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Trait and Social Processes in the Link Between Social Support and Affect: An Experimental, Laboratory Investigation

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ABSTRACT This study investigated the extent to which the link between perceived social support and affect reflected support recipients' trait perceived support as well as three distinct social processes: the objective supportiveness of providers, the unique relationships among recipients and providers that were stable over occasions, as well as the unique relationships that varied across occasions. Ten recipients interacted with each of the same four providers on five separate occasions, for a total of 200 interactions. Recipients and independent observers rated recipient affect and provider support. Greater perceived support was related to greater positive affect for recipients' trait perceived support, as well as for relationships that were stable over occasions and relationships that varied across occasions. No social support effects were found for negative affect. Perceived similarity was a consistent predictor of recipients' support perceptions. Implications for social support models and interventions were discussed.

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A vast amount of research has documented an association between social support and numerous mental health variables (Sarason, Sarason, & Gurung, 2001), including depression (Cronkite, Moos, Twohey, Cohen, & Swindle, 1998), self-esteem (Newcomb & Keefe, 1997), suicidal ideation (Schutt, Meschede, & Rierdan, 1994), eating disorders (Stice, 2002), and anxiety disorders (Brewin, Andrews, & Valentine, 2000). Despite this extensive literature, scholars lack a full understanding of the extent to which the link between perceived support and mental health reflects trait-like differences among support recipients in their tendency to perceive others as supportive, as well as a number of different social processes. The relative magnitudes of trait perceived support and social processes have important theoretical and practical implications. Most social support models differ in the extent to which they emphasize trait and social processes (Sarason, Sarason, & Pierce, 1990). Moreover, the design of social support interventions should differ greatly, depending upon whether one attempted to influence trait perceived support or one of several different social processes (Lakey & Lutz, 1996).

The present study investigated the link between perceived support and affect using the techniques of Cronbach and colleagues' multivariate generalizability theory (Brennan, 2001a; Cronbach, Gleser, Nanda, & Rajaratnam, 1972; Strube, 2000). Multivariate generalizability analyses can isolate support recipients' trait perceived support from several distinct social processes and estimate correlations between support and mental health for each of these components. The present study utilized an experimental, within subjects design in which participants met with the same set of providers in the laboratory over multiple occasions. Recipients and independent observers rated affect and social support. Recipients also rated the perceived similarity of providers to recipients to assess the extent to which support recipients used similarity information to judge supportiveness. The use of multiple occasions allowed us to examine the extent to which specific social processes were stable across multiple social interactions. Thus, the present study differed from most social support research in that social support and affect were studied in the course of repeated face-to-face interactions.

To disentangle trait and social processes in social support, researchers have used Cronbach et al.'s (1972) Generalizability Theory (G Theory; Lakey, Drew, & Sirl, 1999; Lakey, McCabe, Fisicaro, &

Drew, 1996) and Kenny and La Voie's (1984) Social Relations Model (SRM; Branje, van Aken, & van Lieshout, 2002). These two approaches are essentially similar and can decompose variance in perceived support into a number of theoretically important components. The recipient trait component reflects the extent to which recipients consistently differ from one another in their ratings of provider supportiveness, averaged across providers. For example, John may consistently perceive the same providers as more supportive than does Bob. In contrast, social processes occur when some feature of social interaction influences the ratings of recipients. The present study distinguished among three distinct social processes: the provider component, the relationship component that was stable over occasions, and the relationship component that varied across occasions. The provider component reflects the objectively supportive characteristics of providers, as reflected in the extent to which recipients agree that some providers are more supportive than other providers. For example, on average, recipients may agree that Amy is more supportive than is Beth. Here, objectivity is defined in terms of interobserver agreement. Both relationship components reflect systematic differences in how recipients see the supportiveness of the same providers. For example, Beth may see John as more supportive than Bob, but Linda may see Bob as more supportive than John. Relationship components reflect the emergent properties of dyads that are independent of the stable characteristics of both recipients and providers. Phrased differently, relationship components reflect the unique match between specific pairs of recipients and providers. The present study distinguished between the relationship component that was stable across occasions and the relationship component that varied across occasions. The implications of this distinction for social support models and intervention will be discussed in more detail later in the introduction.

Previous research has found that perceived social support reflects a blend of recipients' trait perceived support, providers' objective supportiveness, and the unique relationships among providers and recipients (Branje et al., 2002; Lakey et al., 1996, 1999). The relationship component has been the strongest influence on perceived support in studies of U.S. college students (Lakey et al., 1996), depressed inpatients (Lakey et al., 1999), and Dutch families (Branje et al., 2002). However, research has only just begun to examine the extent to which these components of perceived support are related to

mental health constructs. Each component is statistically and conceptually independent, and, therefore, the correlation between mental health and perceived support could occur for any one or for all components.

We believe that distinguishing among recipient, provider, and relationship components in perceived support's link to mental health is important for understanding how social support is related to mental health and essential for designing more effective social support interventions. We first describe how these distinctions can clarify how support is related to mental health, which is defined in this article as levels of positive and negative affect.

First, these distinctions can clarify the extent to which perceived social support is related to mental health because of trait and social processes. Some authors have hypothesized that the link between perceived support and mental health primarily reflects trait perceived support (Kendler, 1997; Lakey & Cassady, 1990; Sarason, Pierce, & Sarason, 1990; Sarason, Sarason, & Shearin, 1986). If so, the link between perceived support and affect should occur for the recipient trait component specifically. If the link between perceived support and affect reflected recipient traits primarily, it would suggest that the vast amount of research on social support and mental health reflected personality processes more than social processes. In contrast, if the link between support and affect reflected social processes primarily, personality processes should be de-emphasized in social support models.

Second, such distinctions can help social support models that emphasize social processes become more explicit. Most social support models have proposed that support affects mental health through social processes (Sarason, Sarason et al., 1990). However these models have not articulated whether such social processes reflect the objectively supportive qualities of providers, or the unique relationships among recipients and providers. Such distinctions are important for a precise description of how social support is related to mental health. For example, a link between support and mental health for the provider component would indicate a nomothetic process, whereby objectively supportive providers elicit more favorable affect in nearly everyone. In contrast, the same link for the relationship component would indicate an idiographic processes whereby some providers are supportive and elicit favorable affect for some recipients, but not for others.

