Dynamic Role of Social Support in the Link Between Chronic Stress and Psychological Distress

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How a chronic environmental stressor can interfere with the buffering effects of social support by eroding social support was analyzed in this prospective, longitudinal study. A classic buffering effect of support was found after 2 months of exposure to the stressor, household crowding. Crowded residents with low perceived support had greater increases in psychological distress than did crowded residents with high perceived support. However, after 8 months exposure the buffering effect disappeared. Moreover, greater crowding had become directly associated with lower support, which in turn was associated with greater increases in psychological distress. All analyses controlled for prior distress. Under some types of chronic stress, the buffering effects of social support may be short-lived because the stressor eventually erodes social support.

Social support has been studied extensively as a coping resource that can mitigate the adverse psychological effects of environmental stressors (see recent volumes by Cohen & Syme, 1985a; Duck & Silver, 1990; Gottlieb, 1987; Sarason, Sarason, & Pierce, 1990; Vaux, 1988). The perception, or belief, that others are available to provide emotional comfort or practical assistance in times of need appears to be particularly beneficial for mental health (Wethington & Kessler, 1986). Individuals with high levels of perceived support appear to be more resistant to the adverse psychological effects of environmental stressors than do individuals with relatively low levels of perceived support (see review by Cohen & Wills, 1985). That is, perceived social support may buffer individuals from the adverse psychological consequences of exposure to stressors.

A variety of mechanisms have been described to explain the buffering, or moderating, effects of social support (for review, see Vaux, 1988). For example, psychological benefits of support might result from its effect on subjective appraisals of stressors, on choice of coping strategies, or on feelings of self-esteem and personal mastery (Cohen & McKay, 1984; Gore, 1981; Lieberman, 1982; Pearlin, Lieberman, Menaghan, & Mullan, 1981; Thoits, 1986). Although it is important to examine the pathways through which support can influence the stress process, it is equally important to examine in greater detail the interplay between stressors and support (cf. Barra, 1986; Rook & Dooley, 1985; Shinn, Lehmann, & Wong, 1984; Vaux, 1988). Moreover, given the importance of perceived support in the stress process (Heller & Lakey, 1985), it is critical to examine how stressors might influence such perceptions.

Few empirical studies have been focused on the effects of stressors on support processes. One possible reason for this neglect may lie in the assumptions of the familiar buffering model of social support. In the buffering model, support is implicitly conceptualized as a stable coping resource that emanates from relatively immutable personal or environmental characteristics. Furthermore, this resource is presumed to be independent of the type or amount of stress confronting an individual. This is particularly true of perceived support, which some scholars claim is "not context dependent, and hence is more stable over time" (Eckenrode & Wethington, 1990, p. 87; also see Sarason, Pierce, & Sarason, 1990). Thus, support is assumed to be independent of the stressor and antecedent to both the stressor and psychological distress, as depicted in Figure 1. If one is testing a model that presupposes independence between social support and the stressor, then there is little reason to examine any association between these variables. Indeed, such an association might be undesirable or suspected of representing a confounded relationship between the stressor and social support (Cohen & Wills, 1985; Thoits, 1982).

In this article, we empirically investigate an emerging alternative perspective on the role of social support in the link between stress and psychological distress. In contrast to the buffering model, this perspective conceptualizes support as a dynamic, endogenous variable that can be affected by certain stressors (Barrera, 1986; Gore, 1985; Quittner, Glueckauf, & Jackson, 1990; Rook & Dooley, 1985; Shinn et al., 1984; Vaux, 1988, 1990; Wheaton, 1985). Interrelations between stressor and support variables are treated as important objects of study, rather than as problems that must be controlled to preserve an...
that study, male heads of household who were living in crowded dormitories (Lakey, 1989).

able to them than their counterparts living in less crowded homes for an average of 8 years perceived that they had less support available to them than their counterparts living in less crowded homes (Evans, Palsane, Lepore, & Martin, 1989). The lower levels of perceived support among crowded residents, in turn, largely accounted for that group's higher levels of psychological distress relative to the uncrowded group's. When the positive association between crowding and symptoms was evaluated after partialing out the effects of support, the prior significant correlation between crowding and symptoms became nonsignificant. Thus, rather than functioning as a static, exogenous moderator variable that operated independently of the stressor, support appeared to function as a dynamic, endogenous variable that mediated the relationship between crowding and psychological distress.

