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Multilevel Longitudinal Impacts of Incivilities: Fear of Crime, Expected Safety, and Block Satisfaction

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Several aspects of the incivilities thesis, or the role of social and physical disorder in encouraging crime and fear, deserve further testing. These include examining individual- and streetblock-level impacts on reactions to crime and local commitment over time, and testing for lagged and co-occurring impacts at each level. We model these four types of impacts on three reactions to crime and community satisfaction using a panel study of residents ($n = 305$) on fifty streetblocks, interviewed two times a year apart. At the individual level, incivilities showed unambiguous, lagged impacts on satisfaction, fear, and worry; furthermore, changes in perceived incivilities accompanied changes in resident satisfaction and fear. At the streetblock level: incivilities failed to demonstrate expected lagged impacts on either of the two outcomes where data structures permitted such impacts; changing incivilities, however, were accompanied by changing community satisfaction and changing perceptions of relative risk. Before we conclude that lagged ecological impacts of incivilities are weaker than previous theorizing suggests, we must resolve some outstanding theoretical and methodological issues.

KEY WORDS: incivilities; fear of crime; multilevel; broken windows.

1. INTRODUCTION

The findings of this research shed light on the connections over time between incivilities and both reactions to crime and local commitment. We seek to separate out streetblock, or social- psychological dynamics, from individual-level, or psychological dynamics, and to do so within a longitudinal framework, clarifying the differences between lagged impacts

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vs. co-occurring changes upon four outcomes of theoretical interest. We present below a brief summary of the evolution of this thesis along with supporting empirical work, closing with a statement of specific questions addressed in the current analysis.

The incivilities thesis refers to a family of theoretical notions explaining how local physical deterioration and disorderly social behavior inspire concern for personal safety and community viability and interfere with local attachment, among urban residents and other users of urban space (Taylor, 2001, pp. 93–120). Such a thesis was ''needed'' since nationwide assessments from the mid-1970s on, from sources such as the National Crime (Victimization) Survey, show, especially in urban settings, many more people are afraid of potential victimization than are crime victims (Cook and Skogan, 1984; Dubow, McCabe, and Kaplan 1979).

Scholars such as James Q. Wilson (1975) suggested the source was disorderly physical and social conditions afflicting the urban spaces in or through which residents and workers (respectively) passed the time or passed through. Disorderly social conditions included public drinking or drunkenness, rowdy and/or unsupervised teen groups, ''hey honey'' hassles, neighbors fighting or arguing, late night noise or parties, prostitutes, and from the mid-1980s on, public drug sales and the presence of crack addicts. Disorderly physical conditions included abandoned housing, shuttered stores, graffiti, litter, vacant trash-filled lots, unkempt lawns, yards or housing exteriors, abandoned cars and since the mid-1980 s, the conversion of houses or apartments to drug-selling locations. Hunter (1978) and Lewis and Maxfield (1980) coined the terms *social incivilities* and *physical incivilities* to describe these two sets of conditions. (For the closely related discussion of fear and more general urban unease see Garofalo and Laub, 1978.)

These initial theorists focused on the outcome of fear of crime, the latter being defined as an affective state reflecting safety-related concerns about possible street victimization (Ferraro, 1994). Fear is distinct from both perceptions of risk, a more cognitive assessment of the likelihood of victimization (LaGrange and Ferraro, 1989), and worry about property crimes while away, or worry about the potential victimization of family members (Dubow, McCabe, and Kaplan 1979; Taylor and Hale, 1986). Those individuals who perceive more local incivilities, or who are surrounded by more disorderly conditions, will report higher fear and greater perceived risk (Ferraro, 1994).

The first significant elaboration to the core incivilities-fear connection appeared with Wilson and Kelling's (1982) *Atlantic Monthly* piece. This article, which subsequently proved enormously influential upon researchers examining fear of crime (Ferraro, 1994) and upon policy analysts in

community policing (Greene and Taylor, 1988), suggested the incivilities-fear connection was both social psychological and longitudinal, and that incivilities could have both behavioral and crime consequences. In brief, Wilson and Kelling argued that on a streetblock, physical deterioration remaining unrepaired over time would erode residents' trust in one another, their informal control over the public spaces on the block as well as their time spent there, and would encourage local delinquency, the deterioration signaling increased opportunities for delinquent behavior (Cloward and Ohlin, 1960). Essentially, residents infer that the neighborhood is becoming increasingly socially disorganized (Bursik, 1988). Over a longer period, serious offenders might be attracted to the locale, as it would lack natural surveillance (Jacobs, 1968; Taylor, 1988, pp. 249–269).

Later, Skogan (1986, 1990) further "ecologized" the thesis, suggesting that the dynamics operated at the neighborhood level. Renaming the model "decline and disorder," he shifted the focus to neighborhood change as the ultimate outcome of interest; changes in residents' fear and local commitment might foreshadow later neighborhood deterioration. The processes connecting deterioration and neighborhood decline included the weakened informal social control mentioned by Wilson and Kelling, associated deterioration in community morale and satisfaction, and adverse impacts on local housing markets (Skogan, 1990, p. 65). Impacts of neighborhood crime on house values have been well established in the literature (Little, 1976; Taylor, 1995) but separate net impacts of incivilities, have not.

In short, Skogan argued "[D]isorder can play an important, independent role in stimulating this kind of urban decline" (Skogan, 1990, p. 12). Current theorists (Kelling and Coles, 1996, p. 25) have accepted, given Skogan's arguments and evidence, that "disorder, both directly and as a precursor to crime, played an important role in neighborhood decline."

The processes undergirding the longitudinal components are several. Wilson and Kelling (1982) described one set of processes at the streetblock level. Skogan describes additional ones at the neighborhood level. First, "visible physical decay may spark fear of crime, because Americans have come to associate it with higher levels of risk" (Skogan, 1990, p. 47). He does not specify whether the impact is simultaneous or temporally lagged, or both, but argues that both fear and perceived risk should become elevated. Second, echoing an earlier suggestion by Hunter (1978), Skogan suggests residents may infer from widespread incivilities that "the mechanisms by which healthy neighborhoods maintain themselves have broken down" (1990, p. 48), and as a result, simultaneous and/or lagged impacts of incivilities on residential satisfaction, local commitment, and perceptions of neighborhood viability should be evident. Third, Skogan expects that

incivilities (he calls them disorder) will lead to more incivilities (p. 49) because "certain disorders are self-propagating...to the extent to which disorder becomes self-generative and feeds on itself, current levels of disorder produce future levels of disorder" (1990, p. 49). The "disorder producing more disorder" causes fear to grow and local satisfaction to wane. Therefore, in addition to contemporaneous or lagged impacts of incivilities, *changes* in incivility levels or types or both may be linked to changes in fear or local satisfaction or commitment. As incivilities increase in a locale, so too should concern.[5]

Figure 1 organizes the different dynamics implicated in various versions of the incivilities thesis. "Inc." represents incivilities; "Rxn." represents various reactions to crime such as fear, as well as local person-place bonds such as local commitment or residential satisfaction. Although the ecological level in the model is labeled "Streetblock" to conform to the current analyses, it can stand in for either streetblock or neighborhood dynamics. The original idea is captured in Pathway (a): individuals seeing more incivilities are more fearful. Wilson and Kelling introduced Pathway (d) representing longitudinal, social psychological, or ecological impacts; residents on blocks with more incivilities will, over time, become more fearful and withdraw from the public arena. Skogan described how Pathway (d) could function at the neighborhood level. Furthermore, Skogan anticipated and tested in his own work (see below) for cross-sectional, ecological impacts of incivilities on reactions to crime and local commitment (Pathway (b)).

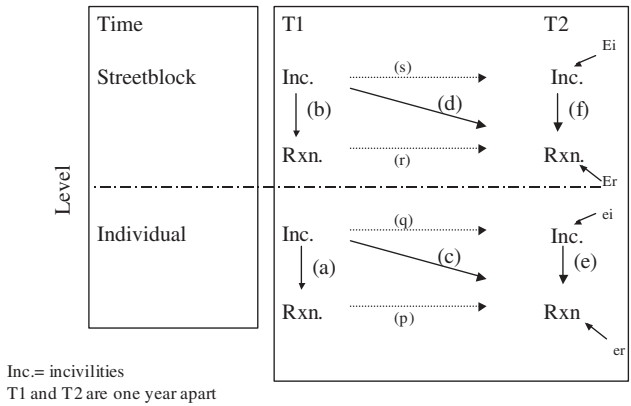

Fig. 1. Incivilities thesis and reactions to crime: Model tested.

[5]To link changes in incivilities with *later (in time)* changes in reactions to crime, we would need a panel design study with respondents interviewed at three points in time.

