

EXPERIENCE SAMPLING

Experience sampling allows 'real-time' data collection in participants' everyday lives, and complements the data offered by surveys and experiments.

Key Readings

- **An overview of experience sampling** ([book chapter](#))
- **Using mobile devices for experience sampling** ([book chapter](#)): This chapter goes through the various opportunities and considerations when using mobile devices for experience sampling. It covers the use of sensors and machine learning in existing apps as well. [The [Wiki page](#) gives a list of apps that have been developed for complex experience sampling requirements.]

Note: Alternative terms - ecological momentary assessment, daily diary methods

General Experience Sampling Principles

Here are some standard practices in experience sampling (largely drawn from the two book chapters above):

Briefing participants

Communicate the following instructions to participants:

- Describe the purpose of the research to participants (stressing the necessity for respondents to report their life as it actually is - with all its joys and problems).
- Ensure participants keep the device on and respond to all signals received, unless they go to bed or really need privacy.
- They should answer the questions as soon as possible after each signal
- Discuss situations this might be difficult (e.g., driving a car).
- Allow participants to fill out a practice experience sample message.
- If possible, collect a phone number allowing the participant to be contacted in case any question or complication arises.
- When the week is completed, debrief participants.

How often should you contact participants?

Typical protocol: Ping participants 7-10 times a day for 7 consecutive days

- "Systematic sampling" / "Signal-contingent sampling": Within the 15-18 target hours each day, one signaling time is selected at random in every block of 90-120 min (with the provision that no signals should occur within 15 min of each other)

Alternatives:

- "Event-contingent sampling": Tag experience sampling to an activity (e.g., 'ping participant every time the participant sends a Whatsapp message to x person or goes to x location')
- Have participants set when they should be contacted based on predetermined timetables
- "Interval-contingent sampling": Participants automatic answer some questions after a designated interval (e.g. hourly reports)
- Ping multiple people at the same time (to look at couples, families, etc.)

What information should you collect?

Each experience sample should be short (taking ≤ 2 mins to complete). This could include questions about:

- Location
- Time

- Social context
- Primary and secondary activity [Open ended or give options - see below for possibilities]
- Content of thought [Open ended or give options - see below for possibilities]
- Likert scales on perceived situation:
 - Affect (happy, cheerful, sociable, friendly) / emotional experience
 - Activation (alert, active, strong, excited)
 - Cognitive efficiency (concentration, ease of concentration, self-consciousness, clear mood)
 - Motivation (wish to do the activity, control, feeling involved)
- Topic-specific content: self-image, self-awareness, adjustments to changes in residence, intervening daily events, binge eating, alcohol and drug consumption, thought disorders, problems faced, etc.

[See Appendix 1: Sample experience sampling questions from the Csikszentmihalyi and Larson chapter]

You may also collect additional interview or questionnaire data before or after the test week.

What problems might you face?

- Compliance is a difficult issue. Compliance drops with schedule demands (increased frequency / longer duration of study), and with laborious measures at each sample.
 - Typical rate of compliance: 70-90% (depending on the population and method)
- Delays: Often due to tasks that cannot be interrupted.
 - Typical protocol: Discard responses if >20 mins have lapsed.
- Self-selection bias: Owing to the onerous nature of data collection, you are likely to recruit a select group of participants only
- Unwanted effects of experience sampling: The very act of pinging participants multiple times may affect their experience of the phenomenon you're measuring

Improving compliance: The need to pilot

- Before launching the study, pilot test all materials for the expected duration of the study.
 - Do it yourself! You'll quickly see whether your suggested method is feasible or not.
 - Also, test on lab members and with friends to ensure that they understand the instructions and respond the way you expect them to.

