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The Contagion of Stress Across Multiple Roles

Previous research on multiple role stress has hypothesized the existence of two types of stress contagion: spillover, in which the stresses experienced in either the work or home domain lead to stresses in the other domain; and crossover, in which the stresses experienced by one's spouse at work lead to stresses for oneself at home. However, empirical evidence of these processes has been largely indirect and qualitative. This study provides the first direct quantitative evidence on the causal dynamics of stress contagion across work and home domains in married couples. Contrary to previous thinking, results indicate that husbands are more likely than their wives to bring their home stresses into the workplace. Also, stress contagion from work to home was evident for both husbands and wives. Furthermore, the contagion of work stress into the home sets in motion a process of dyadic adjustment, whereby individuals, particularly wives, appear to modify their housework efforts to compensate for the work stresses of their spouses.

Such findings provide important insights into the dynamics of gender differences in role stress and confirm the value of studying chronic stress processes at the level of analysis where such stresses are inevitably manifest—in day-to-day events and activities.

As large numbers of married couples have adopted lifestyles in which both members have jobs outside the home and share parenting responsibilities, so also has concern over multiple-role stress grown (for a review, see Baruch, Biener, and Barnett, 1987). A major explanation for how the combination of work and family roles generates stress is that there is a *contagion* of stressful experiences between the two role domains (Piotrkowski, 1979). Two forms of contagion are hypothesized in the literature: stress spillover, whereby a stress in either the work or home domain results in stress in the other domain for the same individual (e.g., an individual has an argument with his or her spouse one evening and, for that reason, has a bad day at work the following day); and stress crossover, whereby a stress experienced by an individual's spouse in the workplace leads to stress being experienced by the individual at home (e.g., an individual's spouse has a bad day at work and argues with that individual later that day). Although there is considerable

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evidence from semistructured interviews that contagion processes of both types exist (Crouter, 1984; Piotrkowski, 1979; Repetti, 1987), we have, as yet, no direct quantitative evidence that this is so.

There are several uncertainties surrounding research on stress contagion up to now. The most important of these is that none of this work has been carried out in such a way that contagion has been documented directly. The most common strategy has been to make use of cross-sectional survey data to correlate structural characteristics of the work role (such as number of hours worked) with indices of adjustment to the marital role (such as marital satisfaction). Significant correlations are interpreted as evidence of stress spillover from work to home. Clearly, though, either unmeasured common causes of both work and home stress or selection of a particular work routine in response to a troubled marriage could create a significant correlation in the absence of true stress contagion.

Under the assumption that contagion effects can be documented directly, a second major uncertainty is whether they occur primarily from work to home, primarily from home to work, or in both directions. Most previous research has assumed that contagion is primarily from work to home (for a review, see Staines, 1980). The empirical results obtained to date, though, are equally consistent with a home-to-work interpretation of stress contagion.

A third major uncertainty stems from the suspicion that role stresses in the workplace cross over to affect the spouse of the stressed person. Previous reviews of research on family adaptation to acute stress (e.g., Elder, 1974; Moen, Kain, and Elder, 1983) have documented that major family stresses cause coordinated changes in the behavior of both husbands and wives. For example, Elder's work on the impact of the Great Depression has demonstrated that wives, in response to the husband's reduced work role, altered their work and expenditure patterns to make ends meet. However, we have no direct evidence of similar changes in response to chronic work-role stresses. The main evidence on the crossover of these stresses has been based on qualitative data (e.g., Piotrkowski, 1979; Repetti, 1987) or has been indirect (e.g., MacDermid and Crouter, 1986). As a result, we do not know how chronic work stresses affect the spouse, nor, more generally, what pat-

terns of family adaptation they set in motion.

A fourth major uncertainty concerns male-female differences in stress contagion. Pleck (1977) has suggested that work-to-home contagion is stronger for husbands than wives and that home-to-work contagion is stronger for wives than husbands. Few studies have examined this question and the results to date are equivocal. Crouter (1984) found that subjective perceptions of home-to-work spillover among blue-collar workers are more pronounced for wives than for husbands. However, Pleck and Staines (1985), in a national survey of 500 dual-earner couples, found that the cross-sectional associations between work variables and spouse's functioning are as strong for women as men. Similar results have been reported more recently by MacDermid and Crouter (1986).

