

Reciprocal Support Provision: Personality as a Moderator?

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Abstract

In some cases, support provision can be predicted by the history of prior social exchange. Receiving may encourage providing. Moreover, personality dispositions may moderate the degree to which persons reciprocate support. Co-student dyads (N = 43) facing an exam repeatedly reported their levels of received and provided support. Data revealed both direct and moderated reciprocal support provision. Actors' receipt of emotional support predicted the subsequent change in actors' provision of emotional support, indicating reciprocity. Also, more reciprocal emotional support provision was found in introverted and open individuals, whereas more reciprocal instrumental support provision was observed in introverts and less open individuals. Findings were partially validated when partner-provided support instead of actor-received support served as the predictor of later support provision. Copyright © 2006 John Wiley & Sons, Ltd.

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INTRODUCTION

What makes us support the persons we value? Considering the large amount of studies on the effects of social support on well-being, health and performance in recipients (e.g. Berkman, Glass, Brissette, & Seeman, 2000; Gleason, Iida, Bolger, & Shrout, 2003; Uchino, Cacioppo, & Kiecolt-Glaser, 1996), relatively little research has been conducted to find predictors of support provision. Because social support literature has traditionally focused on the role of the supported person and how an individual benefits or fails to benefit from received or perceived social support, the underrepresentation of research studying support provision is not surprising (Dunkel-Schetter, Blasband, Feinstein, & Bennett, 1992).

In accordance with a useful theoretical and empirical distinction suggested by e.g. Antonucci (2001), we refer to *actually received* and *provided support* as the retrospective reports of experienced supportive interactions as stated by the recipient or provider.

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Excluded from this definition are forms of perceived or anticipated social support which refer to the general expectation that support is available should the need arise (e.g. Sarason, Pierce, & Sarason, 1990).

As a consequence of the early focus on the recipient in social support literature, studies that explored the criteria leading persons to support each other, heavily relied on early findings on the social psychology of prosocial behaviour which traditionally focused on the provider side of helping behaviour (e.g. Latané & Darley, 1970). Extending prosocial behaviour literature to the case of unsolicited social support, Dunkel-Schetter and Skokan (1990) underscored common and unlike features of both fields. The most prominent difference between research on prosocial behaviour and social support, apart from focusing on one or the other side of the supportive dyad, concerns the types of relationships under investigation. While in prosocial behaviour research, degree of acquaintance between helper and helped was typically low; in social support research, usually better-acquainted support dyads (or groups) are investigated. Consequently, above and beyond helper and helped characteristics, a number of proximal or distal relationship factors as predictors of support interactions have to be considered in the latter line of research. In their review, Dunkel-Schetter and Skokan (1990), thus, distinguish four categories of predictors that may be associated with granting more or less support to a well-acquainted recipient: Stress-factors, recipient factors, provider factors and relationship factors. In this study, we were primarily interested in one type of relationship factor that has repeatedly been found to play a major role in the continuation and efficacy of social support processes i.e. reciprocity.

Reciprocity in supportive interactions

In many cases, one of the most critical predictors of support provision is past support receipt (Cutrona, Hessling, & Suhr, 1997; Gleason, et al., 2003; Jung, 1988; Liang, Krause, & Bennett, 2001). Such findings suggest that persons try to establish and maintain an equilibrium of social give and take with their network members (Antonucci, Fuhrer, & Jackson, 1990; Williams, 1995).

Equity theory (e.g. Walster, Walster, & Berscheid, 1978) proposes a central motive for reciprocity in supportive interactions. According to this view, persons try to maintain equal shares of give and take to avoid violating social norms and counteract dependency. In terms of equity theory, receiving more than giving should lead to higher distress because of guilt, shame and a growing sense of not being able to cope independently. Accordingly, a number of studies have shown that reciprocity in supportive relationships improves relationship satisfaction and individual adaptation to stressful encounters (e.g. Gleason et al., 2003; Liang et al., 2001) and is generally highly valued (Uehara, 1995; Williams, 1995). An often high association between receiving and giving support may in part be explained by this highly valued norm of give and take.

However, findings concerning reciprocity and its adaptiveness are not unequivocal, especially when different types of relationships are investigated (Ingersoll-Dayton & Antonucci, 1988). For instance, in the case of an older sample, Rook (1987) reported higher importance of reciprocity within friendships as opposed to families. Moreover, some authors suggested that among some familial relationships the idea of give and take may be overruled by a general norm for solidarity or unconditional help (George, 1986; Jung, 1990). The predictions by Clark and coworkers can account for these mixed findings (e.g. Clark & Jordan, 2002; Clark & Reis, 1988).

Clark and coworkers propose that in relationships desired to be formal (i.e. strangers, acquaintances or coworkers), individuals should react positively to a reciprocal give and take. In communal relationships (i.e. family, romantic partners or good friends), however, members feel a degree of mutual responsibility and give benefits in response to needs or show concern for the other (Clark & Reis, 1988). In many experimental as well as correlational studies, Clark and coworkers (e.g. Clark & Jordan, 2002) found convincing evidence for the validity of the distinction between communal and exchange relationships. However, as Clark and Reis (1988) assert, moderators other than the desired type of relationship may play a role in the way benefits are exchanged in dyads or groups. They specifically suggest stable dispositional factors as likely candidates for moderation.

Higher-order personality factors and support processes

Personality factors make themselves known in countless interactions with the social and material environment. As Buss (1992) argued, there are two pressing questions to be answered by personality researchers. One pertains to the causal origins of personality and the other one concerns the 'consequences' of stable interindividual differences: 'What are the implications of personality for the ways in which individuals interact with their worlds?' (Buss, 1992, p. 478). Most studies addressing higher-order personality factors and support indicators have done so focusing on the recipient side, addressing questions such as: who mobilizes support, who benefits from support, who perceives more support or who gets more support (e.g. Asendorpf & van Aken, 2003; Branje, van Lieshout, & van Aken, 2004; Cutrona et al., 1997; Watson & Hubbard, 1996). With the emerging interactionist perspective on social support within dyads or groups, these questions may likely be extended to involve more complex embedding of personality traits in support and network processes (cf. Neyer & Voigt, 2004).