In addition to identifying what kinds of stressors might alter support processes, it is worthwhile to consider the characteristics of stressors that might disrupt support processes. There is some speculation, as well as indirect evidence, that long-term, chronic stressors can have insidious effects on support. For example, terminal physical illnesses, recurring mental illnesses, and bereavement are chronic stressors that may threaten or overburden supportive network members to the point that those members withdraw support from the ailing individual (cf. Kessler, McLeod, & Wethington, 1985; Kiecolt-Glaser & Glaser, 1988; Light & Lebowitz, 1988; Wortman & Conway, 1985; Wortman & Dunkel-Schetter, 1979; Wortman & Lehman, 1985). Withdrawal of support, or a perceived lack of support, probably results from a subtle, time-dependent process. A net loss in support might be apparent only over time. This is consistent with the perspective that support is a dynamic variable. At the onset of the aforementioned chronic stressors, support may be offered by family and friends. The victims may perceive that others are available to provide emotional comfort and practical assistance, and the victims may benefit psychologically from this belief. That is, social support may initially act as a buffer. However, if the victims do not recover from their loss or illness over time, or if their condition places continued or increasing demands on their support network, social bonds are likely to loosen and support is likely to eventually deteriorate. The deterioration of support may, in turn, be aversive and increase psychological distress.

Thus, the role of social support in the stress process may qualitatively shift. At the onset of a stressor, or under acute, stressful conditions, support may be a resource that buffers, or moderates, the negative effects of the stressor on mental health. However, if the stressor is protracted, support may deteriorate, losing its buffering capacity. Moreover, if higher support is associated with less psychological distress, then the deterioration of support resulting from chronic stress exposure could increase psychological distress. To put it more abstractly, the role of support in the stress process can change from a moderating variable to a mediating variable as a result of chronic exposure.
to a stressor. More detailed discussions of the conceptual and analytical distinctions between moderator and mediator variables are available in several reviews (Baron & Kenny, 1986; Frese, 1986; Wheaton, 1985).

With regard to crowding, we expect that short-term exposure to household crowding has few if any effects on perceived support from roommates and that individuals in crowded conditions who have high levels of perceived support will develop fewer psychological distress symptoms than individuals in crowded conditions who have low levels of perceived support. In contrast to the short-term buffering, or moderating, role of perceived support on the crowding-distress process is the previously discussed mediating role of support observed under chronic crowded living conditions (Evans et al., 1989). Thus, with long-term exposure, we expected crowding to interfere with the buffering role of perceived support as a result of eroding perceived support from roommates. The deterioration of support, in turn, is expected to be associated with increased levels of psychological distress.

To test this model of the dynamic role of perceived social support in the stress process, we examined the relations among household crowding, perceived support from roommates, and psychological distress over time, beginning with initial occupancy. We hypothesized that there would be no initial differences in psychological distress or perceived support between crowded and uncrowded residents. We predicted that after a short period of occupancy, crowding would increase levels of psychological distress, but it would do so more among residents with low levels of perceived support than among residents with high levels of perceived support. That is, higher levels of perceived support would moderate the effects of crowding on psychological distress. However, we expected that after an extended period of occupancy, perceived support would be lower as a result of prolonged exposure to crowded living conditions and that perceived support would act as a mediator in the link between crowding and psychological distress. Referring the reader back to Figures 1 and 2, we predicted that perceived support would function as a moderator (Figure 1) after a short exposure to the stressor. After a subject endured more extended exposure to the stressor, perceived support would function as a mediator, intervening between the stressor and psychological distress (Figure 2).

Method

Subjects

Participants were 173 college students (73 men, 100 women) who (a) agreed to complete all three interviews (only 6% of the sample refused to complete later interviews after completing the initial interview), (b) did not move to a new residence by the time of the 8-month interview (1% of the initial sample had moved by the 8-month interview), and (c) could be reached by phone by the 8-month interview (6% of the sample did not answer their phone, 2% were on vacation, and 2% were hospitalized or too sick to come to the phone over a 2-week calling period). The final sample of 173 participants represented 76% of the 2-month sample (n = 228) and 67% of the initial sample (n = 260). Participants who did not complete all three interviews did not differ significantly from the final sample in their mean level of psychological distress, perceived support, or perceived crowding measured during the initial interview (ps > .05).

The sample members were predominantly White (64%), with an average age of 20 years (SD = 2.3 years), a personal share of rent of $248.80 (SD = $73.70), and a monthly income of $698.90 (SD = $324.60).

Procedure

Before the start of the fall semester, university housing staff identified students who were moving into off-campus apartments. An equal number of men and women were randomly selected to participate in the study. To guarantee independent data points, we allowed only one person per apartment to participate. Respondents were contacted by telephone and invited to participate in the study. In exchange for their participation, respondents were eligible to win $300, $100, or $50 from a lottery. Less than 10% of those contacted refused to participate in the study.

