PSC Discussion Papers Series

Volume 18 | Issue 8 Article 1

6-2004

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ISSN 1183-7284

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Discussion Paper no. 04-08

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June 2004

On the web in PDF format: http://www.ssc.uwo.ca/sociology/popstudies/dp/dp04-08.pdf

Paper prepared for Conference on Work-Life Balance across the Life Course, International Sociological Association, University of Edinburgh, United Kingdom, 30 June - 2 July, 2004

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Abstract:
Based on a sample representative of the Canadian population aged 30-59, this paper assesses the impact of time spent on productive activities, and various types of activities, on stress and health. The main finding is that the number of hours spent is a better predictor of stress than is the type of activity. Moreover, the effects of paid and unpaid work are additive rather than multiplicative. That is, the more people work, regardless of what they are doing, the more likely they are to feel stressed. Still, working irregular hours and non-traditional family models are also associated with poorer health and reduced stress. Being married appears to mitigate the effect of unpaid work on stress, but does not mitigate the effect of paid work on stress. The effects are similar, though weaker, for health, reflecting that the effects of hours worked are more likely to be long term and that there is probably an endogenous relation between health and current labour force status.

Introduction

In recent decades, the life course has evolved in the direction of delayed entry into production and reproduction, and in modern societies a lengthening of a period of retirement in later life. These trends have accentuated the pressure on prime adult ages. The period of youth, or adolescence and young adult ages, has undergone important changes, in particular an overall extension of the period, a delay in the transitions out of education and into regular work, and also a delay in the transitions out of parental homes and into family formation. These early life transitions are also less clearly defined, and they are more variable across individuals (Beaujot, 2004). It is therefore unclear when youth ends, but age 30 can be used as a demarcation when a majority have made the transitions into an adult work life, sustained relationships and childrearing (Beaujot et al., 1995).

These changes in the early life course, along with the lengthened period of retirement, put many demands on the period of mid-life, taken here as ages 30-59. In the early part of this period, there is pressure to pay off student loans and start families. With children remaining at home and in school for longer periods than previously, the later parts of mid-life include not only the demands of day-to-day expenses, but the pressure to save for children's education and for one's own retirement. These pressures are typically handled by maximizing the time in productive roles, for both men and women. But the period of mid-life is also the stage of the life course where reproductive activities are time-intensive.

This paper looks closely at work and family-related sources of stress and health. We focus on people in their mid-life because it is this group that is most likely to have both extensive work and extensive family obligations. Our goal is to assess the time-use patterns to determine which are most important. We will look both at general measures of time occupied in paid and unpaid

work, and more detailed measures that tap the type of work. Before we begin our analysis, however, it is important to discuss previous research in the area.

Sources of stress in mid-life, and associated time-use dimensions

Research on stress has increasingly focused less on discrete events than on more chronic sources of stress associated with the demands and constraints of social and economic arrangements (Menaghan, 1994; Shields, 2004). With this in mind, it is well documented that excessive role responsibilities—whether work or family related—are detrimental to psychological well-being (Broman, 1988; Fox and Nickols, 1983; Gore and Mangione, 1983; Lowe and Northcott, 1988; Nelson and Burke, 2002). It is also clear that the pressures on time-use vary over the life course. At youth ages, pressures come from education and employment (Franke, 2004). At prime adult ages, the differentiation is especially by marital and parental status (Zukewich, 2003), and at older ages the main differences are between those who are employed and those who are not employed (Fast and Frederick, 2004).

Corresponding with the increase in dual-earner families, Canadian time-use data show an increase in total time spent on productive activities—paid and unpaid work—for both men and women from 1986 to 1998. The average time spent in total productive work by 25-44 year old parents with children under 25 increased from 8.7 hours to 9.7 hours for women, and from 9.0 to 9.9 hours for men (Fast et al., 2001). Reflecting the increased work time, leisure time was found to be lowest at ages 25-44, and 45-69, as long as people were employed and/or parents (Fast and Frederick, 2004: 17). Still, despite increasing work levels, parents have not been decreasing their parenting time, especially those with young children (Zuzanek, 2001). Women and men with children under five years of age are spending about an hour more on daily total work time than those who have no children (Kukewich, 2003). It is not surprising, then, that previous research also indicates that the presence of children increases stress (Fox and Nickols, 1983). Nonetheless, evidence from Canada suggests that single persons aged 25-44 are most likely to be highly stressed, unhappy and dissatisfied (Fast and Frederick, 2004: 25). For the young without children, the main source of stress is paid work (Zukewich and Cooke-Reynolds, 2003).

Besides these family and life course questions, various dimensions of work can be related to time-use and to stress: total time at work, standard vs. non-standard, type of work, and schedules. For instance, people are found to be happier, especially about the balance of work and family in their lives, when they work fewer hours (Frederick and Fast, 2001). Conversely, both women and men are more likely to experience time-crunch when they do more hours of paid work. Persons in the 1998 time-use survey who considered themselves workaholic—which was 27 percent of the population—also experienced more stress and dissatisfaction with the way they spent their time, but claimed to have higher levels of job enjoyment, happiness with finances, and self-esteem (Kemeny, 2002).

