

Drivers of social interaction: exploring the effect of modality styles on face-to-face contacts

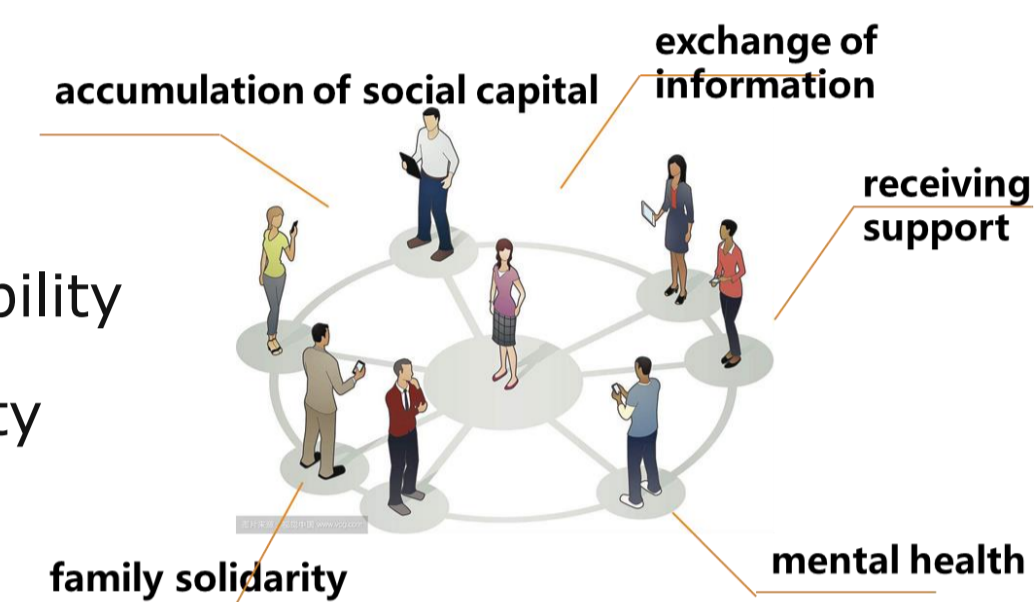
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Research Background

- Importance of social interactions
- Car use: environmental vs. social sustainability
- Alternative to car dependent: multimodality



Research Question

- How individuals' social interactions with different companions are related to their modality styles in the context of a developing country, with a family oriented and collectivist culture (Beijing, China)?

Data

"Daily Activity and Travel Survey of Beijing, 2012", by Peking University

- 709 respondents
- Socio-economic characteristics
- One -week's activity diary data
- Spatial attributes: Points of Interest (POI) data

Dataset for this study

- 410 commuters
- 2063 out-of-base non-work activity episodes
- 2870 days (2020 commute days, 850 non-commute days)
- Solo activities and 3 types of social contacts: family members, friends, colleagues