The structured interview was administered approximately 2 weeks (M = 12 days, SD = 5.4 days), 2 months (M = 52 days, SD = 6.0 days), and 8 months (M = 234 days, SD = 11 days) after respondents occupied their apartments. To minimize attrition, we sent reminder letters to respondents before their 2-month and 8-month interviews, respectively. Trained researchers interviewed participants by telephone. We kept interviewers blind to respondents' housing conditions by placing questions about household crowding at the end of the interview schedule. Respondents were unaware of the specific objectives of the study, and confidentiality of all responses was emphasized to interviewers and participants.

Measures

We collected background data (e.g., race and gender) at initial occupancy. Household crowding, perceived social support from roommates, and psychological distress were measured in all interviews. Income was included as a potential control variable because it could possibly influence selection into crowded apartments as well as levels of psychological distress. Income was measured as monthly income from all sources (parents, savings, work, etc.). Household crowding was calculated as the ratio of the number of persons and the number of rooms in the respondent's apartment. The number of rooms did not include bathrooms and hallways. On average, there was 1 person per room, with a range of 2 rooms per person to 2 persons per room. Household crowding was stable throughout the study. Neither the mean level of crowding nor the range of crowding changed over time; the correlation between crowding 2 weeks and 2 months after occupancy was .89, p < .001, and the correlation between crowding 2 weeks and 8 months after occupancy was .84, p < .001.

A modified version of the Friend subscale of the Social Support Appraisals Scale (SSA, Vaux & Harrison, 1985; Vaux et al., 1986) was used to measure respondents' perceptions, or beliefs, about support available from their roommates. The SSA has adequate concurrent, convergent, and divergent validity with five other validated social support measures and has good reliability (α = .80–.90, Vaux et al., 1986). The SSA was modified by making 6 friend-support items specific to roommate relationships. Respondents were told that roommates refers to all of the people they live with, not just the people with whom they share a bedroom. For example, respondents indicated on a 5-point scale (1 = strongly disagree to 5 = strongly agree) whether they could "relax on their roommates" or whether their "roommates don't care about their welfare" (reverse coded). Originally, the question stems were "rely on their friends" and "friends don't care about their welfare."

Psychological distress was measured with the Demoralization Index
of the Psychiatric Epidemiology Research Instrument (PERI; Dohrenwend, Shrout, Egri, & Mendelsohn, 1980), a standardized, 25-item symptom checklist for nonclinical populations. Respondents indicated on a 5-point scale (0 = never to 4 = very often) whether they had experienced a particular symptom (e.g., "felt nervous") in the prior week. Other validated measures of psychological distress, such as the Langner-22 Scale (Langner, 1962), are highly correlated with the PERI Demoralization scale (Link & Dohrenwend, 1980). The Langner-22 Scale predicts eventual psychiatric case openings.

Results

Analytic Strategy

The analytic strategy was designed to assess the changing role of perceived support over time in the link between household crowding and changes in psychological distress. We also examined the plausibility of self-selection as an alternative explanation of the effects of household crowding on perceived support or psychological distress. The viability of a self-selection, reverse-causation alternative would be weakened by finding no correlation between crowding and either perceived support or psychological distress during the initial period of occupancy.

We used two basic approaches to examine the changing role of perceived support as a coping resource over time. First, we examined the zero-order correlations between household crowding, perceived support from roommates, and psychological distress at 2 and 8 months respectively after occupancy. We expected that after 2 months of exposure, perceived support would moderate, or buffer, the positive relation between household crowding and psychological distress (Figure 1). Therefore, crowding and perceived support should be uncorrelated, or independent, 2 months after occupancy. In contrast, after 8 months of exposure, we expected perceived support to mediate the effects of crowding on levels of psychological distress (Figure 2). Therefore, crowding and perceived support should be correlated 8 months after occupancy.

Second, we more completely tested the model of the changing role of perceived support from a moderator to a mediator by using a series of regression analyses. In the respective analyses of the moderator and mediator functions of perceived support, baseline, psychological distress symptom levels were statistically controlled. This approach helped control for potential spurious associations between either crowding or support and later psychological distress that might be caused by prior levels of psychological distress (Depue & Monroe, 1986). In addition, the outcome variable (residualized distress) represents change in level of psychological distress, rather than absolute level of psychological distress.