The root cause of all these uncertainties is the problem of establishing causal priority between home and work role stresses. As noted above, past research has not seriously attempted to solve this problem. To do so, it is necessary to use a longitudinal design rather than the cross-sectional designs typical of previous studies.¹

Several qualitative studies of stress contagion indicate that spillover and crossover involve dynamics that occur in a daily process (Crouter, 1984; Piotrkowski, 1979; Repetti, 1987)—a bad day at work causing arguments at home the same evening or problems at home affecting work the next day. A longitudinal research strategy involving daily assessment would consequently seem to be appropriate to study these contagion processes rigorously. This is the approach taken here. Daily diaries are used to record role-related stress and mood in a sample of respondents studied every day for a period of six weeks. Because these diaries record *variation* in role stresses over time, they enable us to study the causal dynamics within chronic role situations—situations that appear static in conventional cross-sectional surveys. Stress contagion can be studied empirically with data of this sort by using through-time variation to establish causal priorities.

METHOD

Design and Sample

Respondents were men and women in 166 married couples, volunteers from a larger sample of 778

intact couples in the Detroit metropolitan area who participated in a community survey of marital stress and coping. Respondents in the diary study were asked to complete a short questionnaire on each of 42 consecutive days (six weeks). Respondents were not paid for their participation, although a \$5 gift was sent along with the first diary booklet. Seventy-four percent of the respondents who agreed to participate in the diary study completed the full set of 42 diary days. Eighty-nine per cent completed 28 days or more.

In order to examine whether the couples in the diary study differed systematically from those in the larger community survey, we compared three groups of couples on selected background variables: (a) those who did not participate in the diary study ($n = 612$), (b) those where either the husband or the wife did not complete the diary on all 42 days ($n = 66$), and (c) those where both the husband and the wife completed diaries on all 42 days ($n = 100$). As shown in Table 1, results of one-way analyses of variance reveal mostly minor differences among the groups. There are no significant differences in age, education, or hours worked for either husbands or wives in the diary subsample and larger sample. Nor do couples dif-

fer in average number of children or family income. The only significant difference observed is that couples who completed the full diary period have somewhat fewer marital arguments (an average of 0.9 arguments per month) compared to the larger sample (an average of 1.1 arguments per month). This difference is fairly small, however, in substantive terms, and even though it leads to a downward bias in the mean number of arguments reported in the diary sample, its impact on the distribution is sufficiently small that estimates of stress contagion are unlikely to be affected.

Measures

The diary included a checklist of 22 stresses that occurred over the past 24 hours. We consider 7 of these stresses here. Two involve overloads—"a lot of work" at home or on the job. The other 5 involve interpersonal stresses—"tensions or arguments with" one's spouse, children, supervisor at work, coworkers, or work subordinates. On the basis of preliminary analyses, the 3 interpersonal work stresses were combined into a single measure.

TABLE 1. COMPARISON OF NON-DIARY COUPLES, INCOMPLETE DIARY COUPLES, AND COMPLETE DIARY COUPLES: MEANS AND STANDARD DEVIATIONS (IN PARENTHESES) ON SELECTED COUPLE-LEVEL AND SPOUSE-LEVEL VARIABLES

Variable	Non-diary ($n = 512$)	Incomplete Diary ($n = 66$)	Complete Diary ($n = 100$)	<i>F</i>	<i>p</i>
Couple characteristics					
Number of children	2.5 (1.8)	2.7 (2.1)	2.4 (1.6)	0.54	.58
Family income (dollars)	41,600 (20,600)	42,700 (20,800)	42,800 (19,200)	0.21	.81
Frequency of arguments (per month)	1.1 (1.0)	1.1 (1.0)	0.9 (0.8)	2.97	.05
Husband characteristics					
Age (years)	43.5 (13.0)	41.3 (12.4)	44.6 (11.9)	1.30	.27
Education (years)	13.3 (2.7)	13.8 (2.3)	13.6 (2.6)	1.86	.16
Hours worked (per week)	41.0 (20.1)	44.0 (17.3)	43.0 (16.5)	1.06	.35
Wife characteristics					
Age (years)	40.9 (12.3)	39.0 (11.9)	41.5 (11.5)	0.95	.39
Education (years)	13.1 (2.1)	13.2 (1.8)	13.5 (2.1)	0.98	.38
Hours worked (per week)	20.5 (20.2)	24.7 (20.1)	20.0 (18.3)	1.42	.24

Note: Multiple comparison tests (Scheffé) were carried out for each variable. No pairs of means differed significantly from one another at the 5% simultaneous confidence level.