Determining the extent to which support and mental health are related for the recipient, provider, and relationship components has important implications for social support interventions. To influence a specific trait or social process, interventions must be designed very differently (Lakey & Lutz, 1996). In our opinion, interventions should target the processes that have the strongest influence on the mental health construct targeted for intervention, as well as the processes that display the strongest links between social support and mental health. For example, if support and mental health were linked primarily for the recipient component, it would suggest that interventions should focus on changing the personal characteristics of recipients rather than on providing access to supportive others (e.g., Brand, Lakey, & Berman, 1995). If support and mental health were linked primarily through the provider component, interventions should increase access to objectively supportive providers. If support and mental health were linked primarily through the relationship component, interventions should increase access to specific providers uniquely matched to specific recipients. Although models of social support have not been explicit as to which type of social process is most important, most social support interventions (e.g., Heller, Thompson, Trueba, Hogg, & Vlachos-Weber, 1991) have reflected the implicit assumption that social support operates through the objectively supportive properties of providers. In such interventions, providers were assumed to be supportive to all recipients and there were no attempts to match specific providers with specific recipients.

Therefore, it is important for social support research to determine the extent to which the link between perceived support and mental health reflects recipient, provider, and relationship components. Lakey and Scoboria (2005) appear to be the first to have estimated correlations between mental health and perceived support for both trait and social process components separately. Using multivariate generalizability analyses (Cronbach et al., 1972), Lakey and Scoboria (2005) found that the correlation between support and both high positive and low negative affect occurred for both trait and social process components and that the magnitude of the correlations was similar for both components ($\rho \cong .40$ to .60).

Although an important first step, Lakey and Scoboria's research (2005) has important limitations. First, and most importantly, they used a design in which each participant rated his or her most

important social network members. Although such a design maximized realism, the design could not separate the provider and relationship components. As just discussed, estimating the link between perceived support and mental health for both of these components is important for understanding how social support is related to mental health and is essential for designing more effective social support interventions. Yet, distinguishing between provider and relationship components requires a fully crossed design in which all recipients interact with the same providers. This requirement makes it difficult to study recipients' most important network members because most people do not have the same most important network members. In the present study, recipients and providers were strangers when the study began, thus permitting all recipients to interact with all providers. Strangers may not be able to influence affect to the same extent as established personal relationships, and, therefore, this design may underestimate the magnitude of social processes. Nonetheless, most social support and psychotherapeutic interventions offer strangers as supportive others (e.g., Heller et al., 1991).

A second limitation of Lakey and Scoboria (2005), which is shared by nearly all social support research, is that recipients were asked to rate the typical supportiveness of specific providers as well as their typical experience of affect. Recipients' memories of previous social interaction and associated affect may be quite different from what recipients thought and felt at the time of the interaction. If the goal of research is to study what occurs in specific social interactions, as compared to global cognitive representations of the social world, recipients' ratings should occur as proximate to specific social interactions as possible. Thus, participants in the present study provided ratings immediately after each interaction, making it more likely that participants based their ratings on the most recent interaction.

A third limitation of Lakey and Scoboria (2005), as well as all G theory/SRM studies of social support conducted thus far, is that recipients rated providers at a single point in time. As noted by Kenny, Mohr, and Levesque (2001), single-point ratings make it impossible to determine the extent to which relationship components reflect the enduring qualities of relationships, merely transient factors that were present when recipients made their ratings, or transient characteristics of a recent interaction. As an example of a relationship effect that is stable across occasions, Beth may see John as more supportive than Bob, but Linda may see Bob as more supportive than John when

perceptions are averaged across multiple occasions. Yet, relationship effects may not be stable over time. On any given occasion, depending upon the differing nature of Beth and Linda's current stressors, or perhaps John or Bob's current affective state, Beth may see Bob as more supportive than John, and Linda may see John as more supportive than Bob. We describe the statistical component that reflects this phenomenon as the relationship component that varies across occasions. It is important to distinguish between these two types of relationship components because the magnitudes of these components have implications for intervention. Interventions based on any relationship component require that investigators forecast the specific matches among providers and recipients that will be most supportive. Yet, forecasting relationship components assumes that they are at least partially stable across occasions. Thus, it is essential to estimate the extent to which relationship components in perceived support are stable across occasions. To permit such estimates, the current study observed interactions across five occasions.

Finally, the current study also investigated the information used by recipients to judge the supportiveness of providers. First, we examined the extent to which recipients' judgments of support reflected recipients' perceptions of providers' similarity to recipients. Perceived similarity has already been established as a strong predictor of supportiveness (Lakey et al., 2002; Suitor, Pillemer, & Keeton, 1995). Yet, as described by Lakey, Lutz, and Scoboria (2004), the correlation between support and similarity only reflects true similarity when the correlation occurs for relationship components. This is because similarity describes a relation between two or more individuals rather than a property of an individual in isolation, as is the case when the similarity–support correlation occurs for the recipient or provider components. Although Lakey et al. (2004) observed strong correlations between similarity and support for the relationship component, they studied participants' judgments of TV characters. We were interested in the extent to which such an effect would generalize to perceptions of live social interaction.

Second, the present study investigated the extent to which recipient and relationship effects for support occurred because recipients elicited different levels of observable support from providers. Previous research has already documented that the recipient component partly reflects recipients' cognitive biases whereby recipients differ in the extent to which they perceive providers as

supportive, regardless of the actual characteristics of providers (Lakey et al., 1996, Study 3). However, to what extent do recipient effects reflect a process whereby some recipients characteristically elicit greater support from all providers than do other recipients? Regarding relationship effects, Lutz and Lakey (2001) documented a cognitive mechanism whereby recipients systematically disagreed in their perceptions of providers' supportiveness because recipients differed in how they combined information about providers in computing support judgments. Yet, to what extent do relationship effects in recipients' judgments reflect a phenomenon whereby providers differ in the extent to which they behave supportively to some recipients, but not others? To examine the extent to which recipient and relationship effects reflected the observable behavior of providers, the present study included observer ratings of providers' supportiveness. If recipient and relationship effects on perceived support reflected differences in observable supportiveness, then recipients' and observers' ratings of providers' supportiveness should be significantly correlated for the recipient and relationship components.