So far, studies have shown more or less consistent direct effects of higher-order personality factors on several support-related variables. The most consistent of which pertain to Extraversion that has been linked to higher perceived support (Asendorpf & van Aken, 2003; Asendorpf & Wilpers, 1998), higher actually received support (e.g. Swickert, Rosentreter, Hittner, & Mushrush, 2002), more support seeking (Watson & Hubbard, 1996), and provision of the same in times of stress (e.g. Cutrona et al., 1997) or wider social networks in general (e.g. Swickert et al., 2002). Because Extraversion involves sociability, these findings are not surprising.

In terms of Neuroticism, relatively consistent evidence emerged of higher levels of negative interaction, less satisfaction with support and higher mobilization of support in times of need (e.g. Cutrona et al., 1997; Knoll, Rieckmann, & Schwarzer, 2005; Lincoln, Taylor, & Chatters, 2003; McCrae, 1990).

With regard to Openness to Experience, Agreeableness and Conscientiousness, less consistent evidence of linkage with support indicators emerged thus far. In a study by Bishop et al. (2001), Openness, Agreeableness and Extraversion were linked to higher-order coping factors including use of emotional support whereas Conscientiousness was associated with coping strategies that involved instrumental support seeking. Agreeableness has furthermore been linked with higher perceived support (Branje et al., 2004) among family members. Asendorpf and Wilpers (1998) reported higher contact frequency with family members among more conscientious college students. Both Agreeableness and Conscientiousness include orientation to social norms. Agreeableness specifies tendencies to avoid conflicts, being pleasant, being cooperative and somewhat submissive.

Conscientiousness implies high levels of social responsibility. Openness, on the other side, might imply a need for social stimulation for new ideas and creative problem-solving.

In sum, all the Big-Five personality factors to some extent express themselves through or rely on different aspects of social interaction, including the provision, receipt and perception of support and orientation towards social norms. This, in turn, makes all of them, in their own respects, plausible candidates for moderator functions in social interaction processes, such as, reciprocal support provision.

The present study

Our aim was to explore determinants of social support provision within a specific sample of non-romantic co-student dyads facing a mildly stressful situation. With regard to the existing findings (Clark & Reis, 1988; Rook, 1987), our first interest was to find indicators of reciprocity in the provision of different forms of support among peers who had to deal with the same situational context.

Because the present study entails different measurement points, we explored reciprocal support provision primarily in a 'longitudinal' sense i.e. earlier supportive actions predicting later ones. Yet this study spans a fairly brief time span only (i.e. four days). Distinguishing different forms and time frames of reciprocal action, such as, long-term give and take, defined as a life-long process (Antonucci, 2001) or immediate reciprocal interactions that are often studied in observational research (e.g. Pasch, Bradbury, & Davila, 1997), the one studied here might best be described as 'short-term'.

In accordance with Dunkel-Schetter and coworkers (1992) model on 'supportive support interactions', we emphasized the actor's view on the amount of received support in our concept of reciprocity. Usually, the overlap between providers' and recipients' accounts of supportive interactions is only moderate in size (Bolger, Zuckerman, & Kessler, 2000; Dunkel-Schetter et al., 1992). This medium congruency can be explained in a number of ways that have to do with differing views on the supportiveness of interpersonal processes between both parties. Accordingly, predictive patterns for an actor's provision of support by the actor's support receipt versus a partner's support provision should differ in magnitude, both theoretically and empirically. Assumingly, a person only reciprocates for what he or she perceives to have received him or herself. We thus defined indicators of reciprocal provision primarily as the longitudinal association of actors' received with actors' provided support. Specifically, we expected that the degree of actors' received support at an earlier measurement point in time predicted later change in the actors' provision of support. Only for attempts at partial validation we then conducted the same analyses again using the respective partners' information, partners' provided support (instead of actors' received support) as an alternative predictor.

Additional predictors of provision of support were also investigated. As suggested by earlier findings (Dunkel-Schetter & Skokan, 1990), degree of amicability as another relationship factor was expected to predict higher levels and change in support provision. Actors' and partners' sexes were also tested as covariates of support provision. Studies with friendship dyads have found more emotional and less instrumental support provision in women than in men (e.g. Fritz, Nagurney, & Helgeson, 2003; MacGeorge, Gillihan, Samter, & Clark, 2003).

Finally, we were interested in potential moderation of reciprocity by provider factors i.e. higher-order personality. In the literature, a primary focus thus far lay on direct

relationships between the Big Five and different components of the support process (e.g. Asendorpf & Wilpers, 1998; Watson & Hubbard, 1996). However, as pointed out by Clark and Reis (1988), it is likely, that stable personality factors also moderate the exchange of benefits in dyads. Some evidence supporting this proposition is available. For instance, affective dispositions have been found to moderate reciprocity. A study by Pasch et al. (1997) showed that interacting with their spouses, newlywed husbands with high levels of negative affectivity were more likely to reciprocate negative helper behaviours. Early experimental literature on disclosure suggested Neuroticism as a moderator in reciprocal disclosure, in that emotionally unstable persons tended not to reciprocate as much as emotionally stable individuals did when it came to revealing intimate information (Chaikin, Derlega, Bayma, & Shaw, 1975; Cunningham & Strassberg, 1981).

Addressing the question of differential reciprocity, we were primarily interested in higher-order personality factors' possible moderating impact on reciprocal support provision. Because so far not much evidence for differential reciprocity in social interactions exists (e.g. Pasch et al., 1997), we approached this question exploratively.

METHOD

Participants

A total of 94-medical students participated in the study. Of these, 8 (9%) could not be matched up with a partner in their respective course or their partners did not provide data at all measurement points in time. They were excluded from further analyses. The remaining 86 students (91%; 43 dyads) had a mean age of 23 years ($SD = 3.25$) and were currently in their second year of medical school. Twenty-one students were men (24.4%) and 65 were women (75.6%). Most of the students were single ($n = 71$; 82.6%), the others were married or lived in a longer-term relationship ($n = 15$; 17.4%).

The majority of student dyads were same sex ($n = 28$ dyads), 15 dyads were mixed sex. The partners had known each other, on average, for 15.56 months ($SD = 11.55$ months).

