

## Housing Quality and Mental Health

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This study examined the potential link between housing quality and mental health. First, the development of a psychometrically sound, observer-based instrument to assess physical housing quality in ways conceptually relevant to psychological health is reported. Then 2 different studies, including a prospective longitudinal design, demonstrate that physical housing quality predicts mental health. Possible underlying psychosocial processes for the housing quality–psychological distress link are discussed.

The hypothesis that housing quality affects mental health has proved difficult to evaluate scientifically. The importance and salience of this hypothesis stems from the fact that we spend more time in the home environment than in any other setting. Therefore, if the physical environment is capable of influencing mental health, housing quality ought to be a prime candidate for research. Furthermore, throughout much of the world, housing stock is substandard, barely meeting, if at all, minimum requirements for shelter and refuge. This is sadly true for upward of 10% of housing in the United States (U.S. House of Representatives, Committee on Appropriations, 1994).

There are several reasons why it has been difficult to conduct rigorous, scientific research on housing quality and mental health. First, people choose where they live. This makes it difficult to disentangle the impact of housing quality from personal characteristics (e.g., socioeconomic status [SES] and initial levels of mental health) that could lead to spurious associations between housing quality and mental health. Second, existing measures of housing quality have been developed within one of two perspectives: either to assess threats to public health or in terms of

construction standards or building codes. Neither of these perspectives has consciously taken into account environmental qualities conceptually relevant to mental health. In addition to serious conceptual drawbacks, most extant housing quality indices rely on respondent's self-report of housing quality, thus rendering associations with self-report measures of mental health subject to mono-method bias. Third, assessment of mental health in the general population requires instruments designed to measure nonclinical symptomatology. Prior research on housing quality and mental health has relied primarily on nonstandardized, author-generated measures of mental health or used catastrophic indicators, such as psychiatric case openings.

The aims of the present study were twofold. First, we endeavored to develop an observer-based index of housing quality that is conceptually relevant to mental health and is built on a sound psychometric foundation. Second, we assessed the relations between housing quality and mental health with a standardized mental health index designed for nonclinical populations. Moreover, we incorporated improvements in research design that reduce the plausibility of alternative explanations for the hypothesized relationship between housing quality and mental health.

The primary physical housing variable studied in relation to mental health has been building height or floor level, with concerns focused on the potentially negative impacts of high-rise living on young children and their mothers because of restricted play opportunities and social isolation, respectively (Gifford, in press). Although there are some null findings, the preponderance of data supports an association between high-rise occupancy and elevated symptoms of psychological distress among young children (Ineichen & Hooper, 1974; Richman, 1977; Saegert, 1982). In a rare true experiment on housing and mental health, Fanning (1967) found that young military wives who had been randomly assigned to multiple-dwelling units had higher rates of neuroticism than their counterparts assigned to single-family, detached housing. Many studies have also linked residing on higher floor levels with social isolation among mothers of preschool-age children (Gifford, in press).

A much smaller number of studies has examined housing structural quality as it relates to mental health. These studies have had

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mixed results (Evans, Wells, & Moch, in press; Freeman, 1984; Halpern, 1995). Nearly all suffer from serious methodological deficiencies (e.g., self-reported housing quality, no SES controls, or unstandardized assessments of mental health) that render definitive conclusions impossible. Three studies have used stronger research designs to look at the physical quality of housing and mental health. Wilner, Wackley, Pinkerton, and Tayback (1962) studied a large sample of well-matched, low-income families, half of whom resided in slum housing and half of whom relocated to better quality public housing. Psychological well-being, social relations with neighbors, and children's school performance all significantly improved in the relocated group in comparison with the group remaining behind in slum housing. Elton and Packer (1986) compared mental health among public housing occupants requesting relocation because of dissatisfaction with their current residence. Half of their sample was randomly placed into new public housing and half remained in the old housing. The group placed into new housing evidenced reduced depression and anxiety symptoms relative to the comparison group. More recently, Halpern (1995) studied residents of public housing, half of whose residences had been randomly selected to be renovated. His results were similar to Elton and Packer's.