In Canada, total time at work has undergone polarization in recent years, with an increase both in the proportions working part-time and in those working 41 or more hours (Sunter and Morissette, 1994). For employed persons aged 25 and over, the proportion working 41 or more hours has increased for men from 18.0 percent in 1980 to 24.3 percent in 1995, and for women from 5.6 to 8.6 percent (Shields, 1999: 35). Williams (2002) finds that those with higher incomes spend

more time in paid work, and they are more likely to feel rushed, and to have less time for leisure. Williams (2003a, 2003b) finds that, besides being associated with longer hours, work related stress is higher for persons in management, natural and applied sciences, health fields, and in social science and education.

In recent years, there has also been an increase in the proportion of persons in non-standard employment, including part-time, temporary, multiple jobs and own-account self-employment (Beaujot, 2000: 139; Vosko et al., 2003). These forms of employment are likely to bring stress associated with lack of financial security, especially if they are non-voluntary. Moreover, compared to working regular day-time schedules, shift work is found to bring high levels of work stress (Shields, 2002). Men who were in evening, rotating or irregular shifts in 1994/95 had higher likelihood of developing a chronic condition by 1998/99. For both sexes, those working evening shifts had more psychological disorders over the next two years.

Research generally suggests that that stress at home or at work can spill over to cause stress in the other realm (Bolger et al., 1989; Crouter, 1984). For example, irregular work schedules and long working hours tend to elevate family tensions, which in turn lead to greater stress and possibly a decline in mental well-being (Menaghan and Parcel, 1990). Evening schedules and other forms of complex work schedules reduce the family time when both parents are present with children (Lapierre-Adamcyk et al., 2004a; Rapoport and Le Bourdais, 2004). Simply put, this line of reasoning suggests that the there is an interaction between work and family constraints in their effects on stress.

It is also important to note that men and women seem to be stressed by different factors. For example, some evidence suggests that men are more affected by paid work (Clearly and Mechanic, 1983; Kandel, Davies and Raveis, 1985; Kessler and McLeod, 1984) and the women are more affected by family-related factors (Aneshensel, Frerichs and Clark, 1981; Bird and Fremont, 1991). Research also suggests that irregular work patterns and work schedules are related to depression for mothers (Lapierre-Adamcyk et al., 2004b). The fact that there are gender differences suggests that the division of family work may be another factor that produces stress. The double burden comes from the lack of change in men's unpaid work, following on women's greater participation in paid work. Marital relationships and children also bring greater differentiation in the roles of women and men, undermining these desired forms of equality (Kukewich, 2003; Beaujot and Liu, 2004). While a gender-based division of labour may reduce the stress associated with being pulled in two directions, it brings frustrations to those who want to maximize their independence and career goals.

Time-use, stress and health

It is well documented from longitudinal analyses that the impact of stress on health tends to be cumulative rather than immediate. For instance, men who had high personal stress in 1994/95 had higher likelihood of migraine headaches, ulcers or arthritis by 1998/99, while women had higher likelihood of chronic bronchitis, emphysema, ulcers, asthma, back problems, or arthritis, and both sexes had lower odds of a self-assessment of continuing good health (Health Reports,

2001: 22). On the other hand, cross-sectional studies have found only weak to moderate relationships between stress and various health indicators (Wilkins and Beaudet, 1998).

The mechanisms through which stress would affect health probably include a greater propensity for less healthy behaviour, in terms of diets, addictions and physical activity, but stress may also alter the immune system and increase susceptibility to disease (Shields, 2004). In a more complete model, the effect of stress would be mitigated through personal resources and social support. For instance, Shields (2004) finds that stress levels are higher for those with less education and income, and for the previously married.

Focussing on long hours of work, Shields (1999) proposes that these can bring unhealthy life styles including a propensity to use eating or alcohol as forms of relaxation, lack of sleep, fatigue and thus a propensity to addiction and obesity that would increase the susceptibility to cardiovascular disease. Studying persons who worked at least 35 hours per week in 1994/95, Shields differentiated those working 41 or more hours. Men working long hours averaged 55 hours, while women averaged 51 hours. Long hours were more likely for persons with more education and higher incomes. Men who switched to long hours had a greater likelihood of smoking and weight gain in the next two years, while women were at greater risk of depression and of increased alcohol consumption. There are likely to be selection effects operating in the relation between time-use patterns and health, however. For instance, persons with poor health may reduce their time at work, and they may also reduce the intensity of time-use in their family life. As another example, the work environment may have adverse effects on health, but it may also be that specific health problems will make workers more susceptible to workplace stress.