Procedure

Data were assessed in five one-week intensive courses for Medical Psychology at a German University Hospital. The Medical Psychology courses were concluded by a final written exam. The exam was presumed to be a mild stressor because of low rates of failure in past exams and a fairly high predictability in preparatory efforts to pass the exam. Participation in Medical Psychology classes is mandatory in German medical schools. Students are required to pass the class and the exam to move on to their third year of medical school. Due to all-day mandatory attendance during the course and the additional requirement of giving an oral presentation, preparatory studying for the exam was limited to take place in the evenings for most students. This was assumed to lead to marked constraints of students' personal lives or spare time during course-week, and thus to an increase in perceptions of stressfulness of the situation. In accordance with this and as reported elsewhere (Knoll, Schulz, Schwarzer, & Rosemeier, in press), data indicated a decrease in positive affect and a mild increase of negative affect during course week.

Data were assessed at four points in time during the course of the classes. The first measurement occasion took place on the first day of class (t_1 , Monday). The second and

third on the third (t2, Wednesday) and fourth days (t3, Thursday) of classes, respectively. The fourth measurement occasion took place on the day of the final exam (t4, Friday). A female investigator passed out questionnaires to the medical students at t1 through t3, upon t4 only number of mistakes made in the written exams were recorded. Thus, the fourth measurement was not further analysed in the present study. Measurement occasions took place around noon on the respective days.

Upon the first measurement occasion, the students were asked to pair up with one of their fellow class participants. Student dyads were instructed to remain in this constellation for the entire assessment period. Measurements t1 through t3 were divided in two parts where participants provided self-reports (1) and partner-ratings (2) for most variables.

Measures

Provided and received support

Support indicators were assessed at two points in time (t2 and t3) using an adapted and shortened version of the Berlin Social Support Scales (BSSS) by Schulz and Schwarzer (2003). Participants were instructed to report whether *with regard to the upcoming exam* they had provided or received support during the last two days (t2) and during the last 24 hours (t3). Each scale consisted of three items. *Emotional* support items were: (1) 'She/he has shown that she/he likes me', (2) 'She/he has inquired about my condition', (3) 'She/he has assured me that the exam won't be too difficult' (received), (4) 'I have shown her/him that I liked her/him', (5) 'I have inquired about her/his condition' and (6) 'I have assured her/him that the exam won't be too difficult' (provided). *Instrumental* support items were: (1) 'She/he provided me with information about the exam', (2) 'She/he provided me with literature for the exam', (3) 'She/he has copied texts and materials for me' (received), and (1) 'I provided her/him with information about the exam', (2) 'I provided her/him with literature for the exam', (3) 'I copied texts and materials for her/him' (provided). Items were rated on 4-point Likert-type scales ranging from *does not apply at all* (0) to *applies exactly* (3). Internal consistencies of the received instrumental support scale were Cronbach's $\alpha = 0.69$ (t2) and $\alpha = 0.86$ (t3), for provision of instrumental support consistencies were Cronbach's $\alpha = 0.75$ (t2) and $\alpha = 0.74$ (t3). Internal consistencies of the received emotional support scale were $\alpha = 0.68$ (t2) and $\alpha = 0.80$ (t3), for provision of emotional support consistencies were Cronbach's $\alpha = 0.77$ (t2) and $\alpha = 0.82$ (t3). Support stability was medium to high with a re-test reliability of $r_{tt} = 0.81$, $p < 0.001$ for provided and $r_{tt} = 0.81$, $p < 0.001$ for received emotional support and $r_{tt} = 0.65$, $p < 0.001$ for provided and $r_{tt} = 0.73$, $p < 0.001$ for received instrumental support. Intercorrelations between emotional and instrumental support were medium in size (received support: t2 $r = 0.52$, $p < 0.001$; t3 $r = 0.48$, $p < 0.001$; provided support: t2 $r = 0.42$, $p < 0.001$; t3 $r = 0.45$, $p < 0.001$). Testing provided and received support items separately at each measurement point in time, principal component analyses with oblique rotation and a marker-item factor loading cut-off of 0.40 yielded two components with eigenvalues greater than 1 in each analysis. In each case, emotional and instrumental support items loaded on two separate components.

Degree of amicability

Degree of amicability in student dyads was assessed once at t1 using one item from the partner-rating version of the German translation of NEO-FFI (Borkenau & Ostendorf, 1993; 'information on the person you rated') asking each of the partners to rate their personal relation to their partner on a 9-point differential ranging from *dislike* (-4) to

very amicable (4). The mean value was 2.35 (SD = 1.28). Partner overlap in this measure was 67% ($p < 0.001$), as indicated by an intra-class correlation.

Personality

Higher-order personality traits (i.e. Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness) were assessed using the German version of the NEO-FFI (Borkenau & Ostendorf, 1993; Costa & McCrae, 1989). Participants endorsed items on a 5-point scale, rating the resemblance of each item to their own *usual* thoughts and actions. The response scale ranged from 0 (*has nothing to do with my thoughts or actions*) to 4 (*describes my thoughts or actions very well*). Each scale was represented by 12 items.

Internal consistencies were generally acceptable with Cronbach's $\alpha = 0.85$ for Neuroticism, $\alpha = 0.72$ for Extraversion, $\alpha = 0.73$ for Openness, $\alpha = 0.76$ for Agreeableness, and $\alpha = 0.81$ for Conscientiousness. Interscale correlations yielded a negative association between Neuroticism and Extraversion ($r = -0.22$, $p < 0.05$) and between Neuroticism and Conscientiousness ($r = -0.29$, $p < 0.05$).

Analyses

In general, we conceptualized indicators of 'reciprocity' in provision of support as the prediction of change variance in actors' provision by actors' earlier received support. In our design, this meant that reciprocal provision was presumed to occur when actors' received support two days prior to the exam (t2) predicted change in actors' provision of support from two days to one day prior to the exam (t2 to t3). To avoid collinearity problems in these analyses, we used an unstandardized residualized change score (from t2 to t3) of the actors' support provision variables (Cohen & Cohen, 1983).

Only in an attempt to partially validate the reciprocity findings, we repeated all analyses using earlier partners' provision of support as a predictor of later change in actors' provision of support. Using partners' provided support as a predictor, we expected at least a partial replication of the findings involving actors' received social support as a predictor, although, in accordance with Dunkel-Schetter et al. (1992), effects were assumed to be less consistent.