Figure 1. Number of days with social interaction

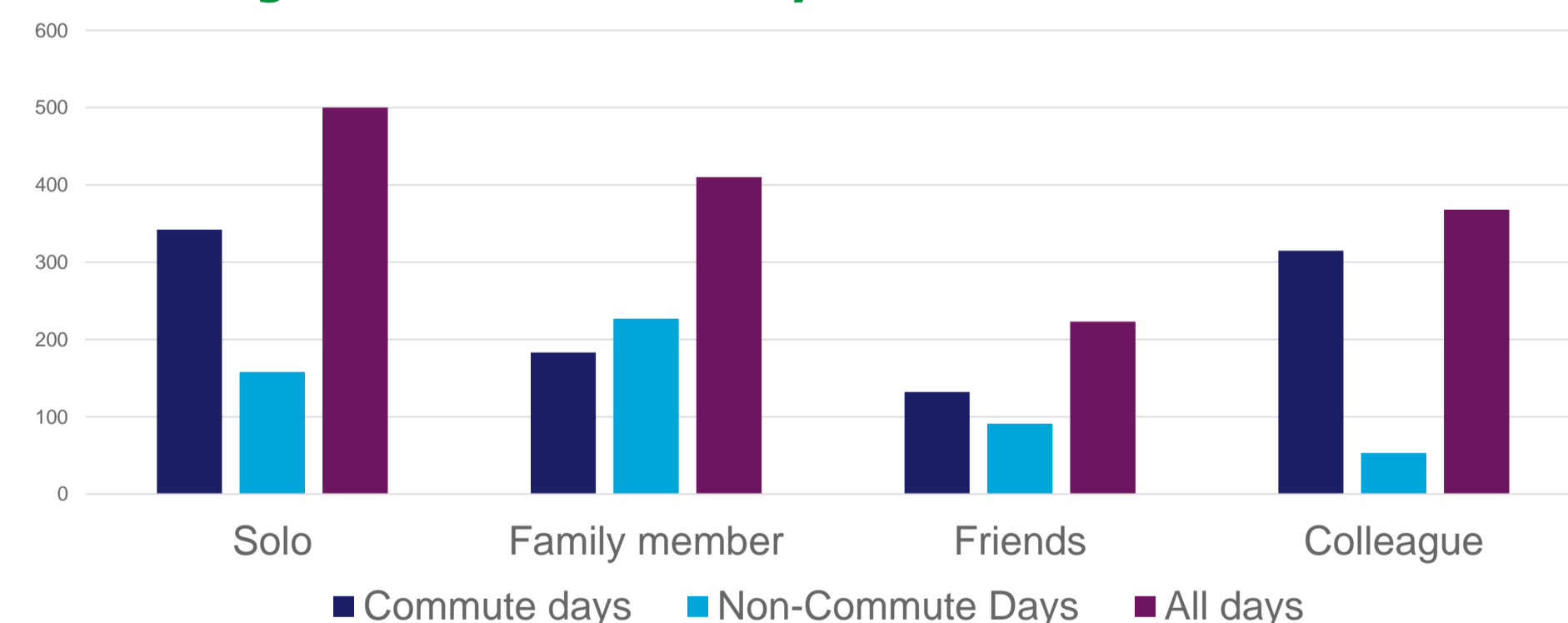
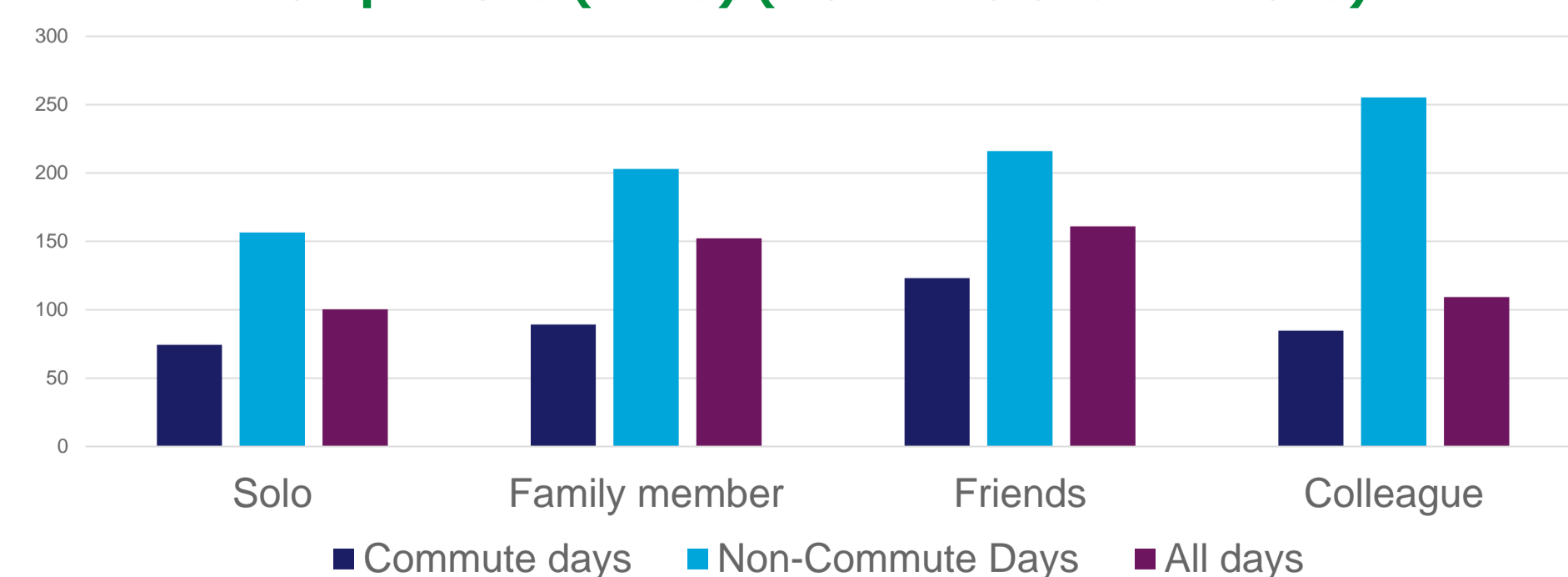


