Scheduling Inequality: Variations in Dual-Earner Couple Work Schedule Coordination

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Abstract

This paper analyzes work scheduling and schedule coordination of American, dual-earner couples with children at two points in time (1990 and 2012). The literature on schedule coordination presumes that couples coordinate working schedules so as to maximize joint leisure. Research on childcare choice, however, highlights the experience of a subset of parents who work non-overlapping schedules so as to minimize reliance on non-parental care. This suggests two contrasting scheduling logics with differing expressions of "coordination." Results yield null findings of schedule coordination when evaluated across the full population of dual-worker parents, but significant evidence of coordination—in opposite directions—when schedule type is taken into account. While there is considerable socioeconomic variations in couples' observed schedule type, socioeconomic variations in schedule coordination are limited contingent on schedule. Contrary to expectations, no evidence is found for declining schedule coordination over time.

Extended Abstract

This paper argues that evidence regarding couples' coordination of work schedules may be mis-estimated as a function of heterogeneous scheduling logics across the population. To test this hypothesis, I analyze scheduling and schedule coordination within a population of couples that is particularly likely to display variation: dual-earner couples with children. Such couples may have preferences for either joint leisure or for parental care for children. Maximizing the former—by increasing similarity of working schedules and thus work time overlap—necessarily requires increasing reliance on non-parental care providers; maximizing the latter by working non-overlapping work schedules should have the effect of reducing joint leisure. Both logics demand "coordination," but toward opposite ends.

A growing body of literature in economics and sociology analyzes the coordination of dual-earner couples' work schedules. This research marks an important attempt to move beyond questions of labor supply (numbers of days and hours worked) and toward an understanding of the temporal organization of employment and family life. This research has been focused on demonstrating (1) whether couples coordinate working schedules so as to maximize joint leisure and (2) the socio-demographic correlates associated with greater or lesser coordination. Within this literature, coordination is typically assessed in terms of work time overlap (WTO): hours in which both partners are working. The underlying thesis is that joint leisure is a normal good or, put simply, that couples enjoy spending time together. Studies in this field have demonstrated evidence of couple-level coordination in the United States (Hamermesh 2002, 2000), Britain (Jenkins and Osberg 2005; Sullivan 1996), the Netherlands (van Klaveren and Maassen van den Brink 2007; van Velzen 2001), Australia (Venn 2004), Sweden (Hallberg 2003), Italy, and Belgium (Carriero, Ghysels, and van Klaveren 2009).

This literature on schedule coordination has, however, failed to consider insights that research on childcare choice offer into the work scheduling decisions of one large subset of dual-earner couples: those with young children. Research in this field documents multiple factors—including but not limited to financial resources, available family support, geographic location, and ideas and beliefs about childcare and children's development (Chaudry, Henly, and Meyers 2010; Meyers and Jordan 2006)—that influence what sort of care parents seek out for their children. These decisions about care are shaped by and have the potential to shape work schedules in ways both small and large. At the extreme, this literature details the experience of couples who elect to work non-overlapping shifts so as to minimize reliance on non-parental care. The arrangement of such schedules requires active coordination, but it follows a distinct logic from that which is presupposed in the schedule coordination literature.

This paper analyzes socioeconomic variations in scheduling and schedule coordination of dual-earner couples with young children in the U.S. at two points in time: 1990 and 2012. I evaluate coordination by comparing real couples' work schedules to those of pseudo-couples: "fake" couples that are created by matching socio-demographically similar couples and swapping their component members. These pseudo-couples are designed to form an appropriate comparison group to the real couples with whom they are associated, but they by construction cannot be coordinating schedules. I document which sorts of couples are more or less likely to work certain types of schedules and, contingent on schedule type, which are more or less likely to successfully coordinate those schedules.