Pathways (e) and (f) also deserve comment. In the longitudinal model shown, the two observations are a year apart. Interpreting Pathway (e) requires recognizing that earlier (Time1) scores for both fear and incivilities are included at the individual level in the causal model. Interpreting Pathway (f) requires the parallel recognition at the streetblock level. Pathway (e) is interpreted in light of the controls represented in pathways (p, q, c); pathway (f) is interpreted in light of the controls in pathways (s, r, d). Consequently, pathway (e) tells us about the extent to which unexpected changes in incivilities between Time1 and Time2 *accompany* unexpected changes in (e.g.,) fear of crime between Time1 and Time2 at the individual level. Pathway (f) tells us about the same connection at the streetblock level. ''Unexpected'' is the technical term we use to stand in for the Time2 residual after predicting it with Time1 scores. For example, in the case of incivilities at the individual level it represents that portion of incivilities at Time2 that is independent of Time1 scores on incivilities (recognizing pathway (q)). At the streetblock level, it also is the portion of Time2 means independent of Time1 streetblock means (recognizing pathway (s)). In the case of reactions to crime and local commitment, it also represents residuals, independent of Time1 scores. Since Time1 scores at the individual level, for both incivilities and the outcomes, are centered around their respective block means,[6] the unexpected changes at the streetblock and individual levels are independent.

Pathway (f) was implied by both Skogan's version of the incivilities thesis for communities, and Wilson and Kelling's version for streetblocks. If incivilities can be ''self-propagating,'' and if this is more likely in some locales than in others, then as incivilities increase in a locale so too should average fear levels. Pathway (e) has not been explicitly postulated by prior theorizing but seems a straightforward extrapolation from the initial cross-sectional version of the incivilities thesis. If those residents who see themselves surrounded by more incivilities are more fearful than their neighbors, it seems plausible that if they see incivilities increasing, it would elevate their fear.

Continuing to rely on the schematic in Fig. 1 to help organize work to date, what empirical support exists for each impact pathway? The key idea from Wilson-Garofalo-Laub, that those perceiving more neighborhood problems are more concerned for their safety, has been repeatedly supported (Pathway (a)). Initial analyses of individual-level outcomes confounding between- and within-neighborhood predictor variance (e.g., Lewis and Maxfield, 1980) have been confirmed by later studies partitioning predictor variance (Covington and Taylor, 1991), correctly modeling within-neighborhood correlated errors, and controlling for direct and indirect victimization experiences (Taylor, 1997). Ecological analyses at either the

[6]Please refer to the explanation of group mean centering below.

streetblock level (Kurtz *et al*., 1998; Perkins *et al*., 1992) or the neighborhood level (Skogan, 1990; Taylor, 1996; Taylor *et al*., 1985), and contextual analyses (Taylor and Covington 1993; Covington and Taylor, 1991; Rountree and Land, 1996a,b; Taylor, 1997) confirm cross-sectional ecological impacts of incivilities on fear, perceived crime problems, and local commitment (Pathway (b)).

Although the individual-level, lagged longitudinal incivility impact has not yet been investigated (Pathway (c)), several studies have attempted to gauge the lagged ecological impact (Pathway (d)). Many of the latter have fallen short, however, because they have failed to apply adequate statistical controls (Perkins and Taylor, 1996; Perkins *et al*., 1993; Skogan and Lurigio, 1992). One has used crime rather than incivility indicators for testing Skogan's proposed community impacts (Harrell and Gouvis, 1994; cf. Rosenfeld, 1994).[7]

One contextual assessment of Pathway (d) interviewed different residents in 30 Baltimore neighborhoods with the first and second set of interviews twelve years apart (Taylor, 2001, pp. 203–236). Results confirmed significant impacts on one out of five reactions to crime: night-time, on-the-block fear, but not daytime fear on the block or in the neighborhood, or nighttime fear elsewhere in the neighborhood, or avoidance of dangerous places. Lagged impacts of incivilities on moving intention were observed, but no other indicators of local commitment, such as block satisfaction, were investigated.

Another investigation focusing on local attachment and involvement using the same thirty neighborhood data found some ecological impacts of changing incivilities on local commitment and involvement (Pathway (f)). Unexpected changes in graffiti between the two surveys helped predict weaker sense of community, but not did not affect attachment to place (Hyde, 1998, pp. 198–203).

Limitations of the two above studies include an extremely long period—twelve years—during which ecological changes were allowed to accumulate, and a lack of available Time1 individual data for those interviewed at Time2. Thus, it has not yet been possible to test the longitudinal portion of the full model depicted in Fig. 1 (Pathways (c) through (f)) in one analysis. The present study seeks to do so using the streetblock as the ecological context with one year between the first and second resident interviews, using a panel rather than a wave study design. In the dense, urban residential contexts often found in older, large cities, the

[7]Given space limitations we omit discussion here of work on the longitudinal impacts of incivilities on neighborhood crime rates (Markowitz *et al*., 2001; Sampson and Raudenbush, 1999; Taylor, 2001). Markowitz *et al*. investigated ecological effects of disorder on fear with three panels of British Crime Survey data but did *not* lag the impact of disorder on fear (p. 310).

streetblock is well accepted as a meaningful social and physical unit (Perkins *et al.*, 1992; Taylor, 1988). In these contexts streetblocks may function as ongoing behavior settings (Taylor, 1987, 1997).

1.1. Purpose

The present examination addresses the following questions. (1) Do reactions to crime increase, and does block satisfaction decrease, over time, on blocks with high initial levels of incivilities (Pathway (d))? (2) Do individuals perceiving more incivilities initially become more afraid and less satisfied over time (Pathway (c))? For both these analyses, the focus is on change in the outcome, so we control for initial outcome levels (pathways (p, r)).[8] With multi-level modeling we can separate out pooled, within-group processes from between-group (between streetblock) dynamics.

A second pair of questions addresses co-occurring changes in incivilities and outcomes. (3) On streetblocks where incivilities are increasing, are the block residents as a group becoming more fearful and less satisfied with the locale (pathway (f))? Several processes might undergird this connection. Skogan (1990) suggested that disorder propagates itself, and that propagation itself inspires concern. Alternately, ecological change is a complex and multi-stranded process (Taub *et al.*, 1984), and this connection could reflect an intertwining of these different strands of change taking place on streetblocks. (4) Are individuals who think, compared with their neighbors on the block, that local incivilities are worsening, also at the same time becoming more concerned about their personal safety and less satisfied with the block (Pathway (e))? Individuals who see incivilities on their block increasing faster than their neighbors do are interpreting changes in local conditions, perhaps including changes in incivilities, but perhaps other changes as well, in a more dire light than those living nearby. Jang and Johnson (2001) suggest the finding that perceived and assessed incivilities do not always correlate extremely closely arises from these interpretive processes, which vary across persons, and that these processes are time dependent. It seems plausible that those making this ''darker'' interpretation of local changes will feel more vulnerable and less committed to the locale. Because of the centering procedures used, we can investigate these impacts separately at the individual and group (streetblock) level.

The four questions described above represent the central focus of our investigation. We are not aware of another investigation that has

[8]Ideally, we would also like to be able to examine the impacts of changing incivilities on changing outcomes, with a lag separating the two change periods. Our research design, however, does not permit us to do this. As noted earlier, that would require a three panel survey design.

simultaneously examined these four different impacts of incivilities using a meaningful ecological grouping.

2. METHOD

2.1. Site and Sampling Procedures

The site of the study was Baltimore City, Maryland. Using probability sampling procedures in 1987 we sampled 50 neighborhoods, one streetblock (both sides of the street) within each neighborhood, households on each block, and designated respondents, either a household head or a spouse of a household head, at each household. We had previously defined Baltimore City's neighborhoods using procedures that maximized the ecological validity of the boundaries generated (Goodman and Taylor, 1983; Taylor and Covington, 1988). Field workers went out to each sampled block to list all occupied households, and to code on-site incivilities as well as defensible space features and territorial markers using a closed-ended, pre-tested form (Perkins *et al.*, 1992). Initial contacts were attempted by telephone where a number was available, otherwise in-person contact procedures were used. Contact and screening procedures were identical in both modes.

We sampled households using a multi-stage, stratified, clustered sampling frame. Fifty neighborhoods were sampled with a probability proportional to population size from a geographically stratified list of all 237 ecologically defined neighborhoods.[9] Within each neighborhood one streetblock was selected with a probability proportional to streetblock population, as reflected in the number of listed, non-duplicate, non-business phones. Fieldworkers listed all occupied residential units on each sampled streetblock, and rated the physical environment of the block and of the sampled addresses. An interval sampling procedure with a random start was used to sample 12 households on each block. A pre-approach letter was sent to each selected household and trained interviewers subsequently attempted contact with each household. Contacts were made by phone if possible, otherwise interviewers made contact in the field. Of the 412 interviews completed in wave 1 (winter 1987), 46% were by phone and 54% were in-person. The contact procedures—number of contacts at each designated household, times of contact attempts, etc.—were identical for both phone and in-person respondents. Eligible respondents were household heads and spouses of heads. If the household contained more than one (head or spouse of head), a designated respondent was randomly selected. The response rate was between 72% and 84% for the first wave of surveys.

[9]We excluded from the sampling frame the downtown and some two-dozen public housing communities, given how different these were from more typical "residential" neighborhoods.

Out of an initial sample frame of 601 potential respondents, 13 households were never used and 13 others were verified in-person as vacant, thus leaving a total sample size of 575 households where contacts were attempted. Using this as the denominator, our response rate was 72% for wave 1. Taking into account only those households ($n = 492$) in which someone was actually reached, however, the per-household-contacted response rate becomes 84% (number of refusals, break-offs, and language problems = 80).