The advantage of time-use data is its applicability to both paid work and family work. For women, there has been much attention to the double burden as a source of stress, but there has been inadequate attention to men's double burdens associated with longer hours of paid work. Long hours of work may be more problematic for white-collar workers, while others may be stressed by other aspects of time use, in particular shift work, multiple job-holdings and non-standard employment. The reduction of stress with age may be related to either lower stresses at work or to stages of the life course that involve reduced demands on family time. The relationship to health is not simple: stress is alleviated over the life course while health deteriorates over these ages, though only slowly during the period of mid-life (Health Reports, 1999).

Hypotheses

While much attention has been paid to stresses that come from work, and those that are associated with given periods of the life course, little research has taken advantage of data including equivalent measures for paid and unpaid work. There is also a relative dearth of research focussing on total productive time, that is all activities except the down-time associated with leisure and personal time. The present paper attempts to address these questions by testing five hypotheses:

1. Time in productive activities has an impact on stress and health.

2. Stress and health is differentially associated with certain types of paid work (occupations offering less security, schedules other than the regular day, multiple job holding, and non-standard work), and certain types of unpaid work (long hours of child care or elder care).
3. Stress and health are particularly related to the time spent in productive activities, but also with specific uses of this time, and its division in families.
4. Personal resources (education, income) and social support (family structure) will have mitigating effects on stress and health.
5. The effects on health are more likely to be delayed relative to the effects on stress, and selection effects are likely to have a larger role in health questions, as people with poorer health are not able to spend as much time in productive activities. Thus, we expect that the effects discussed above will be weaker on health than they are on stress.

Data, Variables and Methods

The dataset we employ is Canada's 1998 General Social Survey on Time Use (Statistics Canada, 1998). The core of the survey is a 24-hour time-use diary for respondents. The target population was all Canadian residents aged 15 and over, excluding residents of the northern territories and full-time residents of institutions. Respondents were contacted by telephone, and adjustments were made for the 2% of the target population without telephones. The total sample size is 10,749, representing a response rate of 77.6%. We rely only on a subset of the sample—*i.e.*, those aged 30-59—resulting in a sample size of 5,943.

Dependent Variables: Stress and Health

The stress dependent variable is an index based on the number of responses indicating time-crunch among the following ten items: plan to slow down in the coming year, consider yourself a workaholic, tend to cut back on sleep, often feel have not accomplished what set out to do, worry that not spending enough time with family or friends, constantly under stress trying to accomplish more than can handle, feel trapped in daily routine, do not have time for fun anymore, often feel under stress when don't have enough time, would like to spend more time alone. Health is measured as a dichotomous variable that simply taps whether the respondent has "poor health" as measured through at least one of the following conditions: in the past twelve months had a serious illness or injury, or limited in the amount or kind of activity can do at home, at work, or at school because of a long-term physical or mental condition or health problem.

Paid and Unpaid Work

We explore to sets of variables representing paid and unpaid work. The first set is simply two variables tapping the total amount of time spent on paid and unpaid work activities. Aside from the daily diary, the dataset also includes weekly estimates of time spent on given activities. We rely on these measures in order to avoid the potential problem of irregular daily responses. Respondents were asked to estimate their total time over the previous week in four activities: paid work, unpaid child care for one's children or the children of others, unpaid housework, yard work or home maintenance for self or others, and unpaid care or assistance to seniors. The second set of variables essentially divided these two variables. With respect to unpaid work, we looked at amount of time spent on childcare and the amount of time spent on caring for seniors. For paid work, we explore work schedule, which is divided into 7 categories: (1) not working,

(2) under 30 hours regular day, (3) under 30 hours other than regular day, (4) 30-40 hours regular day, (5) 30-40 hours other, (6) more than 40 hours regular day, and (7) more than 40 hours other.

Control variables
Based on previous research, we compare respondents and their spouse/partner in terms of doing more, less, or the same amount of paid and unpaid work (Beaujot and Liu, 2004), defining five models of spousal time use: (1) complementary-traditional (he does more paid work and she does more unpaid work), (2) complementary-gender-reversed (she does more paid work and he does more unpaid work), (3) women's double burden (she does the same amount or more paid work, and more unpaid work), (4) men's double burden (he does the same amount or more paid work, and more unpaid work), and (5) role-sharing (they do the same amount of unpaid work). We also include controls for gender, age (treated as a continuous variable)[1], education (no qualifications, high school diploma, some post-secondary, college diploma, university degree), income (less than $20,000, $20,000-$39,999, $40,000-$59,999 and $60,000 and over), and parental status (no children under 15, at least one child under 5, at least one child under 15 but none under 5).

Statistical models
In order to simplify interpretation of the findings, we divide the sample into two groups: (1) those in marital relations (including those who are cohabiting), (2) those not in marital relations. We also perform a separate analysis on only those from the married group who are working outside the home. For each group, the goal is to explore the effects of various work and family related factors on stress and health status. Ordinary least squares regression is used for the models predicting stress; logit models are used to predict health status. We fit two models for each dependent variable. Model 1 includes only the two overall time measures for paid work and unpaid work. Model 2 removes these predictors and replaces them with more detailed measures of the type of work respondents were doing, both paid and unpaid.