Data were analysed using overall correlations, intra-class correlations and cross-intra-class correlations (double-entry method; Griffin & Gonzalez, 1995), as well as multilevel or hierarchical linear modelling due to exchangeable dyad members as well as non-independence in variables within-dyads (HLM 5.05; Raudenbush, Bryk, Cheong, & Congdon, 2001). According to suggestions by Campbell and Kashy (2002) regarding these specific forms of analyses that require accounting for non-independence, no specific level-2 predictors were specified in these models and level-2 slopes were fixed.¹ For each analysis, all main effects and interaction terms (if of interest) were included in the level 1 models that represented the analysis model for each dyad:

(1) Predicting Change in Support Provision:

*Change in Actors' Provided Support*_{t2 to t3} = $b_0 + b_1$ (*Support Indicator*_{t2}) + b_2 (*Additional Predictor*₁) + b_n (*Additional Predictor*_n) + r

(2) Predicting Moderated Reciprocal Support Provision:

¹In preliminary analyses we included dyad composition as a possible level-2 variable in the models predicting level and change of support provision. Because dyad composition was not associated with provision of support, these analytical steps are not reported here.

$$\text{Change in Actors' Provided Support}_{t_2 \text{ to } t_3} = b_0 + b_1 (\text{Additional Predictor}_1) + b_2 (\text{Support Indicator}_{t_2}) + b_3 (\text{Personality Moderator}_A) + b_4 (\text{Support Indicator}_{t_2} \times \text{Personality Moderator}_A) + r$$

where *Change in Actors' Support Provision*_{t₂ to t₃} refers to the residualized change of the respective support provision indicator from t₂ to t₃; *Support Indicator*_{t₂} is the respective actors' received support measure at t₂ or partners' provided support at t₂ in the respective additional analyses; *Additional Predictors*_{1 to n} are predictors for change in support provision (e.g. Actors' Sex); *Personality Moderator*_A is the respective actors' personality factor tested as a moderator for reciprocal support provision at t₁; *Support Indicator*_{t₂} × *Personality Moderator*_A is the two-way interaction term of the simple effects; and *r* is the level-1 residual. In analyses testing more than one potential actors' personality moderator, the additional simple effect and all respective two-way interactions were added to the models.

To obtain estimates of these effects, the restricted maximum likelihood (REML) approach was used. In analyses involving interaction terms, Level 1 simple effects (i.e. received support and the personality traits) were centred around their grand means and then multiplied to form the interaction term (Aiken & West, 1991; Campbell & Kashy, 2002).

In accord with Kenny's (1996; Campbell & Kashy, 2002) Actor-Partner Interdependence Model (APIM), preliminary analyses included both the actors' and the partners' personality traits as simple effects and potential moderators in the actors' reciprocal support provision process. However, because above and beyond the actors' information, partner variables did not contribute to the prediction of change in actors' provision of support, and did not alter the relationship between actors' earlier received support (or partners' earlier provided support) and change in actors' provision of support; most partner information was dropped from the final analyses presented in this study.

Finally, data were routinely checked for multivariate outliers (Tabachnick & Fidell, 2001). In models involving the prediction of change of actors', instrumental support provision by actors' received (or partners' provided) instrumental support at two days prior to the exam, one dyad had to be excluded from the analyses because of multivariate outliership and resulting model identification problems.

RESULTS

Results are divided into three sections. First, within-dyad similarities in predictors and outcomes are presented. Following this, bivariate and longitudinal relations of the independent variables with actors' support provision are reported. In the last section, actors' higher-order personality factors are tested as possible moderators of the prior support—later provision relationship.

Within-dyad similarity in predictors and outcomes

Support provision and receipt

Intra-class correlations were significant at both points in time in provision and receipt of emotional support only. At both assessments, overlap between the two partners' emotional support ranged from 50 to 60%. In terms of instrumental support however only t₂

assessments showed within-dyad overlap at a significance level of $p < 0.10$. All coefficients were positive, suggesting that higher support provision and receipt in one dyad member was associated with higher provision and receipt in the other, especially for emotional support (see Table 1).

Degree of amicability

Partners within dyads were highly similar concerning their rated degree of amicability with 67% overlapping variance (see Table 1).

Personality

There were no significant intra-class correlations in either of the five personality factors (see Table 1).

Bivariate associations with actors' support provision

Actors' received support and partners' provided support

Overall correlations revealed medium to strong positive associations between levels of support provision and support receipt within the same person at both measurement points in time (t2 two days, and t3 one day prior to the exam). High levels of support receipt on a given day corresponded with high levels of support provision on the same day. As reported above, correlations of partners' provided support with actors' provided support (i.e. support provision's ICCs) were positive and medium in size (see Table 1).

Sex

Concerning actors' sex and partners' sex as correlates, actors' emotional support provision was higher in women and in female partners, especially two days before the exam. This effect could not be found for provision of instrumental support (see Table 1). In further analyses, interaction terms of actors' and partners' sex were computed and along with their simple effects (actors' sex and partners' sex as level-1 predictors) they were tested as level-2 predictors in HLM analyses predicting levels of actors' provided support at both points in time. Using this approach, differences between same-sex dyads and mixed-sex dyads with regard to actors' support provision were investigated. However, dyad composition did not significantly contribute to actors' levels of support provision at any time.

Degree of amicability

Regarding degree of amicability in the medical student dyads as rated by the actors, also positive associations mainly with actors' emotional support provision at both points in time were observed. In terms of actors' provision of instrumental support, relations were also positive however non significant. Generally, actors tended to yield more support in more amicable dyads (Table 1).

Predicting change in actors' provision of support in the full sample

Actors' received support, sex and degree of amicability as possible predictors

Aside from actors' sex, either degree of amicability (as rated by the actor), partners' sex or the interaction of actors' and partners' sex (dyad composition as a level-2 predictor) explained any change variance in actors' provision of any kind of support. Hence, these latter variables were not further analysed, but actors' sex was kept as a control variable.