During late winter and early spring 1987, interviewers completed 412 resident interviews for the first wave. Analyses of extensive on-site ratings of dwelling characteristics indicated there were no significant differences between selected households where an interview was successfully completed and those where it was not. A year later, 336 of the original 412 participants were available for re-interviewing. In 1988, we successfully re-interviewed 305 of them, for a response rate of 91%.[10]

2.2. Crime and Crime Changes

It is difficult to link local crime changes to the timing of our surveys, since crime data are reported by year while each survey took place ~1/4–1/3 of the way into each new year. The following, however, provides some contextual information about crime rates.[11]

The fifty neighborhoods recorded a nonsignificantly higher aggravated assault rate (791/100,000 residents vs. 773/100,000) and burglary rate (1987/100,000 residents vs. 1966/1,000) in 1987, the year of the first survey as compared with 1986. Robbery rates declined nonsignificantly from 1986 (1103/100,000) to 1987 (1073/100,000). In the city as a whole, excluding public housing communities, neighborhood aggravated assault rates dropped from 1986 (836/100,000) to 1987 (803/100,000). So too did robbery rates (1123/100,000 in 1986; 1013/100,000 in 1987) and burglary rates (1957/100,000 in 1986; 1837/100,000 in 1987).[12] Therefore, in the city as a whole,

[10]Seventy of the Time1 respondents had moved off their block and were thus ineligible. Another six had died. Our response rate for interviewing the 336 eligible Time1 respondents was 91%. We compared Time2 respondents with Time2 non-respondents to see if our follow up sample was representative. At the Bonferroni adjusted alpha level, the two groups were not different on sex, age, race, or education. There was a slight over-representation of owners as compared to renters in the Time2 respondents vs. non-respondents, and cases were weighted accordingly. The weight to correct for this bias was slight.

[11]We asked about victimization incidents in the survey, but the streetblock is not conducive to the creation of meaningful prevalence rates.

[12]These results for the city as a whole are weighted by 1980 neighborhood population. Since these are averages for neighborhood crime rates and do not include crime from public housing communities, they will not match total reported crime rates for the city.

all three of these rates were dropping slightly; two out of the three (robbery, burglary) were dropping in the sampled neighborhoods.

Looking at the changes from 1987 to 1988, aggravated assault rates increased significantly in the 50 sampled neighborhoods (up to 872/100,000 in 1988) ($t = -2.12$; $p < 0.05$). This matched a significant increase citywide in neighborhood aggravated assault rates ($t = -4.51$; $p < 0.001$). In the study neighborhoods, the rate of burglary did not increase significantly from 1987 to 1988 (up to 2086/100,000) and the rate of robbery dropped slightly (down to 1012/100,000). In the broader city during this time neighborhood robbery and burglary rates both declined nonsignificantly.

These overall trends do not mean that significant crime changes were not happening in the individual sampled neighborhoods. They were. Looking at robbery, the street crime thought to most strongly inspire residents' concerns for personal safety, from 1986 to 1988 two neighborhoods tripled or quadrupled their robbery rates; a handful more neighborhoods doubled their rates. In other words, around the overall pattern for the city, and the overall pattern for all 50 sampled neighborhoods, significant and concern-inspiring changes were taking place in several neighborhoods. We looked to see if these crime shifts linked with block-level fear residuals in our later models, and they did not.

2.3. Sample Characteristics

At Time1, the sample had the following characteristics: 55% of the total sample was African-American while 45% were white. 67% of the respondents were female, and 64% had received a high school education. The mean age was 47 years and the mean length of residence in the current neighborhood was 15 years; the mean length of residence at current address was 13 years. 58% of the sample were homeowners. The mean household size was 2.9. Roughly half the sample had a household income of $20,000 or more in 1986, and slightly over half were high school educated. On race and homeownership, the sample was not significantly different from the city population as reported in the 1980 Census.[13]

[13]Cluster survey samples of this design and methodology can somewhat over-represent women and extremely residentially stable persons; our gender ratio here, for example, is comparable to Crutchfield *et al.*'s (1982) Chicago survey. On residential stability, the figures reported here are comparable to figures obtained with Baltimore cluster survey samples since the late 1970s, with mean length of residence of around 14 years. Although we weighted the sample to bring owners vs. renters into line with the best available population figures for the 50 neighborhoods, it is plausible, as one reviewer cogently pointed out, that the "over-representation of females and residentially stable persons" may "have inflated/deflated some of the coefficients for the Level 1 measures."

2.4. Outcomes

For descriptive statistics on the variables see Table I.

Exploratory principal components generated three independent indices for reactions to crime: Emotional Fear, Worry, and Safety Changes.[14]

Emotional fear was based on six items including modified NCVS fear items. Separately for daytime and nighttime, and separately for on the block and elsewhere in the neighborhood, just off the block, respondents were asked "How safe would you feel being out alone?" (very safe (1)/somewhat safe (2)/somewhat unsafe (3)/very unsafe (4)). Two additional items were answered in a yes (1)/no (0) format "Would you be afraid if a stranger stopped you at night in your neighborhood to ask for directions?"; and "Would you feel uneasy if you heard footsteps behind you at night in your neighborhood?" Stephanie Greenberg and Bill Rohe originally developed these last two items (Greenberg, Williams, and Rohe, 1982). Scores on the first four items were recoded as (0) through (1) making the same metric across all the items. The Cronbach's α for this index was 0.82.

Worry was a five-item index. The respondent reported worry about being held up or beaten up, separately for him/herself and for other members of his/her household, and separately for on the block and elsewhere in the neighborhood, just off the streetblock. "How worried are (you/you about other members of your household) about being held up on the street, threatened, beaten up, or anything of that sort, (on your block/elsewhere in the neighborhood)? The fifth item asked "How worried are you about your home being broken into when no one is home?" For all items, available response categories were not at all worried (1)/just a little worried (2)/somewhat worried (3)/very worried (4). The Cronbach's α for this index was 0.86.

Safety changes. Reporting separately for the block and elsewhere in the neighborhood, respondents indicated if the locale was more dangerous (3)/the same (2)/safer (1) compared with "two to three years ago." In a separate item using the same response categories they also reported on future safety directions for their own block: Two or three years from now, do you think your block will be. . .." The Cronbach's α for this four-item index was 0.79. This index refers specifically to past and expected changes in perceived local risk.

In addition to these three indices, we used one single-item outcome: *block satisfaction:* "All things considered, how satisfied or dissatisfied are you with this block as a place to live?" (dissatisfied (1)/somewhat dissatisfied (2)/somewhat satisfied (3)/satisfied (4)).

[14]We decided not to z-score constituent items to equalize item variance for indices, since we sought to compare individual scores at Time1 and Time2.

Table I. Level 1 and Level 2 Variables

Variable	Mean	Std. dev.	Min	Max
Level 1—Individual				
Outcomes				
Emotional fear at Time2	0.59	0.32	0	1
Worry about being victimized at Time2	2.43	1.08	1	3.67
Perceived safety over time at Time2	2.16	0.53	1	3
Block satisfaction at Time2	2.86	0.64	1	4
Incivilities				
Perceived incivilities at Time1	0.39	0.42	0	2
Change in perceived incivilities – L1	0.00	0.26	−0.85	1.02
Other predictors				
Demographics				
Gender (0 = male; 1 = female)	0.67	0.47	0	1
High School Education (0 =no; 1 = yes)[a]	0.64	0.42	0	1
Marital status (0 = no; 1=yes)[b]	0.52	0.50	0	1
Length of residence (years)	13.18	13.06	0	87
Stress and coping covariates				
Life events[c]	0.23	0.19	0	1
Hassles[d]	0.53	0.42	0	2
Negative experiences[e]	0.55	0.46	0	2
Sense of community[f]	0.51	0.35	0	1
Level 2—Streetblock				
Mean house value change (1990 minus 1980)	$29,546	$17,021	$12,127	$113,224
Non-white greater than 20%, less than 80%[g]	0.20	0.40	0	1
Non-white greater than 80%[h]	0.46	0.50	0	1
Percent with a HS education[i]	0.65	0.23	0.22	1
Percent who own their home[j]	0.58	0.35	0	1
Average perceived incivilities—Time1	0.44	0.31	0	1.2
Change in perceived incivilities—L2	0.00	0.12	−0.31	0.21

[a]Ten of the 50 streetblocks had zero variance on this item. To satisfy the HLM requirement that there be variance in each group, we replaced one individual score in each of the streetblocks with zero variance with its opposite score. We then randomly selected another individual from within ten other randomly selected streetblocks and replaced their scores with the opposite of the inserted values, so the variable retained the same overall frequency distribution across the sample.

[b]The same procedure was used here as was used for high school education because there were ten streetblocks with no variance on the predictor.

[c]Seven event domains were added up to provide a cumulative index of life events over the past twelve months (e.g., a close friend or relative died, a close friend or relative got attacked while in your neighborhood; there was a divorce or breakup involving you or other family members or close riends) ($\alpha = 0.52$); higher scores indicated experiencing more events in the past 12 months.

[d]Average of a five item index; domains were adapted from Lazarus' and Folkman's (DeLongis *et al.*, 1982) longer inventory of "daily hassles" ($\alpha = 0.68$) (e.g., household problems, health problems, time pressure). Respondent indicated how often he/she had had that type of hassle in the last four weeks; higher score indicated more hassles.