Whereas the cross-sectional studies reveal small or mixed results, these three longitudinal studies of housing improvements consistently indicate modest gains in mental health among those receiving improved housing. Unfortunately, all three of these longitudinal studies suffer from shortcomings. First and foremost, they all confound improvements in housing quality with granting individual requests for improved housing. That is, in each case, people who were granted their request for better housing were compared with those who also wanted but did not receive improved housing. Second, no measures of housing quality were applied in these three studies. Older, poorer quality housing was contrasted with newer, improved housing options. There was no assessment of the degree of housing quality improvement for each household and thus no assessment of how the degree of housing quality improvement impacted mental health.

To address these and other methodological and conceptual shortcomings in research on housing quality and mental health, we developed an observer-based housing rating scale using psychometric scaling procedures. We then applied this housing quality instrument in conjunction with a standardized tool for assessing psychological distress in nonclinical samples in two heterogeneous samples of households. Furthermore, we controlled for income, and one of these studies was longitudinal and accounted for pre-relocation levels of psychological distress.

## Method

### Participants

Data were collected from two independent samples. Cross-sectional data were obtained from women ( $n = 207$ ) who had at least one child living in the home (mean household size = 3.21 people). The sample was a mixture of low- and middle-income families (mean income:needs ratio = 1.69,  $SD = 1.27$ ). The income:needs ratio is calculated by dividing household income by the federal poverty threshold. Thus, a household income:needs ratio of 1.00 is equivalent to the poverty line. The poverty threshold is a per capita estimate based on annual adjusted cost of living levels. The sample was predominantly White (97%) and resided in rural areas throughout

upstate New York. Nine percent of the sample did not graduate from high school, 31% were high school graduates, 45% had some college, and the remaining 15% were college graduates.

In addition to the cross-sectional, rural sample, a longitudinal, urban sample ( $n = 31$ ) was assessed before and after relocation into a residence financed and constructed cooperatively with Habitat for Humanity. All of the women in the urban sample had at least one child living at home (mean household size = 4.00 people). The sample was low income (mean income:needs ratio = 1.10,  $SD = 0.82$ ) and predominantly African American (61% vs. 39% White). The participants resided in several metropolitan areas in Michigan. Ten percent of the women did not graduate from high school, 23% were high school graduates, 60% had some college, and 7% were college graduates.

### Procedure

Data on housing quality, psychological distress, and background information were collected in home interviews. For the longitudinal, urban sample, data were collected on average 4.5 months prior to relocation to the newly constructed Habitat for Humanity residence and again 7.3 months after the move.

Psychological distress was measured with the Demoralization Index of the Psychiatric Epidemiology Research Instrument (PERI; Dohrenwend, Shrout, Egri, & Mendelsohn, 1980), a standardized symptom checklist for nonclinical populations ( $\alpha = .91$ ). Respondents indicate on a 5-point scale ranging from 0 (*never*) to 4 (*very often*) whether they have experienced a particular symptom (e.g., "felt nervous") in the prior 3 months. The PERI has been widely used across ethnically, economically, and geographically diverse samples both in the United States and abroad. The PERI shows concurrent validity with other measures of psychological health (e.g., Langner, 1962) and is predictive of eventual psychiatric case openings as well as help-seeking reports (Catalano & Dooley, 1983).

Housing quality was assessed by trained raters who evaluated the residence and the immediate neighborhood. A large number of items were included initially to represent a broad range of potentially salient aspects of housing quality for psychological health. Items came from a variety of sources, including existing housing quality indices (Kasl, Will, White, & Marcuse, 1982; U.S. Department of Commerce, Bureau of Census, Inter-University Consortium for Political and Social Research, 1990; Wilner et al., 1962), the child development literature (Bradley & Caldwell, 1987; Wachs & Gruen, 1982), and interviews with Cornell University Co-Operative Extension Housing Specialists. Factor analysis and item-scaling techniques were used to build the final version of the scale. Three-point ratings of quality were assessed for items composing six subscales: Structural Quality (e.g., "Rate the worst ceiling/wall surface in the room" [0 = *more than 1 square foot (.30 m<sup>2</sup>) loose or missing*, 1 = *less than 1 square foot (.30 m<sup>2</sup>) loose or missing*, 2 = *good*]), Privacy (e.g., "Do you have to walk through the bedroom to get to another room?" [0 = *more than one other room*, 1 = *one other room*, 2 = *no other rooms*]), Indoor Climatic Conditions (e.g., "Heat has broken down" [0 = *once a month or more*, 1 = *once in the past three months or last winter*, 2 = *not in a year*]), Hazards (e.g., "Stairs are \_\_\_" [0 = *potentially dangerous (e.g., no risers to individual steps, loose or no handrails, nails sticking out)*; 1 = *structurally sound but cracked, discolored, paint peeling*; 2 = *in good condition*]), Cleanliness/Clutter (e.g., "How much clutter is in the kitchen?" [0 = *chaos*, 1 = *some clutter*, 2 = *little or none*]), and Child Resources (e.g., "Toys are accessible to the child" [0 = *no toys clearly accessible to the child*, 1 = *in one room*, 2 = *in more than one room*]). Neighborhood quality was also evaluated (0 = *most houses in immediate neighborhood have structural damage or are badly in need of paint*, 1 = *a few houses in immediate neighborhood have structural damage or are badly in need of paint*, 2 = *no houses in immediate neighborhood have structural damage or are badly in need of paint*). Neighborhood quality was assessed primarily for evaluating discriminant validity as described below. Some items