In summary, the present study examined three questions: (1) To what extent was perceived support related to high positive and low negative affect for the recipient and provider components as well as relationship components that were stable across occasions and relationship components that varied across occasions? (2) To what extent were relationship components stable across occasions? (3) To what extent were recipients' judgments of support linked to perceived similarity and to the observable supportiveness of providers?

METHOD

Participants

Fourteen individuals (10 recipients and 4 providers), initially unacquainted with one another, participated in the study. Participants were recruited through advertisements posted around the university campus. Providers ranged in age from 20 to 25 years ($M = 23$), and included one African American woman, two European American women, and one Latino American man. The ages of recipients ranged from 19 to 49 years ($M = 30$) and included four African American women, one Asian American man, two European American men, and three European American

women. College majors were quite varied, including computer engineering, chemical engineering, marketing, math, special education, communications, biology, library science, graphic design, social work, and psychology. The majority of participants (73%) were working on their undergraduate degrees with the remainder in graduate school or working post degree. Providers included a recent graduate in library science, a social work student, a psychology student, and a graphic design student. Participation was voluntary. Participants were paid $5 for each interaction. Payment was made after each interaction.

Procedure

Informed consent was obtained from both recipients and providers at the beginning of the study. Participants were met in a waiting area and invited into the interaction room when both members of the dyad had arrived. Each provider met separately with each recipient for 20 minutes on five separate occasions for a total of 50 conversations. Across all participants there were 200 conversations. Participants were instructed to discuss a stressful topic only during Occasion 3. We chose Occasion 3 for this instruction because we wanted participants to have two conversations to get acquainted before prompting them to discuss stressors. However, we did not request that participants discuss stressful topics during the other occasions because we expected that (1) recipients naturally vary in when and with whom they discuss stressful topics and (2) previous research has shown that recipients rely upon much the same information to judge support, whether or not stressful topics are discussed (Lakey et al., 2002; Lakey, Ross, Butler, & Bentley, 1996; Lutz & Lakey, 2001). Prior to the laboratory conversations, participants were told that they would meet with another participant for twenty minutes and that these conversations would be videotaped. Participants were asked to talk about anything they wanted to, with specific word choice left to the two experimenters. When participants asked what they should talk about, they were told, "It's up to you." When participants asked what others talked about, they were told, "All sorts of things." Conversations were held in a private room with two chairs and a small table. Each conversation was videotaped through a one-way mirror. A small wireless microphone out of direct view of participants supplied audio. All participants consented to videotaping. Following each conversation, participants were separated, and recipients rated their own affect, providers' supportiveness, and the perceived similarity of providers to recipients during the most recent interaction. Observers later rated recipients' and providers' affect, as well as providers' supportiveness after viewing videotapes of each conversation.

Measures

Provider supportiveness. Recipients and observers rated providers' supportiveness after each conversation, using a 7-item modified version of the Social Provisions Scale (Cutrona & Russell, 1987). The Social Provisions Scale is a widely used measure of perceived social support that shows good convergent validity with other measures of social support and good discriminant validity with mental health variables such as depression and neuroticism (Cutrona & Russell, 1987). For the current study, items were selected based upon their appropriateness for short conversations. Recipients were asked to "answer the following questions with regard to the person with whom you just had a conversation" on a 4-point scale ranging from *not at all* to *very much*. Internal consistency for recipient ratings of support ranged from .88 to .95, when calculated separately for each provider.

Affect. In the present study, we operationalized mental health as positive and negative affect. Recipients and observers rated affect with the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). This 20-item measure yields separate scores for positive affect and negative affect. The PANAS has good reliability and validity. Factor analysis has mostly corroborated the factor structure of the scales and the PANAS has good convergent and discriminant validity (Watson et al., 1988). Negative affect is more closely linked to anxiety, Neuroticism, life stress, and daily hassles than is positive affect, whereas positive affect is more closely linked to Extroversion (Watson & Clark, 1992) and social support (Finch, 1988) than is negative affect. Depression is composed of both low positive affect and high negative affect. Participants were asked to indicate the extent to which they experienced the affect described by each item during the conversation on a 5-point scale ranging from *very slightly or not at all* to *extremely*. Internal consistency for recipient ratings ranged from .94 to .98 for positive affect when calculated separately for each provider and ranged from .63 to .89 for negative affect when calculated separately for each provider.

Stressfulness of the conversation. Although perceived support is related to favorable affect regardless of the presence of stressors (Sarason et al., 2001), social support research has historically emphasized support in the context of stressful life events. Therefore, following each conversation, recipients rated the most stressful topic discussed on a scale of 1 to 4, ranging from *not stressful at all* to *very stressful*. Recipients also provided a short description of the topic rated. Thirty-four percent of conversations involved topics that were rated as "not stressful at all," 47.5% of topics were rated "a little stressful," 13.5% of topics were rated "stressful," and

5.5% of topics were rated "very stressful." Three of 10 recipients disclosed a "very stressful" topic at least once, and 80% of recipients disclosed a "stressful" topic a least once. All participants discussed a topic that was "a little stressful" at least once. As described earlier, to encourage the discussion of stressful topics, participants were instructed to discuss a stressful topic during Occasion 3. For Occasions 3 to 5, 80% of participants discussed a "stressful" or "very stressful" topic at least once. There was a significant linear trend for participants to discuss increasingly stressful topics across the five occasions ($F = 18.41$; $p < .05$). There was an impressive range of stressors discussed, including "father's colon cancer," "domestic violence cases at work," "relatives' poverty," "gambling debts," "father's alcoholism," "eviction from apartment," "marital and in-law conflict," and "relationship breakup."

Observer ratings. Six independent observers rated recipients' and providers' affect and provider support[1] for each of the 200 conversations (10 recipients $\times$ 4 providers $\times$ 5 occasions) using the same measures used by recipients, immediately after observing each videotaped conversation. Instructions for the scales were modified to refer to recipients or providers as appropriate. In rating affect, observers were asked to "indicate to what extent these adjectives describe the recipient during the conversation." In rating support, observers were asked to "answer the following questions about how supportive the provider was during the conversation." An example social support item is "The provider viewed the recipient as competent."