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Both the selection and the realization of a given scheduling logic have consequences. Non-overlapping work schedules may reduce reliance on non-parental care providers, but these schedules are, in many ways, worse for families. They necessarily limit the amount of time parents spend together and the nonstandard work schedules they entail have been associated with increased marital stress, decreased worker well-being, and a range of children's cognitive and behavioral problems (Han 2005, 2004; Joshi and Bogen 2007; Kingston and Nock 1987; Lesnard 2008; Presser 2003). Regardless of which type of schedule (overlapping or non-overlapping), families are better off when they are more able to realize the associated form of coordination. For couples with overlapping schedules, more complete realization means more time spent together; for couples with non-overlapping schedules it means less reliance on non-parental care providers. How well does socioeconomic status predict schedule type and coordination? How have those relationships changed over time? Answering these questions allows us to better understand labor market inequalities and how they shape family well-being and children's development. Results have implications for policies related to worker scheduling control and access to high-quality childcare.

Data & Methods

Data are drawn from two nationally-representative studies of households with children under age 13: the 1990 National Child Care Survey (NCCS) and the 2012 National Survey of Early Care and Education (NSECE). Both the NCCS and the NSECE collected work schedule data from a responding parent and their partner (if present in the household) for a full seven-day week. Respondents were asked to report, day by day, work schedules for the week immediately preceding the interview. Because of cost, complication, or respondent burden, there are few surveys that collect schedules from multiple adults in a household. Schedule data is also typically collected either from a single specific day (as in the American Time Use Survey) or with reference to an abstract "usual" day (as in the May supplement to the CPS). The NCCS and NSECE suffer from neither of these restrictions. To do so, both surveys effectively trade coverage off against detail: while they do not contain the fine-grained level of specificity that time diary data offer, they provide greater context than most stylized response surveys and offer an unprecedented glimpse into how families with children organize working schedules (Chenu and Lesnard 2006; Juster, Ono, and Stafford 2003).

Analysis for this paper consists of six steps:

1) I use sequence analysis and clustering methods to describe and characterize couples' work schedules. Because data are available from multiple consecutive days, I follow Lesnard and Kan's (2011) two-stage optimal matching procedure, which helps to account for the nested periodicities of days within weeks. Couple-level working schedules are first clustered at the day level; Figure 1 provides a visual representation of the nine resulting clusters. These sequence distribution plots provide the distribution of working states in each 15-minute block throughout the day; they can be thought of as a series of vertical bar plots run up against each other in chronological order. Schedules are then clustered a second time at the week level; Table 1 provides a general summary of these clusters (and indicates how they are then combined into five broad schedule types for subsequent analyses).