Data analysis

Coding responses

Activity and thought can be coded using existing schemes, e.g.:

- 154 activity / thought categories
- 16 larger groups
- 3 global activity areas (work, maintenance, leisure)
- (For thought) Based on functional groups (e.g., thoughts about work, family, self)

Testing reliability

- Split the week in half and compare first half vs. second half (note also that you might expect weekday-weekend differences on some measures)

Sample analyses strategies

- How much of a person's variation in xyz (e.g., happiness) is related to:
 - What he/she does
 - The company he/she keeps
 - The time of day

- Intervening events?
- Is xyz experienced similarly by different individuals?
- How do groups differ in their states, feelings, attitudes, and experiences?
- What's the pattern of a psychological state? (E.g., what's the ebb and flow of concentration in daily experiences?)
 - What affect is it associated with?
 - How long does it last?
 - What factors are related to its ending?
 - Can two states / moods (e.g., happiness and guilt) co-occur? [Within-person and between-person]
 - What's the variance in this state?
- Accuracy in frequency estimates (what are global biases?)

Statistical analyses

[For a discussion of analyses strategies, see Scollon et al.'s article [here](#)]

- *Should you aggregate?* It depends: This manages the dataset, but may skew your results (and you lose valuable source of data)
- *What level of analysis?*
 - Event: E.g., count frequencies of certain events (but beware of outliers that skew data)
 - Subject: E.g., Differences in within-person variability in the frequency of the target event or behaviour. Beware of time dependencies (non-independence within individuals)
 - Can use multi-level modelling that allow both within- and between-person effects, and the interactions between these
 - Can use time series analyses (e.g., spectral analysis) to explore change over time
 - Group: E.g.,

Experience Sampling Platforms

Creating a Facebook messenger bot

Building a bot

Here are some resources to start off with:

- <https://blog.hartleybrody.com/fb-messenger-bot/>
- <https://github.com/hartleybrody/fb-messenger-bot>

Launching a bot

Before a bot is launched, Facebook will need to review and approve it. Please make sure you've fulfilled the [various steps](#) they require.

Privacy Policy: You will need to have a privacy policy for your bot. You can use the approved IRB consent form for your project.

Initiating a conversation at a certain time

Yes, that's possible. For example, see these forums:

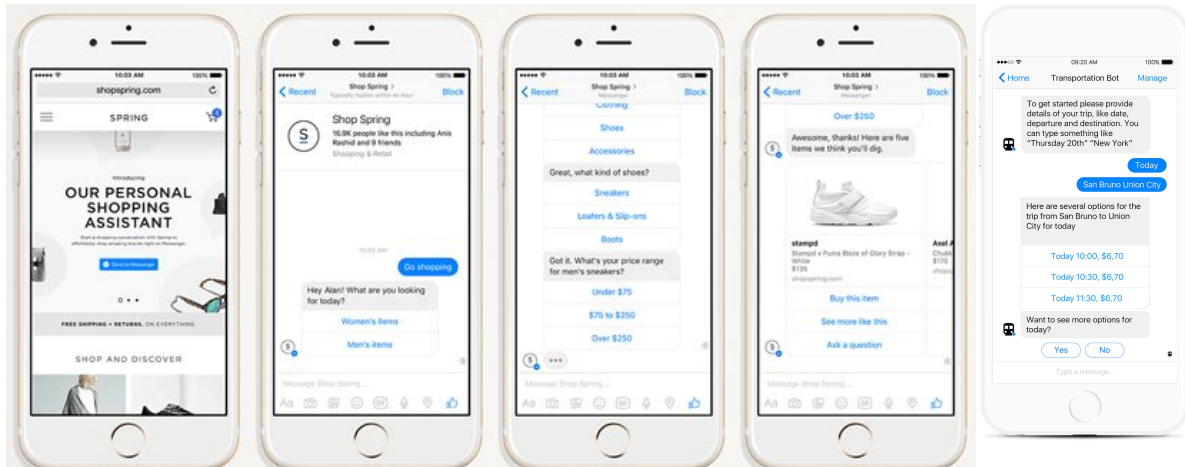
- <https://github.com/jw84/messenger-bot-tutorial/issues/8>

Remember to account for the different time zones participants may be residing in. (This can be programmed into the bot, if the information regarding time zone is collected beforehand.)

What kind of questions can you ask?

For an overview of the Facebook messenger template, see [this article](#).

