that more varied social involvements are beneficial because they engender more opportunities for social contact and integration.

The simple count of self-aspects (the differentiation component of SC) can easily be connected to such sociological research. Moreover, it addresses one shortcoming of the sociological tradition in which the constructs of "identity accumulation" and "role involvement" are typically operationalized using a fixed set of roles. The idiographic method used here provides an alternative and straightforward index of differentiation but one that emphasizes its psychological meaning. Specifically, we found that although more numerous roles do serve as a buffer of some forms of stress (study 1), the maintenance of more roles is associated with reports of greater quotidian stress (subjective stress in study 1, mundane stress in study 2) and with elevated depressive symptoms (an association which reached significance in study 1). Similar ideas have been presented by Epstein (1987) and by Wortman, Biernat, and Lang (1991).

The second component of SC—distinctiveness or overlap—can be tied to existing social-cognitive models of self-structure *integration.* Integrated individuals (i.e., those with a clear and coherent self) are ones with high internal consistency among their various self-aspects. Block (1961) argued that a coherent self-concept is the outcome of psychological development and is indicative of psychological well-being and satisfying functioning. In work drawing on Block's (1961) ideas on self-concept integration, Donahue and her colleagues (Donahue et al., 1993; Roberts & Donahue, 1994) proposed the concept of *self-concept differentiation* (a term that, unfortunately, creates some confusion) to refer to the degree of unshared variance across social roles. When roles overlap or correlate, self-concept differentiation is low. A related construct, *self-concept clarity,* conceptually opposite to Donahue's, has been described by Campbell and her colleagues (e.g., Campbell, 1990). A central facet of clarity is a consistency in the content of different self-aspects (Campbell et al., 1996). Campbell's self-concept clarity is quite similar in meaning to the overlap component of SC, while Donahue's self-concept differentiation reflects *little* overlap among self-aspects.

Interestingly, research on both these constructs reveals *integration* to be advantageous: Donahue's index has been found to be related to poor psychological well-being (low self-esteem, high levels of depressive symptomatology, and high neuroticism; Donahue et al., 1993); similarly, Campbell's index has been found to be related to high self-esteem (Campbell, 1990; Campbell, Chew, & Scratchley, 1991). These findings imply that integration and unity (or, seen differently, high overlap among self-aspects) are beneficial for emotional well-being. Thus, they may seem to contradict the original findings of the SC model (Linville, 1987) proposing that SC is a buffer of depression. However, the present studies (as well as recent work by others, e.g., Campbell et al., 2003; cf. Showers & Zeigler-Hill, 2003) can help reconcile the seeming contradiction by suggesting that the models apply under different conditions. Linville's (1987) model speaks of a stress-buffering effect; our current findings suggest that it may need to be limited further to the buffering of very severe stress. Similarly, the alternative models speak of a cross-sectional association between integration and well-being; our current findings suggest that they may be true even under conditions of elevated but mundane stress.

Comparisons between the predictions of these models are hampered by the differing methodologies they use. In this regard, there are reasons to prefer the type of trait-sort procedure used by Linville (1987) as a basis for a common methodology (for related arguments, see also Campbell et al., 2000, 2003). First, it is possible to assess both differentiation and integration using the SC procedure, as we did in the present studies. Second, as we mentioned in discussing the sociological literature, the SC procedure is distinct in its idiographic nature, which can elicit a more valid representation of self-knowledge than procedures based on a closed-ended questionnaire or a preset and fixed set of roles or self-aspects.

Implications for Emotion Regulation

Our results suggest that the differentiation and integration of self-knowledge have different functions under varying levels of stress. In this study, we began distinguishing between kinds and severity of stress. Clearly, further studies and more information are needed to define the contexts and situations in which a multifaceted self is beneficial or harmful. However, a possibility that emerges from our studies is that the most advantageous organization of our self-concept will depend on the circumstances in which we find ourselves. This idea is consistent with recent research on the dynamic role of the self-concept under stress (Showers, 2002; Showers & Zeigler-Hill, 2003). According to this view, the structure of self-knowledge is not static. Instead, it is deployed or reorganized dynamically in response to stressful conditions (e.g., Showers et al., 1998) or motivational needs (e.g., Woike, Gershkovich, Piorkowski, & Polo, 1999). Along with these models, our findings suggest that flexibility in self-knowledge may offer the greatest advantage: creating greater distinction under severe stress but greater overlap under more mundane stress may provide for the most stress buffering.