Multiple regression analyses were used to test the proposition that perceived support moderates (Figure 1) the association between crowding and increases in psychological distress over the 2-month occupancy period. Initial psychological distress scores were entered on the first step. Thus, the criterion variable was the respondents' residualized psychological distress scores. Household crowding scores at initial occupancy were entered on the next step, followed by perceived social support from roommates at 2 months after occupancy; the cross product of the two centered predictors was entered on the final step as a test of their interaction (Finney, Mitchell, Cronkite, & Moos, 1984). As indicated in standard interaction procedures, the cross product interaction term was estimated after partialing out the main effect contributions of the independent factors, crowding and perceived support (Cohen & Cohen, 1983).

Before analyzing the predicted mediating effects of perceived support 8 months after occupancy (Figure 2), we again tested for an interaction of crowding and perceived support on psychological distress. If perceived support did not moderate the effects of crowding on psychological distress after this longer duration of exposure, we would proceed to evaluate whether perceived support mediated the relation between crowding and psychological distress. Following the procedures outlined by Baron and Kenny (1986), we used four separate regression equations to test for mediation at 8 months after occupancy. In Equation 1, we regressed residualized psychological distress scores onto household crowding scores at initial occupancy. In Equation 2, we regressed residualized distress scores onto perceived support scores at 8 months after occupancy. In Equation 3, we regressed perceived support scores at 8 months after occupancy onto crowding scores at initial occupancy, also controlling for initial levels of psychological distress. In the final equation, we repeated the first equation, except the perceived support term at 8 months after occupancy was forced into the equation before household crowding. The mediating role of perceived support was indicated by the previously significant positive association between crowding and psychological distress (Equation 1) becoming nonsignificant as a result of partialing out the effects of perceived support (Equation 4).

Selection

Correlational analyses were used to examine whether there was systematic selection into crowded apartments that was associated with levels of psychological distress, perceived support from roommates, or financial factors (income and rent) at the point of initial occupancy. There were no significant associations between household crowding and initial levels of psychological distress ($r = .12, ns$) or initial levels of perceived support from roommates ($r = .02, ns$). Thus, selection into crowded apartments does not seem to be related to perceived support or levels of psychological distress. Therefore, any observed associations between crowding and distress or between crowding and support at 2 and 8 months after occupancy were probably not due to biased selection (i.e., a reverse causal process).

There were, however, significant associations between crowding and income ($r = -.28, p < .01$) and between crowding and rent ($r = -.40, p < .01$). These results suggest that financial factors were the primary predictors of who moved into crowded apartments: Poorer students tended to move into more crowded and, hence, less expensive apartments than wealthier students did. However, further analyses revealed no association between income or rent and levels of psychological distress. Because financial factors were not correlated with the level of psychological distress, there was no need to control for them in subsequent analyses. Moreover, there were no significant inter-

1 This assumption was tested empirically by entering income and rent as control variables in all of the regression analyses reported in this article. In no instance did the variables alter the results of the regressions found without such controls.
actions between gender and residential crowding on psychological distress, perceived crowding, or social support. Therefore, gender was not controlled for in any of the analyses.

**Simple Correlations**

The simple correlations between the study variables after 2 months and after 8 months of exposure to household crowding are presented in Table 1. As shown in the first data column in Table 1, after 2 months of exposure, greater crowding was associated with higher levels of psychological distress but was not associated with perceived support. In addition, higher levels of perceived social support were associated with lower levels of psychological distress. This pattern of correlations is consistent with a moderating model of social support, which requires that the stressor (crowding) and support be largely independent factors. The full test of the moderating role of perceived support, however, requires an analysis using regression techniques of the interaction between crowding and perceived support, which is reported below.

As shown in the second data column in Table 1, after 8 months, crowding was no longer independent of perceived social support. Instead, greater crowding was associated with lower levels of perceived support. Furthermore, there was a large and statistically significant (Pearson-Filon Z = 5.02, p < .001) increase over time in the correlations between crowding and perceived support. In addition, greater crowding continued to predict higher levels of psychological distress, and higher levels of perceived support continued to predict lower levels of psychological distress. This pattern of associations is consistent with a mediating model of social support, which requires that the stressor (crowding) and support be intercorrelated. However, the full test of the mediating role of perceived support requires an analysis of the effect of crowding on psychological distress after partialing out the effect of perceived support. This analysis using regression techniques is reported below.

**Regression Analyses**

**Two months after occupancy** Table 2 depicts the results of predicting changes in levels of psychological distress from crowding and perceived support and depicts the Crowding × Support interaction at 2 months after occupancy. Thus, the effect of crowding on changes in levels of psychological distress is presented in line 1; the effect of perceived support on changes in levels of psychological distress is presented in line 2; and the interactive effects of crowding and perceived support on changes in psychological distress are presented in line 3. The interaction term was estimated after entering the crowding, perceived support, and prior psychological distress factors into the equation.