Analysis

The basic statistical model for work-to-home stress contagion is

$$HS_{it} = f[HS_{i(t-1)} + WS_{it} + WS_{jt} + \text{Controls}], \quad (1)$$

where the occurrence of home stress (*HS*) to individual *i* on day *t* is assumed to depend on the presence of the same stress a day earlier, the spillover effects of his or her own stresses at work the same day (*WS_{it}*), and the crossover effects of his or her spouse's work stresses on that day (*WS_{jt}*). Control variables are also included in the model for a series of other variables that may affect both predictor and outcome variables.

The basic statistical model for home-to-work stress contagion is

$$WS_{it} = f[WS_{i(t-1)} + HS_{i(t-1)} + \text{Controls}]. \quad (2)$$

A time lag is assumed in this model whereby home stresses on Day *t-1* affect work stresses the next day. The parallel contagion effect in Equation 1 is assumed to be contemporaneous. This asymmetry in the time lag structure of the two models reflects our assumptions that work stresses occur during the day and then spread into the home the same evening, while home stresses affect work the next day.²

The controls in Equations 1 and 2 include day of the week and length of time in the study. Day of the week is an important control variable because frequency of interaction at home and work varies over day of the week, and this variation can create artificial associations between stress in the two domains if it is not controlled. It is also important to control for length of time in the study to rule out rival hypotheses relating to the possibility of respondents changing how they fill out their diaries because of novelty, boredom, or fatigue.

The models also implicitly control for the effects of factors that are relatively stable over time but vary across individuals, such as personality and living conditions. The main effects of these temporally stable variables can only affect between-person variation in the data (Cohen and Cohen, 1983). Therefore, it was possible to control for all such variables, whether or not they were measured in our study, by including each person's mean value of the outcome as a control variable. This effectively converts the analysis into a study of pooled within-person associations.

Five models were estimated—one for each of the two work stress outcomes (overloads and

arguments) and the three home stress outcomes (overloads, spouse arguments, and child arguments). The outcome variables in each of these models were dichotomies, indicating the presence or absence of the particular stress on a given day. Because parameter estimates in conventional linear-regression and analysis-of-variance procedures are inefficient when outcomes are dichotomous (Hanushek and Jackson, 1977), we used a logistic regression model to estimate the presence and magnitude of stress contagion effects.

RESULTS

The Prevalence of Daily Home and Work Stress

Table 2 presents data on the prevalence of daily home and work stress. The coefficients in the table describe the percentage of days respondents report the occurrence of each stress. There are several patterns in the table. The most dramatic of these is that overloads are much more common than arguments. This is true both at home and work for men and women alike. Indeed, more detailed analyses not reported here show that overloads are by far the most commonly reported of all daily stresses.

A comparison of the first and fourth rows in Table 2 shows a second pattern of interest, that overloads occur more often at work than at home among men while they occur with roughly equal

TABLE 2. PREVALENCE OF DAILY OVERLOADS AND ARGUMENTS AT HOME AND WORK

Source of Stress	Males	Females	Total
Home stress			
Overload	24.3%**	34.4%	29.4%
Argument with spouse	5.2	6.1	5.6
Argument with child	4.5*	7.9	6.2
Work stress			
Overload	32.7%	31.9%	32.4%
Argument	3.1	2.2	2.8

Note: Percentages are calculated on a base of 11,578 total diary days, 5,789 for males and 5,789 for females. Percentages for female work stress are calculated on a base of 3,453 diary days among women in the labor force.

*Male and female percentages differ significantly at the .05 level in the comparison of 5,789 male diary days with 5,789 female diary days, but not in the comparison of 166 males with 166 females (two-tailed tests).