Table 1. Overall correlations, Cross intra-class correlations, intra-class correlations, means, and standard deviations of the central variables

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	M	SD	ICC
1 A prov emo sup t2	0.81	0.42	0.31	0.78	0.70	0.48	0.35	0.47	0.52	0.14	0.27	0.33	0.22	0.37	0.04	0.38	0.14	0.23	-0.18	1.84	0.75	0.47
2 A prov emo sup t3	1	0.33	0.45	0.81	0.83	0.49	0.44	0.52	0.62	0.22	0.30	0.22	0.21	0.40	0.08	0.40	0.08	0.36	-0.11	1.89	0.82	0.62
3 A prov instr sup t2	1	1	0.65	0.37	0.33	0.59	0.47	0.14	0.22	0.24	0.34	0.08	0.13	0.19	0.14	0.03	-0.03	0.10	-0.07	0.54	0.62	0.24
4 A prov instr sup t3	1	1	1	0.31	0.35	0.44	0.54	0.27	0.30	0.34	0.34	0.09	0.14	0.18	0.10	0.15	-0.05	0.10	0.07	0.62	0.72	0.34
5 A rec emo sup t2	1	1	1	1	0.81	0.52	0.38	0.50	0.56	0.13	0.22	0.29	0.15	0.39	0.14	0.31	0.16	0.37	-0.20	1.68	0.76	0.49
6 A rec emo sup t3	1	1	1	1	1	0.55	0.48	0.46	0.61	0.20	0.33	0.30	0.30	0.39	0.18	0.30	0.03	0.38	-0.20	1.68	0.84	0.55
7 A rec instr sup t2	1	1	1	1	1	1	0.73	0.22	0.29	0.33	0.51	0.22	0.07	0.21	0.13	0.12	-0.09	0.21	-0.16	0.63	0.73	0.20
8 A rec instr sup t3	1	1	1	1	1	1	1	0.24	0.29	0.38	0.61	0.15	0.13	0.17	0.08	0.08	-0.06	0.18	-0.01	0.63	0.78	0.28
9 P prov emo sup t2	1	1	1	1	1	1	1	1	0.81	0.42	0.31	0.22	0.33	0.46	-0.09	0.20	-0.11	0.11	-0.04	1.84	0.75	0.47
10 P prov emo sup t3	1	1	1	1	1	1	1	1	1	0.33	0.45	0.21	0.22	0.46	-0.05	0.25	-0.19	0.12	-0.04	1.89	0.82	0.62
11 P prov instr sup t2	1	1	1	1	1	1	1	1	1	1	0.65	0.13	0.08	0.23	0.04	0.04	-0.06	0.04	-0.16	0.54	0.62	0.24
12 P prov instr sup t3	1	1	1	1	1	1	1	1	1	1	1	0.14	0.09	0.18	-0.01	0.18	-0.05	0.04	-0.12	0.62	0.72	0.34
13 A sex	1	1	1	1	1	1	1	1	1	1	1	1	0.06	0.20	0.13	0.18	0.11	0.35	-0.04	—	—	—
14 P sex	1	1	1	1	1	1	1	1	1	1	1	1	1	0.24	0.07	0.07	-0.07	0.12	0.11	—	—	—
15 A amicability	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-0.02	0.14	-0.08	0.23	-0.17	2.35	1.28	0.67
16 A Neuroticism	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-0.22	0.18	0.16	-0.29	1.78	0.70	-0.09
17 A Extraversion	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.04	0.16	0.14	2.67	0.50	0.01
18 A Openness	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.13	-0.19	2.84	0.52	0.04
19 A Agreeableness	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.04	2.73	0.51	-0.05
20 A Conscientiousness	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.72	0.58	-0.16

Note: N = 86 (i.e. N = 43 dyads). A: actor variable, P: partner variable. Prov emo sup: provided emotional support. Prov instr sup: provided instrumental support. Rec emo sup: received emotional support. Rec instr sup: received instrumental support. t2: two days prior to the exam. t3: one day prior to the exam. Above diagonal: all overall and cross intra-class correlations (shaded) above 0.22 are significant at $p < 0.05$ (Griffin & Gonzalez, 1995). ICC: all intra-class correlations (bold) above 0.30 are significant at the $p < 0.05$ level (Griffin & Gonzalez, 1995).

Table 2. Effects of actors' received support on actors' change in provision of emotional support and effects of partners' provided support on actors' change in provision of emotional support

	Actors' change in provision of emotional support t2 to t3					
	<i>b</i>	<i>t(df)</i>	<i>p</i>	<i>b</i>	<i>t(df)</i>	<i>p</i>
Intercept	0.00	0.01 (42)	0.99	-0.08	-0.28 (42)	0.78
Actors' sex	-0.21	-1.42 (82)	0.16	-0.16	-1.20 (82)	0.24
Actors' received emotional support t2	0.21	2.27 (82)	0.03	—	—	—
Actors' received instrumental support t2	0.02	0.17 (82)	0.87	—	—	—
Partners' provided emotional support t2	—	—	—	0.17	1.93 (82)	0.06
Partners' provided instrumental support t2	—	—	—	0.08	0.80 (82)	0.43

Note: $N = 86$ (43 dyads). Effect not tested in this analysis.

To test the degree of reciprocity, actors' changes in provision of support (both instrumental and emotional) from two days (t2) to one day (t3) prior to the exam were predicted by the actors' t2 received support indicators. Actors' t2 received emotional support predicted higher change of actors' emotional support provision from t2 to t3. The same was not true for t2 received instrumental support (see Table 2). Also, none of the received support indicators predicted change in instrumental support provision at this level of analysis.

Validation: using partners' support provision as a predictor

Repeating the analyses using partners' provision of the respective kinds of support as predictors of actors' change in provision of support yielded similar findings. At a 10% level of significance, partners' provision of emotional support at t2 was related with a higher change of actors' provision of emotional support from t2 to t3.

Neither actors' sex nor partners' sex, nor actors' degree of amicability moderated the reciprocal support provision relationships to a significant degree.

Actors' personality moderates actors' reciprocal support provision

In a next step, interaction terms of actors' personality factors by actors' received support at t2 were included as level1 predictors in the models predicting change in actors' provision of support from t2 to t3. As before, we attempted to validate the findings using partners' provision of the respective support forms as an alternative predictor. Among the higher-order personality factors of the actors, Extraversion and Openness turned out as moderators of reciprocal support provision.

Predicting actors' emotional support provision.