[e]Average score of eight non-redundant negative items from the Interpersonal Experiences Questionnaire (Shinn *et al.*, 1984; $\alpha = 0.85$). Respondent was asked how many times in the last four weeks things like the following had happened: people made too many demands, people made things difficult, someone you knew upset you, you found yourself disagreeing with others. Higher score means more experiences happening more often.

[f]Average of a five item index adapted from McMillan and Chavis (1983). Respondent was asked if in the last twelve months he/she had done things with a neighbor living within a couple of blocks like working to improve block appearance, working to get better police protection, going out socially, visiting inside their home, and speaking to a neighbor. Higher score indicates engaging in more activities. Cronbach's $\alpha = 0.69$.

[g]Streetblock scored 1 if the respondent population at Time1 was greater than 20% African-American *and* less than 80% African-American. Item intended to capture racial heterogeneity on the streetblock.

[h]A block scored 1 if in 1987 more than 80% of respondents were African-American, 0 otherwise.

[i]Percentage of the neighborhood population 25 or older that in 1980 reported having a high school education. Based on 1980 census figures reallocated to ecological neighborhoods.

[j]Percentage of occupied housing units in the neighborhood that are owner occupied, based on 1980 census figures reallocated to ecological neighborhoods.

The correlations among these different outcomes were weak to moderate, suggesting that by modeling the four different outcomes independently we are not inflating our α levels improperly.[15]

2.5. Variables: Predictors

Outcome at Time1. We entered, both at the individual and aggregate levels, the Time1 score on each outcome. Consequently, each Time2 outcome, at both the individual and block levels, is transformed into changes between Time1 and Time2 (Pathways (p) and (r) in Fig. 1).

Incivilities: individual level. *Perceived incivilities* were surveyed *at both* Time1 and Time2. At the individual level we used an average score over eight items. For each item the respondent indicated if it was not a problem (0)/somewhat of a problem (1)/or a big problem (2) on his/her streetblock. The items included in the index are: "Vandalism, like people breaking windows or spray painting buildings," "Vacant housing," "People who don't keep up their property or yards," "People who say insulting things or bother other people when they walk down the street," "Litter or trash in the streets," "Vacant lots with trash or junk," "Groups of teenagers hanging out on the street," and "People fighting or arguing." The Cronbach's α for the index was 0.81. The streetblock was previously defined in the protocol.

Household-level perceived incivilities scores were linked to household-level assessed incivilities. Teams of raters made on-block assessments of household-level and block-level incivilities (Perkins *et al.*, 1992), but only at Time1.[16]

Incivilities: aggregate level. At Level 2, we aggregated the perceived individual level incivilities index by streetblock. Different residents on a block agreed remarkably well with one another on their perceptions of problems on their respective blocks ($r_{\text{intraclass}} = 0.746$ at Time1 and 0.755 at Time2). The strong inter-rater reliabilities suggest substantial ecological, or at least social psychological validity of the index for the streetblock arena.

[15]After controlling for the initial levels of each outcome, the correlations of the uncentered variables were as follows: fear with safety change (0.11); fear with worry (0.19); fear with block satisfaction (−0.16); safety change with worry (0.03); safety change with block satisfaction (−0.26); and worry with block satisfaction (−0.14). The question about what the *theoretical* relationships should be between these various outcomes is a difficult one and cannot be pursued given length restrictions (see Ferraro, 1994).

[16]Despite Jang and Johnson's (2001) suggestion that there may be a time lag between increases in assessed incivilities and shifts in perceived incivilities, we did see some modest connection between the two types here. Addresses where raters observed more litter out front, in comparison to other houses on the block, had residents who reported more problems on the block ($\gamma = 0.121$ for litter; $t = 1.74$; $p < 0.10$). Since this analysis group-mean centered the predictor, this connection suggests some modest ecological validity at the individual level.

Further ecological validity was suggested by strong connections between block mean scores on perceived incivilities and block average ratings for vandalism, household deterioration, and litter on the block, number of males hanging out, and percent of addresses that were nonresidential and dilapidated (details available from third author upon request).[17] ANOVA models via HLM for perceived incivilities showed substantial ecological variation at both assessments (Time1 33.66% variance between neighborhoods ($\chi^2 = 201.006$; $p < 0.001$); Time2 34.74% variance between neighborhoods ($\chi^2 = 207.783$; $p < 0.001$)).

Incivilities: change. To create incivilities change indicators we proceeded as follows. At the individual level, scores on the Time1 incivilities index were group mean centered; Time2 group mean centered scores on the incivilities index were then regressed on the Time1 scores (thus capturing pathway (q) in Fig. 1), and the residuals retained. These residuals make up the change indicator at Level 1; their impact reflects pathway (e). At the streetblock level we regressed Time2 block means on the perceived incivilities index onto Time1 streetblock means, capturing pathway (s) in Fig. 1, and retained the residuals. Again, the coefficients for the residuals will capture the co-occurring impact shown in pathway (f). Note that the incivility change indicators, at both levels, control for both initial position, and changes affecting the entire set of streetblocks during the intervening year.[18]

Coefficients for pathways (e) and (f) are only estimable if we have sufficient variance in the partialled predictors at, respectively, the individual and streetblock levels, i.e., if enough unexpected change was revealed between the two assessments. It is clearly substantial at the individual level. Although impacts of Time1 group mean centered incivilities on Time2 were significant ($b = 0.556$; $p < 0.001$; $R^2 = 0.3957$), 60% of Time2 variation in incivilities remained unexplained, thus representing substantial individual level shifts from Time1 to Time2. At the streetblock level, a significant impact of Time1 perceived incivilities on Time2 incivilities ($b = 0.792$; $p < 0.001$), explained 90% of the Time 2 variance. But of crucial importance the χ^2 test (71.39; $p<0.05$) tells us that the remaining 10% aggregate variation in perceived incivilities, representing changes, is substantial and beyond what would be expected by sampling error. In other words, we are

[17]These on-site assessments were completed only at Time1. For details on the procedure see Perkins *et al*. (1992). Since the assessed incivilities were not available at Time2, we were forced to rely on the perceived incivilities indicators to estimate the impacts described in Figure 1.

[18]Each of these regressions used to create the residuals contained a constant. This constant captures overall mean changes in perceived incivilities that might have taken place between Time1 and Time2. At the individual level the constant is de facto forced to be zero since the scores are group mean centered at both times.

able to reject the null hypothesis that the Level 2 variance of incivilities at Time2, after controlling for Time1 incivilities, is zero. We do not have complete stability from Time1 to Time2 at the streetblock level for our incivilities indicators. The upshot is that we can test for the independent contributions of both lagged and simultaneous ecological impacts of incivilities because the two are at least somewhat independent.[19]

Covariates. In addition, a number of individual and ecological predictors were used in some models to control either for individual or block characteristics. At the individual level we controlled for gender (0 = M; 1=F), length of residence, married (1 = yes; 0 = no), and high school education (0 = no; 1 = yes). We also controlled for stress the respondent was experiencing at the time using standardized scales from the stress and coping literature: negative experiences, daily hassles, and significant life events. To control for local social climate, which can influence fear, (Taylor *et al.*, 1984), we also controlled for sense of community.[20]

At Level 2, we used both interview-based (1987) and census-based (1980) variables to fully capture features of neighborhood ecology–status, race, and stability. In an extensive series of model tests to capture relative neighborhood status, we tried using 1980 house value, 1980 house value percentile, and changes in house value from 1980 to 1990 (1990 subtracted

[19]Clearly the size of the residual Time2 variation in perceived incivilities sets an upper limit on impacts we can observe for Pathway (f). As Duncan and Raudenbush (1999) have noted, "...it is important to realize that effects may turn out to be small because the degree of natural variation is small, rather than because the setting is irrelevant" (p. 29). We will not know, of course, if the residual Time2 variation would have been larger had longer time elapsed between the first and second observations. But the important points here are twofold: first, we do have substantial enough residual variation to justify modeling Pathway (f); and, second, the size of the residual variation in no way constrains the lagged ecological impacts of incivilities we might observe (Pathway (d)), and which would be grounded in the substantial ecological variation of perceived incivilities at Time1.

[20]The rationales for these additional variables, viewed largely as covariates in the current analysis, are as follows. At Level 1, following up on the idea that fear of crime is a stress and coping outcome (Riger 1985; Lewis and Riger 1986) we included stressors such as daily hassles, major life events, and negative experiences, as well as coping resources such as sense of community. We expect that stressors can accumulate over time, thereby increasing fear, and that available social supports can dampen fear over time. Details about these indices available upon request from the third author.

from 1980).[21] We opted for the house value change. For stability we used percent of owner occupied households. Both theory and previous empirical work link higher stability to lower fear and higher satisfaction (e.g., Taylor and Covington, 1993). For race we tried various dummies capturing both racial composition and racial heterogeneity. Heterogeneity usually links to higher fear, as does African-American neighborhood composition (Taylor and Covington, 1993). We retained dummy indicators that, in tandem, captured both racial composition and heterogeneity.