- Questions that can be answered using typical Facebook messenger functions.
- If you are using free text questions, make sure they are short and simple (remember that people have to type responses on their phone).
- Wherever possible, go with multiple-choice questions instead of free text. Here are some examples from current Facebook bots:



- Sample question: On a scale of 1-7, how much did you xyz? (1= Not at all, 7= Very much) For a question like this, using a multiple-choice menu prevents participants from typing 'very much' instead of '7'

Data extraction

Recruiting via MTurk

Several authors have used Amazon's Mechanical Turk to recruit participants for experience sampling:

- Boynton, M. H., & Richman, L. S. (2014) An online daily diary study of alcohol use using Amazon's Mechanical Turk. *Drug and Alcohol Review*, 33, 456-461. ([Link](#))
- Lanaj, K., Johnson, R. E., & Barnes, C. M. (2014). Beginning the workday yet already depleted? Consequences of late-night smartphone use and sleep. *Organizational Behavior and Human Decision Processes*, 124, 11-23. ([Link](#))

However, one difficulty with MTurk recruitment is that you are not allowed to: collect any personal identifiable information from participants (e.g., email), require registration at another website or group, or promote a site or service (even indirectly). Although we haven't tried, I suspect that using Facebook Messenger Bots or having participants download apps will violate the [MTurk Policies](#).

Comments from Marcy Boynton: (Email to Prof Liu, 27 July 2017)

Thanks for your note. In answer to your question, we did not collect names, phone numbers, etc., only email addresses. An email like hotmama25@gmail.com is not inherently identifiable information and so it was allowable. This study was conducted five years ago, so the Amazon policy may have changed as to whether you can ask for an email address. This whole area of Mturk and participant identifiability is a bit touchy, as researchers have shown that in many cases one can pretty easily identify people using their Mturk ID numbers, which researchers do have access to through Mturk. Also, a lot of researchers send Mturk respondents to Qualtrics to complete their studies. By default Qualtrics records IP addresses, which can also be used to identify people (theoretically, anyway). What I did for my study was use emails to send

the daily survey links and survey completion reminders and to help link the daily surveys after the study was over. Once that was done I scrubbed all of my datasets of all email and IP address info.

In terms of survey methodology what we did was initially administer a brief screener that was 10ish questions. At the end of the screener respondents were asked if they would be interested in possibly participating in a follow-up survey study, and if so, to provide an email address. If an individual met the study inclusion criteria they were sent a unique Qualtrics link where they could log in to complete the next portion of the study, which was the baseline survey. A unique Mturk HIT was created for each survey that was completed by a participant. That means that there was a HIT for the screener, another for the baseline survey, and one for each of the daily diary surveys. If I recall correctly, we set up Qualtrics so that it sent each enrolled participant a link for that day's daily survey each day for two weeks, which took them to the correct Qualtrics survey for that day. We had Qualtrics generate a unique code at the end of each daily survey session, which the individual entered into the HIT on Mturk to verify that they completed the daily survey for that day. In short, Mturk was the participant portal and Qualtrics was the data collection tool. We tried to automate as much as possible (e.g., setting up Qualtrics to automatically send daily diary emails), but there still needed to be someone who was on top of verifying participation, monitoring the study, and approved HIT payments.

I thought that I would follow up with one more piece of information relevant to Mturk confidentiality. In the past I have used consent language like that below to communicate to participants that we will keep their data confidential and secure; however, they should be aware that Mturk worker IDs are not themselves anonymous identifiers, strictly speaking.

How will your privacy be protected?

We will ask you for your Amazon Worker ID to ensure all participants receive compensation upon completion of the survey. MTurk worker IDs will not be shared with anyone outside of the research key personnel and will be removed from the data sets used to analyze the data. Note that Amazon has stated that the MTurk platform is NOT meant to support participant anonymity. MTurk worker IDs are linked to Amazon.com public profiles. Amazon.com may disclose worker information. Any data you provide in this study will be kept secure using encrypted and password protected software, and will only be accessible to key authorized research personnel.