In terms of change in actors' provision of emotional support, actors' Extraversion by support receipt and Openness by support receipt interactions were significant (the interaction term involving Extraversion was significant at the 10% level only, see Table 3). Plotting these interactions revealed higher increases of actors' provided emotional support from t2 to t3 in introverted actors when they had received higher levels of emotional support at t2. In extraverted actors however, their own degree of received support did not matter as much in terms of change in their own support provision. In other words, introverts seemed to act stronger on reciprocity when it came to the provision of emotional support (see Figure 1A). On the other hand, more open actors presented with a positive

Table 3. Extraversion and Openness moderate the reciprocal support provision

	Change in provision of emotional support t2 to t3 _a			Change in provision of instrumental support t2 to t3 _b		
	<i>b</i>	<i>t(df)</i>	<i>p</i>	<i>b</i>	<i>t(df)</i>	<i>p</i>
Intercept	0.31	1.39 (42)	0.17	-0.22	-0.94(41)	0.35
Actors' sex	-0.17	-1.35 (78)	0.18	0.10	0.83 (76)	0.41
Actors' received support t2	0.24 _c	3.75 (78) _c	<0.001 _c	-0.05 _d	-0.69 (76) _d	0.50 _d
Actors' Extraversion	0.14	1.15 (78)	0.25	0.13	0.90 (76)	0.37
Actors' Openness	0.06	-0.54 (78)	0.59	-0.11	-1.17 (76)	0.25
Actors' Openness × Actors' Extraversion	-0.27	-0.98 (78)	0.33	0.16	0.57 (76)	0.57
Actors' received support t2 × Actors' Extraversion	-0.24 _e	-1.93 (78) _e	0.06 _e	-0.44 _f	-2.43 (76) _f	<0.02 _f
Actors' received support t2 × Actors' Openness	0.25 _e	2.26 (78) _e	0.03 _e	-0.43 _f	-2.64 (76) _f	0.01 _f
Intercept	0.25	1.09 (42)	0.28	-0.13	-0.55 (41)	0.58
Actors' sex	-0.13	-1.10 (78)	0.27	0.06	0.44 (76)	0.66
Partners' provided support t2	0.18 _c	2.31 (78) _c	0.02 _c	0.17 _d	1.46 (76) _d	0.15 _d
Actors' Extraversion	0.13	1.04 (78)	0.30	0.21	1.41 (76)	0.16
Actors' Openness	0.08	-0.73 (78)	0.47	-0.06	-0.73 (76)	0.47
Actors' Openness × Actors' Extraversion	-0.30	-1.28 (78)	0.20	0.05	0.19 (76)	0.85
Partners' provided support t2 × Actors' Extraversion	-0.03 _e	-0.20 (78) _e	0.84 _e	0.03 _f	0.13 (76) _f	0.90 _f
Partners' provided support t2 × Actors' Openness	0.24 _e	1.89 (78) _e	0.06 _e	-0.36 _f	-1.58 (76) _f	0.12 _f

Note: a: $N = 86$ (43 dyads); b: $n = 84$ (42 dyads). c: received emotional support. d: received instrumental support. e: interaction term with received emotional support. f: interaction term with received instrumental support. t2: two days prior to the exam. t3: one day prior to the exam.

change in their emotional support provision when they had reported higher degrees of received emotional support earlier (see Figure 1B).

These findings were only partially validated using earlier partners' provision of support as an alternative predictor in the equation (see Table 3). Whereas actors' Extraversion did not moderate the relationship between partners' provision of emotional support (t2) and change in actors' provision of emotional support (t2 to t3), a moderating effect for actor Openness was found (at a 10% level of significance). Once again, open actors showed a steeper increase in their own provision of support when their partners had provided them with much emotional support earlier.

Predicting actors' instrumental support provision.

Looking at actors' change in provision of instrumental support, the previously reported finding was replicated for the actors' Extraversion by actors' received instrumental support interaction (see Table 3). Once again, introverts seemed to provide more instrumental support from t2 to t3 if they had received higher levels of instrumental support upon t2, when compared to extraverts who declined in their support provision when they themselves had received support earlier (see Figure 2A). Also, the interaction involving actors' Openness by actors' received instrumental support pointed in the same direction as the one involving Extraversion. In their provision of instrumental support, less open actors relied more on reciprocal support provision (see Figure 2B).

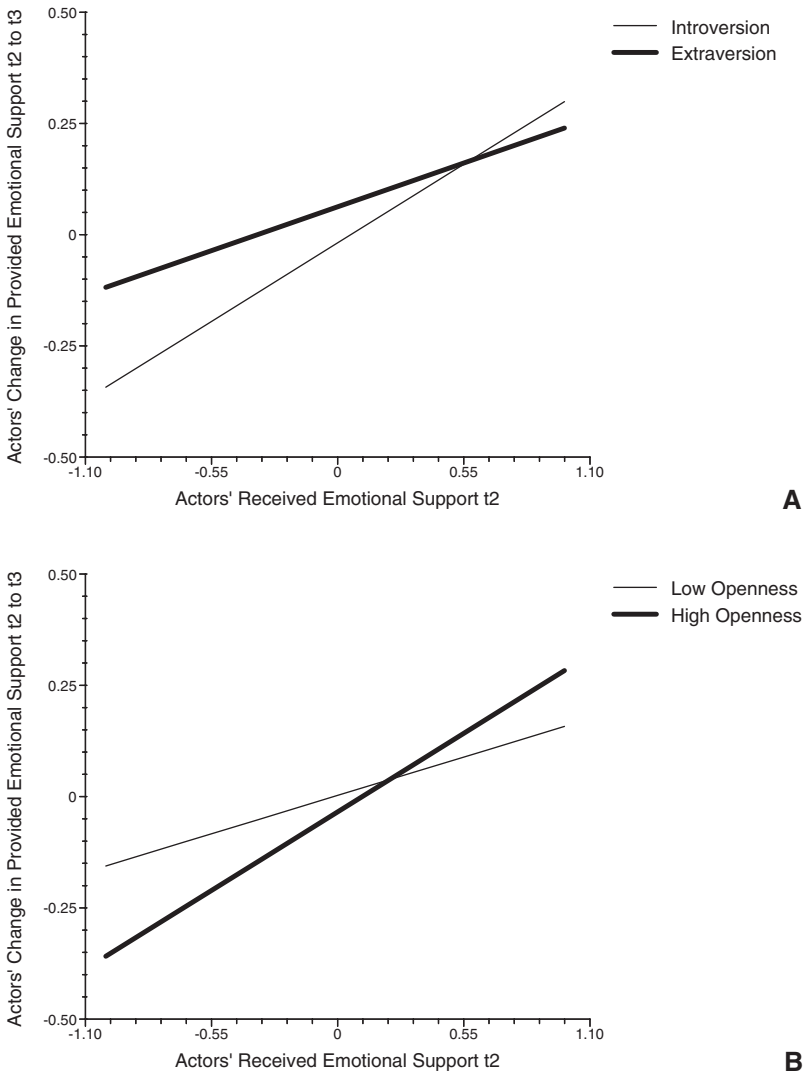


Figure 1. Extraversion (A) and Openness (B) moderate the relationship between received emotional support (t2) and change in provided emotional support (unstandardized residualized change t2 to t3; $N = 86$, 43 dyads).