3. ANALYSIS

A series of models isolated the contributions of incivilities, and the net contributions, at the individual and aggregate levels, linked to both lagged and simultaneous impacts. To recap, incivilities can contribute in four different ways to changing reactions to crime or satisfaction. Incivilities at Time1 can influence within-block changes in reactions to crime at Time2 (Pathway (c)); incivilities at Time1 can influence between-block changes in reactions to crime at Time2 (Pathway (d)). Further, incivilities can change as reactions to crime are changing. This can occur either at Level 1 (Pathway (e)) or Level 2 (Pathway (f)).

Models *A* and *B* provide descriptive information about the data. In model *A*, Time1 incivilities entered at Levels 1 and 2 and describe total lagged impacts on Time2 outcomes, before controlling for Time1 outcomes. Model *B* enters only the outcome at Time1, at both levels. Model *B* addresses a crucial feature of our outcomes. Potential impacts of incivilities on changing reactions to crime and attachment may be limited by the stability of those outcomes, at the individual and/or neighborhood levels, over the course of a year. If these outcomes are extremely stable, then, after controlling for the outcome at Time1, little variance will remain to be explained at Time2 by incivilities or any other predictor. From Model *B* we report the percentage of Level 1 and Level 2 variance remaining. Further, for the latter, multi-level modeling tells us if the remaining variance is "significant," i.e., more than would be expected under the assumptions of

[21]Theorizing (Covington and Taylor, 1991; Taylor and Covington, 1993) suggests that the static measure from 1980 would link negatively to block fear levels, and it did. Higher status insulated residents from fear-provoking situations on their streetblocks. But theory also suggests that changes in status might link to fear. Skogan's (1990) decline and disorder thesis suggests that more slowly increasing house values over the period should be linked with increasing fear, as neighborhood quality declines and residents become more vulnerable to a wider range of problems. Alternatively, quickly increasing house values, betokening a more desirable neighborhood, should link to declining fear levels. Results were stronger for house value change than for house value, and, given collinearity between the two indicators, we could use only one.

sampling error (Bryk and Raudenbush, 1992, pp. 55, 65). Formally, it is a test of the hypothesis that $T_{00} = 0$. If at the block level we do have marked stability in the outcomes, we should be unable to reject this null hypothesis and, therefore, also be unable to conduct a fair test of the lagged, ecological impact of incivilities on changing outcomes. At the individual level, there is no test of the significance of remaining Level 1 variance. We can report descriptively, however, how much remains after controlling for the outcome at Time1.

Models examining impacts on changing outcomes begin with model *C*; there are two versions. In Model *C*, we include incivilities, and the Time1 outcome, at both levels, thus estimating lagged impacts of incivilities at both levels on changes in the outcomes, before adding covariates. In Model *C′* we add indicators of changes in incivilities. This model examines the total impacts of incivilities, via four different pathways, on changes in reactions to crime and satisfaction. Model *D* was identical to model *C* except that covariates were added and incivilities change indicators removed. Model *D′* repeats model *D* but added the two incivilities change indicators.[22,23] These results examine the net impact of four different impact pathways described in Fig. 1, after controlling for other factors. Finally, the last column of the

[22]For one outcome, Worry, the initial Level 2 between-neighborhood variance was nonsignificant. For other outcomes, remaining Level 2 variance was nonsignificant after some runs. For all outcomes we report results that continue to add in Level 2 predictors even though the remaining variance is nonsignificant. This allows consistent presentation across different tables. Strictly speaking, if remaining Level 2 variance is nonsignificant, the significance tests for ecological predictors should not be interpreted. We also ran the results without adding Level 2 predictors once remaining Level 2 variance was nonsignificant. Those were almost identical to those shown here since we group mean centered all Level 1 predictors save gender.

[23]Elaborations of model *D* were run (results not shown) to gauge stability of results across combinations of Level 2 predictors. Different predictors were successively removed from the model and then added back in. Five different model combinations were run. For each model, one Level 2 predictor was removed and the Level 2 predictor removed in the previous model was replaced. In the modifications the variables removed were: neighborhood house value; the percentage of owners on the block; the percentage female on the block; and percentage of individuals with a high school education. These four Level 2 predictors were chosen for removal due to their relatively strong relationship with each other. In a final fifth variation, all four Level 2 variables were removed. For the outcomes we examine here, these variations produced results differing only trivially from the ones shown here.

tables shows model D''. In this model, sense of community and life events were both removed.[24]

All Level 1 predictors, except for gender, are group mean centered and all Level 2 predictors are grand mean centered.[25] All of the Level 1 slopes are fixed.[26] Group mean centering at Level 1 allows us to isolate the level at which incivilities contribute to the outcome and see if incivilities have multi-level impacts; grand mean centering at Level 2 reduces potential collinearity problems. Analyses used hierarchical linear models (HLM) and the tables report unstandardized coefficients. Sample weighting was mentioned previously.

The random effects ANOVAs for each outcome showed the following percentages of total variance at Level 2: Emotional Fear (18.2%, $\chi^2 = 114.02$), Worry about being victimized (0.3%, $\chi^2 = 47.15$), Safety Change (13.7%, $\chi^2 = 96.75$) and Block Satisfaction (30.6%, $\chi^2 = 171.53$). All save Worry show highly significant ($p < 0.001$) between neighborhood variation. For the three out of four outcomes where the ecological variation is significant, some might worry that the ecological fraction is not noteworthy. Theorists such as Liska have disagreed.[27]

[24]One reviewer suggested that impaired sense of community is an outcome which, according to some incivilities theorists, may mediate the impact of incivilities on fear of crime. By partialling for that mediating impact we might be unfairly "cheating" incivilities of a causal impact. So we removed the sense of community index in model D''. The same reviewer also pointed out that the life events index included an indirect victimization item, an outcome which also might mediate impacts of incivilities on fear of crime. Given that the index had some other outcomes that some might construe as mediating incivilities, we opted to remove the entire index as well from model D''.

[25]Group mean centering of Level 1 predictors was chosen rather than grand-mean centering for two reasons. This approach completely separates between-neighbor vs. between-streetblock explanation; further, it maximizes the amount of Level 2 outcome variation remaining to be explained by Level 2 predictors. This approach "preserves" the ecological outcome variance so it can be explained only by Level 2 predictors—and compositional differences in gender, since this Level 1 predictor was not centered. Grand mean centering of Level 1 predictors would have better controlled for compositional differences between the streetblocks, but would have further disadvantaged our crucial tests of ecological impacts. Different results might be obtained with different centering procedures. We believe our choice here "ease[s] interpretation of results" (Bryk and Raudenbush, 2002, p. 32).

[26]We recognize that other authors have successfully examined variations in individual level fear predictors, and the sources of that variation (Rountree and Land, 1996a). But learning about those variations was not our primary purpose here. Further, the limitations of the current data set, in terms of the number of people per group, argued against such an exploration. By fixing the Level 1 slopes the ratio of variables:cases is acceptable, and collinearity among predictors is gauged across the full sample, not on a block by block basis.

[27]"Indeed, even when only a small proportion of the total variance of a dependent variable occurs between social units, and consequently when contextual causal variables can explain only a very small proportion of the total variance, that very small proportion and the contextual variables that explain it are pivotal in conceptually linking macro- and micro- level theories" (Liska, 1990, p. 298).

3.1. Block Satisfaction

Lagged incivilities at both levels affect Time2 block satisfaction (Table II: Model *A*), even after controlling for Time1 satisfaction (Model *C*′). Satisfaction shifted markedly from Time1 to Time2 at both the individual and group level. Time1 satisfaction explained ~84% of the Level 2, Time2 outcome variation, but the chi squared test showed significant, ecological changes remaining ($p < 0.01$; Model *B*). At the individual level Time1 satisfaction explained ~23.5% of the outcome at Time2. Thus, the outcome was not completely stable over time at either the individual or ecological level.

At the individual level (model *C*), those reporting more incivilities than their neighbors at Time1 show declining satisfaction twelve months later. This individual-level, longitudinal connection persists after controlling for respondent background, and other stressors and sources of support (Models *C*′, *D*, *D*′, *D*″). At Level 2, satisfaction is somewhat more likely ($p < 0.10$) to decline in the year following on streetblocks where residents reported initially higher levels of incivilities and we add changing incivilities (Model *C*′).[28] But this result did not persist when we controlled for other covariates (Model *D*, *D*′, *D*″). So of the two possible lagged impacts of incivilities on block satisfaction, the individual but not the ecological one remains significant.[29]

In addition to the significant, individual-level, lagged impact of incivilities, both change components of incivilities linked to satisfaction changes (Models *C*′). Among those residents perceiving unexpectedly more incivilities between the two surveys, block satisfaction was lower than expected ($b = -0.815$). Additionally, Satisfaction was going down faster in locations where, on average, residents thought problems were worsening ($b = -1.07$). Both these significant impacts persisted after controlling for covariates (Model *D*′, D″). Among the covariates, only Level 2 education at the block level affected changing satisfaction; satisfaction was more likely to

[28]At the streetblock level, in order to maintain relatively reasonable levels of statistical power, we treat marginally significant impacts ($p < 0.10 - -p > 0.05$) as worthy of discussion.