Observers were undergraduate research assistants. To ensure that participants and observers had the same concepts in mind when making ratings, observers used lay conceptions of support and affect. Lay concepts of psychological constructs have been used successfully in previous research using independent observers (Borkenau, Riemann, Angleitner, & Spinath, 2001). Observers were provided with dictionary-style definitions of key words used in the measures of social support and affect. For example, the PANAS word "hostile" was defined as "openly opposed or resisting" and the PANAS word "inspired" was defined as "animated, enlivening, or exalting." The Social Provisions Scale word "intimate" was defined as "something of a personal or private nature; knowledge not affect." All observers met to discuss the meaning of the words and to amend the definitions. Observers were instructed to refer to the definitions during their ratings. To examine the internal consistency of the items, we calculated Cronbach's alpha separately for each provider. Internal consistency ranged from .89 to

1. Observers also rated provider affect, but these data did not yield consistent findings, and so they are not reported here. Details of analyses involving provider affect are available from the authors.

.98 for provider support, from .92 to .98 positive affect, and from .85 to .97 for negative affect. Inter-rater reliability was calculated using formulas provided by Cronbach et al. (1972) as well as Cardinet, Tourneur, and Allal (1976).[2] Reliability across the six observers was .90 for provider support, .95 for recipient positive affect, and .92 for recipient negative affect.

Statistical Analyses

Univariate generalizability analyses (Cronbach et al., 1972; Shavelson & Webb, 1991; Strube, 2000) were used to estimate the extent to which each of the main study variables reflected the recipient and provider components, as well as relationship components that were stable across occasions and relationship components that varied across occasions. For recipient ratings of support and affect, we aggregated items to create two composites to decrease measurement error. Thus, the design was a 10 (Recipients) × 4 (Providers) × 5 (Occasions) × 2 (Items) fully crossed, mixed ANOVA with random factors. For observer ratings, we aggregated across all items to simplify the design, and so there was no Items factor for these analyses. Thus, the design was a 10 (Recipient) × 4 (Provider) × 5 (Occasions) × 6 (Observers) fully crossed, mixed ANOVA with random factors. Relationship components that were stable across occasions were reflected in the Recipients × Providers interactions and relationship components that varied across occasions were reflected in the Recipients × Providers × Occasions interactions. We used ordinary least squares estimation procedures because maximum likelihood methods can be problematic with small samples (DeShon, Ployhart, & Sacco, 1998). We used quasi-*F* ratios to test the significance of main effects and two-way interactions because the mean squares associated with these effects are confounded with the variance from higher-order interactions in random effects models.[3] Conventional *F* tests were used for three-way interactions because such interactions were confounded only with variance due to the error term. For all tests, the highest order interaction was used as the error term, because the prototypical generalizability study has one observation per cell and therefore has no conventional, within-subjects error term (Kenny, 1994; Lindman, 1974).

Multivariate generalizability correlations were conducted according to the procedures used by Lakey and Scoboria (2005) and Lakey et al.

2. The formula used to calculate the generalizability coefficient for observer ratings was: $(\sigma^2_r+\sigma^2_p+\sigma^2_o+\sigma^2_{rp}+\sigma^2_{ro}+\sigma^2_{po}+\sigma^2_{rpo})/(\sigma^2_r+\sigma^2_p+\sigma^2_o+\sigma^2_{rp}+\sigma^2_{ro}+\sigma^2_{po}+\sigma^2_{rpo}+(\sigma^2_{rj}/n_j)+(\sigma^2_{pj}/n_j)+(\sigma^2_{oj}/n_j)+(\sigma^2_{rpj}/n_j)+(\sigma^2_{roj}/n_j)+(\sigma^2_{poj}/n_j)+(\sigma^2_{rpoj}/n_j)$, where r = recipient, p = provider, o = occasion, and j = judge (i.e., observer). Analyses were collapsed across items.

3. The formulas used for constructing the quasi *F*s are available from the authors.

(2004), using *Mgenova*, a computer program for multivariate generalizability analyses (Brennan, 2001b). We analyzed the data as a $p^{\bullet} \times i^{\bullet} \times h^{\bullet}$ multivariate generalizability design as described by Brennan (2001a) for which recipients were treated as *p,* providers as *I,* and occasions as *h*. The variables were recipients' and observers' ratings of affect, support, and similarity.

Following Lakey and Scoboria (2005) and Lakey et al. (2004), we tested the significance of multivariate generalizability correlations (ρ) by the normal approximation bootstrap method (Mooney & Duval, 1993), because traditional parametric significance tests are not available for these correlations. Bootstrapping estimates characteristics of the sampling distribution (e.g., the standard error) by selecting random re-samples with replacement from a given study's data. The normal approximation method estimates the standard error of the sampling distribution, and uses the *z* distribution to determine conventional probability values. The normal approximation method yields acceptably accurate results with as few as 50 resamples (Mooney & Duval, 1993). Although a very large number of resamples is optimal, a comparatively small number of resamples was necessary when using *Mgenova*, because we had to run the program separately for each resample and conduct manual calculations for correlations involving provider and relationship components. Because all factors in the design were random, we calculated ρ rather than the residual for each resample (Mooney & Duval, 1993). We used the *bsample* procedure from the statistical program *STATA* (StataCorp, 2003) to draw 50 random resamples with replacement from the original data. We estimated the standard error of the sampling distribution for a given correlation by taking the standard deviation of the distribution of the 50 correlations for the two variables. When the correlation was larger than 1.96 × (the standard error) for a given correlation, the multivariate g correlation was significant.

Finally, we should note that the correlations for the recipient, provider and relationship components are statistically independent because the data for these components are represented incommensurately. For example, the data that form the basis for correlations for the recipient trait component are represented as a single column, whereas the data that form the basis for correlations for the relationship component that is stable across occasions are represented as Recipient × Provider matrices.

