Online Supplement to the Paper

**"Understanding Activity Engagement Across Weekdays and Weekend Days:
A Multivariate Multiple Discrete-Continuous Modeling Approach"**

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Descriptive Analysis: See footnote 3 of the paper.

TABLE A.1 Activity Participation (%) by Day for the Analysis Sample

Activity Purpose	Day of the week						
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Work	82.3	82.9	82.4	82.6	82.5	28.6	28.6
Education	1.9	1.9	1.8	1.8	1.7	1.3	1.1
Escort	25.9	26.1	25.6	25.4	25.3	15.7	15.9
Shopping	59.5	58.6	61.3	59.4	61.3	33	32.5
Personal business	26.9	26.4	25.6	25.9	26.6	13.1	13.3
Recreation	64.9	64.7	66.4	65.7	67.8	42.3	46.4
In-home	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE A.2 Mean Duration (Hours) Among Those Participating by Day for the Analysis Sample

Activity Purpose	Day of the week						
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Work	32.9	33.0	32.0	32.1	32.0	8.7	8.7
Education	13.2	13.6	12.9	12.8	13.2	7.9	7.9
Escort	2.0	2.1	2.0	2.0	2.0	1.5	1.4
Shopping	2.3	2.2	2.3	2.3	2.4	1.7	1.7
Personal business	2.2	2.2	2.2	2.2	2.2	1.7	1.7
Recreation	9.2	9.1	9.1	9.1	9.3	5.8	5.8
In-home	65.1	64.3	64.2	64.0	64.6	26.6	26.7

TABLE A.3 Description of Records with Missing/Erroneous Data
(This table should be read along with the text immediately following Table 1 of the paper)

Person Characteristics (N=1,780 Adult Workers)		Household Characteristics (N=1,218 Households)	
Variable	*Value*	*Variable*	*Value*
Gender (Valid N=1,764)		Household Income (Valid N=642)	
Female	51.1%	Less than £25K	22.6%
Age (Valid N=1,523)		£25K to <£50K	37.3%
18-29 years	20.9%	£50K or over	40.1%
30-39 years	21.2%	Presence of Children (Valid N=1,162)	
40-49 years	22.9%	No child	60.1%
50-59 years	23.6%	Average Household Size (Valid N=1,159)	3.20
60 years and over	11.4%	Average Household Vehicles (Valid N=1,075)	1.62
Student Status (Valid N=1,412)			
Student	11.9%		
Educational Attainment (Valid N=1,162)			
Not a college graduate	70.9%		
College graduate or higher	29.1%		
Work Status (Valid N=1,252)			
Full-time worker	74.4%		
Work Place Location (Valid N=1,073)			
Same location everyday	80.2%		
Frequency of Bus Use (Valid N=954)			
At least once a week	21.0%		
Less than once a week	79.0%		
Frequency of Bicycle Use (Valid N=899)			
At least once a week	15.2%		
Less than once a week	84.8%		
Frequency of Walking (Valid N=872)			
At least once a week	65.8%		
Less than once a week	34.2%		

Note: Descriptive statistics for each segment are computed only for individuals who recorded a valid response for the respective question. Valid sample sizes used for calculation of percentage values are presented in the parentheses.

TABLE A.4 Average Number of Activities Reported by Day
(Please see footnote 5 of the paper)

Diary day	Average number of activities reported
1st	21.07
2nd	21.12
3rd	21.31
4th	20.92
5th	21.80
6th	21.64
7th	21.11

TABLE A.5 Mean Absolute Percentage Error of Predictions of Participation Shares and Average Duration by Market Segment

(Supplement to discussion in Section 6 of the paper)

Segment	Mean Absolute Percentage Error of each model within each market segment			
	Weekly model (the entire diary)			
	Joint		Independent	
	Participation (%)	Average duration (hours)	Participation (%)	Average duration (hours)
Gender				
Male	14.3	15.3	17.1	17.3
Female	14.5	14.8	17.8	18.8
Age range				
18-29 years old	14.3	15.7	17.7	15.9
30-39 years old	14.9	15.7	17.1	17.7
40-49 years old	14.3	14.9	17.1	17.3
50-59 years old	15.5	15.9	16.2	17.3
60 or older	14.3	15.8	17.1	18.1
Student status				
Non-student	14.0	15.9	17.2	16.1
Student	15.0	15.7	17.3	18.7
Educational attainment				
No degree	14.1	16.6	17.1	18.8
College or graduate degree	14.3	17.3	18.5	17.3
Work status				
Full-time worker	15.6	15.3	17.4	17.3
Part-time worker	14.1	15.7	17.1	17.9
Work place location				
Same location everyday	15.4	15.7	18.4	17.1
Different location	13.2	15.6	17.6	18.3
Household income				
Low income	13.7	15.7	16.2	17.3
Medium income	14.3	15.6	18.8	17.8
High income	14.3	15.7	17.9	17.3
Presence of children				
No children	14.3	15.8	18.2	17.3
At least one child	15.0	15.7	17.0	17.8
Overall	**14.3**	**15.7**	**17.1**	**17.3**