[29]A slightly different ecological result was obtained with a multi-method, ecological indicator of incivilities. (We could not use the multi-method indicator here because the assessed data were available only at Time1). At Level 2, the multi-method indicator correlated at 0.727 with the index used here based on perceived incivilities. We replicated the lagged (*but not co-occurring*) impact reported here using a Time1, neighborhood-level incivilities indicator that merged perceptions of problems with separate, on-site ratings of vandalism, dilapidation, litter, vacant housing, males hanging out, and dilapidated, nonresidential properties. With that indicator we did observe a significant (at the alpha specified), lagged ecological impact ($b = -0.003$, $p < 0.10$). Thus, for this outcome the presence vs. absence of an ecological, lagged impact may be partially dependent on the specific method on which the indicator is based. The lack of consistent results for incivilities models across indicators based on different methods has been previously noted (Taylor, 1999).

increase over the period if more residents were high school educated (Model D', D'').

In sum, for incivilities we see three of four possible impacts: Pathways (c), (e) and (f) in Fig. 1. Those who, initially, saw more problems than their neighbors, became more disenchanted with the block, as did those who between the two surveys saw incivilities unexpectedly increasing during the period. Finally, if group-level perceptions of problems were worsening on the block during the period, average satisfaction was dropping as well.

3.2. Emotional Fear

For Emotional Fear, the indicator coming closest to capturing feelings of vulnerability, the block-level outcome at Time1 explained ~78% of the outcome at Time2 (Table II, Model *B*). The remaining neighborhood-level variation was marginally significant ($p < 0.06$). At the individual level, Time1 explained ~26.7% of the outcome at Time2. Thus, at the individual level, fear does not appear to be extremely stable. At the ecological level the marginally significant χ^2 value for the remaining variance does not allow us to unambiguously either accept or reject the null hypothesis of insignificant variance remaining at this level; we cannot decide if block-level fear was or was not stable over the period.

Incivilities link to lagged fear indicators (Table III, Model *A*); fear is higher later in blocks where incivilities were higher initially. We have seen this relationship before (Perkins and Taylor, 1996). Also, those individuals reporting more fear than their neighbors initially, report more fear later; similarly for blocks (model *B*). After we control for Time1 fear, incivilities continue to have a significant lagged impact at the individual level ($b = 0.092$; Model *C*). This effect fades to nonsignificance when we add in the covariates (Models *D*), but strengthens again to significance when we add the between-neighbor impact of changing incivilities (Model D', D''). We also see an impact of incivilities change (Model C', D', D'').

Incivilities impacts appear weaker at the ecological level. The significant impact of changing incivilities (Model C') becomes nonsignificant after we add the other covariates (Model D', D''). The nonsignificant lagged impact of incivilities may be due to the ambiguous stability of block-level fear over the period (Model *B*; $\chi^2 = 0.051$). Since the ecological shifts in fear were of marginal significance, this limited the potential impacts of incivilities on these shifts.

In short, we have two significant individual-level impacts of incivilities on changing fear (Pathways (c), (e)). Those who saw more problems initially than their neighbors did reported vulnerability increasing faster than did their neighbors. In addition, individuals who, between the two surveys, saw

Table II. Predicting Block Satisfaction[a]

	Model *A*	Model *B*	Model *C*	Model *C′*	Model *D*	Model *D′*	Model *D″*
Level 1 variable							
Gender					−0.050	−0.024	−0.021
					(0.067)	(0.061)	(0.061)
Perceived incivilities	−0.631***		−0.344**	−0.451***	−0.321**	−0.451***	−0.451***
	(0.085)		(0.094)	(0.086)	(0.098)	(0.089)	(0.090)
Block satisfaction at Time1		0.526***	0.392***	0.360***	0.376***	0.331***	0.358***
		(0.059)	(0.069)	(0.062)	(0.076)	(0.068)	(0.066)
Sense of community					0.134	0.134	–
					(0.094)	(0.084)	
Length of residence					−0.001	−0.002	−0.001
					(0.003)	(0.002)	(0.002)
Negative experiences					−0.061	−0.041	−0.042
					(0.075)	(0.068)	(0.066)
HS education					−0.074	−0.047	−0.050
					(0.064)	(0.058)	(0.058)
Married					−0.026	−0.007	−0.006
					(0.066)	(0.059)	(0.059)
Life events					0.009	−0.008	–
					(0.173)	(0.155)	
Daily hassles					0.002	0.051	0.047
					(0.082)	(0.074)	(0.070)
Incivilities change—L1				−0.815***		−0.811***	−0.811***
				(0.104)		(0.107)	(0.107)
Level 2 variable							
Aggregated incivilities	−1.022***		−0.278	−0.281^{+}	−0.185	−0.239	−0.239
	(0.133)		(0.195)	(0.164)	(0.190)	(0.166)	(0.166)
Aggregated block satisfaction		0.890***	0.712***	0.709***	0.551**	0.594***	0.594***
		(0.090)	(0.154)	(0.130)	(0.154)	(0.134)	(0.134)

Table II. Continued.

	Model *A*	Model *B*	Model *C*	Model *C′*	Model *D*	Model *D′*	Model *D″*
House value change (90–80)					0.0000001	−0.000001	−0.000001
					(0.000003)	(0.000002)	(0.000002)
Percent who own their home					0.219^{+}	0.116	0.116
					(0.111)	(0.100)	(0.100)
Percent with a HS education					0.412*	0.385*	0.385*
					(0.191)	(0.166)	(0.166)
Non-white 20–80%					−0.101	−0.060	−0.060
					(0.097)	(0.085)	(0.085)
Non-white > 80%					0.023	0.040	0.040
					(0.088)	(0.076)	(0.076)
Incivilities change–L2				−1.07***		−0.948***	−0.947***
				(0.237)		(0.242)	(0.242)
χ^2	96.435	77.985	78.010	68.193	61.178	56.173	56.049
p-Value	0.001	0.004	0.003	0.018	0.028	0.057	0.059
% L2 variance explained	70.57	83.65	83.67	91.01	89.55	93.57	97.68

[a]Standard errors in parentheses.
*$p < .05$; **$p < .01$; ***$p < .001$; $^{+}p < .10$ (at Level 2).

Table III. Emotional Fear[a]

	Model *A*	Model *B*	Model *C*	Model *C′*	Model *D*	Model *D′*	Model *D″*
Level 1 variable							
Gender					0.094*	0.091*	0.091*
					(0.037)	(0.036)	(0.036)
Perceived incivilities	0.155**		0.092*	0.117**	0.075	0.105*	0.104*
	(0.049)		(0.043)	(0.043)	(0.045)	(0.045)	(0.044)
Emotional fear at Time1		0.527***	0.508***	0.488***	0.476***	0.454***	0.449***
		(0.055)	(0.055)	(0.054)	(0.058)	(0.057)	(0.056)
Sense of community					0.013	0.015	–
					(0.049)	(0.047)	
Length of residence					0.002	0.003	0.003*
					(0.001)	(0.001)	(0.001)
Negative experiences					0.030	0.025	0.020
					(0.040)	(0.039)	(0.038)
HS education					0.047	0.039	0.038
					(0.034)	(0.033)	(0.033)
Married					−0.003	−0.008	−0.008
					(0.035)	(0.034)	(0.034)
Life events					−0.065	−0.057	–
					(0.092)	(0.090)	
Daily hassles					0.023	0.007	−0.003
					(0.044)	(0.043)	(0.040)
Incivilities change—L1				0.228**		0.225**	0.226***
				(0.061)		(0.062)	(0.061)
Level 2 variable							
Aggregated incivilities	0.197*		0.020	0.021	−0.086	−0.067	−0.067
	(0.082)		(0.062)	(0.060)	(0.071)	(0.071)	(0.071)
Aggregated emotional fear		0.704***	0.692***	0.690***	0.616***	0.629***	0.629***
		(0.087)	(0.096)	(0.092)	(0.108)	(0.108)	(0.107)

Table III. Continued.

	Model *A*	Model *B*	Model *C*	Model *C′*	Model *D*	Model *D′*	Model *D″*
House value change (90–80)					−0.000001	−0.000001	−0.000001
					(0.000001)	(0.000001)	(0.000001)
Percent who own their home					−0.097^{+}	−0.077	−0.077
					(0.057)	(0.059)	(0.059)
Percent with a HS education					−0.076	−0.071	−0.071
					(0.097)	(0.096)	(0.096)
Non-white 20–80%					0.089^{+}	0.079	0.079
					(0.052)	(0.052)	(0.052)
Non-white greater than 80%					0.035	0.029	0.029
					(0.052)	(0.052)	(0.052)
Incivilities change–L2				0.300*		0.191	0.191
				(0.138)		(0.143)	(0.143)
χ^2	105.104	65.023	65.826	62.575	54.253	54.651	54.981
p-Value	0.001	0.051	0.036	0.052	0.097	0.075	0.071
% L2 variance explained	11.72	78.48	76.23	79.23	83.24	81.75	81.48

[a]Standard errors in parentheses.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; $^{+}p < 0.10$ (at Level 2).

problems on the block worsen more dramatically than did their neighbors, were also becoming more fearful than their neighbors were. Neither the impacts of block-level lagged or changing incivilities were significant in the full model (D', D''). This lack of block-level impacts, however, occurred in the context of statistical results (Model *B*) that were ambiguous on the question of the stability of block-level fear over the period.