**Male and female percentages differ significantly at the .05 level in both the comparison of 5,789 male diary days with 5,789 female diary days and in the comparison of 166 males with 166 females (two-tailed tests).

frequency among women. This sex difference can be traced to the significantly greater prevalence of overloads at home among women compared to men. There is no significant sex difference in the prevalence of overloads at work.

A third pattern is that arguments occur more often at home than at work. This is true both for men and women. The base prevalences of arguments are small, so this difference does not stand out in the table until one considers *relative* prevalences. Arguments are between 45% (child/work) and 67% (spouse/work) more common at home than at work among men and between 277% (spouse/work) and 359% (child/work) more common at home than at work among women. All of these ratios are significantly different from zero. They are also considerably larger than comparable ratios for overloads in the different role domains, which are 34% more prevalent at work than at home among men and 8% more prevalent at home than at work among women. This is an important observation because, as shown in another report (Bolger, DeLongis, Kessler, and Wethington, 1989), arguments have a much more powerful effect than overloads on emotional well-being.

Home-to-Work Stress Contagion

As noted earlier, previous theoretical discussion has hypothesized that home-to-work stress spillover is significantly stronger among women than men (Pleck, 1977). The data in Table 3, however, show exactly the opposite to be the case. Three of the six spillover effects are significant among men, while none is significant among women. Furthermore, all three significant male effects are significantly larger than the parallel female effects.

It is interesting to note that home-to-work stress contagion effects are quite specific. Overloads at home lead to overloads at work. Spouse arguments lead to work arguments. Arguments with children—which probably increases both practical demands and interpersonal tensions—lead both to work overloads and work arguments.

The processes involved are probably both situational and psychological. The contagion of overload is most plausibly interpreted as due to the depletion of time and energy, which creates a deficit of resources for meeting subsequent work demands. The contagion of arguments from home to work is more likely due to psychological mechanisms. The latter could be due to arousal creating a predisposition to subsequent interpersonal conflict at work (Clark and Isen, 1982) or to the recent experience of interpersonal conflict in another domain creating disinhibition and cognitive priming effects (Wyer and Srull, 1981).

It is difficult to know why these contagion effects are confined to men. We searched for parallel effects in subsamples of men and women defined by occupational prestige, measures of work demands (based on the Dictionary of Occupational Titles), and hours worked, on the suspicion that differences in the conditions of male and female work might explain the difference. No such specifications were found. Women are able to avoid the contagion of home stress into the workplace in all the subsamples we considered, whereas the inability of men to prevent this kind of contagion is pervasive.

Work-to-Home Stress Contagion

As noted above, previous discussions have generally assumed that work-to-home stress con-

TABLE 3. HOME-TO-WORK STRESS CONTAGION

Predictors (Home Stress Yesterday)	Outcomes (Work Stress Today)						
	Males		Females		Total		
	Overloads	Arguments	Overloads	Arguments	Overloads	Arguments	
Overloads	<i>b</i>	.31*	.01	-.11	-.25	.10	-.08
	<i>se</i>	(.09)	(.21)	(.09)	(.27)	(.06)	(.16)
Spouse arguments	<i>b</i>	.09	.86*	-.04	-.35	.02	.49
	<i>se</i>	(.19)	(.37)	(.19)	(.52)	(.13)	(.27)
Child arguments	<i>b</i>	.48*	.47	.03	.15	.22	.33
	<i>se</i>	(.18)	(.34)	(.16)	(.41)	(.12)	(.26)

*Significant at the .05 level and also significantly different from the comparable slopes among females (two-tailed tests).

tagion is more powerful and pervasive than home-to-work stress contagion. There has also been some suggestion that work-to-home contagion is more powerful among men than women. Our data allow both of these assumptions to be assessed directly.

The relevant data are reported in Table 4, where we see that there is less consistent evidence for work-to-home stress contagion than we expected. In the total sample, only 3 of the 12 possible contagion effects are significant. Two of these are positive. Neither positive coefficient is consistent across the two subsamples of men and women (although neither coefficient differs significantly by sex of respondent). Furthermore, the significant coefficients are smaller in magnitude than the reciprocal coefficients in Table 3.

It is interesting to note that the largest coefficient in Table 4 involves an increased probability of spouse arguments after a day in which the husband had an argument at work. A coefficient of nearly equal magnitude exists for the relationship between the wife's report that she had an argument at work and the husband's subsequent report of an argument with his wife. This association of variables obtained from different respondents provides a measure of external validity. At the same time, though, we do not find an association between work arguments and the wife's report of a subsequent argument with her husband. This suggests that selective perceptions are playing some part in this particular kind of contagion effect. Husbands might be manufacturing the notion that their spouses are argumentative or women may be denying the actual existence of arguments. We have no independent measure to distinguish between two different possibilities.

Another pattern in this table involves the consistent *negative* association between respondent overloads at work and subsequent home stresses. Staines (1980) discussed the existence of such a pattern, one that reflects the individual's efforts to compensate for the stresses at work by controlling exposure to home stress. This sort of compensation is presumably more likely to occur at home because the ability to control stress exposure is greater at home than work. Furthermore, control is most likely effected by the individual deferring or passing off family demands on others. Ripple effects consistent with such a process can be seen in Table 4, where we find a positive association between spouse overloads at

TABLE 4. WORK-TO-HOME STRESS CONTAGION

Predictors (Work Stress Today)	Outcomes (Home Stress Today)						
	Males			Females			Total
	Overloads	Spouse Arguments	Child Arguments	Overloads	Spouse Arguments	Child Arguments	Spouse Arguments
Respondent overloads	<i>b</i> -0.17*	<i>se</i> (.09)	-0.28 (.17)	-0.30* (.08)	-0.01 (.16)	-0.12 (.14)	-0.16 (.11)
Respondent arguments	<i>b</i> -0.30	<i>se</i> (.25)	.56 (.36)	.07 (.28)	.20 (.40)	.20 (.43)	.52* (.24)
Spouse overloads	<i>b</i> .10	<i>se</i> (.09)	.06 (.19)	.24* (.08)	.00 (.14)	.10 (.13)	.01 (.11)
Spouse arguments	<i>b</i> -0.01	<i>se</i> (.34)	.06 (.55)	.37 (.19)	.31 (.33)	-.16 (.34)	.42 (.25)
							.28 (.17)
							.06 (.11)
							-.03 (.29)

*Significant at the .05 level (two-tailed test).

work and subsequent respondent overloads at home. This is particularly pronounced for women, which means that they are more likely than their husbands to increase their work at home in response to their spouse having a hectic day at work. The fact that male home overload does not increase significantly on days when their wives are overloaded at work, even though women reduce their involvement in home work on those days, suggests that women defer their home work to another day. This, of course, is part of a larger pattern of women experiencing significantly more home work overload than men.

DISCUSSION AND CONCLUSIONS

This study has provided the first direct quantitative evidence on the existence of stress contagion in married couples. The analysis has documented both home-to-work and work-to-home contagion.³ Overloads in one role domain lead to overloads in the other domain, presumably through a process of situational constraint. Arguments in one domain lead to arguments in the other domain, presumably through processes of arousal, disinhibition, or priming.

The data show that home-to-work stress contagion occurs more strongly among men than women. This result, which is opposite to the pattern predicted by previous discussions of contagion, may reflect differences in the socialization of men and women and in the resulting skills of managing multiple roles. Work-to-home stress contagion occurs among both men and women, although it is less consistent and powerful than the home-to-work contagion found among men.

The data also document the existence of a stress compensation process in the home, where men and women reduce their involvements in stressful home situations following a stressful day at work. No such compensation process could be found at work, which presumably reflects the fact that people have much more control over their involvements at home than at work. A crossover effect associated with this compensation was also found. The spouses of people who had a hectic day at work increase their involvement at home in response to the decreased involvement of their spouses. This kind of reaction, though, is more powerful among women than men.

Sex Differences in Home-to-Work Spillover

Why is it that, contrary to previous research, men appear to bring their home stresses to work with them whereas women do not? Although we have no direct evidence from our own data, we suspect that this gender difference is due to the differential socialization of men and women with regard to housework and child care. It is interesting that, although wives in our sample bear a disproportionate share of housework (see Table 1), they do not show the effects of these burdens in terms of increased stress in the workplace. In contrast, the majority of men have not been socialized into the homemaking role and, consequently, are less able to contain the stresses that accompany it.⁴ Consistent with this thinking, there is now evidence that female labor force participation has a negative effect on the mental health of men married to women employed outside the home (Kessler and McRae, 1982, 1984; Ross, Mirowsky, and Huber, 1985). It is possible that the sensitivity of men to home stress, which presumably increases when their wives take jobs outside the home, helps explain this effect. In future analyses, we plan to use data from our baseline survey to investigate whether this gender difference in spillover can be explained in terms of the differing gender role orientations and work commitments of husbands and wives.

Dyadic Adjustment to Crossover

A truly interpersonal perspective on work stress and the family presumes that when one spouse experiences stress in the workplace there is an adjustment at the level of the marital dyad (Pearlin and McCall, 1989; Pearlin and Turner, 1987). Our data on stress crossover confirm such a perspective in that we find statistically reliable links between the work stresses of one spouse and independent reports of home stress on the part of the other spouse. These data suggest that spouses, particularly women, increase their work effort at home to compensate for the decreased effort of the spouse following a hectic day at work. Thus, in terms of coping with a contagion of role overload from the workplace into the home, the most appropriate unit of analysis is clearly the marital dyad, with wives, in particular, acting as buffers for their husbands, protecting them from excessive accumulation of role demands. The

asymmetry in this buffering effect parallels, and possibly helps explain, the fact that marriage is associated with improved emotional adjustment among men but not among women (Kessler and McRae, 1984).

We view this compensation mechanism as part of a more general process of giving and getting support in married couples, a topic that is beyond the scope of this article. In future work on this broader topic we will ascertain whether spousal differences in vulnerability to stress can be linked to daily reports of the provision and receipt of support.

The Link between Roles and the Microstructure of Stress

This article documents that a rich analysis of role stress is possible by focusing on the level of experience where such stress is manifest—in day-to-day experience. Although previous empirical studies of stress contagion have relied on either qualitative descriptions or indirect quantitative assessments based on cross-sectional data, we have documented that the microstructure of chronic stress can be studied systematically. Dynamics of stress contagion at this level of analysis provide insights into broader issues involving the importance of multiple roles. Although only a first step in the direction of linking roles to the microstructure of stress, this analysis illustrates the considerable promise that daily diary research holds for making such links.

NOTES

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1. It is possible to establish causal priority with cross-sectional data by means of simultaneous equation procedures (Kessler, 1987). However, this requires the availability of theory about instrumental variables. No such theory currently exists in this area, which makes it necessary to rely on longitudinal data.
2. The validity of these assumptions depends on respondents being consistent in following instructions to complete our diaries just before going to

bed each night. It also depends on respondents working on a regular time schedule beginning in the morning and ending in the afternoon. No data about possible variation in these situations were collected, so it is not possible for us to validate that they occurred in the way assumed. The results reported below, however, do not depend on the validity of these assumptions because the same basic patterns of associations emerge in analyses that use either time-lagged or cross-sectional models for either home-to-work or work-to-home contagion.

3. We did not examine stress contagion within role domains because we felt there was little basis for distinguishing reciprocal effects in those situations. It is interesting, however, that the relationships between overloads and arguments within domains are small (ranging from $-.05$ to $+.05$), just as they are between domains. There was a more substantial correlation between spouse arguments and child arguments (.17 among husbands and .13 among wives).
4. In findings consistent with this argument, when we restrict our analyses to those husbands who, compared to their wives, do an equal or greater amount of housework, the extent of home-to-work spillover increases.

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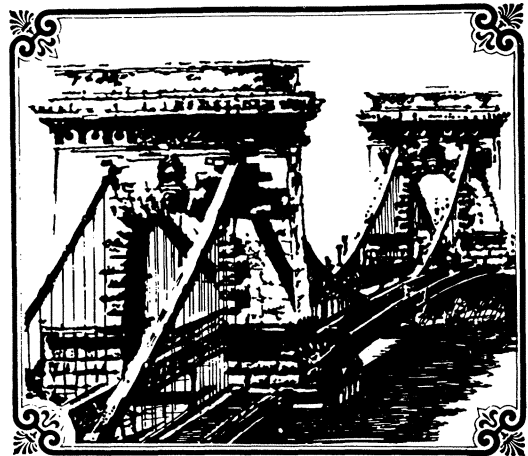
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