Distributions of stress and poor health

We begin by looking at Table 1, which shows the distributions of stress, health, and some of the important predictors for the complete sample of those aged 30-59. This table also shows the bivariate correlations for stress and health with paid work, unpaid work and age. It is interesting to note that age is negatively correlated with stress, but positively correlated with poor health. We also see that paid work has apparently differing effects on stress and health—the correlation is negative for poor health but positive for stress. As will be seen later, the findings are similar for the regression models.

[Table 1 about here]

Table 2 shows the bivariate relationships between the dependent variables and all other predictors found in the models to be discussed later. We see here that stress is higher for women,

[1] We explored for possible curvilinear effects of age using polynomial regression, but none of these were statistically significant.

those who are cohabiting or married, those with younger children and those in family models involving either complementary roles or women's double burden. In terms of the work variables, stress is typically higher for people working the full-year and more than 40 hours per week, those with multiple jobs, and respondents in households where both are working full-time. The indicators of unpaid work show higher stress for those doing more childcare or elder care.

We also see from Table 2 that there are some similarities in terms of the correlates of health and the correlates of stress. For example, persons who are working more than one job and spend time caring for seniors are most likely to feel stressed and have bad health. There are many more differences, however. For example, people who are post-married have the lowest health, while those who are married have best health. Moreover, there is higher predominance of poor health for those without children. The work indicators show better health for those working the full-year, regular shifts, and worse average health for persons not working or in households were neither are working. The unpaid work indicators show better average health for those doing more childcare, and for those not doing elder care. Finally, health is worse for those in complementary gender reversed marriages, and when men have a double burden.

[Table 2 about here]

Effect of productive activities on stress and health

We now turn to the models discussed earlier. We begin with Table 3, which reports the models for people not in married relations. We see from Model 1 that stress has a statistically significant positive relationship with both paid and unpaid work, but the relationship is stronger for paid work. In other words, confirming hypothesis 1, the more people work—whether paid or unpaid—the more likely they are to feel stressed. Model 2 gives a more detailed look at the particular types of work that effect stress. We see here that work schedule matters significantly, but again, the more one works the higher their stress levels. Having said that, it appears that those who work other than regular day shifts, controlling for the number of hours, feel slightly more stressed than those working regular days. Regarding unpaid work, it seems that it is not the number of children that matters, but rather how much time is spent on childcare that is important. The more time spent on childcare, the higher the average stress level. This finding is paralleled for care of elders—again, the more time spent, the higher the average stress level. It is important to note that the Akaike Information Criterion (AIC) is smallest for Model 1, suggesting that total time rather than the nature of the work is most important in determining stress.

[Table 3 about here]

The effects of paid and unpaid work on health outcomes are quite different. For example, Model 1 indicates that unpaid work has no apparent impact whatsoever on health status. Moreover, we also see from Model 1 that paid work has a significant negative impact on poor health. Of course, it is difficult to unpack the direction of causation here—there is undoubtedly a selection effect in that those who are unhealthy cannot work—but this finding is interesting nonetheless. The coefficient for the "not working" term in Model 2 confirms that those who are not working have the highest probability of bad health. On the other hand, although the effects of child-

related variables are in the expected direction, they are consistent with the effects of the unpaid work variable in Model 1 in that they are statistically insignificant.

We now turn to Table 4 to assess the effects on stress and health for those in marital relations. Starting with the stress dependent variable we see that the magnitude of the coefficients for Model 1suggests that paid work has a slightly larger impact on stress in the married population, though here we include both those who are working and those who are not working in these models. Model 2 shows that the effects of work schedule are quite similar to what was seen for the non-married population. The effects of the specific unpaid work variables—elder care and child care—are also generally similar in that the more time spent on care, the higher the average stress level. Still, for those who are married, the number of children has an impact on stress that is independent on the amount of time devoted to care of these children. Again, as with the unmarried sample, we find that the unpaid work hours has no significant impact on health status. Moreover, although paid work is negatively related to poor health, the selection bias is again clearly evident in the fact that the largest single predictor of health status is whether or not one is working. Unlike for the unmarried sample, we now see that the AIC is smallest for Model 2 both for stress and for health. As we shall see in a moment, however, this difference disappears when we look only at those married people who are working.

[Table 4 about here]

The limitation of looking at the whole married population together is that many of the sample were not working, making it impossible to include several variables assessing the effects of the various paid work-related variables. By looking only at married workers, we can assess whether the specific paid work and unpaid work variables interacted. In turns out that none of the interactions we assessed was statistically significant, however, and thus no interaction terms are included in the models reported in Table 5, which looks only at married workers. It should also be noted that we explored for interactions between sex and both the unpaid and paid work variables, but they were also not statistically significant so are excluded from the model as well. Despite the lack of interactions, Table 5 shows some interesting results. The most important finding is the differential effects of both paid and unpaid work on stress and health. Both predictors have a statistically significant effect on the former, but virtually zero effect on latter.