Validation of these findings using partners' provision of instrumental support as an alternative predictor in the moderator models failed (see Table 3).

DISCUSSION

Predicting support provision: reciprocity, sex and amicability

Concerning only emotional support in the full sample, findings suggest reciprocity as a predictor of support provision over time. Actor level of prior received emotional support

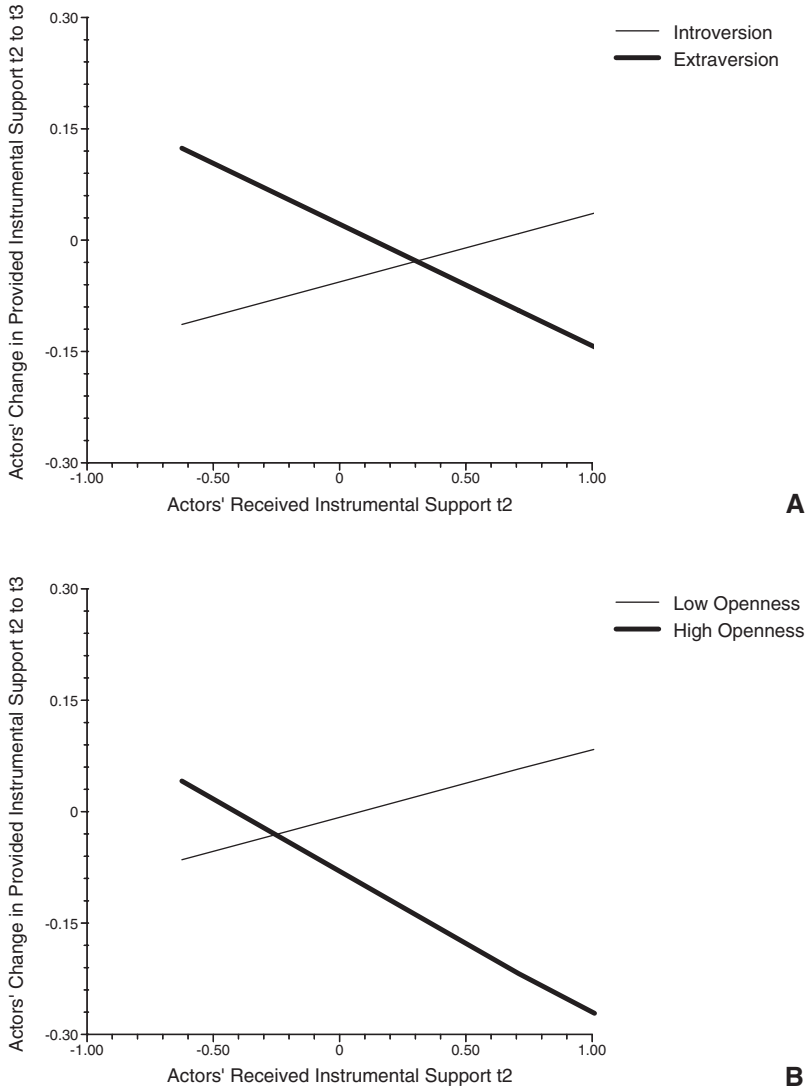


Figure 2. Extraversion (A) and Openness (B) moderate the relationship between received instrumental support (t2) and change in provided instrumental support (unstandardized residualized change t2 to t3; $n = 84$, 42 dyads).

predicted later change in actor provision of the same. This finding was validated using a different data source as a predictor i.e. partner accounts of earlier provided emotional support. Moreover, reciprocity turned out to be somewhat domain-specific, in that the degrees of earlier actor-received or partner-provided instrumental support did not predict change in the actors' provision of emotional support. This domain-specificity along with the lack of reciprocity effects for instrumental support provision in the full sample might be a special feature of this peer-relationship context. Participants mostly granted what they got themselves. In the case of more costly instrumental support they did not even consistently return the favours. This suggests a specificity of support provided that might

not be found within more intimate forms of relationships where boundedness or norms of solidarity within dyads or groups might overcome rules of equity and higher investments in relationships might be the rule (Jung, 1990).

On the other hand, reciprocity of instrumental support provision might be longer-term or not context dependent. Within the short time frame of this study and the relatively narrow options for instrumental support provision (i.e. help with the exam preparation), it is likely that reciprocity in this case extends to other parallel or consecutive academic contexts. This explanation is still in line with predictions by Clark and coworkers about the nature of benefit exchange in predominantly non-communal relationships (Clark & Reis, 1988). Reciprocity as a highly valued norm in exchange relationships might still depend on the nature of the benefits exchanged e.g. the immediacy of the reciprocal act may vary.

With regard to actors' sex as a predictor of actors' support provision, our findings resembled earlier results (e.g. Fritz et al., 2003; MacGeorge et al., 2003). Women actors received and in part provided more emotional support; however, similar associations were not observed for instrumental support. Different explanations exist for this well-replicated finding. Traditionally, differences in gender roles (Helgeson, 1994; Spence, 1984) have been discussed, suggesting different motivations for support provision in terms of emotional expressiveness/communion versus instrumentality/agency (Fritz et al., 2003). A recent study by Fritz et al. (2003) found a higher level of provided emotional support in women mediated by their degree of communion i.e. their focus on others' needs, their focus on forming connections and their degree of emotional expressiveness. MacGeorge et al. (2003), on the other hand, found evidence of a skill deficit in emotional sensitivity in men that might also account for their lower levels of emotional support provision.

Actor-reported degree of amicability only predicted level of support provision, but not change over time. Moreover, degree of amicability did not moderate the actor's reciprocal provision of support. Taking into account earlier findings on the differential efficacy of reciprocal support in different types of relationships (cf. Ingersoll-Dayton & Antonucci, 1988), this implies that the formal type of relationship might be more crucial for reciprocity and its consequences than quality of relationship within one relationship category (Clark & Reis, 1988).