Figure 1. *Sequence Distribution Plot of Couple-Days in Dual-Earner Couples, NCCS and NSECE combined.*
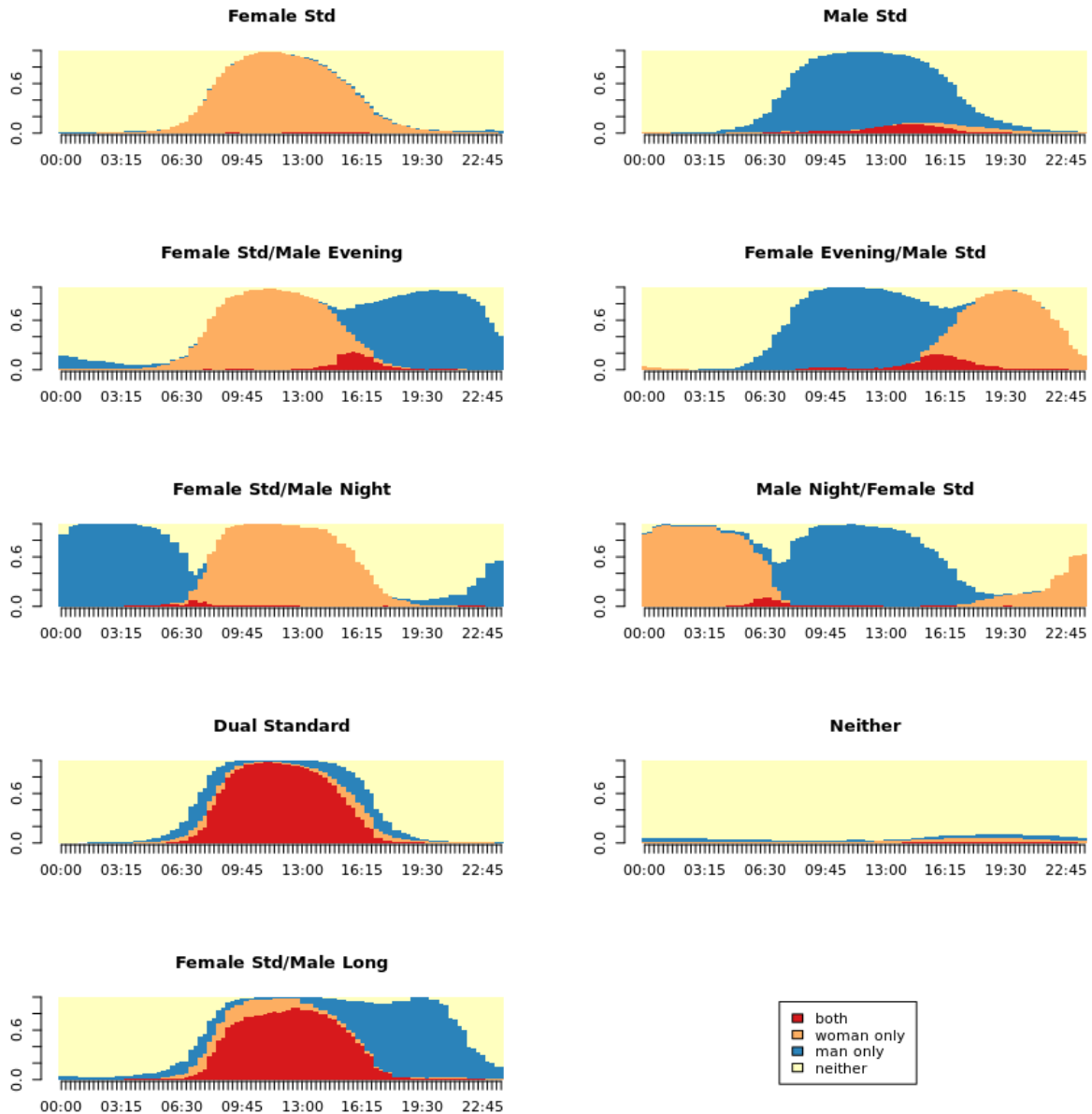

TABLE 1 HERE

2) I then match each couple to one other similar couple. I match on the basis of a broad set of variables that have been employed for this purpose in the previous literature (Carriero et al. 2009; Hallberg 2003; Jenkins and Osberg 2005; van Klaveren and Maassen van den Brink 2007). I follow Carreiro and colleagues (2009) in employing nearest-neighbor matching on the basis of the Mahalanobis distance between cases. I limit matches within survey-year: cases from 1990 can only be matched to others from 1990 and those from 2012 only to others from 2012.

3) In the third step, I create a population of pseudo-couples by pairing members across these matched couples. The real couple $[F_i, M_i]$ and the matched couple $[F_j, M_j]$ swap partners to yield two pseudo-couples: $[F_i, M_j]$ and $[F_j, M_i]$. By construction, these pseudo-couples should form a plausible comparison for the real couples.

4) I then compare schedules of real couples and pseudo-couples. I employ two dependent variables. WTO is the number of hours in the recorded week in which both members of the couple are working. The second is a dissimilarity index (DI) developed by Chenu and Robinson (2002). DI runs on the interval [0,200]; the lower the score the more similar the two schedules. I calculate the WTO and DI for every real and every pseudo-couple in the sample. In this step, I carry out a naive comparison of these values for all real and associated pseudo-couples across the full population.

5) The fifth step repeats the fourth, but takes couples' schedules into account. Rather than running a single t-test across the full population, I run multiple tests within groups defined by real couples' schedule type. That is, I am comparing the WTO and DI of real couples with a given schedule type to their associated pseudo-couples.

6) Finally, I assess the characteristics that make it more or less likely that couples will be able to successfully coordinate their schedules. My focus here is just on two of the schedule types: couples with a dual standard schedule and those who are off-scheduled. The goal is to demonstrate whether generally more-advantaged couple are able to more fully coordinate their schedules, contingent on what coordination "means" in their given case.