[Table 5 about here]

Turning to the specific measures of paid work shown in Model 2, we see that among married workers stress is highest for those working overtime (41 or more hours), and lowest for those working part-time (up to 30 hours). The other paid work indicators were not statistically significant: schedules, the household labour force status, multiple jobs, and the socio-economic status of the respondent's job. As can be seen in Table 5, most of the variance associated with the hours of paid work (Model 1) is absorbed in Model 2 by the simpler measure of working over-time, full-time or part-time. Still, the AIC values suggest that the total time spent variables (Model 1) do a better job at predicting stress, and also health, than do the more specific measures (Model 2). The hours of childcare and senior care are each associated with higher stress, but the relationship is significant only in the case of childcare.

With respect to health outcomes among married workers, Model 2 shows that in this population of married workers, the only work category that was somewhat (significance of .1 not shown in the table) related to the health indicator was that of multiple jobs, showing that those with multiple jobs had poorer health. The other indicators of paid work were not significantly related to the health indicator in this population of married workers: part-time, full-time, over-time, work schedule, and the household labour force status. The specific measures of unpaid work that were related to the health indicator were the categories of child care up to five hours and senior care up to five hours, though all categories of these two types of care were associated with a higher likelihood of poor health.

The control variables in the stress models for Tables 3-5 operated in the expected directions. Stress is higher for women, especially in the married population. Stress decreases with age at basically the same rate in the married and non-married populations. There is more stress for parents with children under 15, especially if there are children under 5 years of age. These relationships are stronger in the married population. In this married population, lower household income is also related to higher stress. Stress is lower in the categories other than complementary roles, especially for shared roles and men's double burdens. It is especially in the population of married workers that the non-traditional family models are associated with lower stress. At the same time, it is of interest that stress was not significantly related to the labour force status of the household (both full-time, both employed but not both full-time, one employed, neither employed).

Regarding the control variables for health, gender is not statistically significant but age is positively associated with poorer health. There is also poorer health in the lowest income category for both the non-married and married populations. In the married population, those without a university degree have poorer heath; in the population of married workers, it is especially those with college diplomas who have poorer health. Those with children under 15 have better health, especially if there are children less than 5 years of age (this is statistically significant in the married population). Those families that do not have complementary roles have poorer health, especially in the case of shared roles, men's double burdens and the gender reversed category.

Summary and discussion

This paper focussed on the mid-adult ages (30-59) in order to be able to mostly ignore questions associated with both delayed early life transitions and retirement. Other research has found it useful to differentiate younger families to age 30, families in mid-life (ages 30-59) and older families aged 60 and over (Beaujot et al., 1995). There is more uniformity at ages 30-59, with the majority of people working, living in relationships, and living with children. Earlier research has identified this stage of the life course as one that includes much pressure, especially for parents (Fast and Frederick, 2004; Zukewich, 2003). Research on stress has identified questions of work or jobs among the more relevant factors (Zukewich and Cooke-Reynolds, 2003).

The first hypothesis proposed that time in productive activities has an impact on stress and health. Our results suggest that hours of paid work are particularly relevant to stress. Hours of

unpaid work are also related to stress, but to a lesser degree. While stress is higher for women, gender did not interact with the other variables in the model, suggesting that the processes operate similarly for women and men. The lack of an interaction between paid and unpaid work suggests that specific combinations of these kinds of work do not reduce nor exaggerate the effects. That is, the effects of paid and unpaid work are additive rather than multiplicative.

Concerning the second hypothesis, our results also suggest that the specific characteristics of work matter less than the number of hours. That is, other than the qualifier for over-time, full-time and part-time, the specific indicators of paid work had a lesser effect, be it questions of the type of job, scheduling, multiple jobs or the labour force status of the household. For instance, the indicator of part-time, full-time and over-time overshadowed the impact of whether the household labour force status involved both working full-time, both employed but not both full-time, one employed or none employed.

Besides the time spent in paid and unpaid work, and the specific uses of this time, the third hypothesis proposed that the division of paid and unpaid work in families would affect stress and health. It would seem that the categories of shared roles, men's double burdens and gender reversed are associated with poorer health, and with reduced stress. There may be selectivity effects here, with non-traditional forms of division of work occurring more often when there are health problems for one of the spouses. Nonetheless, these family models reduce stress. There is need for further investigation of family models regarding the division of paid and unpaid work.

Concerning hypothesis four, there is some evidence that higher income helps to mitigate stress, or at least that stress is highest at low incomes. Controlling for income, there was not evidence of the mitigating effect of education. Being married did not mitigate the effect of hours of paid work on stress since the coefficient on paid work was higher for married persons. However, being married did mitigate the effect of non-paid work on stress, with the coefficient reduced by half in the married population.

As expected in hypothesis five, there are stronger effects on stress than on health in a cross-sectional analysis. The results regarding the health index are more difficult to interpret, especially because longer hours of paid work are associated with better health. In other words, the selection effects are making it difficult to analyse the influence of work factors on health. Stated differently, there is probably an endogenous relation between health and current labour force status. Longitudinal research suggests that unemployment has a direct adverse effect on mental health (Dooley, Prause and Ham-Rowbottom, 2000). Moreover, other research has concluded that cross-sectional research finds weak to moderate relationships between stress and health (Wilkins and Beaudet, 1998).

Nonetheless, previous longitudinal analyses suggest that stress, and by implication the factors affecting stress, do have an impact on health (Health Reports, 2001; Shields, 2002). There is cause for concern as persons with better health work longer, bringing a higher likelihood of stress, which would later have negative impact on their health. Especially as we seek to maximize productivity over a longer life course, there are suggestions here that burn-out could result from this strong pressure to produce in mid-adult ages. Stress decreases over time, as there are fewer family pressures, and as some come to work fewer hours, but the harm may have

already been done. The culture of early retirement certainly suggests an interest to withdraw from stressful work once sufficient pension benefits have been accumulated.

Since they have a significant relationship with stress, hours of paid and unpaid work may be seen as significant factors in individual health over the long term. A conference on social determinants of health has suggested that various factors are at stake as social determinants, including income inequality, social inclusion and exclusion, employment and job security, working conditions, contribution of the social economy, early childhood care, education, food security and housing (Edwards, 2003). It may be that the stress associated with hours of work are as important as other working conditions listed in this summary.

Besides its cross-sectional nature, there are certainly limits to the present research for purposes of the questions under investigation. In particular, the measure of stress could cover many different situations, depending on the respondent. Research on stress and health suggests that it would be important to measure more aspects of the stress process, including distress or chronic strain, that is, the inability to handle stress, with indicators associated with mental health problems (Avison and Gotlib, 1994). It is also important to measure more of the mediating factors, including social supports and psychological resources.

Further research is also necessary on the family and socio-economic factors that mediate health outcomes. Or do elements of family life, especially the high standards for child care and the strong needs to be productive, themselves bring stress and long-term negative health outcomes. For instance, Zuzanek (2001) is concerned about workplace and parental fatigue, which means too little time when children are young, and too little communication when they are older. It would also be useful to further investigate the effects of stress associated with paid and unpaid work for marital relationships themselves, and for children's family environments and emotional well-being (Menaghan, 1994).

Some have suggested that men would be happier with less time on the job, while women would be better off if they spent less time in unpaid work, and more in paid work (Frederick and Fast, 2001). While there is interest to re-balance paid and unpaid work, the evidence presented here would not suggest that doing less unpaid work and more paid work would reduce the stress that women experience. What is needed is a reduction in both types of work, and especially in paid work.

In conclusion, the main findings of this paper are that both paid and unpaid work effect stress, and that it is the amount of time rather than type of work that matters most. Moreover, the effects of these two types of work are additive rather than multiplicative—i.e., doing more of one does not make the impact of the other stronger. These findings suggest, then, that being overly busy causes high levels of stress. These results held for both married and unmarried people and both men and women. The effects of paid work on health were similar, but there was no apparent effect of unpaid work on health. Of course, the effects on health are especially difficult to disentangle since those with poor health are more likely to work less.

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Table 1. Descriptive statistics for age, paid work, unpaid work, stress, and health, for population aged 30-59, Canada, 1998

			Correlation with	
Variable	Sample size	Mean	Stress	Poor Health
Age	5943	42.97	-0.187	0.114
Paid work (hours)/week	5805	31.22	0.192	-0.123
Unpaid work (hours)/week	5292	34.35	0.116	0.016
Stress	5650	4.28		
Health (percent poor)	5943	.19		
N		5943	5598*	5943*

*Number of cases used for calculating the correlations between age and the two dependent variables stress and poor health. Results are weighted, but the unweighted sample sizes are given.

Table 2. Descriptive statistics for the stress index (means) and poor health (percentages) by various characteristics, persons aged 30-59, Canada, 1998

	Sample size	Stress (mean)	Poor health (percent)
Sex			
Men	2799	4.14	16.8
Women	3144	4.42	21.3
Marital status			
Married	3552	4.32	16.6
Cohabiting	471	4.62	20.0
Post-married	984	4.04	27.3
Single	918	4.00	25.2
Parental status			
No child under 15	3465	3.86	22.7
At least one under 5	883	4.95	13.1
Children under 15 but not under 5	1595	4.75	15.4
Education level			
Bachelors and above	1264	4.30	15.9
Diploma	1421	4.37	20.7
Some university	914	4.44	21.6
High school	980	4.25	18.6
Under high school	1079	4.13	25.0
Weeks worked in year			
No work	1220	3.43	26.5
Part year (under 41 weeks)	829	4.21	23.5
Full year (41-52 weeks)	3848	4.50	15.7
Multiple jobs			
No	5621	4.26	18.9
Yes	293	4.93	20.5
Hours worked last week			
No work	1583	3.66	27.1
Part-time (under 30 hours)	438	3.78	21.5
Full-time (30-40 hours)	2058	4.28	15.9
Over-time (41+ hours)	1722	4.89	14.5
Work schedule			
Regular day	3043	4.45	15.7
Regular evening or night	186	4.51	15.5
Other schedule	1077	4.51	16.8
No work or non-response	1617	3.64	27.3
Socio-economic classification (Pineo)			
Not working	1209	3.42	26.3
Professional/senior managers	706	4.58	13.0
Semi-professional/technician/middle manager	1127	4.50	15.3
Supervisors/foremen/women	221	4.95	17.7
Skilled workers/employees/farmers	849	4.37	19.0
Semi-skilled workers/employees	860	4.31	17.6
Unskilled workers/employees/farm labors	868	4.47	20.5