3.3. Worry

The worry index captures the more cognitive aspect of fear of crime (Dubow *et al.*, 1979). The chi-squared for the ANOVA showed that there was no significant Level 2 variance to be explained (see Table IV). Therefore, significance tests of the Level 2 predictors should not be interpreted.[30] Further, we cannot answer the question of whether block-level worry was stable over time, because there was no significant Time2, neighborhood level variation in the outcome initially. The individual-level outcome at Time1 explains 18.5% of worry at Time2. Therefore, even though ecological variance is minimal at both surveys, we do have significant amounts of individual-level changes in worry that our models can try to predict.

Lagged, Level 1 incivilities significantly influence changes in worry (Models *D*, D', D''), even after we add in covariates and changing incivilities indicators. Those seeing more problems initially, compared with their neighbors, grew increasingly worried about crime between the two surveys. The changing incivilities indicator at the individual level, however, does not affect changing worries about crime.

In short, with worries about crime, there appear to be sizable shifts during the period at the individual level, and some of those shifts are linked to initial perceived problems (Pathway (c)). The other three possible impacts of incivilities were not significant; the poor performance of the two ecological incivilities indicators was foreordained given the lack of between-neighborhood variation on the outcome.

3.4. Safety Changes

This index is closer to a perceived risk than a fear index (Rountree and Land, 1996b; LaGrange and Ferraro, 1989), with the addition that it focuses on past and expected shifts. Given the temporal focus of this index, we

[30]Level 1 results were virtually identical to those shown here when no Level 2 predictors were included.

Table IV. Worry About Being Victimized[a]

	Model *A*	Model *B*	Model *C*	Model *C′*	Model *D*	Model *D′*	Model *D″*
Level 1 variable							
Gender					−0.196	−0.208	−0.212
					(0.133)	(0.133)	(0.132)
Perceived incivilities	0.783***		0.466*	0.501**	0.399*	0.457*	0.460**
	(0.182)		(0.175)	(0.177)	(0.172)	0.175	(0.173)
Worry at Time1		0.560***	0.501***	0.493***	0.498***	0.488***	0.478***
		(0.076)	(0.079)	(0.079)	(0.076)	(0.076)	(0.074)
Sense of community					0.029	0.032	–
					(0.182)	(0.181)	
Length of residence					0.010	0.010	0.010*
					(0.005)	(0.005)	(0.005)
Negative experiences					0.137	0.126	0.097
					(0.149)	(0.149)	(0.145)
HS education					0.052	0.038	0.034
					(0.127)	(0.127)	(0.126)
Married					−0.768***	−0.777***	−0.778***
					(0.130)	(0.129)	(0.129)
Life events					−0.327	−0.313	–
					(0.344)	(0.343)	
Daily hassles					−0.153	−0.180	−0.232
					(0.164)	(0.164)	(0.153)
Incivilities change—L1				0.297		0.423	0.427
				(0.245)		(0.234)	(0.233)
Level 2 variable							
Aggregated incivilities	0.332		−0.026	−0.002	−0.265	−0.216	−0.216
	(0.208)		(0.211)	(0.211)	(0.242)	(0.247)	(0.247)
Aggregated worry		0.550***	0.558***	0.527**	0.525**	0.512**	0.513**
		(0.130)	(0.144)	(0.145)	(0.142)	(0.142)	(0.142)

Table IV. Continued.

	Model *A*	Model *B*	Model *C*	Model *C′*	Model *D*	Model *D′*	Model *D″*
House value change (90-80)					0.0000001	0.000001	0.000001
					(0.000005)	(0.000005)	(0.000005)
Percent who own their home					−0.341^{+}	−0.297	−0.297
					(0.189)	(0.195)	(0.194)
Percent with a HS education					−0.013	−0.006	−0.006
					(0.316)	(0.316)	(0.315)
Non-white 20–80%					0.263	0.245	0.245
					(0.168)	(0.169)	(0.169)
Non-white greater than 80%					0.087	0.081	0.081
					(0.151)	(0.151)	(0.151)
Incivilities change—L2				0.685		0.434	0.434
				(0.478)		(0.477)	(0.476)
χ^2	47.697	39.765	40.434	38.537	38.990	38.454	38.603
p-Value	> 0.500	> 0.500	> 0.500	> 0.500	> 0.500	> 0.500	> 0.500
% L2 variance explained	0.00	53.86	49.32	51.70	40.57	30.80	33.52

[a]Standard errors in parentheses.
$^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$; $^{+}p < 0.10$ (at Level 2).

might expect changing incivilities indicators to make stronger contributions than lagged incivilities indicators.

Controlling for the outcome at Time1 leaves substantial Time2 variation to be explained; 54% of the neighborhood outcome variation remains and 88.1% of the individual level variation remains (Table V, Model *B*). Thus, we saw substantial shifts on this outcome from Time1 to Time2 at both the ecological and individual levels.

The lagged impacts of incivilities, at both the neighborhood and individual levels, proved nonsignificant. Ecological shifts in incivilities, however, did consistently influence views about local safety trends. (Models C', D', D''). On those blocks where residents on average thought problems were worsening between the surveys, they also agreed that the block and neighborhood had been becoming and would continue to become less safe.

At the individual level, negative experiences explained changing views about local safety. Those who reported more negative experiences than their neighbors at Time1, increased significantly on perceived risk by Time2. This fits with the stress and coping literature applied to reactions to crime (Lewis and Riger, 1986). Negative life experiences represent social "strain," and the opposite of social support. Apparently, these strains later elevate concerns about local safety risks. Some of the negative interpersonal experiences in the index could be linked to a disorderly block social climate.

In sum, one of the four possible impacts of incivilities linked to changing views about local safety trends (Pathway (f)). On streetblocks where residents on average saw problems intensifying between the surveys, they also were more likely to agree block safety was slipping and would continue to diminish. Neither individual level incivility impact proved relevant, nor did the lagged block impact.

4. DISCUSSION

This research tests a multilevel, longitudinal incivilities thesis over a one-year period using four outcomes, three of which are indices with excellent internal consistency. The three indices represent reactions to crime, while the fourth represents residential satisfaction. We tested four possible pathways of incivilities' influence: lagged vs. co-occurring, and individual- vs. neighborhood-level impacts. Table VI summarizes the patterns of incivility impacts across outcomes and pathways.

For three of the four outcomes—satisfaction, fear, and worry—we find significant, individual-level, lagged impacts. Those who at Time1, compared with their neighbors, saw their respective blocks as more problem-ridden, were more likely over the following year to become less satisfied with the

Table V. Perceived and Expected Safety Changes[a]

	Model *A*	Model *B*	Model *C*	Model *C′*	Model *D*	Model *D′*	Model *D″*
Level 1 variable							
Gender					−0.035	−0.035	−0.034
					(0.067)	(0.067)	(0.067)
Perceived incivilities	0.131		0.047	0.049	0.019	0.022	0.020
	(0.083)		(0.082)	(0.083)	(0.085)	(0.086)	(0.085)
Perceived safety over time		0.289***	0.282***	0.282***	0.278***	0.279***	0.278***
		(0.058)	(0.060)	(0.060)	(0.060)	(0.060)	(0.060)
Sense of community					0.014	0.014	–
					(0.090)	(0.090)	
Length of residence					−0.001	−0.001	−0.001
					(0.003)	(0.003)	(0.002)
Negative experiences					0.182*	0.182*	0.187*
					(0.075)	(0.075)	(0.073)
HS education					−0.003	−0.004	−0.003
					(0.064)	(0.064)	(0.063)
Married					−0.128	−0.129	−0.129*
					(0.065)	(0.065)	(0.065)
Life events					0.059	0.060	–
					(0.172)	(0.171)	
Daily hassles					−0.123	−0.125	−0.115
					(0.082)	(0.082)	(0.077)
Incivilities change—L1				0.019		0.023	0.022
				(0.116)		(0.117)	(0.117)
Level 2 variable							
Aggregated incivilities	0.001		0.034	0.036	−0.182	−0.067	−0.067
	(0.133)		(0.114)	(0.093)	(0.142)	(0.125)	(0.124)
Aggregated safety over time		0.555***	0.557***	0.582***	0.510**	0.550***	0.550***

Table V. Continued.

	Model *A*	Model *B*	Model *C*	Model *C′*	Model *D*	Model *D′*	Model *D″*
		(0.133)	(0.135)	(0.112)	(0.143)	(0.123)	(0.122)
House value change (90–80)					−0.000006*	−0.000004^{+}	−0.000004^{+}
					(0.000003)	(0.000002)	(0.000002)
Percent who own their home					−0.194	−0.087	−0.087
					(0.118)	(0.103)	(0.103)
Percent with a HS education					−0.060	−0.031	−0.031
					(0.194)	(0.166)	(0.166)
Non-white 20–80%					0.015	−0.036	−0.036
					(0.102)	(0.089)	(0.088)
Non-white greater than 80%					−0.008	−0.038	−0.038
					(0.096)	(0.082)	(0.082)
Incivilities change—L2				1.192***		1.068***	1.068***
				(0.233)		(0.247)	(0.246)
χ^2	97.079	77.603	77.360	49.737	64.629	44.388	44.695
p-Value	0.001	0.005	0.004	0.327	0.014	0.331	0.319
% L2 variance explained	0.00	45.67	42.45	91.26	51.61	89.47	–

[a]Standard errors in parentheses.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; $^{+}p < 0.10$ (at Level 2).