Extraversion and openness moderate actors' reciprocal support provision

The present findings involving Extraversion and Openness as actor moderators of actors' short-term reciprocal support provision are mixed. Both high Extraversion and Openness were related with less reciprocal instrumental support provision. The same was true for Extraversion, but not for Openness as a moderator of reciprocal emotional support provision. In this support domain open individuals seemed to rely more heavily on reciprocal support provision.

Generally, concerning the findings indicating lower reciprocal support provision in actors, extraverted actors and open actors might have reciprocated after all, but at a later point in time or in a different episode. Antonucci (2001) suggests that support exchange may be a life-long process and, thus, may not be readily discernible within a specified time frame or a particular event. In this view, an individual works off and on a longer-term support account (e.g. spanning the time spent in medical school). For instance, individuals might provide lots of support during a given time frame (e.g. one course or one semester), thus accumulating support 'credits', and falling back on them once they need help.

If open actors and extraverted actors did not very much rely on rules of reciprocity in their provision of instrumental and partly emotional support in this context, then again this might be due to different reasons. For instance, they might use reciprocal support provision in particularly committing contexts only, such as the family context, but not with acquaintances. However, in the case of open individuals with their need to focus on new experience and stimulating environments, a sole focus of 'social investment' into given and well-known social structures seems unlikely. Also, previous findings by Asendorpf and coworkers (Asendorpf & van Aken, 2003; Asendorpf & Wilpers, 1998) as well as by Neyer and Asendorpf (2001) speak against this explanation for Extraversion. In all three studies, Extraversion had no effects on the relationship with one's family, but only on the relationship with one's friends.

We believe that, extraverts yield their easily enacted emotional assistance spontaneously and at a fairly high level. In providing emotional support, extraverts may be somewhat independent of the amount of support they themselves received from a particular partner because a generally larger social network of potential support sources is available to them (e.g. Swickert et al., 2002). We furthermore suggest that extraverts might in part use their provision of emotional assistance as a tool to ensure social contact and stimulation. Finch and Graziano (2001) summarize Extraversion's association with social behaviour as being agentic in motive and driven by a desire to make a social impact. On the other hand, if extraverts rely on their social surroundings for stimulation and as sources of positive affect, then they might also be somewhat more attentive to their networks' actions and needs and, as a consequence, extraverts might make more support available to them. For instance, the findings by Cutrona et al. (1997), involving couples interacting in support-eliciting situations, suggested that extraverts' social information processing is somewhat more sensitive to emotionally supportive action than is the case in introverts. This might hint at a possible explanatory path between Extraversion and supportive interaction, likely including support provision.

As for the more resource-demanding instrumental support, the pattern of results concerning actors' Extraversion as a moderator of their reciprocal instrumental support provision might in some way resemble the effects of performance-contingent rewards on intrinsic motivation (cf. Deci, Koestner, & Ryan, 1999). If an agentic extravert is being denied the possibility to initiate a higher-cost social assistance interaction then this might damage his or her motivation to provide help at all.

The moderation of the actors' received-provided emotional support relationship by actors' Openness was somewhat inconsistent with the findings concerning the provision of instrumental support. Providing emotional support, more open actors seemed to act on reciprocity more intensely than less open actors. Concerning instrumental support however the opposite was true.

Regarding the former finding to the degree that they might benefit from social contacts in terms of stimulation, open actors might also try to foster them by returning not-so resource-demanding emotional assistance promptly if they had been offered emotional assistance themselves. Pointing to this possibility, Kosek (1995), in a cross-sectional study, found Openness to Experience positively related with general prosocial behaviour in college students.

However, regarding the more costly instrumental support, open actors might return their favours more consistently and perhaps more promptly in situations that hold some interest for them i.e. novel situations or higher-impact episodes. In standard academic situations

such as our study context, open individuals might try to lower their personal and social investments to some degree. This again points to an explanation offered by exchange theory. In this line of reasoning, one should try to maximize rewarding aspects of relationships and minimize losses (Berscheid & Walster, 1969). Thus, whereas in resource-demanding support interactions equity theory would predict higher provision efforts in response to received support; in exchange theory, this prediction might not hold. Future studies might specifically address possible links between Openness and supportive action in different stressful situations.

In sum, whereas the present findings suggest that the pattern of results partly overlapped for extraverts and open individuals, we speculate that the underlying motives might differ to some degree.

Validation attempts: partners' provision of support as a predictor for actors' provision of support

Attempts to validate the reciprocity-related findings using partners' provision of support as a predictor, instead of actor reports of received support, were partially successful. Effects were less consistent and somewhat smaller, however, many times not reaching significance (see Tables 2 and 3).

Mostly, these failed validation attempts were expected due to the assumption that a considerable part of a partner's provided support might not be encoded as such by the recipient or likewise, some interaction detail is encoded as received support by the recipient, but may not have been intended as support provision by the partner (Bolger et al., 2000; Dunkel-Schetter et al., 1992). Assuming then, that one reciprocates favours only when he or she is aware of them, the less consistent indications at reciprocity if defined as a reaction to partner-reported provision efforts is not surprising.

Limitations

One important limitation of the present study concerns the findings' probable lack of external validity, or put more positively, the highly specific study setting involving only one type of relationship (i.e. student dyads) with partners facing the same circumstances (i.e. an upcoming exam), within a limited time-frame (i.e. roughly one week). In this sense, conclusions from our findings may be limited. This may not so much be the case with regard to the importance of reciprocity as a determinant of support provision. Much evidence to this effect already exists (Cutrona et al., 1995; Gleason, et al., 2003; Jung, 1988; Liang et al., 2001). Nevertheless, pending replication, the evidence concerning actors' Extraversion and Openness as moderators of actors' reciprocal support provision should be considered with care. Furthermore, possible explanations for why short-term reciprocal support provision was only differentially granted, remain speculative. However, the fact that generally moderation effects emerged across different domains of actors' support provision and were partly validated using partner-reported provision of support as an alternative predictor, still warrants closer examination.

CONCLUSIONS

This study yielded additional evidence for the importance of reciprocity as a predictor of support provision. Moreover, the present evidence points to the actors' personality as a possible co-determinant of reciprocal support provision.

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