Number of children under 15			
None	3465	3.86	22.7
One	970	4.70	14.4
Two	1071	4.95	14.9
Three	360	4.91	13.6
Four+	77	4.17	16.7
Hours of childcare/week			
Zero	2543	3.85	21.6
Up to 5 hours	421	4.52	26.2
More than 5 hours	2477	4.71	18.3
Hours of senior care/week			
Zero	4189	4.28	18.9
Up to 5 hours	920	4.26	25.0
More than 5 hours	472	4.56	25.0
Household labor force			
Both full-time	1494	4.76	14.5
Both employed but not both full-time	612	4.22	17.3
One employed	1148	4.17	20.2
None employed	228	3.71	37.6
Full-time no spouse	1284	4.31	20.0
Other no spouse	555	3.43	45.7
Family model			
Complementary	1403	4.56	17.2
Complementary gender reversed	142	3.80	25.8
Women's double burden	696	4.60	15.4
Men's double burden	259	4.10	23.6
Shared roles	392	4.23	21.1
Total		4.28	19.1
N	5943	5598	5943

Table 3. Determinants of stress and poor health, persons not in marital relations, aged 30-59, Canada, 1998

Covariate	Stress (OLS models)		Poor health (Logit models)	
	Model 1	Model 2	Model 1	Model 2
Constant	3.83**	5.67**	-1.59**	-2.82**
Women	0.426**	0.489**	0.021	0.086
Age	-0.029**	-0.033**	0.026**	0.023**
Education				
No qualifications	0.319	0.278	0.201	0.239
High school diploma	-0.244	-0.225	-0.194	-0.123
Some post secondary	0.193	0.224	-0.006	0.099
College diploma	0.150	0.122	0.159	0.230
(University degree)	0.0	0.0	0.0	0.0
Household income				
(more than $60,000)	0.0	0.0	0.0	0.0
No information	-0.233	-0.185	-0.127	-0.109
40,000 to 59,999	-0.070	-0.023	0.142	0.152
20,000 to 39,999	0.140	0.207	0.193	0.180
Less than 20,000	0.208	0.187	0.541*	0.576*
Paid work hours	0.026**		-0.024**	
Unpaid work hours	0.007**		0.003	
Parental status				
Child under 15 but none under 5	0.395	0.449	-0.346	-0.383
At least one under 5	0.672	0.709	-0.680	-0.735
(None under 15)	0.0	0.0	0.0	0.0
Work/schedule				
(41+ hours regular day)		0.0		0.0
41+ hours other		-0.214		-0.265
30-40 hours regular day		-1.192**		0.276
30-40 hours other		-0.887**		0.160
Under 30 hours regular day		-1.674**		-0.015
Under 30 hours other		-1.833**		0.844*
Not working		-1.447**		1.294**
Child care in week				
More than 5 hours		0.389*		0.238
Up to 5 hours		0.145		0.191
(None)		0.0		0.0
Elder care in week				
More than 5 hours		0.328*		0.151
Up to 5 hours		0.254*		0.287*
(None)		0.0		0.0
Adjusted or pseudo R square	0.079	0.087	0.085	0.095
Akaike Information Criterion (AIC)	7719.3	8097.4	1844.9	1944.0
N	1660	1746	1660	1746

* *P*-value< .05; ** *P*-value< 0.01. Results are unweighted.

Table 4. Determinants of stress and poor health, persons in marital relations, aged 30-59, Canada, 1998