Table VI. Results Summary

Incivility impacts in full Models	Outcome: changes in			
	Block satisfaction	Fear	Worry	Safety change
Individual-level: Lagged (pathway (c))	$p<0.001$	$p<0.05$	$p<0.05$	ns
Individual-level: Co-Occurring (pathway (e))	$p<0.001$	$p<0.01$	ns	ns
Block-level: lagged (pathway (d))	ns	ns	ns	ns
Block-level: co-occurring (pathway (f))	$p<0.001$	ns	ns	$p<0.001$
Significant between-neighborhood outcome variation?	Yes	Yes	No	Yes
Significant between-neighborhood outcome change?	Yes	marginal	No	Yes

block, to feel more vulnerable, and to worry more about crime.[31] These results at the individual level roughly parallel what has been seen in an earlier lagged analysis (Perkins and Taylor, 1996). However, since initial outcome levels were not controlled in those earlier analyses, the current results go beyond them by linking the initial incivilities to later changes in the outcomes.

Two individual-level connections between changing incivilities and changing outcomes showed us that individuals who—between the two surveys—saw local problems intensifying more than their neighbors were also more likely to be experiencing decreasing block satisfaction and increasing feelings of personal vulnerability. Extrapolating from the theoretical logic of the incivilities thesis according to Wilson, Hunter, and others, suggests changing incivilities should be driving changes in satisfaction and fear; that is the model tested here. It also seems plausible the connection may be working the other way, with the changing fear and changing satisfaction driving changes in perceived problems. As an individual becomes more fearful, local features may be interpreted in a more threatening way. This expands the initial symbolic interactionist argument made by Hunter (1978) about how residents interpret incivilities.

[31]One reviewer has observed "the (short) one year lag period in conjunction with the small number of persons within blocks might be interfering with estimates of the Level 1 effects for the Time1 measures." This might explain why we failed to observe lagged, individual-level impacts for safety changes. But it did *not* preclude observing significant impacts for this pathway for the other three outcomes.

And these two processes may operate together, in a loop that some may view as causal. But we did not test for possible non-recursive connections here, so it is safest to say that although modeled in line with the core psychological incivilities thesis, these individual-level connections represent co-occurring changes. Future research using instrumental variables should be able to clarify more fully how the changes interconnect. Nonetheless, at least the results here establish that changing perceived incivilities intertwine with changing psychological outcomes like those examined here. This moves us beyond the already well-supported finding in the literature linking these processes cross-sectionally.

At the streetblock level our ability to test the ecological, longitudinal version of the thesis was somewhat impeded by either the lack of between-neighborhood outcome variation, or the relative block-level stability of the outcome, given only a one year lag between the first and second interviews. The worry outcome exhibited minimal between-neighborhood variance at either interview. In addition, the fear outcome was relatively stable, such that block-level changes in fear over time were only marginally significant ($p < 0.06$). Nevertheless, for two outcomes—block satisfaction and local safety trends—the outcome did vary across neighborhoods, and that variation remained unambiguously significant after controlling for the outcome at Time1. Therefore, for these two outcomes no data features limited the testing of the longitudinal and ecological version of the incivilities thesis. Further, at the ecological level there were enough shifts in incivilities between Times 1 and 2 such that significant variation remained at Time2 after controlling for Time1.

The partitioning of ecological incivilities at Time2—that portion predicted from Time1, and that portion unexpectedly changing between Time1 and Time2—allows us to separate elements of ongoing urban structure from those reflecting urban change and processual dynamics (Bursik, 1986, p. 58). The lagged, ecological incivilities indicators reflect the ongoing intensity of perceived problems at both Time1 and Time2; impacts of these show the net contribution of *continuing* social disorder and physical deterioration as seen by groups of residents, separate from other static features of structure appearing in the set of covariates. The hypothesized, lagged, ecological impact failed to appear with either of the two outcomes—block satisfaction and local safety trends—where data features permitted its emergence. In short, after controlling for other factors, blocks with more incivilities initially did not become less satisfied over time, nor did they become more pessimistic about local safety trends, even though block views on these matters were shifting between the surveys. Nonsignificant results for the two outcomes clearly permitting such impacts suggest that stable ecological differences in incivilities fail to affect later shifts in attachment or

reactions to crime. Such results contrast with those obtained using cross-sectional data and with the expectations based on the longitudinal, ecological version of the incivilities thesis. Why the failure to observe those here? Theoretical, methodological, or contextual factors may be responsible.

Starting with potential theoretical concerns, part of the problem here may be too short a period for ecological change on outcomes like fear (cf. Stanko, 1995). Even though one year was enough time for incivilities and two of the outcomes to shift at the streetblock level, it may not have been sufficient time for the theoretical processes described to complete their cycle. Theoretically, we are somewhat in the dark on this issue. Although the later versions of the incivilities thesis clearly describe the processes involved, they fail to specify the temporality of the expected shifts. How long does it take for deterioration to raise residents' concern levels and restrict their behavior as a group? It also may be that the temporality of the incivilities-reactions processes varies by type of locale or the specific outcome in question; results here suggest the perceived safety change outcome was more temporally volatile. Future research in a range of neighborhoods of varying types with more than two interview points could help clear up these questions.

Turning to potential methodological concerns, the pattern seen here may depend on the type of incivilities indicators chosen. The failure in other studies to observe multimethod convergent validity for incivilities indicators, especially when the focus is on changes, has been documented elsewhere (Taylor 1999), and the conceptual implications noted (Jang and Johnson 2001). Repeated investigations using different types of indicators, and/or combining them, seem needed.[32]

There may be concern about context as well. Some may think the period chosen between the two interviews was too "quiet," and that was why we did not see the lagged impacts. We do not think this is the case for several reasons. The timing of the two surveys coincided with increasing crack usage, as shown by the Drug Abuse Warning Network (DAWN) emergency room data (Taylor, 2001, p. 246). Further, as described earlier, assault was increasing around the time of the surveys. Finally, analyses of newspaper articles between the two surveys suggest considerable activity (Perkins and Taylor, 1996). Numerous high profile crimes and disorder-

[32]Lack of statistical power does not appear to be a relevant explanation. We did not conduct a complete HLM power analysis. But if we focus on the between-neighborhood variance in outcomes, and the other ecological predictors, the amount of the outcome they explain, and use our α level of 0.10, treating the problem as an ecological regression problem, we had statistical power of at least 80%, and perhaps up to 99%, to detect an addition to explained between-neighborhood variance of about 6.5%. The variation in power depends on the amount of variance explained by the covariates, including the outcome at Time1.

related events took place, many in the sampled neighborhoods. Therefore, we do not think it likely that the lack of expected lagged results at the neighborhood level arose from an unusually "quiet" period between the two assessments. But of course, we would like to see attempts to replicate the current results in other locations.

Consequently, given the pattern we see here, the ecological, longitudinal version of the incivilities thesis operationalized as a lagged effect (Pathway (d)) may be mis-specified. But until the theoretical and methodological issues noted here are addressed, such a conclusion may be premature.

Receiving more support is a version highlighting ecological, co-occurring changes (Pathway (f)). For two outcomes, safety trends and satisfaction, streetblocks where residents as a group saw local problems worsening unexpectedly, were also blocks where residents' perceptions of relative risk and local attachment were simultaneously shifting. These results connect temporary changes in block structure, as reflected in group-level incivility shifts, to these outcomes.

These tests of changing group features were recursive only. Although this is what the theory has specified, nonrecursive relationships seem plausible as well (see also Bursik, 1988 for comments on nonrecursive social disorganization-fear of crime links; see also Markowitz *et al*., 2001). Hunter (1978) suggested a symbolic interactionist perspective might explain the cross-sectional, individual-level connections between fear and incivilities. Comparable, mutually reinforcing dynamics also may be connecting various shifts in group properties. In the same way that individual-level, co-occurring relationships deserve to be unpacked with nonrecursive models, so too do the comparable social psychological linkages. Researchers at higher levels of aggregation, with larger ecological units, have begun this investigation (Markowitz *et al*., 2001).

Policy implications are a particularly tricky business when the outcome in question is something like fear of crime. The only point upon which most would agree, and seems supported by the results here, is that those interested in reducing fear should pay attention not only to those locations where fear is high, but also to the individuals in those locations whose fears are higher than their neighbors.

In sum, the current investigation examined individual and group impacts of incivilities on local satisfaction and reactions to crime. At the individual level, incivilities showed an unambiguous lagged impact on three of the four outcomes; furthermore, changes in perceived incivilities linked with changes in two outcomes. The psychological processes described by the earlier versions of the incivilities thesis work longitudinally as well as cross-sectionally. At the streetblock level, incivilities failed to demonstrate an

unambiguous lagged impact on either of the two outcomes where the data structures permitted such impacts. Although we suspect that lagged ecological impacts of incivilities may be weaker than previous theorizing has led us to expect, several theoretical and methodological issues need attention before leaping to such a conclusion. Ecological changes in group views about incivilities, however, did connect with changes on two outcomes, suggesting an intertwining of these various threads of ecological change.

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