Table 1  
*Cross-Sectional, Zero-Order Correlations Between the Housing Quality Instrument and Its Subscales and the Neighborhood Quality Scale*

Measure	1	2	3	4	5	6	7	8
1. Housing Quality	—	.65**	.54**	.61**	.71**	.48**	.26**	.09
2. Cleanliness/Clutter		—	.30**	.37**	.18*	.41**	.27**	.00
3. Indoor Climatic Conditions			—	.27**	.06	.15*	.18*	-.10
4. Privacy				—	.23**	.25**	.12*	.11
5. Hazards					—	.10	.10	.10
6. Structural Quality						—	.18*	.18*
7. Child Resources							—	.13
8. Neighborhood Quality								—

\*  $p < .05$ . \*\*  $p < .01$ .

(e.g., heating) were based on interview data, but whenever possible observer ratings were used (81 out of 88 items). Because one of the primary objectives of this study was to develop a reliable and valid instrument to assess housing quality in psychologically meaningful terms, details on the Housing Quality Instrument's psychometric properties are presented in the Results section.

## Results

### *Psychometric Properties of the Housing Quality Instrument*

**Reliability.** Reliability of the Housing Quality Instrument was assessed with the cross-sectional data in two ways. First, a measure of internal consistency, Cronbach's alpha, indicated moderate reliability ( $r_{kk} = .78$ ) for the overall instrument. Reliability for the six Housing Quality subscales (Structural Quality, Privacy, Indoor Climatic Conditions, Hazards, Cleanliness/Clutter, and Child Resources) ranged from .71 to .89. Second, interobserver reliability was estimated by comparing the evaluations of two independent raters for 23 randomly selected homes (Ebel  $r = .72$ ). Subscale interobserver reliability ratings ranged from .61 to .86.

**Validity.** Construct validity was evaluated in several ways. Principal-components factor analysis of the cross-sectional data with oblique rotation yielded six coherent Housing Quality factors plus a Neighborhood Quality factor. The latter was developed for use as an independent scale and for a check on discriminant validity. The six Housing Quality subscales, consisting of 88 items, accounted for 32% of the total variance, with eigenvalues

ranging from 3.45 to 9.53. Items were retained on the basis of factor loadings and item analysis (Cronbach's alpha). The inter-correlation matrix for the subscales is shown in Table 1.

To assess the ability of the Housing Quality Instrument to discriminate among housing of known quality, we had a subset of 34 rural houses independently identified as exceptionally good or poor in housing quality by raters who had been trained to use the Housing Quality Instrument but had not rated the particular houses with the Housing Quality Instrument. We then conducted  $t$  tests to compare overall housing quality and quality on the Housing Quality subscales with the cross-sectional data. As can be seen in Table 2, with the exception of Indoor Climatic Conditions, all of the interior housing subscales discriminated between poor- and high-quality houses. As expected, neighborhood quality in these rural homes was not different between the high- and poor-quality houses.

As a third procedure to examine the validity of the Housing Quality Instrument, we compared the overall Housing Quality score and the subscale scores before and after residential relocation in the urban longitudinal sample. As shown in Table 3, all of the indoor subscales, except for Child Resources, showed improvement.