RESULTS

Univariate generalizability analyses were conducted to determine the relative magnitude of recipient and provider components, as well as relationship components that were stable across occasions and that

varied across occasions, as measured from the perspectives of participants (Table 1) and observers (Table 2). Effects involving items and observers were excluded from the tables to simplify the presentation of results. In reporting results, we emphasized the proportion of the total variance accounted for (ω^2). For recipient ratings of provider support, there were significant and sizable effects for trait-like differences among recipients ($\omega^2 = .24$), relationships that were stable across occasions ($\omega^2 = .17$) and relationships that varied across occasions ($\omega^2 = .12$). There was no significant provider effect. For observer ratings, provider support significantly reflected trait-like differences among recipients ($\omega^2 = .10$), the objectively supportive properties of providers ($\omega^2 = .05$), as well as relationships that were stable across occasions ($\omega^2 = .02$) and relationships that varied across occasions ($\omega^2 = .11$).

Recipient positive affect, as rated by recipients, largely reflected trait-like differences among recipients ($\omega^2 = .39$) with additional considerable contributions from relationships that were stable across occasions ($\omega^2 = .08$) and relationships that varied across occasions ($\omega^2 = .17$). Recipient positive affect, from the perspective of observers, reflected trait-like differences among recipients ($\omega^2 = .13$), providers ($\omega^2 = .01$), and relationships that varied across occasions ($\omega^2 = .07$).

Recipient negative affect, as rated by recipients, strongly reflected relationships that varied across occasions ($\omega^2 = .35$, $p < .05$), and, to a lesser extent, by trait-like differences among recipients ($\omega^2 = .09$). There were no effects for providers or for relationships that were stable across occasions. The same pattern was found for observer ratings of recipient negative affect as there were significant effects for relationships that varied across occasions ($\omega^2 = .14$), as well as for trait-like differences among recipients ($\omega^2 = .04$), but no effects for providers or for relationships that were stable across occasions.

Recipients' judgments of providers' similarity to recipients significantly reflected trait-like differences among recipients ($\omega^2 = .22$), relationships that were stable across occasions ($\omega^2 = .20$), and relationships that varied across occasions ($\omega^2 = .13$), but not providers.

These univariate analyses provided useful information regarding one of the study's main goals: the extent to which relationship components of perceived support were stable across occasions. For both recipient and observer ratings, there were significant components of perceived support for relationships that were stable across occasions.

Table 1
Univariate Effect Sizes for Recipients' Ratings
[Recipients (10) × Providers (4) × Occasions (5) × Items (2)]

	PSS			PA			NA			Similarity		
Effect	ω^2	F′	df	ω^2	F′	df	ω^2	F′	df	ω^2	F′	df
Recipient	.24*	51.43	3.8	.39*	138.19	6.4	.09*	13.74	2.6	.22*	32.40	5.1
Provider	.00	< 1.00	2.7	.00	< 1.00	2.2	.00	2.25	1.1	.00	< 1.00	< 1.0
Relationships that are stable across occasions	.17*	10.15	20.1	.08*	8.03	14.5	.00	< 1.00	1.5	.20*	8.10	19.3
Relationships that vary across occasions	.12*	2.27[a]	108.0	.17*	4.02[a]	108.0	.35*	3.50[a]	108.0	.13*	1.90[a]	108.0
Error	.19		108.0	.12		108.0	.27		108.0	.29		108.0

Note. PSS = Perceived social support; PA = positive affect; NA = negative affect; Sim = similarity.
[a]True F.
*$p < .05$.

Table 2
Univariate Effect Sizes for Observers' Ratings
[Recipients (10) × Providers (4) by Occasions (5) × Observers (6)]

	Pss			PA			NA		
Effect	ω^2	F′	df	ω^2	F′	df	ω^2	F′	df
Recipient	.10*	41.03	6.2	.13*	71.95	7.6	.04*	16.48	2.8
Provider	.05*	44.83	1.4	.01*	12.82	1.6	.00	<1.00	<1.0
Relationships that are stable across occasions	.02*	3.22	7.7	.01	1.77	5.8	.01	2.27	4.7
Relationships that vary across occasions	.11*	3.09[a]	108.0	.07*	2.85[a]	108.0	.14*	3.73[a]	108.0
Error	.31		540.0	.22		540.0	.31		540.0

Note. PSS = Perceived social support; PA = positive affect; NA = negative affect; Sim = similarity.
[a]True F.
*$p < .05$.

For recipients' ratings, relational perceived support was slightly more stable across occasions ($\omega^2 = .17$) than it was variable ($\omega^2 = .12$). For observer ratings, relational perceived support was more variable across occasions ($\omega^2 = .11$) than it was stable ($\omega^2 = .02$).

Correlations Between Support and Affect

The primary goal of the present research was to examine correlations between provider support and recipient affect when the correlations reflected recipient traits and providers' objective supportiveness, as well as relationships that were stable across occasions and that varied across occasions. As described below, there were consistent significant correlations between recipient positive affect and provider support for most components. In contrast, there were no significant correlations between support and low negative affect. Table 3 provides the multivariate generalizability correlations and associated standard errors between perceived social support, positive affect, negative affect, and similarity for recipient and observer ratings. Following Kenny (1994), when there was no significant univariate effect for a given construct, we did not calculate

Table 3
Multivariate Generalizability Correlations (and Standard Errors)
[Recipients (10) × Providers (4) × Occasions (5)]

	PSS (R)	PA (R)	NA (R)	Sim (R)	PSS (O)	PA (O)	NA (O)
PSS (R)							
Recipient	—	.78* (.16)	− .52 (.43)	.98* (.17)	− .15 (.55)	.02 (.50)	− .41 (.48)
Provider	—	nc	nc	nc	nc	nc	nc
Relationships that are stable across occasions	—	.78* (.10)	nc	.59* (.17)	.12 (.40)	nc	nc
Relationships that vary across occasions	—	.25* (.06)	− .13 (.11)	.37* (.14)	.21* (.06)	.18* (.05)	− .02 (.10)
PA (R)							
Recipient	—	—	− .52 (.43)	.63 (.37)	− .28 (.39)	− .39 (.40)	− .35 (.34)
Provider	—	—	nc	nc	nc	nc	nc
Relationships that are stable across occasions	—	—	nc	.76* (.11)	− .19 (.37)	nc	nc
Relationships that vary across occasions	—	—	− .24* (.07)	− .05 (.06)	.22* (.11)	.22* (.10)	− .02 (.12)
NA (R)							
Recipient	—	—	—	− .39 (.48)	− .58 (.38)	− .50 (.36)	.24 (.36)
Provider	—	—	—	nc	nc	nc	nc
Relationships that are stable across occasions	—	—	—	nc	nc	nc	nc
Relationships that vary across occasions	—	—	—	− .10 (.14)	.08 (.08)	− .08 (.13)	.37* (.10)

(*Continued*)

Table 3 (Cont.)