Preliminary Findings

I find no evidence of schedule coordination across the full population of dual-earner couples with children (Step 4 above). On average in 1990, real couples spent 25.7 hours per week jointly working. Pseudo-couples actually had slightly *higher* work time overlap (26.1 hours) and slightly *more* similar work schedules than those of real couples (DI of 49.9 compared to 51.3). For neither outcome in either year is there a statistically significant difference.

There is also no evidence of changes in schedule coordination over time. While couples' schedules are significantly less similar (p<.001) and involve significantly fewer hours of WTO (p<.001) in 2012 than in 1990, results suggest no evidence of coordination in either year.

When I disaggregate analyses by schedule type (Step 5), however, I find strong evidence of coordination—in opposite directions—for the majority of couples. Table 2 presents weighted t-tests for schedule coordination comparing real and pseudo-couples by schedule group.

TABLE 2 HERE

Couples falling in the dual standard group (top row) appear to be coordinating so as to increase schedule similarity. In both 1990 and 2012, couples in this group have significantly greater WTO (just over two hours more) and significantly lower dissimilarity in schedules (between six and seven points lower) than their associated pseudo-couples. For couples in the Single Standard and Off-Scheduled groups, by contrast, there is evidence of the opposite: couples in these groups have significantly *less* similar schedules than would be expected. For instance, in 1990, couples

in the Single Standard group had 3.1 hours less of work time overlap than their pseudo-couple counterparts (p<.01) and those in the Off-Scheduled group had 11.3 hours less (p<.001). The final two groups show only small differences in WTO and DI between real and pseudo-couples. Comparing the left and right panels across all schedule groups, the differences in coordination appear trivial between 1990 and 2012.

The last piece of analysis considers whether certain couples are more or less able to effect their form of coordination. I focus just on Dual Standard and Off-Scheduled couples. These two groups represent the obvious extremes: the former show evidence of coordinating to increase similarity while the latter the opposite. Table 3 reports on differences between real and pseudo-couples in their WTO and schedule DI accounting for a range of characteristics of the couple. For example, in the top rows I examine differences for households in which the youngest child is below age five and those in which the youngest child is between five and twelve years old. Dual Standard households with a young child have 2.6 hours more of WTO relative to their associated pseudo-couples compared to 1.7 hours more WTO for couples whose youngest child is older.

TABLE 3 HERE

For couples with a Dual Standard schedule (left panel) there are a number of unexpected findings. First, I find strongest evidence of coordination among couples in which the survey respondent was Hispanic. Such couples average three hours more WTO than their pseudo-couple counterparts (compared to just under two hours for couples with white respondents). Second, there is greater evidence of coordination amongst the unmarried than the married (3.48 more hours of WTO compared to 2.04). Third, the results on household income appear U-shaped: couples with lowest and highest incomes show greatest evidence of coordination. Fourth, greater education does not appear to be associated with greater coordination. Couples with female or male members with less than a college degree show higher WTO and lower DI relative to their pseudo-couple peers than couples with more educated members.

For Off-Scheduled couples (right panel) there are fewer differences by household characteristics. Married couples appear to more effectively reduce WTO and increase schedule dissimilarity (i.e., WTO difference of 11.2 hours compared to 9.7 hours for the unmarried). Couples in the lowest income bracket (those making less than $25,000 per year) have the smallest difference in WTO and DI. They average 8.7 hours less of WTO than their pseudo-couple counterparts; the average across all Off Scheduled couples is 10.7 hours less.

Discussion & Future Directions

The evidence marshaled here provides support for the idea of heterogeneous logics of work schedule coordination. Across the full sample of dual-earner couples, I find no evidence of schedule coordination. When disaggregated by schedule group, however, I find that these null results mask significant differences that, as predicted, tend in opposite directions. I find no substantive differences in coordination between 1990 and 2012, either across all couples or when disaggregated by schedule type. There is a wide-spread belief that work scheduling has grown worse over time, in ways that should negatively affect couple-level coordination. This null finding runs contrary to that narrative, and is a generally hopeful conclusion: couples appear to, at the very least, not be losing ground in coordinating their schedules.