Figure 2. Average time spent with different companions (mins) (Non-zero observations)



Face-to-face interaction with different companions

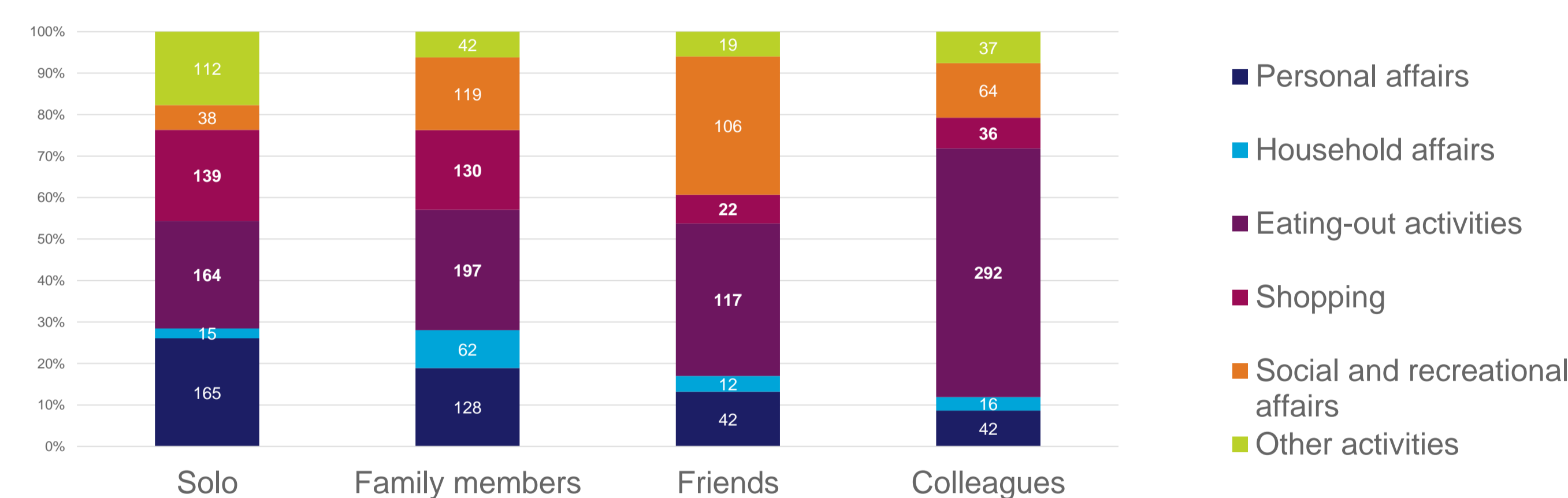
Measurement: daily level, non-work activities, out-of-base, total duration (Figure 1)

- More solo activities and interactions with colleagues in commute days
- Interaction durations are longer in non-commute days

Activity type with different companions (Figure 2)

- Solo: personal, eating-out and shopping
- Family : eating-out/shopping/personal, more household affairs than other companions
- Friends: eating-out, social and recreational activities
- Colleagues: eating-out