	PSS (R)	PA (R)	NA (R)	Sim (R)	PSS (O)	PA (O)	NA (O)
Sim (R)							
Recipient	—	—	—	—	−.10 (.64)	−.12 (.56)	−.02 (.41)
Provider	—	—	—	—	nc	nc	nc
Relationships that are stable across occasions	—	—	—	—	.35 (.22)	nc	nc
Relationships that vary across occasions	—	—	—	—	.13 (.07)	.17 (.09)	.10 (.13)
PSS (O)							
Recipient	—	—	—	—	—	.83* (.22)	.56 (.40)
Provider	—	—	—	—	—	−.90* (.44)	nc
Relationships that are stable across occasions	—	—	—	—	—	nc	nc
Relationships that vary across occasions	—	—	—	—	—	.45* (.07)	.21* (.07)
PA (0)							
Recipient	—	—	—	—	—	—	.07 (.49)
Provider	—	—	—	—	—	—	nc
Relationships that are stable across occasions	—	—	—	—	—	—	nc
Relationships that vary across occasions	—	—	—	—	—	—	−.03 (.15)

Note. *$p < .05$. R = Recipient ratings; O = Observer ratings; PSS = Perceived social support; PA = positive affect; NA = negative affect; Sim = similarity. Nc = correlation not calculated because one or both of the univariate effects was not significant.

multivariate g correlations involving that construct. Each cell in Table 3 lists the multivariate generalizability correlation and the correlation's standard error for each of the four components. For example, the first cell lists the correlations between perceived support and positive affect for recipient ratings for each of the four components. The correlation for the recipient component was .78 with a standard error of .16. The correlation for the provider component was not calculated because there was no significant univariate effect for either perceived support or positive affect. The correlation for the relationship component that was stable across occasions was .78 with a standard error of .10.

When correlations reflected trait-like differences among recipients, recipients who consistently perceived providers as more supportive consistently reported more positive affect than did recipients who perceived providers as less supportive ($\rho = .78$). Observers witnessed a similar pattern; recipients who consistently expressed more positive affect elicited consistently more support from providers than did recipients observed to express less positive affect ($\rho = .83$). Nonetheless, recipients' perception of support, when reported by recipients, was not the same effect as recipients' elicitation of support, when reported by observers. That is, the recipient component for support when rated by recipients was not significantly related to the recipient component for support when rated by observers. There were no significant correlations involving negative affect for the recipient trait component.

When correlations reflected the objectively supportive characteristics of providers, the only significant correlation was the counterintuitive finding that the more supportive the provider, the less positive affect was observed in recipients ($\rho = -.90$) when both support and recipient affect was rated by observers. There were no significant provider effects on recipients' ratings of support or affect, and therefore we did not estimate correlations among those components.

When correlations reflected relationships that were stable across occasions, more supportive dyads were associated with greater recipient positive affect ($\rho = .78$) when recipients provided ratings. In contrast, observers' ratings of provider support were not significantly correlated with recipients' ratings of positive affect. There were no univariate effects for negative affect or for observers' ratings of recipients' positive affect, and so correlations were not calculated for those components.

When correlations reflected relationships that varied across occasions for both recipient and observer ratings, more supportive interactions were associated with more positive affect in recipients. This correlation was significant when recipients rated their own affect and providers' support ($\rho = .25$), when recipients rated affect and observers rated support ($\rho = .22$), when observers rated affect and recipients rated support ($\rho = .18$), and when observers rated both recipient affect and provider support ($\rho = .45$). There were no significant correlations involving recipient negative affect.

Correlates of Supportiveness

The final goal of the present study was to investigate two potential correlates of support. To what extent did recipients judge similar providers as supportive, especially for relationship components, and to what extent did recipients' perceptions of providers' support correspond to observers' views of providers' support? If recipients' perceptions of provider support corresponded well with observers' views, it would suggest that recipients' support perceptions were based on the supportive actions of providers, as observed by others.

Recipients consistently saw more similar providers as more supportive. This link was observed when correlations reflected trait-like differences among recipients ($\rho = .98$), when correlations reflected relationships that were stable across occasions ($\rho = .59$), and when correlations reflected relationships that varied across occasions ($\rho = .37$). We did not estimate the correlation between support and similarity for the provider component because there were no significant univariate effects for these constructs.

In contrast, recipients' ratings of support were not significantly related to observers' ratings of support for either trait-like differences among recipients or for relationships that were stable across occasions. There was modest, but significant, agreement between recipients and observers on provider supportiveness ($\rho = .21$) when correlations reflected relationships that varied across occasions.

DISCUSSION

The goals of the present study were to examine (1) the extent to which support and affect were related for recipient and provider

components, as well as for relationship components that were stable across occasions and that varied across occasions; (2) the extent to which relationship effects were stable across occasions; and (3) the extent to which recipients based their support judgments on perceived similarity and the support offered by providers, as reported by independent observers. The main findings of the present study were that the correlation between recipient positive affect and provider support reflected trait-like differences among recipients as well as relationships that were stable across occasions and that varied across occasions. Furthermore, many of the links between support and positive affect were found for both recipient and observer ratings. In contrast, no significant correlations involving negative affect were observed. Relationship effects for perceived support were somewhat stable across occasions, but there were also large effects that reflected relationships that varied across occasions. Recipients appeared to use the perceived similarity of providers to recipients to judge supportiveness, and this effect reflected both trait-like differences among recipients, as well as relationships that were stable across occasions and that varied across occasions. Evidence that recipients based support judgments on observable support offered by providers was obtained only for relationships that varied across occasions.

Previous studies have found that perceived support reflects a blend of the effects of recipients' traits, providers' objective supportiveness, and the unique relationships among recipients and providers (Branje et al., 2002; Lakey et al., 1996, 1999). However, previous studies have not indicated which of these components account for the link between support and mental health. Lakey and Scoboria (2005) found that the correlation between support and affect occurred for components that reflected both recipient traits and a combination of different social processes. However, Lakey and Scoboria (2005) could not disentangle several distinct social processes because participants did not rate the same providers. In the present study, recipients interacted with the same providers across multiple occasions, permitting the isolation of three distinct forms of social process: the objectively supportive characteristics of providers, relationships that were stable across occasions, and relationships that varied across occasions. It is important to distinguish among these different forms of social processes because the implications for models of support and for intervention differ depending on which social processes account for the link between support and affect.

More supportive relationships were associated with more positive affect, for both relationships that were stable across occasions, as well as those that varied across occasions. When recipients provided ratings, the link between support and positive affect was especially strong (.78) for relationships that were stable across occasions. However, observers' ratings did not yield the same strong correlation in the present study. Apparently, recipients' subjective experiences of support from providers did not correspond to the same judgments made by observers when judging the same social interactions. Finally, more supportive interactions were associated with greater recipient positive affect than were less supportive interactions, when these constructs reflected relationships that varied across occasions. Although of modest magnitude (.18 to .45), these correlations were found quite consistently across both recipients' and observers' ratings.

Objective provider characteristics did not consistently emerge as important to the link between support and affect in this study—although the sample was small—and so there may not have been enough power to detect such effects. The likely low power for detecting provider effects may be especially problematic because previous studies using the G theory or SRM approaches suggest that provider effects are quite small. For example, the average provider effect was .04 in Lakey, McCabe et al.'s samples (1996; Studies 1 & 2) that were most similar to the current study, and Branje et al. (2002) estimated provider effects at .03. The one significant correlation involving affect and support for the provider component was contrary to expectation: The most supportive providers elicited the least positive affect in recipients, when observers rated both support and affect. The present study provided no explanation for this unexpected effect, although previous research has often found that more objective measures of specific supportive actions are related to less favorable affect (Barrera, 1986). We wondered if the objectively supportive providers elicited boredom (i.e., low positive affect) among the recipients, in the same way that some perceivers see Carl Rogers, as depicted in training videos, as supportive yet dull.

The current study also replicated Lakey and Scoboria's (2005) finding that part of the correlation between perceived support and positive affect reflected trait-like differences among recipients. In addition, the current study observed what appeared to be two separate mechanisms for recipient traits. For one mechanism, recipients

who characteristically viewed providers as more supportive also characteristically experienced more positive affect than did recipients who characteristically viewed providers as less supportive. Yet, this effect for recipients' trait perceived support did not correspond to observers' ratings of the extent to which some recipients consistently elicited more support from providers than did other recipients. Instead, recipients' trait perceived support was closely related to recipients' tendency to see other people as similar to themselves. This pattern of findings is consistent with models that have emphasized the role of recipients' perceptual biases in social support and affect (e.g., Lakey & Cassady, 1990; Sarason, Pierce et al., 1990). Different trait mechanisms were suggested by the correlation between observers' ratings of recipient positive affect and provider support for trait-like differences among recipients. This correlation indicated that the recipients who characteristically expressed the most positive affect also elicited the most support from providers. Insofar as part of social skills involves expressing positive affect, this effect is reminiscent of Sarason and colleagues' findings that participants with high perceived support displayed higher levels of observer-rated social skills than did low perceived support participants (Sarason, Sarason, Hacker, & Basham, 1985; Sarason et al., 1986). Thus, in the current sample, recipients' subjective experience of positive affect was related to their private perceptions of support, and recipients' expression of positive affect was related to how providers treated recipients, but these two mechanisms were unrelated.

To summarize the findings regarding perceived support and affect, positive affect and support were significantly related for trait-like differences among recipients, relationships that were stable across occasions, as well as relationships that varied across occasions. Surprisingly, there were no significant correlations involving negative affect, which is inconsistent with the findings of Lakey and Scoboria (2005). One important difference between the current study and Lakey and Scoboria (2005) is that the current study involved people who began the study as strangers, whereas Lakey and Scoboria studied recipients' most important network members. Although there was a strong negative affect component for relationships that varied across occasions in the current study, this component was not related to perceived support. Perhaps the link between negative affect and low perceived support requires a longer relationship history than captured by the five interactions studied here. For example, low

perceived support may become linked with negative affect when providers are unsupportive in particularly critical situations, and perhaps such situations did not occur in the present study. It is also possible that perceived support has a closer affinity with positive affect than with negative affect, as observed by Finch (1988). If so, perceived support may be more relevant for clinical depression, which is composed of both high negative affect and low positive affect, than with anxiety disorders, which is composed primarily of negative affect (Watson, Clark, & Carey, 1988).

Are Relationship Components Stable Across Occasions?

A second goal of the present study was to estimate the extent to which relationship components were stable across multiple occasions. Previous studies have found strong effects for relationships, and because of this, some investigators have recommended that social support interventions focus on the relationship component of perceived support (Lakey & Lutz, 1996). However, this recommendation presumes that the relationship component is stable over occasions because stable treatment effects should require stable perceptions of support. The present study found substantial stability for the relationship component of support when based on recipients' perceptions, but much less stability when based on observers' perceptions. If replicated in subsequent studies, the present findings may indicate that interventions based on relationship components may be durable, at least when based on recipients' perceptions. The present study also found substantial variation across occasions in relationship effects. Thus, not only does supportiveness vary, depending upon the specific recipient and provider involved, but it varies across specific conversations as well (Kenny et al., 2001).

On What Do Recipients Base Judgments of Support?

A final goal of the current study was to investigate the kind of information that recipients used to judge provider supportiveness. Previous research has found that recipients judged providers as supportive insofar as recipients saw providers as similar to recipients (Lakey, Ross, et al., 1996; Lakey, Adams, et al., 2002; Suitor et al., 1995). However, only correlations between similarity and support for relationship components involve true similarity because true

similarity describes relationships among recipients and providers, rather than a characteristic of providers or recipients in isolation (i.e., provider and recipient components). The current study replicated Lakey et al.'s (2004) finding that participants appeared to use similarity to judge support when those judgments reflected both relationships that were stable across occasions, as well as trait-like differences among recipients. However, the current study improved upon the design of Lakey et al. (2004) by studying perceptions of live people instead of well-known TV characters. In addition, the current study also found the link between similarity and support for relationships that varied across occasions. Thus, even though recipients typically perceived some providers as more similar and supportive than other providers, the perception of similarity and support also varied meaningfully from conversation to conversation.

The current study was also designed to detect the extent to which recipients' judged recipient supportiveness on the basis of the quality of support offered by providers, as judged by independent observers. There was some evidence for such effects. The recipients who perceived specific conversations as most supportive also received the highest quality support, as rated by observers, for the component that reflected relationships that varied across occasions. Thus, for this component, recipients' judgments of provider support appeared to be based, in part, on the observable supportive qualities of providers. Nonetheless, the magnitude of this relation was not especially strong. The relatively weak correspondence between recipients' perceptions and the actual behaviors of providers has been noted in many other studies using a range of different methodologies (Barrera, 1986; Dunkel-Schetter & Bennett, 1990) and speaks to the idiographic and subjective nature of perceived support, at least as captured by relationship components.

Theoretical Implications

We believe that the approach taken in the current study can contribute to our understanding of how social support is related to mental health. First, investigations of this kind can help social support models be more explicit about the kinds of social processes that are related to mental health. Although most social support models hypothesize that the correlation between perceived support and mental health reflects social processes (Sarason, Sarason et al.,

1990), most models are vague about important aspects of these social processes. For example, does the social process reflect the nomothetic, objectively supportive properties of providers, as implied by most intervention programs, or is it an idiographic process that varies from person to person? Is social support a broadly generalizable process that is stable over time, as implied by most social support measures, or is it a highly contextualized process that varies from occasion to occasion? We believe that the current study, combined with others of similar design, ultimately will provide an important body of findings that will stimulate greater precision and clarity in describing the exact social processes by which social support is related to mental health. So far, the current study, as well as previous findings (Branje et al., 2002; Lakey, Ross, et al., 1996; Lakey, Adams, et al., 1999), suggests strongly that perceived support is much more an idiographic than nomothetic process. If so, models of social support will need to articulate the psychological mechanisms by which such idiographic processes take place. Social support theorists might draw from the work of Mischel and Shoda (1995), who hypothesized a number of psychological mechanisms that might explain idiographic patterns in behavior. As an example of these mechanisms, Lutz and Lakey (2001) found that recipients differed in how they combined information about providers in judging support, and these differences in mental algebra led to idiographic judgments of support.

Second, previous social support models have tended to describe social support as either a social process or as a personality process. The approach taken by the present study integrates both types of processes within a unified framework. Rather than offering competing explanations for the same phenomenon, models that emphasize personality or social processes present accurate descriptions of different processes that occur at different levels of analysis.

Implications for Interventions

If replicated, the results of the current study will have important implications for intervention because the findings suggest which social support processes should be the most promising for new social support interventions. In our view, the most promising components will be those that (1) demonstrate significant links between social support and mental health and (2) are amenable to stable change.

Following these criteria, the current findings suggest that the temporally stable relationship component may be the most promising aspect of social support for intervention. In the following paragraphs we describe the basis for this conclusion and outline the implications for intervention.

Our criteria suggest that interventions aimed at the recipient component may have limited effectiveness. Although there was a significant correlation between positive affect and trait perceived support in both the present study and in Lakey and Scoboria (2005), influencing this component may prove difficult because this component is, by definition, the component that is stable across occasions and support providers. Consistent with this reasoning, Brand et al. (1995) reported only modest success in modifying trait perceived support.

The component of support that reflects relationships that vary across occasions may also be a poor candidate for intervention. Although there were consistent, though modest, correlations between positive affect and support for this component in the present study, this component, by definition, is not stable over time. Presumably, successful interventions should produce durable changes.

Thus, we believe it may be more effective to direct interventions to the component of perceived support that reflects relationships that are stable across occasions. In the current study, this component demonstrated two desirable qualities. First, it displayed strong links to positive affect. Second, by definition, it was durable across occasions. Because such effects involve unique matches between specific recipients and providers, successful intervention will require that social support researchers learn to forecast favorable matches.

Limitations

Before closing, it is important to review some of the current study's limitations. One limitation was that the participants were strangers when the study began. In order to differentiate between provider and relationship components, recipients had to interact with the same providers. This prevented the study of intimate relationships for practical reasons, as it would be difficult to find recipients who all had close personal relationships with the same providers. Thus, the findings may not generalize to close relationships. For example, as discussed previously, the absence of correlations between low

negative affect and support may mean that it takes longer than five interactions for negative affect and low perceived support to be linked. In addition, the magnitude of the social processes may have been larger and relationship components may have been more stable over occasions if we had studied close personal relationships. Nonetheless, social support interventions that provide recipients with new interaction partners must begin with relative strangers. A second important limitation is the small number of recipients who participated in the study. Although the study observed 200 separate social interactions, these interactions only involved 10 recipients and 4 providers. It is encouraging that the findings of the current study corresponded well with previous studies (e.g., Lakey, McCabe, et al., 1996, 1999, 2004; Lakey & Scoboria, 2005). Nonetheless, larger studies will be needed to provide firmer estimates of the magnitude of the correlations between affect and support for recipient, provider, and relationship components.

Third, the controlled laboratory environment may have reduced the external validity of the studies. Participants were scheduled to meet with particular providers on certain occasions. This does not reflect the more flexible nature of support seeking and social interaction outside the laboratory. Furthermore, participants were aware that conversations were videotaped and that research assistants would view the videos. Observation may have changed the nature of the interactions and limited their external validity.

In conclusion, the present study suggested a view of support that integrates several independent processes in the link between perceived social support and affect. The correlation between support and positive affect reflected both trait-like differences among recipients as well as the unique relationships among recipients and providers. Furthermore, the relational aspect of perceived support included a component that was stable across occasions, as well as a component that varied across occasions. Perceived support was related to positive affect for each of these components. These findings suggest that models that emphasize trait or social processes do not offer competing explanations of the same phenomenon but, rather, accurately describe different phenomena at different levels of analysis. The present study suggests the development of new social support interventions that specifically target the component of support and mental health that reflects relationships that are stable across occasions.

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