TABLE A.6 Predictions of Participation Shares and Average Duration – Females
(Supplement to discussion in Section 6 of the paper)

| Activity purpose | Weekly model (the entire diary) | | | | "One-day" model (one random weekday * 5 plus one random weekend day * 2) | | | | Sample | |
| | Joint | | Independent | | Joint | | Independent | | | |
	Participation (%)	Average duration (hours)	Participation (%)	Average duration (hours)	Participation (%)	Average duration (hours)	Participation (%)	Average duration (hours)	Participation (%)	Average duration (hours)
Weekdays										
Work	86.5	35.17	88.3	37.45	76.56	27.6	74.6	26.97	82.6	32.39
Education	2.1	8.7	2.2	8.7	1.3	17.1	1.2	17.3	1.8	13.15
Escort	20.5	2.97	19.14	3.04	14.2	3.13	17.5	3.16	25.7	2.02
Shopping	61.2	2.77	61.6	2.87	54.7	2.36	57.3	2.42	59.8	2.28
Personal Business	22.1	2.33	20.3	2.59	21.87	1.78	25.4	1.72	26.3	2.21
Recreation	67.2	10.25	67.62	10.36	59.3	7.89	60.1	7.88	65.9	9.15
In-home	--	59.78	--	59.87	--	66.3	--	66	100	64.45
Weekend										
Work	31.3	10.2	32.63	10.56	34.6	7.31	32.9	7.21	28.6	8.68
Education	1.9	7.5	2	7.2	0.8	8.56	0.9	8.57	1.2	7.92
Escort	14.7	1.68	15.6	1.72	10.2	2.45	9.9	2.4	15.8	1.43
Shopping	35.3	1.75	37	1.78	30.65	1.79	31.2	1.79	33	1.69
Personal Business	15.8	1.56	16.53	1.42	9.8	2.02	9.4	2.09	13.2	1.72
Recreation	48.6	6.5	48.9	6.79	37.85	7.76	38.4	8.01	44	5.81
In-home	--	28.45	--	28.96	--	30.1	--	30.15	100	26.65
Mean absolute percentage error	**14.5**	**14.8**	**17.8**	**18.8**	**21.0**	**21.7**	**24.5**	**22.9**		

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TABLE A.7 Predictions of Participation Shares and Average Duration – Individuals from a High-Income Household
(Supplement to discussion in Section 6 of the paper)

| Activity purpose | Weekly model (the entire diary) | | | | "One-day" model (one random weekday * 5 plus one random weekend day * 2) | | | | Sample | |
| | Joint | | Independent | | Joint | | Independent | | | |
	Participation (%)	Average duration (hours)	Participation (%)	Average duration (hours)	Participation (%)	Average duration (hours)	Participation (%)	Average duration (hours)	Participation (%)	Average duration (hours)
Weekdays										
Work	86.5	34.56	87.45	36.12	76.23	27.8	74.32	28.76	82.6	32.39
Education	2.1	8.6	2.3	8.64	1.1	16.93	1.2	17.2	1.8	13.15
Escort	20.5	2.97	19.2	3.01	15.4	3.11	17.7	3.15	25.7	2.02
Shopping	62.23	2.79	62.4	2.78	52.35	2.35	56.32	2.45	59.8	2.28
Personal Business	22.1	2.58	20.5	2.59	22	1.79	25.41	1.73	26.3	2.21
Recreation	66.87	9.87	67.5	10.23	59.3	7.89	60.1	7.88	65.9	9.15
In-home	--	60.36	--	61.32	--	66.42	--	66.84	100.0	64.45
Weekend										
Work	31	10.23	32.1	10.32	34.6	7.34	33.24	7.34	28.6	8.68
Education	1.9	7.5	1.98	7.42	0.9	8.55	0.9	8.6	1.2	7.92
Escort	14.7	1.68	15.32	1.69	10	2.45	9.9	2.5	15.8	1.43
Shopping	35	1.75	37.24	1.78	32	1.83	29.56	1.82	33.0	1.69
Personal Business	15.7	1.48	16.3	1.44	10.2	2.02	9.5	2.06	13.2	1.72
Recreation	48.5	6.6	48.6	6.85	38.6	7.78	3.84	7.97	44.0	5.81
In-home	--	28.32	--	29	--	30.1	--	31.67	100.0	26.65
Mean absolute percentage error	**14.3**	**15.7**	**17.9**	**17.3**	**20.5**	**21.6**	**25.2**	**23.4**		