Crowding was a significant predictor of positive (higher) increases in levels of psychological distress by 2 months after occupancy (line 1 in Table 2). Perceived support was a significant predictor of negative (lower) increases in levels of psychological distress (line 2 in Table 2). However, the significant negative interaction of crowding and perceived support (line 3 in Table 2) reveals that the association between crowding and levels of psychological distress was moderated by perceived support. As illustrated in Figure 3, individuals in crowded apartments who had high perceived support reported little change in levels of psychological distress, whereas their crowded counterparts with comparatively low levels of perceived support reported increases in psychological distress.

**Eight months after occupancy** We expected that the buffering role of perceived support would disappear after longer exposure (8 months) to household crowding. We also anticipated that the levels of perceived support would be diminished as a result of the extended exposure to crowding. In addition, the deterioration of perceived support was expected to account for higher levels of psychological distress among more crowded residents.

We tested the stress-buffering role of support at 8 months after occupancy by using the same approach as described above. The outcome was residualized distress scores, and we evaluated the interactive effect of crowding and perceived support after entering the independent crowding and perceived support terms in the equation. The interaction was not statistically significant (β = −.08, ns). Thus, perceived support from roommates did not moderate the effects of crowding on levels of psychological distress after 8 months of exposure. One potential reason for the disappearance of the buffering effect on perceived support is that at 8 months after occupancy, greater crowding was associated with lower levels of perceived support, even after controlling for initial levels of psychological distress (β = −.18, p < .01). Additional mediation analyses, below, supported the hypothesis that the deterioration of perceived support resulting from prolonged exposure to crowding might explain the association between chronic household crowding and increases in psychological distress.

The results of predicting changes in levels of psychological distress from crowding, perceived support, and from crowding after partialing out the effects of perceived support at 8 months after occupancy are presented in Table 3. Crowding was a significant predictor of positive (higher) increases in levels of psychological distress by 8 months after occupancy (line 1 in Table 3). Perceived support was a significant predictor of negative (lower) increases in levels of psychological distress (line 2 in Table 3). As noted above, crowding was a significant predictor of lower levels of perceived support. Furthermore, when the effects of perceived support were partialled out, crowding was no longer a significant predictor of changes in psychological distress.

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**Table 1**

**Simple Correlations 2 Months and 8 Months After Occupancy**

(n = 173)

<table>
<thead>
<tr>
<th></th>
<th>2 months after occupancy</th>
<th>8 months after occupancy</th>
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</thead>
<tbody>
<tr>
<td>Crowding and support</td>
<td>−.07</td>
<td>−.35*</td>
</tr>
<tr>
<td>Crowding and symptoms</td>
<td>.21*</td>
<td>.27*</td>
</tr>
<tr>
<td>Support and symptoms</td>
<td>−.38*</td>
<td>−.40*</td>
</tr>
</tbody>
</table>

*Note.* Correlations that share a subscript differ using the Pearson-Filon test of difference between correlated correlations—subscript a indicates Z = 5.02, p < .001. * p < .01, two-tailed.
distress (line 3 in Table 3). These analyses suggest that perceived support from roommates appears to have mediated, or explained, the positive association between crowding and changes in levels of psychological distress 8 months after occupancy.

Additional analyses were conducted to examine whether changes in (as opposed to absolute levels of) perceived support from roommates between 2 and 8 months after occupancy would likewise result in a pattern of results suggesting mediation. For these analyses, residualized scores of perceived support from 2 to 8 months were used as the mediating variable. The regression analyses were the same as those described above using absolute levels of perceived support, and they yielded nearly identical results. Crowding was associated with decreases in perceived support from 2 to 8 months after occupancy (β = −.32, p < .01), and decreases in perceived support were associated with increases in levels of psychological distress (β = .32, p < .01). After we adjusted for changes in perceived support, the previously significant association between crowding and changes in levels of psychological distress disappeared.

**Discussion**

This study provides preliminary evidence that perceived support is a dynamic coping resource that can change as a result of some stressful conditions. Specifically, we found a qualitative shift in the role of perceived support in the stress process, which may have resulted from the chronicity of exposure to the stressor, household crowding. Two months after occupancy, perceived support from roommates moderated the positive association between household crowding and changes in levels of psychological distress. Increases in psychological distress over the initial 2 months were apparent among residents in crowded conditions who had relatively low levels of perceived support, but were not apparent among residents in crowded conditions who had high levels of perceived support. This finding is consistent with the classic buffering model of social support (Cohen & Wills, 1985).