### *Housing Quality and Mental Health*

Cross-sectional and longitudinal data are presented for a low- and middle-income, rural sample and for a low-income, urban sample participating in the Habitat for Humanity housing program.

Table 2  
*Cross-Sectional Housing Quality Scores for Predetermined Poor- and High-Quality Houses*

Measure	Poor-quality housing	High-quality housing	$t(205)$
Housing Quality	1.90	2.13	6.46***
Cleanliness/Clutter	1.22	1.53	9.85***
Indoor Climatic Conditions	2.09	2.24	1.60
Privacy	2.22	2.33	3.18**
Hazards	1.42	1.68	5.30***
Structural Quality	2.55	2.89	4.39***
Child Resources	1.06	1.46	5.59***
Neighborhood Quality	0.92	1.03	0.54

\*\*  $p < .01$ . \*\*\*  $p < .001$ .

Table 3  
Pre- and Post-Relocation Urban Housing Quality Scores

Measure	Original residence	New residence	<i>t</i> (30)
Housing Quality	1.87	2.14	8.96***
Cleanliness/Clutter	1.41	1.70	5.02***
Indoor Climatic Conditions	1.80	2.29	4.33***
Privacy	1.39	2.24	9.32***
Hazards	1.30	1.46	2.34**
Structural Quality	2.79	3.00	5.15***
Child Resources	1.14	1.10	0.86

\*\*  $p < .01$ . \*\*\*  $p < .001$ .

We used regression analyses throughout to maintain the continuous nature of the Housing Quality Instrument. Because of our focus on mothers' psychological distress, the Child Resources subscale was not included in the overall Housing Quality Instrument. As indicated above, the Child Resources subscale includes items such as availability of toys, books, and other learning materials for children.

For the cross-sectional, rural sample of low- and middle-income mothers, we regressed PERI scores onto the overall Housing Quality Instrument after statistically controlling for the income:needs ratio ( $r = -.39$  for the correlation between housing quality and the income:needs ratio). After controlling for income, we found that housing quality was a significant predictor of psychological distress ( $B = -0.46$ ,  $SE$  of  $B = 0.13$ ),  $t(204) = 3.55$ ,  $p < .001$ . The increment in  $R^2$  after controlling for the income:needs ratio was .13. As can be seen in Table 4, as housing quality increases, symptoms of psychological distress drop. The zero-order  $R^2$  between housing quality and the PERI was .12. The data shown in Table 4 are for descriptive purposes only; all of the regression analyses maintained the continuous nature of the housing quality variable.

For the longitudinal, urban sample, we used changes in overall housing quality (Time 1 – Time 2) as the predictor of Time 2 post-relocation PERI scores in a regression equation, statistically controlling for pre-relocation PERI scores. Thus, we examined the relation between changes in housing quality and residualized psychological distress. Change in housing quality was significantly related to psychological health ( $B = -19.70$ ,  $SE$  of  $B = 7.94$ ),  $t(27) = 2.48$ ,  $p < .02$ . The increment in  $R^2$  was .13. Improved housing quality was associated with reduced psychological distress. Without controlling for prior PERI scores, we found that the simple  $R^2$ , post-relocation, was .09.

### Discussion

The objectives of this study were to develop a reliable and valid instrument to assess housing quality and to use that instrument to examine the effects of housing quality on mental health. Measures of internal consistency and interobserver agreement indicated that the Housing Quality Instrument is a reliable instrument. Validity of the Housing Quality Instrument was demonstrated in several ways. Factor analysis yielded six coherent and meaningful subscales that are moderately intercorrelated (see Table 1). These subscales include Cleanliness/Clutter, Indoor Climatic Conditions, Privacy, Hazards, Structural Quality, and Child Resources. A separate scale

was also developed to assess neighborhood quality. The Neighborhood Quality scale was not expected to be highly correlated with the Housing Quality Instrument or its subscales in the rural areas studied because there is a large degree of heterogeneity in housing quality within neighborhoods. Very few of the residential units we studied in upstate New York are located in predominantly lower- or middle-class neighborhoods; instead, many houses are mixed in among properties ranging dramatically in income and residential quality. We saw this lack of relationship as discriminate validity, which was borne out in several respects. The Neighborhood Quality scale was not correlated with overall housing quality nor with five out of the six subscales of the Housing Quality Instrument (see Table 1). Furthermore, houses that differed in overall quality could be significantly differentiated by the Housing Quality Instrument and its subscales (see Table 2), whereas neighborhood quality was not distinctive across high- and low-quality housing units. One subscale, Indoor Climatic Conditions, did not significantly differentiate between high- and low-quality houses. We do not have any explanation for why this was the only subscale that did not behave as expected.

