

# Smartphone-based Qualitative Analyses of Social Activities During Family Time

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# Summary

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# Motivation

One of the most common structures of social interaction is that among the members of a modern-day nuclear family.

- Family, as a social structure, is instrumental in shaping the personalities of individual members through routine or non-routine activities (Davey & Paolucci, 1980).
- Positive familial interactions decrease possibilities of violence in both domestic and external scenarios (Youth Risk Behavior Survey, 2000), familial engagement decreases likelihood of succumbing to substance abuse (The National Center on Addiction and Substance Abuse, Columbia, 2011).

## Motivation Cont'd

- How do people in various familial roles spend time with their family, and more precisely, what social activities do they perform together?
- What is the nature of the interactions among family members? How satisfied are they with these interactions?
- Are families losing out on spending quality time together with each person being engrossed in their own smart devices?

# Sampling and Generalization - Facets

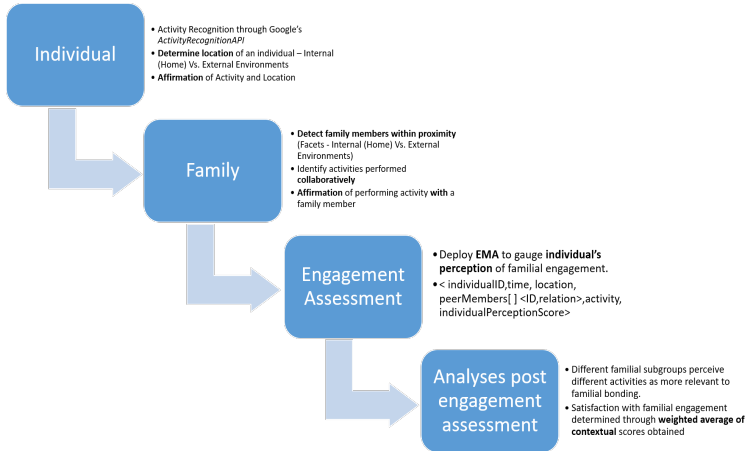
- Need to monitor families from diverse social and economic backgrounds
- Need to monitor families of different sizes, due to presence of diverse roles in larger co-located families (e.g. mother, siblings, grandparents, nieces and nephews, etc.)
- Need to differentiate the needs and expectations of the millennial generation

# Sampling and Generalization - Study Demographics

Families surveyed	12 (2-4 members each)
Age range	18 to 60 years
Gender	46% male, 54% female
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Individual millennials surveyed	78
Age range	18 to 25 years
Gender	55.12% male, 44.88% female

Table: Demographic Information of Participants

# System Design





# Smartphone Data Features and EMAs

## 1 Interpersonal Relation Cognizance

- Crucial to recognize and monitor the interactions between inherent members of a family while both individually identifying them and taking into account the nature of each interpersonal relationship.

## 2 Proximity

- Installation and Utilization of BluetoothLE Beacons to locate individuals in familial spaces, as well as to recognize members' proximity to one another.
- Employment of trilateration to position individual family members on a 2-dimensional plane, and proceed to determine the collective participation of the family in a common activity within proximity of one another.

# Smartphone Data Features and EMAs - Cont'd

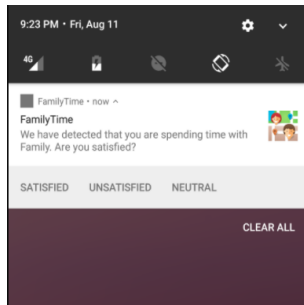


Figure: EMA Notification with Satisfaction survey

## Smartphone Data Features and EMAs

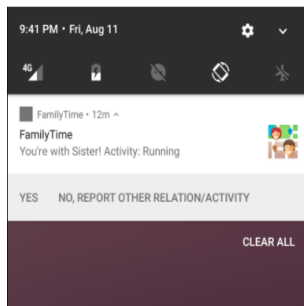


Figure: EMA to validate family members in proximity and activity

## Smartphone Data Features and EMAs

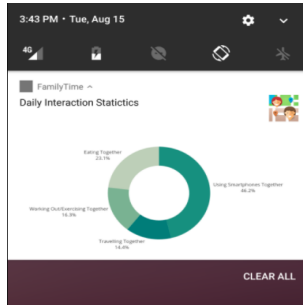
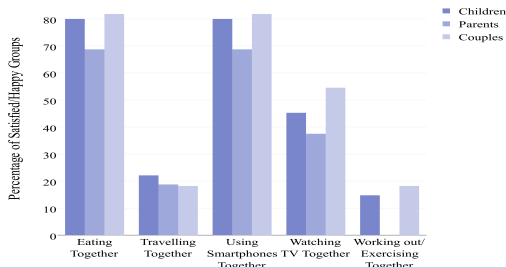


Figure: Daily familial interaction summary notification

## Results - Intra-Family Interactions

### ■ Satisfaction Quotient during various social activities:

Eating/Dining	59.25%
Working out/Exercising	14.81%
Traveling	29.6%
Engaging with Smartphones	74.08%



# Familial Expectations Among Millennials

- Significant departure from complementary/common schedules for millennial members with respect to their families.

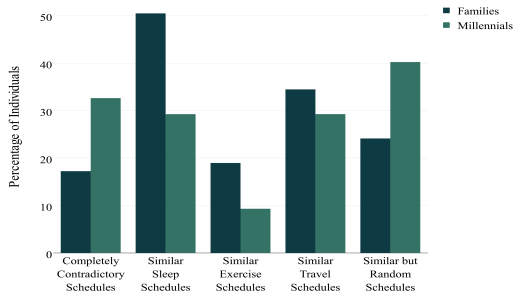


Figure: Collective Activity Participation Habits Among Families and Millennials Living Separately

- Task Related Attention Distribution among millennials & Home environment correlation:
  - 5.4% of the total respondents said they dedicate their complete attention to their family while with them, whereas almost 28.38% prefer to multi-task between their phone and family. Only 15.3% of the participants felt that their phone was a source of distraction.

# Ongoing and Future Work

- Inclusively accounting for the behavior of varied and complex familial groups such as extended families, flat-mates etc.
- Replication of this study across populations from different demographics, as social pressures and expectations with respect to one's family may differ across cultures
- Dynamic definition of proximity thresholds using deep learning models.



## Additional References

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# Thank You!

## Questions?