However, at 8 months after occupancy, the interaction between crowding and support disappeared. Thus, under conditions of prolonged exposure to crowding, the effectiveness of perceived support from roommates as a buffer of crowding stress was diminished. In addition, the data were consistent with our previous cross-sectional findings in India (Evans et al., 1989) that suggested a mediating effect of social support in the link between chronic residential crowding and distress. In the present longitudinal study, at 8 months after occupancy, crowding was no longer independent of perceived support but had become associated with lower levels of perceived support, which in turn was associated with increases in psychological distress associated with crowding. Thus, perceived support appears to have shifted from an independent, exogenous factor that buffered the negative effects of crowding on psychological symptomatology to a variable that was endogenous to crowding and may explain its adverse psychological effects. In more general terms, perceived support appears to have shifted its qualitative role in the stress and psychological distress process from a moderating to a mediating function.

**Moderating Role of Social Support**

Three primary questions arise in interpreting the present findings. First, why were people with low levels of perceived support less resistant to the adverse psychological effects of crowding after 2 months of exposure? This question is a variant of the frequently addressed problem of explaining the buffering effect of social support in the stress-distress relation. In the case of crowding, lower levels of perceived support may increase people’s psychological distress by decreasing perceived control over the regulation of social interactions (cf. Pearlin et al., 1981), by increasing the number of negative interactions, or by exacerbating the degree of threat imposed by unexpected social interactions, which are common under crowded conditions.

Thus, short-term exposure to crowded living conditions may affect levels of psychological distress when perceived support is low because individuals in crowded conditions appraise the

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2 As an additional test of spuriousness, the crowding and perceived support terms were reversed in the regression equation that predicted changes in levels of psychological distress. If a third, unspecified variable was creating a spurious association between crowding and support, reversing the terms should not have altered the regression results. Thus, if spuriousness was operating, one would expect that perceived support would no longer be a significant predictor of distress after partialing out the effects of crowding. However, perceived support was still a significant predictor of distress after partialing out the effects of crowding (β = −.89, p < .001). The spuriousness hypothesis was not supported.
interactions that occur with unsupportive roommates as less controllable and more threatening than those that occur with supportive roommates. Alternatively, undesirable social interactions may become more common or more salient in crowded homes in which individuals perceive their roommates to be unsupportive. The increased frequency or salience of undesirable social interactions in turn can increase psychological distress. This interpretation seems reasonable because a great deal of research has shown that crowding may increase negative, unwanted social interactions (see Baum & Paulus, 1987; Sundstrom, 1978) and that negative social interactions are detrimental to psychological well-being (Fiore, Becker, & Coppel, 1983; Pagel, Erdly, & Becker, 1987; Rook, 1984; Schuster, Kessler, & Aseltine, 1990). In contrast to the individuals in crowded homes who have low levels of perceived support, individuals in crowded homes who have high levels of perceived support probably appraise the excessive social interaction as nonthreatening, or possibly even desirable.

**Mediating Role of Social Support**

The second and third questions are more complex, and they are related. Why was crowding associated with lower levels of perceived support after 8 months of exposure? Why did perceived support apparently shift in function from a moderator to a mediator in the crowding and psychological distress relation over time? These questions are particularly challenging because few researchers have studied the effects of stressor duration on social support, and few researchers have contemplated the conditions that can lead to a negative association between a stressor and social support.

We have suggested that the type of stressor and contextual factors such as duration of exposure might affect the relation between the stressor and support and, in turn, the role of support in the stress–distress process. Specifically, stressors that result from negative social involvements (e.g., unwanted or undesirable social interactions, criticisms, and invasion of privacy)

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**Table 3**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Total R²</th>
<th>F(totol R²)</th>
<th>ΔR²</th>
<th>F(ΔR²)</th>
<th>df</th>
<th>b</th>
<th>SE_e</th>
<th>Standardized B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crowding</td>
<td>.46</td>
<td>72.65**</td>
<td>.02</td>
<td>4.97*</td>
<td>1, 171</td>
<td>5.57</td>
<td>2.50</td>
<td>.13</td>
</tr>
<tr>
<td>Support</td>
<td>.51</td>
<td>89.20**</td>
<td>.07</td>
<td>23.34**</td>
<td>1, 171</td>
<td>-0.95</td>
<td>0.20</td>
<td>-.27</td>
</tr>
<tr>
<td>Crowding with additional control for support</td>
<td>.52</td>
<td>60.60**</td>
<td>.006</td>
<td>2.16</td>
<td>2, 170</td>
<td>3.55</td>
<td>2.41</td>
<td>.08</td>
</tr>
</tbody>
</table>

*Initial level of psychological distress was entered first in all equations.