Covariate	Stress (OLS models)		Poor health (Logit models)	
	Model 1	Model 2	Model 1	Model 2
Constant	3.87**	5.67**	-2.36**	-2.90**
Women	0.723**	0.806**	-0.092	0.005
Age	-0.030**	-0.031**	0.023**	0.019**
Education				
No qualifications	0.036	0.066	0.353*	0.419**
High school diploma	-0.020	0.043	0.278	0.363*
Some post secondary	0.063	0.062	0.434**	0.466**
College diploma	-0.188	-0.147	0.428**	0.481**
(University degree)	0.0	0.0	0.0	0.0
Household income				
(more than $60,000)	0.0	0.0	0.0	0.0
No information	-0.120	-0.175	0.079	0.002
40,000 to 59,999	0.229*	0.216	0.105	0.097
20,000 to 39,999	0.385**	0.359**	0.162	0.106
Less than 20,000	0.507*	0.352	0.619**	0.566**
Paid work hours	0.030**		-0.016**	
Unpaid work hours	0.003*		0.001	
Family model				
Missing data	-0.059	-0.250	0.064	-0.017
Shared roles	-0.267	-0.342*	0.435**	0.470**
Men double burden	-0.376*	-0.417*	0.408*	0.446*
Women double burden	-0.012	-0.112	0.117	0.238
Gender reversed	-0.241	-0.228	0.345	0.448*
(Complementary roles)	0.0	0.0	0.0	0.0
Parental status				
Child under 15 but none under 5	0.450**	0.472**	-0.251*	-0.306*
At least one under 5	0.736**	0.782**	-0.379*	-0.393*
(None under 15)	0.0	0.0	0.0	0.0
Work/schedule				
(41+ hours regular day)		0.0		0.0
41+ hours other		0.174		-0.197
30-40 hours regular day		-0.575**		-0.190
30-40 hours other		-0.884**		-0.149
Under 30 hours regular day		-1.594**		-0.059
Under 30 hours other		-1.165**		0.289
Not working		-1.443**		0.843**
Child care in week				
More than 5 hours		0.183		0.155
Up to 5 hours		0.491**		0.364*
(None)		0.0		0.0
Elder care in week				
More than 5 hours		0.348*		0.100
Up to 5 hours		0.079		0.332*
(None)		0.0		0.0
Household labour force status				
One employed		-0.229		-0.272
Both employed but not both FT		-0.304		0.057
Both full time		-0.059		-0.158
(Neither employed)		0.0		0.0
Adjusted or pseudo *R*-square	0.104	0.105	0.049	0.061
Akaike Information Criterion (AIC)	16,228.8	15,642.4	3226.1	3102.5
N	3485	3350	3505	3380

* *P*-value< .05; ** *P*-value< 0.01. Results are unweighted.

Table 5. Determinants of stress and poor health, persons working and in marital relations, aged 30-59, Canada, 1998

Covariate	Stress (OLS models)		Poor health (Logit models)	
	Model 1	Model 2	Model 1	Model 2
Constant	3.50**	5.79**	-3.29**	-3.23**
Women	0.761**	0.801**	0.062	0.150
Age	-0.030**	-0.031**	0.032**	0.027**
Education				
No qualifications	0.037	0.164	0.171	0.172
High school diploma	0.022	0.157	0.171	0.196
Some post secondary	0.020	0.062	0.339	0.265
College diploma	-0.196	-0.103	0.460**	0.437*
(University degree)	0.0	0.0	0.0	0.0
Household income				
(more than $60,000)	0.0	0.0	0.0	0.0
No information	-0.231	-0.231	-0.011	-0.030
40,000 to 59,999	0.175	0.189	0.078	0.039
20,000 to 39,999	0.367*	0.434**	-0.045	-0.061
Less than 20,000	0.221	0.022	0.011	-0.177
Paid work hours	0.040**		-0.003	
Unpaid work hours	0.004*		0.003	
Work hours				
(Over-time)		0.0		0.0
Full-time		-0.659**		-0.104
Part-time		-1.400**		0.127
Work schedule				
Other		0.023		0.026
Regular evening or night		0.038		-0.097
(Regular day)		0.0		0.0
Family model				
Missing data	-0.145	-0.264	-0.026	-0.001
Shared roles	-0.369*	-0.468**	0.319	0.396*
Men double burden	-0.524**	-0.605**	0.262	0.334
Women double burden	-0.015	-0.188	0.058	0.162
Gender reversed	-0.417	-0.434	-0.026	-0.012
(Complementary roles)	0.0	0.0	0.0	0.0
Parental status				
Child under 15 but none under 5	0.346**	0.259	-0.295*	-0.278
At least one under 5	0.587**	0.485*	-0.266	-0.186
(None under 15)	0.0	0.0	0.0	0.0
Child care in week				
More than 5 hours		0.330*		0.121
Up to 5 hours		0.761**		0.437*
(None)		0.0		0.0
Elder care in week				
More than 5 hours		0.311		0.123
Up to 5 hours		0.110		0.321*
(None)		0.0		0.0
Household labour force status				
(One employed)		0.0		0.0
Both employed but not both FT		-0.119		0.229
Both full time		0.168		0.028
Multiple jobs (No)		-0.116		-0.374
Job classification				
Unskilled		-0.073		0.347
Semi-skilled		-0.294		0.102
Skilled labor		-0.243		0.298

Supervisors or foremen		0.028		-0.100
Semi-professional		-0.164		0.220
(Professional)		0.0		0.0
Not working		-0.280		0.363
Adjusted or pseudo *R*-square	0.089	0.086	0.022	0.030
Akaike Information Criterion (AIC)	7,719.3	8,097.4	1,844.9	1,944.0
N	2742	2613	2761	2647

* *P*-value< .05; ** *P*-value< 0.01. Results are unweighted.