Comments from Klodiana Lanaj: (Email to Prof Liu, 30 July 2017)

It's been a while since I ran that study now, but if I remember this correctly, I posted a one-time recruitment survey on Mturk. In the consent form, we made it clear that participants would get paid for that survey, and invited them to participate in a larger study. We explained the entire study to participants (e.g., how many surveys, how many times a day, how much each survey paid, how we'd distribute the surveys etc) and invited those interested to provide an email address where we could send the daily links (that's the only identifying information we collected from them). Not sure if this opposed MTurk policies at the time – their email address could be created just for our study. For those who had indicated that they wanted to participate in the ESM study, we then emailed them the survey links with unique codes for each day as well as an MTurk hit link, which we posted just before we sent the emails out. We specified that this HIT was by invitation only in its description and that all others would be rejected. Amazon did not have an issue with this at the time. Participants had to paste the code provided to them at the end of each survey in that HIT and that's how we ensured they got paid for each of the daily surveys. So I posted 21 HITS for the whole study (1 for the recruitment/trait survey, 10 am, and 10 pm surveys) – this took time to set up and manage, but it worked out well. The data quality was pretty good.

I think I ran the study in 2013-2014, so I'm not sure if Mturk rules have changed since then. I have not done an Mturk ESM study since then.

Topic-specific References

Communication: Experience sampling method applications to communication research questions
([link](#))

APPENDIX 1: Sample questions

Appendix: Experience-Sampling Form

Date:_____Time Beeped:_____am/pm Time Filled Out__am/pm

As you were beeped...

What were you thinking about?_____

Where were you?_____

What was the MAIN thing you were doing?_____

What other things were you doing?_____

WHY were you doing this particular activity?

(☐) I had to (☐) I wanted to do it (☐) I had nothing else to do

	Not at all	Some what	Quite	Very
How well were you concentrating?	0	1 2 3	4 5 6	7 8 9
Was it hard to concentrate?	0	1 2 3	4 5 6	7 8 9
How self-conscious were you?	0	1 2 3	4 5 6	7 8 9
Did you feel good about yourself?	0	1 2 3	4 5 6	7 8 9
Were you in control of the situation?	0	1 2 3	4 5 6	7 8 9
Were you living up to your own expectations?	0	1 2 3	4 5 6	7 8 9
Were you living up to expectations of others?	0	1 2 3	4 5 6	7 8 9

Describe your mood as you were beeped:

	Very	Quite	Some	Neither	Some	Quite	Very	
Alert	0	o	.	—	.	o	0	Drowsy
Happy	0	o	.	—	.	o	0	Sad
Irritable	0	o	.	—	.	o	0	Cheerful
Strong	0	o	.	—	.	o	0	Weak
Active	0	o	.	—	.	o	0	Passive
Lonely	0	o	.	—	.	o	0	Sociable
Ashamed	0	o	.	—	.	o	0	Proud
Involved	0	o	.	—	.	o	0	Detached
Excited	0	o	.	—	.	o	0	Bored
Closed	0	o	.	—	.	o	0	Open
Clear	0	o	.	—	.	o	0	Confused

(continued)

(continued)

Tense	0	o	.	—	.	o	0	Relaxed
Competitive	0	o	.	—	.	o	0	Cooperative

Did you feel any physical discomfort as you were beeped:

Overall pain or discomfort	none			slight				bothersome		severe
	0	1	2	3	4	5	6	7	8	9

Please
specify: _____

Who were you with?

<input type="checkbox"/> Alone	<input type="checkbox"/> Friend(s)	How many?
<input type="checkbox"/> Mother		
<input type="checkbox"/> Father	Female <input type="checkbox"/>	Male <input type="checkbox"/>
<input type="checkbox"/> Sister(s) or brother(s)	<input type="checkbox"/> Strangers	
	<input type="checkbox"/> Other _____	

Indicate how you felt about your activity:

	low								high	
Challenges of the activity	0	1	2	3	4	5	6	7	8	9
Your skills in the activity	0	1	2	3	4	5	6	7	8	9
	not at								very	
	all								much	
Was this activity important to you?	0	1	2	3	4	5	6	7	8	9
Was this activity important to others?	0	1	2	3	4	6	6	7	8	9
Were you succeeding at what you were doing?	0	1	2	3	4	5	6	7	8	9
Do you wish you had been doing something else?	0	1	2	3	4	5	6	7	8	9
Were you satisfied with how you were doing?	0	1	2	3	4	5	6	7	8	9
How important was this activity in relation to your overall goals	0	1	2	3	4	5	6	7	8	9
<i>If you had a choice...</i>										
Who would you be with?	_____									
What would you be doing?	_____									

Since you were last beeped has anything happened or have you done anything which could have affected the way you feel?