*p < .05, two-tailed. **p < .001, two-tailed.
or stressors that lead to social withdrawal reactions are likely candidates for environmental demands that may erode perceived social support. Living in crowded conditions for long periods is but one stressor that has been shown to have negative effects on perceived social support (Evans et al., 1989; Lakey, 1989).

Other stressors also might diminish perceived social support and affect other types of social support (e.g., enacted support and social contact). That is, it is possible that the source of stress and support need not be intimately linked, as are crowding and perceived support from roommates, in order for the stressor to have adverse effects on social support. For example, some major stressful life events may directly reduce the number of potential support providers in one's network (e.g., death of a spouse, migration, divorce, retirement, job loss, and graduation from school; cf. Thoits, 1982). In addition to removing members from one's support network or blocking social access, major events may have more subtle effects on support availability. Certain stressors may be stigmatizing conditions (e.g., AIDS, mental illness and criminal conviction) or may be so tragic (e.g., cancer, death of child, and rape) that otherwise supportive network members may become distant, threatened, overwhelmed, or incapacitated to help the victim (cf. Vaux, 1988). Catastrophic stressors, such as war and natural or technological disasters, may reduce network members' abilities to offer help to others as they are struggling themselves to marshal coping resources to face the stressor (Edelstein, 1988). Additionally, stressors such as noise might interfere with support processes by limiting communication (Evans & Cohen, 1987). Finally, excessive overtime at work (House, 1981) or dual roles as worker and homemaker might limit the amount of time and energy people have to develop and maintain supportive personal ties.

Additional Factors Influencing the Stress-Support Relation

Contextual and individual factors other than the type and characteristics of the stressor and social support variables can influence the role of social support in the stress process. Sociodemographic factors (e.g., Riley & Eckenrode, 1986); dispositional factors such as self-esteem, locus of control, and social competence (e.g., Cohen, Mermelstein, Kamarck, & Hoegerman, 1985; Cohen & Syme, 1985b; Eckenrode, 1983; Lefcourt, Martin, & Saleh, 1984); ways of coping (e.g., Dunkel-Schetter, Folkman, & Lazarus, 1987; Dunkel-Schetter & Skokan, 1990; Wortman, 1984); and social network properties (e.g., Caturia, 1986; Hirsch, 1979, 1980; Wellman, 1979) are but a few variables that might influence whether others will offer support to an individual facing a stressor and whether a stressed individual will seek support or perceive it to be available. Moreover, contextual and individual variables such as those listed above might influence the stability of the buffering effect of social support in stressful situations (Cohen, in press). For example, socially competent individuals might be better able to maintain their social support resources during prolonged stressful situations than less socially competent individuals might be (cf. Heller & Swindle, 1983). In such instances, support buffering might be stable for the socially competent individuals but disappear for the less socially competent individuals under prolonged stressful situations.

We also recognize that stress might mobilize social support or increase levels of perceived support (cf. Barrera, 1986; Eckenrode & Wethington, 1990; Weaton, 1985; Vaux, 1988). For example, individuals who show signs of coping with a stressful situation may trigger increased support from individuals around them. Alternatively, individuals coping with a stressor may be more likely than individuals not coping with a stressor to appraise the amount of support they have available to them. As a result of this appraisal process, individuals coping with a stressor may perceive that they have more support available to them than do individuals not facing a stressor. Explanations of the conditions under which stress is associated with higher levels of social support have benefited from research on helping behaviors (e.g., Eckenrode & Wethington, 1990). Thus, explanations of support mobilization are slightly more developed than our current speculations about the causes of support deterioration. Further development of models for explaining social support as a dynamic coping resource should consider both support mobilization and support deterioration processes.

Limitations

Without random assignment to crowded living conditions, we cannot be sure that other unmeasured factors were not operating to create spurious associations between crowding and psychological distress. However, the plausibility of spurious factors is limited because there were no differences in levels of perceived support from roommates or psychological distress between individuals in crowded and uncrowded conditions during the initial weeks of living together. If a third variable (e.g., a personality factor) was influencing selection into crowded homes as well as perceptions of support and levels of psychological distress, then we would expect to see associations between crowding and perceived support or between crowding and psychological distress during the initial occupancy period. In addition, the primary predictors of occupancy in a crowded household were rent and income, although these financial factors were not associated with levels of psychological distress and therefore could not explain any associations between crowding and psychological distress.