In the version of this paper that will be presented at PAA, I plan to make several methodological and substantive additions. First, I am revising the matching and pseudo-couple generation algorithm. My goal is to match each real couple not to one single other but rather to multiple similar couples, thereby yielding a broader population of pseudo-couples whose scheduling characteristics will be weighted according to their similarity to the real couple. Second, I will present more results that analyze the socio-demographic correlates of schedule types. This will allow me to more clearly demonstrate differences in (1) selection into work schedules and (2) successful coordination contingent on that schedule. Table 3 currently provides some sense of the latter, but more weight will be given to the initial selection step.

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Table 1. Summary of Work Schedules in Dual-Earner Households

	Prevalence (% of person-weeks)		Avg Length of the Family Work Week		Avg Work Time Overlap (WTO)		Avg Dissimilarity Index (DI)	
	1990	**2012**	**1990**	**2012**	**1990**	**2012**	**1990**	**2012**
Dual Standard	66.4	64.3	52.4	50.9	34.1	28.9	28.7	36.5
Single Standard								
Female Std	1.3	3.5	61.7	48.7	5.8	4.5	103.0	97.2
Male Std	14.1	17.4	58.3	53.7	9.8	8.7	85.2	85.5
Off-Scheduled								
Female Std/Male Evng	4.3	2.9	79.3	73.3	3.3	2.6	121.0	120.0
Female Std/Male Night	1.9	1.3	82.6	75.0	2.0	0.1	127.0	128.0
Female Evng/Male Std	3.7	2.6	72.4	69.3	4.8	3.9	113.0	113.0
Female Night/Male Std	1.6	0.9	85.8	75.5	2.4	2.4	128.0	122.0
Limited Work	3.6	5.2	57.4	43.9	7.6	5.4	91.4	89.5
Dual Long	3.2	1.9	74.2	79.0	31.1	30.7	57.7	63.1

Note: Family Work Week is the count of the total number of hours that one or both partners is working

Table 2. T-Tests for Schedule Coordination by Schedule Group

	1990				2012			
	WTO diff	**sig**	**DI diff**	**sig**	**WTO diff**	**sig**	**DI diff**	**sig**
Dual Standard	2.08	***	-6.05	***	2.12	***	-6.98	***
Single Standard	-3.11	**	8.68	***	-2.88	***	8.92	***
Off-Scheduled	-11.3	***	35.6	***	-10.7	***	34.3	***
Limited Work	1.39		-7.72		0.217		-5.40	
Dual Long	-0.697		7.39	+	-0.601		5.47	

Table 3. Demographic Variations in Coordination within Select Schedule Types (1990 and 2012 combined)

	Dual Standard				Off-Scheduled			
	WTO diff	sig	DI diff	sig	WTO diff	sig	DI diff	sig
Youngest Child								
<5 years old	2.60	***	-7.91	***	-11.1	***	35.3	***
5+ years old	1.70	***	-5.40	***	-10.9	***	34.8	***
Respondent Race								
White	1.95	***	-6.27	***	-11.0	***	34.9	***
Black	2.13	***	-6.73	***	-11.1	***	35.2	***
Hispanic	3.01	**	-9.40	***	-11.6	***	36.6	***
Other	2.05	***	-6.44	***	-11.0	***	35.0	***
Marital Status								
Married	2.04	***	-6.32	***	-11.2	***	35.6	***
Unmarried	3.48	**	-10.7	**	-9.71	***	30.1	***
Household Income								
<25K	3.10	*	-9.72	**	-8.67	***	27.9	***
25-50K	1.84	***	-5.78	***	-11.2	***	35.6	***
50-75K	2.33	***	-7.38	***	-11.8	***	37.7	***
>75K	2.75	***	-8.51	***	-10.8	***	34.3	***
Female Education								
Less than College	2.64	***	-8.09	***	-10.8	***	34.3	***
College +	1.60	***	-5.08	***	-11.5	***	36.7	***
Male Education								
Less than College	2.83	***	-8.56	***	-11.0	***	34.7	***
College +	1.29	**	-4.23	***	-11.0	***	36.1	***