Further evidence for the validity of the Housing Quality Instrument comes from expected changes in housing quality in the longitudinal, urban sample. The residences of a small group of women moving from substandard to modest, well-built Habitat for Humanity housing were evaluated before and after the move. Five out of the six Housing Quality subscales, as well as overall housing quality, changed in the expected direction (see Table 3). The one Housing Quality subscale to not change, Child Resources, was not expected to shift because the provision of resources for children (toys, books, designated play area, etc.) largely reflects parental efforts to provide for children and not the quality of the house per se. Given the 1-year duration from the previous residence to the new Habitat for Humanity housing, we did not expect that mothers would suddenly alter their provision of resources targeted for their children in their home.

The second objective of this research was to evaluate in a more rigorous manner the hypothesis that housing quality can affect mental health. To do this, we used two different samples in conjunction with a standardized instrument designed to measure low levels of psychological distress in nonclinical populations. Results from both studies converged in support of the hypothesis. In the cross-sectional comparison of low- and middle-income, White, rural inhabitants, after statistically controlling for income, we found that better quality housing was related to lower levels of psychological distress. Our cross-sectional findings build on ear-

Table 4  
Cross-Sectional Housing Quality Quartiles and Psychological Distress

Quartile	Psychological distress score <sup>a</sup>	
	<i>M</i>	<i>SD</i>
First	1.30	0.62
Second	1.16	0.55
Third	0.96	0.42
Fourth	0.85	0.46

<sup>a</sup> Range = 0–4.

lier work indicating that poorer quality housing can lead to poorer mental health (Evans et al., in press; Freeman, 1984; Halpern, 1995). In a second study, low-income African American and White women residing in urban areas were assessed before and after moving to better quality housing. Changes in housing quality predicted post-relocation PERI scores after statistically controlling for pre-relocation PERI scores. These longitudinal findings are in accord with prior studies of the impacts of housing improvements on mental health (Elton & Packer, 1986; Halpern, 1995; Wilner et al., 1962).

The data from the present longitudinal sample provide stronger evidence than prior housing research that improved housing quality can benefit mental health. Most studies of housing quality have relied on cross-sectional designs with respondent assessments of housing quality and, in some cases, had inadequate controls for SES. Unfortunately, the few instances of longitudinal designs confounded housing improvements with receiving or being denied requests for better housing. In the present longitudinal study, all the participants received better housing. The degree of housing improvement predicted the level of change in psychological distress. Moreover, this effect occurred after controlling for pre-relocation mental health scores. Short of random assignment to housing, the present design illustrates a more scientifically rigorous way to study housing quality and human well-being. As noted earlier, one study that was able to use random assignment with a military sample found that multiple-family, high-rise housing did appear to have some negative effects on women's mental health (Fanning, 1967). Typically, however, researchers are not able to randomly assign individuals to housing. The use of military samples is not particularly desirable for studying housing quality because, generally, the physical quality of military housing is high and relatively homogenous.

Demonstrating that housing quality can be accurately assessed and then shown to predict psychological distress is but a first step in a program of research on housing quality and mental health. An important, but at present unanswerable, question is, How does housing quality affect mental health? What individual and interpersonal processes are disrupted by poor housing quality that could mediate the apparent connection between housing quality and psychological distress? We know from research on environmental stressors that individuals chronically exposed to residential crowding and noise, respectively, tend to have strained interpersonal relationships and evidence diminished motivation associated with learned helplessness (Evans, in press; Evans & Cohen, 1987). One or both of these psychosocial processes could be disturbed by prolonged exposure to poor housing. It is also conceivable that housing quality could be capable of injuring self-esteem, reflecting on one's status and level of achievement vis-à-vis the outside world. Additional research is required to further understand how and why housing quality can influence mental health.

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