Another limitation of the present analysis is that we do not know to what degree chronic crowding interfered with the actual availability of support from roommates versus the perceived availability of support from roommates. This issue is important if we are to understand why chronic crowding is associated with lower levels of perceived support. It is possible that chronic exposure to crowding diminishes individuals' perceptions of support availability by reducing social contact, by biasing social-information processing, or by diminishing the actual supportiveness of crowded roommates. Currently, we believe that some combination of these factors is responsible for eroding perceived support under chronically crowded living conditions. Individuals probably adapt to crowded conditions by withdrawing and perhaps "tuning out" social stimulation to reduce the social overload experienced in crowded conditions (Baum & Paulus, 1987).
would be lower perceived support due to diminished social contact and biases in social information processing. A challenge for future researchers is to examine the mediating factors that explain the negative effects of chronic crowding or other enduring stressors on social support.

A final limitation of this study concerns the possible reciprocal relationship between perceived social support and psychological distress at 8 months after occupancy. The possibility of a nonrecursive relationship between perceived support and psychological distress cannot be ruled out with our data. Thus, the mediation model may need to be qualified by adding a feedback loop from psychological distress to perceived support. By controlling for initial levels of psychological distress in the regression analyses, we eliminated the potential confound between concurrent levels of perceived support and psychological distress that might be caused by prior levels of distress (Monroe, 1983). However, this does not rule out the possibility of a reciprocal relationship between concurrent levels of perceived support and psychological distress. Examination of the cross-lagged associations (Kessler & Greenberg, 1981) is not useful in the present analysis because perceived support and psychological distress have different stability characteristics (i.e., different autocorrelations over time). In such situations, the less stable variable will tend to appear as the predominant cause even if the true cross-lag coefficients are causally equal (Rogosa, 1980).

Two-staged least squares analysis is another possible approach to determining whether there is feedback from the dependent variable to the mediator (James & Singh, 1978). This approach, however, requires the use of instrumental variables for each of the reciprocally related variables (i.e., social support and psychological distress). Instrumental variables are related to one of the variables but not the other. Nevertheless, this alternative, reciprocal model of the hypothesized mediational role of perceived support in the link between chronic crowding and psychological distress does not negate the clear findings that perceived support initially buffers the effects of crowding on psychological distress, but that with longer exposure to crowding, the buffering effect of perceived support disappears and crowding becomes inversely correlated with perceived support.

Conclusions

Our results show that the classic buffering role of perceived social support is operative (in a prospective analysis, with longitudinal controls for prior distress) after a relatively short-term exposure to a stressor—2 months of residential crowding. Furthermore, our analyses provide evidence for our a priori hypotheses that chronic exposure to residential crowding is associated with lower perceived social support and that social support can no longer function as a stress buffer. Although after 2 months of exposure to crowding, perceived support interacted with (moderated) crowding to attenuate its adverse psychological effects, by 8 months of exposure to crowding, the moderating effect was absent. In addition, our prospective, longitudinal analysis replicates our prior cross-sectional findings (Evans et al., 1989) that the deterioration of perceived support resulting from prolonged exposure to crowded living conditions is an underlying mechanism (mediator) that helps to explain the relation between residential crowding and psychological distress.

Social support has been typically conceptualized as a static, exogenous variable that exists largely independently of stressors. Its role usually has been restricted to two functions: Support can have direct or main effects on well-being and support can function as a moderator that may buffer the harmful effects of stressors on well-being. We have attempted to transcend the limitations of this traditional conceptualization of support (i.e., direct vs. moderating effects) by applying a more transactional approach to the study of support processes (cf. Eckenrode & Gore, 1981; Heller & Swindle, 1983; Shinn et al., 1984; Shumaker & Brownell, 1984; Vaux, 1988). Although our model may be limited to particular types of stressors and social support, it appears that stressors can directly affect social support. It also appears that an inverse relationship between a stressor exposure and social support might indicate one pathway through which stressors might influence psychological well-being. That is, social support can, under some circumstances, function as an endogenous mediator of the effect of stress on well-being. We also have suggested that the role of social support in the stress process can shift qualitatively. This may occur because of characteristics of the stressor itself or because of other contextual factors in which the stressor is embedded. The present study is focused on the latter, showing that the duration of exposure to crowding seems to alter the role of perceived social support as it intercedes between crowding and psychological health. Future research could elaborate on the model by examining other factors that can influence the stability of the buffering effect of social support in response to a range of stressors in a variety of different conditions, durations, and intensities.

References


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