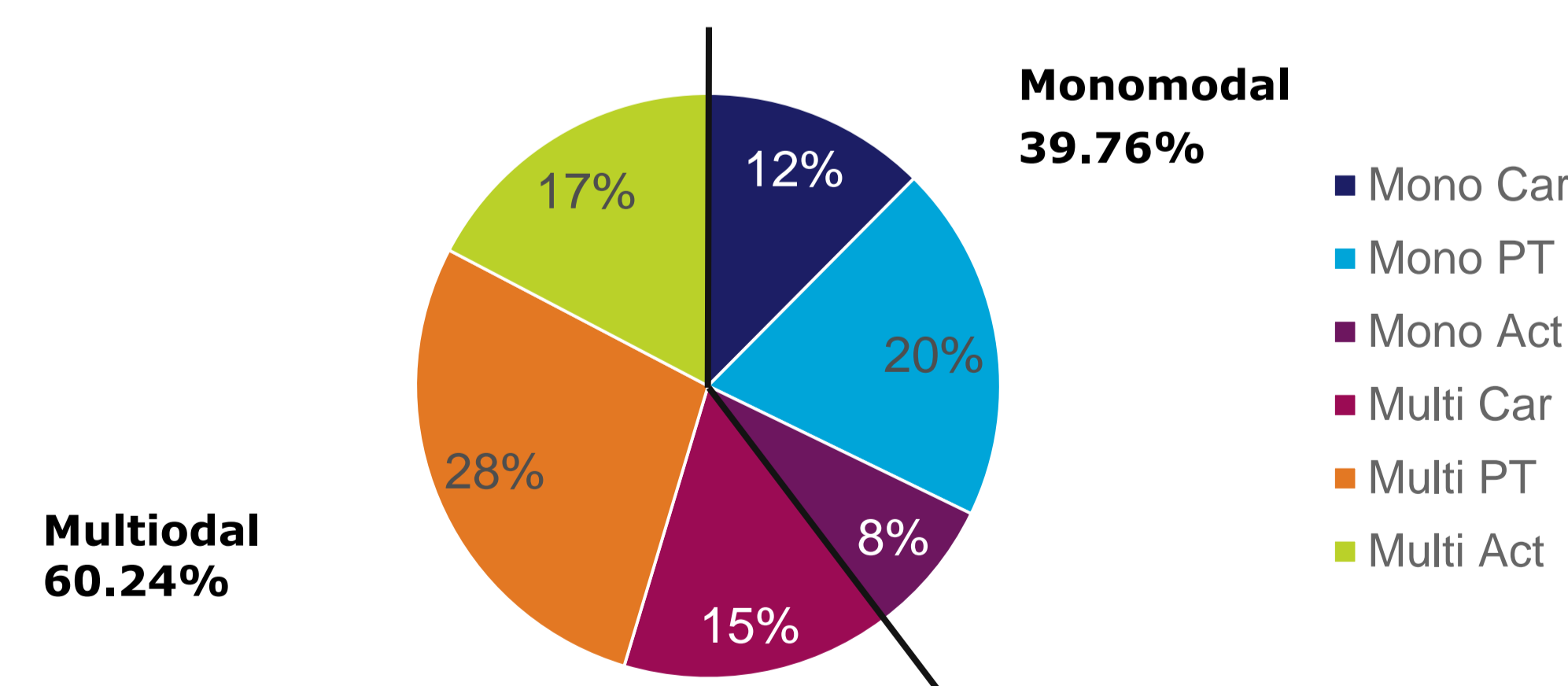
Figure 3. Activity types for different companions



Distribution of modality styles

- Modality:** monomodality as exclusively using a single mode for more than 90% of trips in the week; multimodality as the use of at least two modes
- Habitual modes:** most frequently used mode (car, public transport, active modes)
- 6 subgroups (Figure 4)

Figure 4. Distribution of modality styles



Methodology: Multivariate Tobit model

- Censored distribution**
zero-observations for certain companion types
- Relation between interactions with different companions**
Seemingly Unrelated Regression (SUR)
- Repeated observations for each individual**

Model Results

Rho Correlations between the interactions with different companions

Commute Day: Family member \leftrightarrow Friends \leftrightarrow Family members

Non-commute day: not significant

Modality styles (Mono Car users as reference category)

Commute Day: Mono PT \rightarrow family member (-), friends(-)

Mono Act \rightarrow friends (-)

Multi PT \rightarrow family member (-), friends(-)

Multi Act \rightarrow family member (-), friends(-)

Multi Car/solo, interaction with colleagues: no significant difference

Non-commute day: Mono PT \rightarrow family members (-)

Multi Car \rightarrow family members (+)

Multi PT \rightarrow solo activities(+)

Multi Act \rightarrow solo activities (+), friends (+)

Work and daily attributes

Day (Friday, Sunday), work durations

Personal and spatial factors

Commute day:

Female : family members (+)

Male : friends (+) , colleagues (+)

Higher Educated : colleagues (+)

Married : family(+), friends(-), colleagues(-)

Extended household : friends (-) , Colleagues (-)

No. of restaurants around home : family (+)

No. of public recreational facilities around workplace: friends (+)

Non-commute day:

Male: friends (+)

Higher Income: family(+)

Married: family(+), friends (-)

Restaurants around home:friends (+)

Conclusion

- The influence of modality styles differ across companion types, as well as between commute and non-commute days
- Advantages for car users in commute days, facilitating interactions with family members and friends
time constraints imposed by work and commute;
the flexibility and capability offered by car
- More out-of-base activity for multimodal traveler in non-commute days
high density and mixed landscape in Beijing

Further Research

- Trade-off between out-of-base and in-base interactions
- Exploring higher-level orientations or lifestyles: affecting both travel and activity (a latent-class approach)