Limitations and Future Directions

We need to note several limitations to our studies. First, both use relatively small samples, which may have lowered the power to detect some of the effects of interest. However, our findings of two-way interactions (and of a three-way interaction in study 2) do suggest that power was sufficient. Moreover, the finding of significant effects that go against prediction (e.g., the exacerbation of severe stress by SC-D in study 2) could not be attributed to weak power. Nonetheless, larger samples would have allowed us to conduct more nuanced analyses, comparing, for example, individuals who experienced one severe stressor to those who experienced multiple ones. A larger or more symptomatic sample would have also allowed us to examine the stress-buffering or exacerbation role of SC at varying levels of original symptomatology, which would be useful in differentiating the effects of SC on the onset versus maintenance of depressive symptoms.

Another limitation, particularly in study 1, was the use of problematic stress indices. Both the objective index (exam score) and the subjective one were imperfect and could have affected the results of this study. Study 2 was designed specifically to correct this problem and to examine the role of stress using better indices. For this reason, we place greater weight on its results. Nonetheless, it is possible that our choice of time periods in this study (i.e., the computation of the mundane stress index as an accumulation over 4 months and the limitation of the severe stress index to the immediate 2 weeks) may limit the generality of these results. Further studies should examine the role of the SC components under various conditions. As Rothermund and Meiniger's (2004) findings suggest, specific attention should be paid to the interaction of these components with positive versus negative events.

Our samples came from two different cultures, spoke different languages, and faced different stressors (both those measured and ones unmeasured). This makes a direct comparison of the studies problematic; future work may benefit from examining similar questions (e.g., comparing specific academic stressors to broader self-reported stress) with uniform methods.

The studies adapted the original method used in SC studies. Strictly speaking, therefore, they are not replications of Linville's (1987) work. Among the substantial methodological departures were the large group administration, the breaking down of the task into successive steps, and the listing and naming of self-aspects prior to the assignment of features. A conceptual change was the restriction of self-aspects to social roles. Again, this departure apparently did not erase the effect, although the results may have differed had we used the more vague designation of self-aspects used by Linville.

One feature of our designs that was similar to those used in other studies were the short time intervals between the pretest and posttest assessments. Although common, these intervals (of 1 to 4 days in study 1 and of 2 weeks in study 2) are somewhat short, and as our own work (Rafaeli-Mor & Steinberg, 2002) has shown, buffering effects are more likely to emerge when the time lag is shorter. A more stringent test of the refined SC model will examine buffering or exacerbation over longer time lags.

Finally, though prospective studies such as these offer some support for the demonstration of causality, they are no substitute to experimental manipulation of the variables. Nonetheless, our conclusions regarding the effects of varying levels of stress would be difficult if not impossible to obtain from studies in which stress is manipulated rather than measured.

Summary

Although inspired by Linville's (1985, 1987) SC model, our studies depart from her approach to conceptualizing SC. Elsewhere, we have shown that the popular unitary index of SC produces inconsistent results (Rafaeli-Mor & Steinberg, 2002). We have explored the internal consistency of SC measures and have argued that the model requires examining two component processes separately (Brown, Hammen, Wickens, et al., 1995; Rafaeli-Mor et al., 1999), and now we have shown that separating the components reveals an interesting pattern of results. In these studies, we examined the role of the two mechanisms—high number of roles and low overlap (or high distinction) among them—as buffers of different types of stress. We found that the same structural organization may buffer us under one type of stress but exacerbate the effect of stress under another. Specifically, the number of roles, alone, serves as a buffer of low-level subjective stress; *high* overlap among self-aspects, alone, serve as a buffer of accumulated mundane stress; but low overlap and the interaction of low overlap and the number of roles serve as buffers of severe stressors such as loss or victimization.

This last finding provides clear support to the SC model but qualifies this support only to conditions of severe stress. Under less adverse conditions, our findings are consistent with the predictions of Block (1961) and with the findings regarding self-concept clarity (Campbell,

1990). Along with these writers, we believe that our work speaks to the importance of considering both integration and differentiation and to the adaptive benefit that can emerge from each.

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Acknowledgments. *Supported in part by a National of Institute of Mental Health National Research Service Award MH09894 to the first author. We thank Christopher F. Daley, Wendi Gardner, Atara Hiller, Sue Mineka, Efrat Neter, Jasia Pietrzak, and Bill Revelle for valuable comments on earlier versions of this manuscript.*

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