Nasty cracks, comments, etc. *****

APPENDIX: Sample project outline

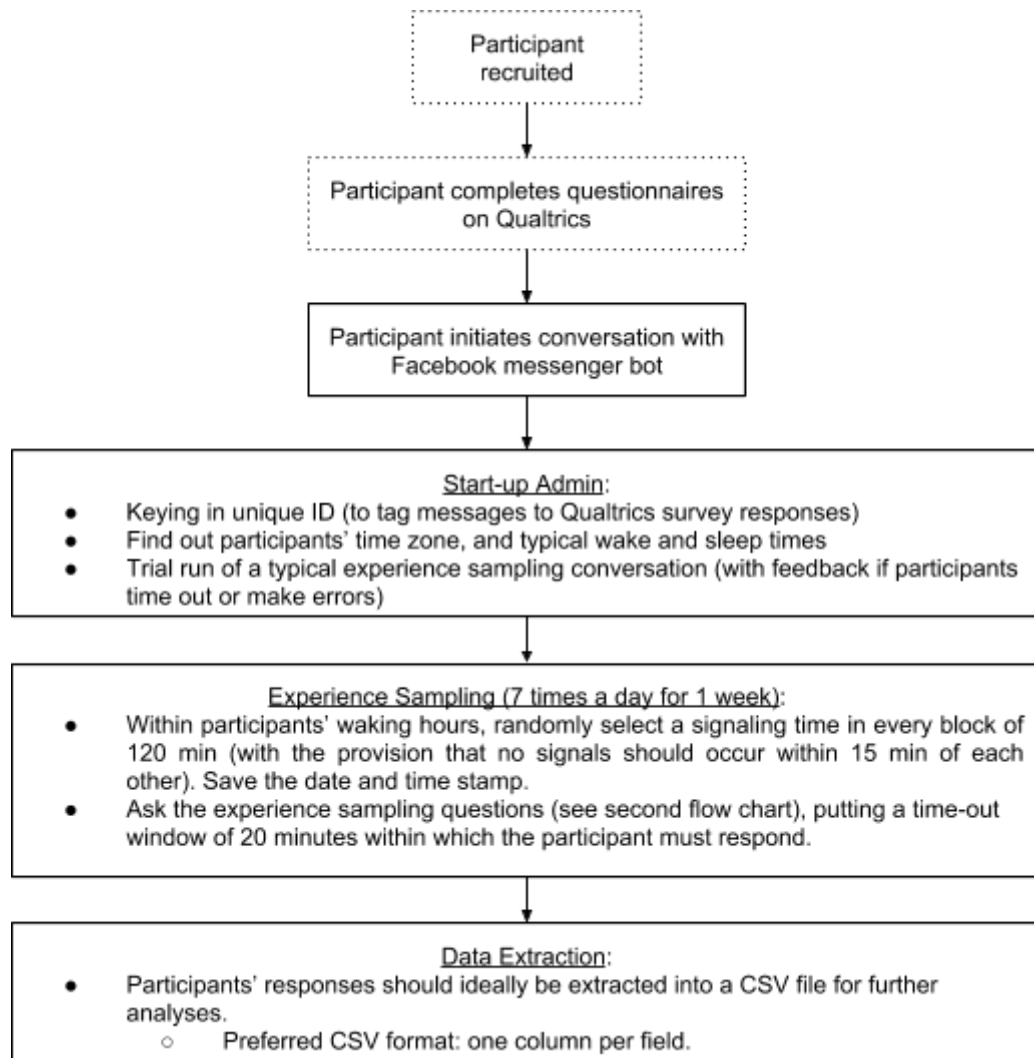
PROJECT BRIEF

PHUBBING: AN EXPERIENCE SAMPLING STUDY

IRB: A-15-170, Trial registration: TBA
Research assistant(s): Han

Experience sampling platform: Facebook Messenger Bot

Overview of participant procedures



Flowchart of questions each time participants are contacted:

