Documentation of the SIV Survey

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1 About the SIV Survey

This document describes a small-scale experience-sampling survey conducted on a Swedish population sample in the spring of 2016. The survey is named SIV, which is an acronym for *The Study of Individual Well-Being*.[1] The survey was designed by Martin Berlin and Filip Fors (Department of Sociology, Umeå University), and implemented together with Göran Landgren (Department of Informatics, Umeå University), who programmed the survey and set up the recruitment web site. The data is used in the paper by Berlin and Fors (2017), and the current document is a complement to the description of the survey and the data made in that paper.

The SIV survey is a mobile-phone based implementation of the Experience Sampling Method (Larson and Csikszentmihalyi, 1983; henceforth ESM). Unlike typical ESM studies, we were only concerned with the inter-relationship between different subjective well-being (SWB) variables. Hence, we did not include any contextual questions, e.g. about the respondents' activities, location and company. The survey was designed so as to measure individual well-being 1) momentarily; 2) repeatedly; 3) at random times; and 4), over a reasonably long time horizon. The main goal of the data collection was to investigate the association between life satisfaction and affective well-being, but the data can also be used to answer other questions.

In addition to the ESM part, which lasted three weeks distributed across a seven-week period, participants also filled in a short questionnaire when signing up for the survey, and another one at the end of the ESM part. A timeline of the survey is shown in Figure 1.

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[1] The Swedish name is *Studien om individuellt välbefinnande.* The survey was approved by the Swedish Ethical Review Board (The Stockholm Regional Board, case no. 2015/1752-31/5).
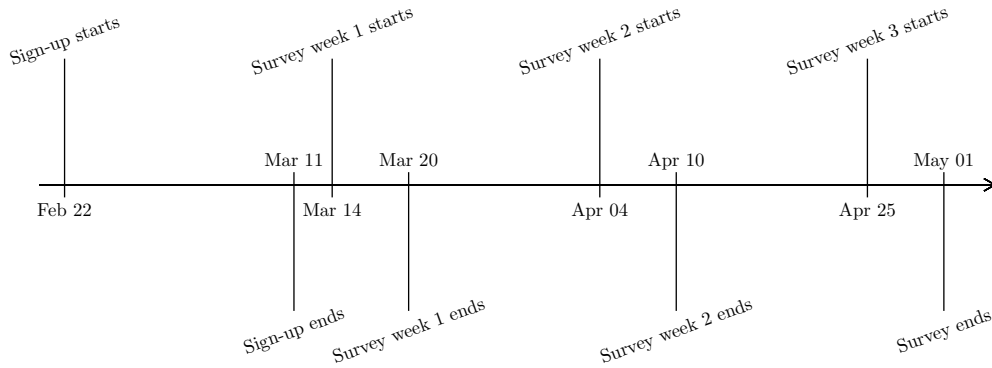
Figure 1: Timeline of the SIV survey

2 Sample

2.1 Sampling and recruitment procedure

The sample is a simple random sample of the population of Swedes aged 18–50 (i.e. persons registered as residents in Sweden). Participation required a smartphone—i.e. a phone with mobile internet connection and a web brower. According to official statistics by Statistics Sweden, smartphone usage drops quite sharply after around 50 years of age, and hence we did not include persons older than 50 years in our sample. The study was in Swedish. Hence, persons who did not speak Swedish were also de-facto excluded. The sample was obtained from the official government register of the Swedish population.[2]

Participants were contacted by means of a recruitment letter sent to the residential address. The letter explained the purpose and the structure of the survey, and pointed to the study's website where participants could register and read more. In order to register at the website, participants needed to provide their mobile phone number and confirm participation by clicking a link sent via SMS (thus also confirming that they had a smartphone). Participants also needed to enter a unique personal code enclosed in the letter, and fill in a short questionnaire with questions about demographic variables and life satisfaction (described in more detail below). The recruitment letter (for a fictitious person) and screenshots from the website (both in Swedish) are shown in Appendix A and Appendix B, respectively.

We aimed for a sample size of at least 200 persons. Due to budget limitations and

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[2]The name of the register (in Swedish) is Statens personadressregister (SPAR).

uncertainty about what participation rate could be expected for this type of study, we sent out invitation letters sequentially, delivered 10–21 days prior to the start of the ESM part. We sent three batches of letters to 1,000 persons each: the first arrived on February 22, the second on March 1 and the third on March 3. The gross sample thus included 3,000 persons. A total of 263 persons signed up for the study. Out of these, 263 persons participated, in the minimum sense of answering at least one ESM-query. In Berlin and Fors (2017), participation is instead defined as having answered a minimum of two queries spread across two (out of three) different survey weeks. There were 252 participants according to this latter criteria, which implies a net participation rate of 8.4 %.[3] The descriptive statistics presented below refer to this sample.

In the interest of future studies, we wanted to investigate the effect on participation of sending a reminder letter. We did so by means of a split-ballot experiment in which the respondents in half of the first batch, who had not already signed up or had their original letters returned due to incorrect address (456 persons), were sent a reminder letter delivered two weeks after the original letter, on March 7 (one week prior to the start of the ESM part). The reminder letter was effective: 66 persons from the reminder group signed up, compared to 33 in the control group.

All participants who answered at least one query in the ESM part (i.e. the former of the two participation criteria above), were rewarded with two cinema tickets, sent by mail to the same address as the recruitment letter.

2.2 Sample composition

Descriptive statistics for the participating sample ($n = 252$), based on the sign-up questionnaire, are shown in the left column of Table 1. The right column shows corresponding statistics for the target population in the right column (from official statistics). We do not have comparable statistics for employment, which in our case refers to "main activity", during the past seven days. The share of married or cohabiting is not directly comparable either, since official statistics of cohabitation are based on registered residential address, and is thus likely to be an underestimate.

The sample is quite heterogenous, with respect to these variables. Around two thirds are employed, and the remaining third are either studying, unemployed or on parental leave. The age distribution of the sample matches that of the target population almost perfectly, but women are heavily overrepresented.

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[3]The net participation rate is 8.5 % when excluding from the denominator 40 persons whose recruitment letters were returned because of incorrect address.

Table 1: Descriptive statistics

	Sample	Population
Female	0.64	0.49
Married/cohabiting	0.68	0.58
Children in household	0.51	0.63
Age 18–26	0.27	0.27
Age 27–35	0.26	0.27
Age 36–44	0.29	0.27
Age 45–50	0.18	0.19
Employed	0.68	
Student	0.17	
Parental leave	0.05	
Unemployed/sick/other	0.09	
Android*	0.39	
iPhone*	0.61	

Based on a participating sample of 252 individuals.
* Based on a subset of 233 respondents answering the end questionnaire. Populations statistics are from Statistics Sweden.

3 Survey Design

3.1 Method for data collection

The ESM-part of the study is, essentially, a web survey with a smartphone adapted interface, which is accessed from a web link (URL) sent via an SMS notification. After clicking the link, the web survey would open in the default web browser on the respondent's phone. Thereafter the respondent would choose an alternative for one or more self-rating questions. The web survey was designed to be platform independent, i.e. it worked on different kinds of smartphones and web browsers. In order to, as far as possible, capture well-being "here and now", each query could be answered no later than an hour after the SMS notification is sent.

Technically, we used a pre-programmed schedule (described below) for all queries. Whenever it is time to send a query, our server makes a call to the Application Programming Interface (API) of a third-party service for sending SMS:es. The URL included in each SMS is unique, to ensure that we can link responses with respondents. All survey responses were saved in a database on a secure server.

3.2 Survey structure

There were three active ESM-weeks, distributed evenly across a seven-week period that started on Monday, March 20 and ended on Sunday, May 1 (see Figure 1). The three active survey weeks, corresponding to the first, fourth and seventh week of this period, are henceforth referred to as survey weeks 1, 2 and 3. Our motivation for spreading out the survey weeks is to get a more representative picture of individual well-being. The schedule of queries was randomized at the individual-level, according to the following structure. For each survey week, three active survey days were sampled (uniformly, without replacement). Within each survey day, three queries were sent: one during the morning (9 am – 1 pm), one during the afternoon (1 pm – 5 pm) and one during the evening (5 pm – 9 pm). The exact timing of the queries was randomized within respective time interval. Hence, each individual received 27 queries in total. Respondents were informed about the survey structure, but not about their specific schedules. Hence, they could not know in advance exactly when they would receive the queries.

The queries were simple. Each query included a question about current affective well-being, and the typical query included this question only. A screenshot of the survey interface, as seen on a phone screen, is shown in Appendix C. Besides affect, other questions were added randomly to some of the queries, again with randomization at the individual level but according to a common structure, so that all respondents received the same set of questions each survey week (and hence over the course of the whole survey period). Once each day, a question of day satisfaction was included. Once each week, a single-item life satisfaction question was included, and also a set of five specific affect questions (included block-wise, in randomized order). Each respondent thus received a total of 54 questions, or two questions per query, on average. The order of the questions was randomized within each query. The questions are described further in the next subsection.

All participants were also required to fill in a questionnaire when signing up for the study, up to three weeks before the start of the ESM part. This could be done either from a desktop computer or from a mobile device. The sign-up questionnaire included five socioeconomic questions and the Satisfaction With Life Scale (Diener et al., 1985; henceforth SWLS).

Finally, there was a short questionnaire that was sent out right after the conclusion of ESM part on the evening of May 1. This questionnaire was sent out via SMS and answered on the phone, like the ESM-questions, but it could be answered also during the next day. This questionnaire also included the SWLS scale, followed by four survey

evaluation questions.

It should be noted that the SWB measures in the ESM-part were measured in a "controlled" way, i.e. on random occasions. This was not the case for SWLS in the sign-up and end questionnaires. It cannot be ruled out, e.g., that respondents were in a better (or worse) mood when signing up for the survey, which in principle may have affected their answers.

3.3 Questions and measures

The main measure of affective well-being, included in each of the 27 queries, is based on the question "How do you feel right now?". The answers were elicited on a bipolar numeric response scale ranging from 0 to 10, with the endpoints labelled with a set of negative and positive adjectives: "extremely sad, displeased, depressed" and "extremely glad, pleased, happy", respectively. These adjectives are taken from the Swedish Core Affect Scale (Västfjäll et al., 2002), and are meant to capture valence, i.e. the good/bad dimension of the experience (rather than the degree of arousal, see Russell, 1980).

A measure of day satisfaction (henceforth DS) was included once each day (not necessarily in the evening), based on the question "All things considered, how satisfied are you with this day so far?". The response scale ranged from 0 to 10, with endpoints labelled "extremely dissatisfied" and "extremely satisfied".

The block of specific affect questions, included once every survey week, includes the following five emotions: happiness, sadness, stress, tiredness and pain. The questions were phrased "How happy do you feel right now?", and similarly for the other emotions. The response scale for these questions was unipolar, ranging from 0 to 6, and with endpoints labelled e.g. "I don't feel happy at all" and "I feel extremely happy".

The single-item life satisfaction measure (henceforth SILS), included once every survey week, is based on the question "All things considered, how satisfied are you with your life as a whole nowadays?", with a response scale ranging from 0 to 10, and with endpoints labelled "extremely dissatisfied" and "extremely satisfied". The Swedish formulation of this question was adopted from the European Social Survey.

The SWLS scale, included in the sign-up and end questionnaires, includes five questions that are all answered on a scale from 0 to 6, with endpoints labelled "completely disagree" and "completely agree". The SWLS questions are "In most ways my life is close to my ideal", "The conditions of my life are excellent", "I am satisfied with my life", "So far I have gotten the important things I want in life" and "If I could live my life over, I would change almost nothing". Henceforth, we refer to the mean across these

five items as SWLS.[4]

The complete questionnaire (in Swedish) can be found in a separate document on Martin Berlin's website.[5]

4 Descriptive statistics

4.1 Response behaviour and survey evaluation

A total of 6804 ESM-queries (252 respondents times 27 queries) were sent to the participating sample, of which 5378 were answered. The overall response rate was thus 79 %, or 21 answers per respondent, on average. The response rate was stable over the survey period: 79 % during the first week, 80 % during the second, and 78 % during the third. The response rate across days of the week, shown shown in the top row of Table 2, was also fairly stable, but with somewhat fewer responses during weekends.

Table 2: Well-being across weekdays

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Response rate	0.81	0.80	0.80	0.81	0.81	0.75	0.76
Mean affect	6.33	6.17	6.39	6.53	6.90	6.84	6.66
Number of obs.	822	817	728	786	776	737	712
Mean DS	6.35	6.43	6.56	6.60	6.84	6.93	6.85
Number of obs.	269	263	245	259	265	249	233
Mean SILS	6.94	6.74	6.66	6.56	6.91	7.07	7.03
Number of obs.	93	99	85	88	88	84	62

Number of individuals = 252.

The distribution of responded queries per individual is shown in the left panel of Figure 2. 98 % of respondents answered ten or more questions and 70 % at least twenty.

Questions could be answered in up to one hour. The right panel of Figure 2 shows the distribution of response times, in seconds. Responses were generally provided very quickly—the mean and median response times were 633 and 170 seconds, respectively, and three-quarters of all responses were provided within 15 minutes. Hence, we are confident in interpreting our affect measures as genuinely capturing well-being "here and now".

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[4]The internal consistency of the SWLS scale in our sample, as measured by Cronbach's alpha, is equal to 0.86 (sign-up) and 0.88.
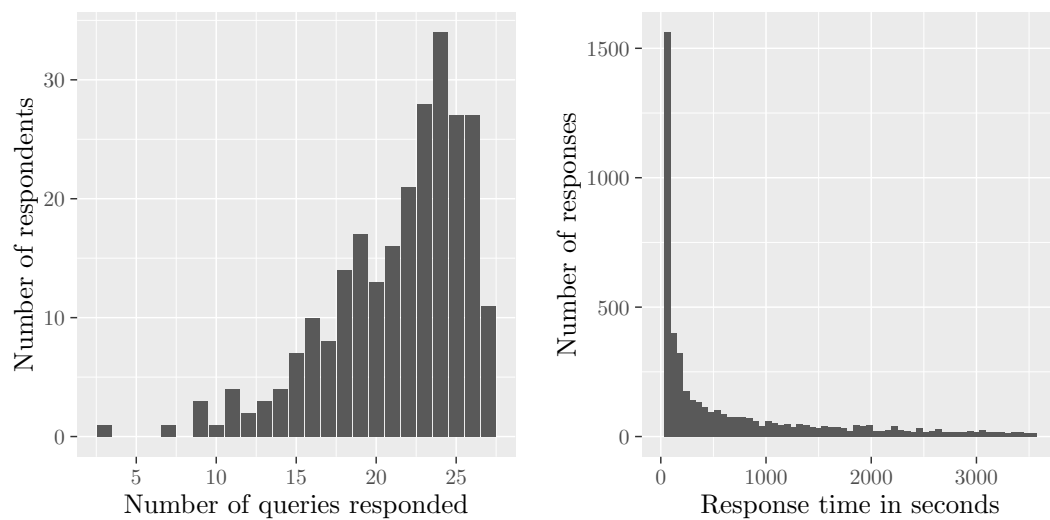
[5] http://www.su.se/english/profiles/mabe7257.

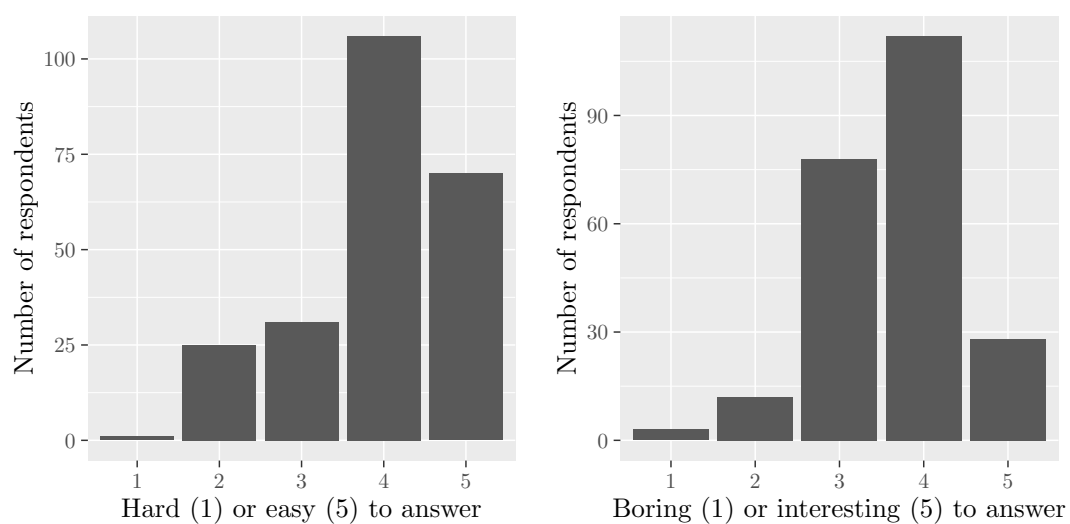Figure 2: Distribution of response rates and response times

Figure 3: Survey evaluation

The high response rate indicates that the survey was not seen as too intrusive or difficult to answer—a general concern for ESM-studies. We also have direct information about this issue, since the respondents were asked to evaluate their survey experience in the end questionnaire (in which 233 responded). They were asked the questions "Do you think it was easy or hard to respond the questions in the survey?" and "Do you think it was interesting/fun or boring/annoying to respond to the questions in the survey?", with five alternatives ranging from "Very hard" to "Very easy", and "Very boring/annoying" to "Very interesting/fun", respectively. The distribution of answers are shown in Figure 3, with answers coded from 1 (negative) to 5 (positive). 76 % of the respondents stated that the survey was fairly or very easy to answer, and 60 % that it was fairly or very fun/interesting. Rather few respondents were explicitly negative: 11 % stated that it was fairly or very hard to answer, and 6 % that is was fairly or very boring/annoying.

4.2   Well-being variables

The mean and standard deviation of affect, across all responses, are 6.5 and 1.9, respectively, and its distribution is shown in the left panel of Figure 4. The mean of DS is 6.6 and the standard deviation is 1.9. The distribution of DS is shown in the right panel of Figure 4. The distributions of the specific affect variables, along with means and standard deviations, are shown in Table 3.

The mean of SILS, based on all pooled weekly observations, is 6.8, and the standard deviation is 1.9. For comparison, mean SILS among Swedes aged 18–50 in the European Social Survey from 2014, is 7.7, which is substantially higher.

The distribution of SILS scores is shown in the left panel of Figure 5. The mean of SWLS from sign-up is 4.0, and the standard deviation is 1.1. In the end questionnaire, the mean is 4.1 and the standard deviation is 1.1. The distribution of SWLS from the sign-up is shown in the right panel of Figure 5.

Table 2 shows variation in affect, DS and SILS across days of the week. Affect peaks on Fridays and Saturdays, which is consistent with higher DS on these days. SILS is also somewhat higher during the weekend, although the peak extends to Monday in this case. This is suggestive of a current-mood bias in life satisfaction judgments, discussed further in Berlin and Fors (2017).
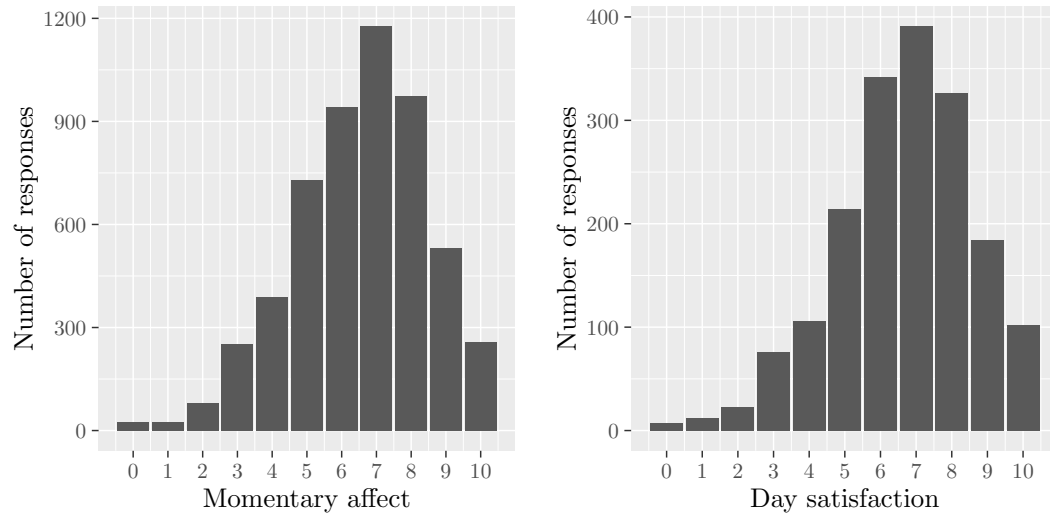
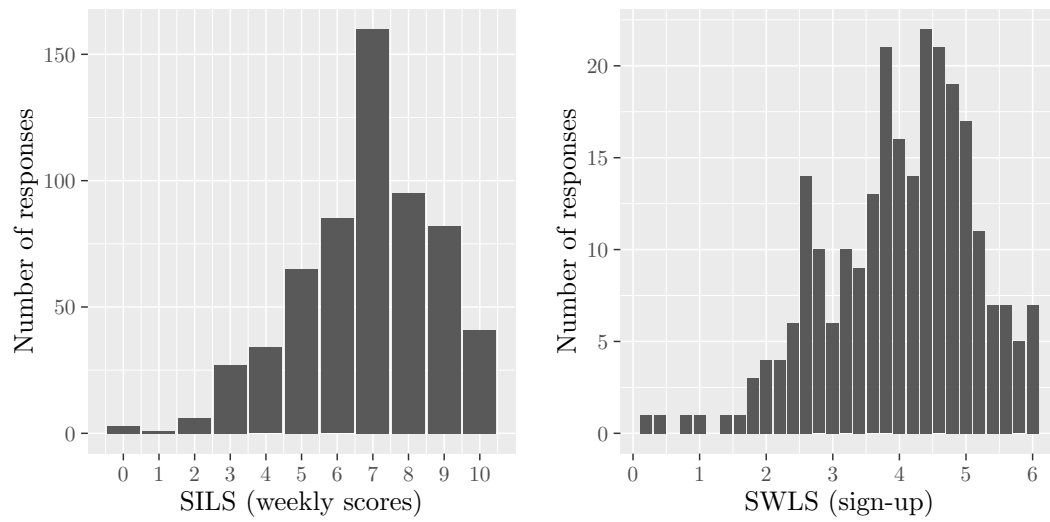9

Figure 4: Distribution of affect and day satisfaction

Figure 5: Distribution of life satisfaction

Table 3: Distributions of specific affect scores

	Intensity (% of responses)								
	0	1	2	3	4	5	6	Mean	Std dev
Happiness	1.5	3.4	12.6	26.1	33.0	18.1	5.4	3.6	1.2
Sadness	29.4	20.4	20.1	16.0	10.1	3.9	0.2	1.7	1.5
Stress	19.9	15.8	19.4	18.1	15.7	7.8	3.3	2.3	1.7
Tiredness	6.7	12.7	14.8	22.0	24.5	14.5	4.7	3.1	1.6
Pain	45.8	19.2	13.5	9.0	8.2	3.1	1.1	1.3	1.5

Number of individuals = 246, number of observations = 613. An intensity of 0 means that the feeling was not experienced at all and 6 means that the feeling was very strong.

References

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A   Recruitment Letter

Martin Berlin
Institutet för social forskning
Stockholms universitet

29 februari 2016

ANDERS ANDERSSON
ANDERSVÄGEN 10 A
123 45 ANDERSLÖV

Inbjudan att delta i forskningsstudie om välbefinnande

Välkommen att delta i Studien om individuellt välbefinnande (SIV) – en veten-skaplig undersökning som genomförs av Stockholms universitet och Umeå uni-versitet. Syftet med SIV är att öka kunskapen om människors vardagliga känslor av välbefinnande och livstillfredsställelse.

Din medverkan är värdefull

Ditt namn och din adress har valts slumpmässigt från Statens personadressreg-ister, och din medverkan är viktig för att studiens resultat ska bli tillförlitliga. *Som tack, till dig som deltar, skickar vi dig två biocheckar med posten.*

En mobiltelefonbaserad undersökning

SIV är helt mobilbaserad. Du deltar genom att svara på korta frågeutskick om hur du mår för stunden. Utskicken görs via SMS på slumpmässiga tider under undersökningsperioden. Det är enkelt att delta, och det enda du behöver är en mobiltelefon med internetuppkoppling.

Undersökningen pågår i nio dagar, fördelade under vecka 11 (14 – 20 mars), vecka 14 (4 – 10 april), och vecka 17 (25 april – 1 maj). Varje undersökningsdag får du tre frågeutskick per dag (morgon, eftermiddag och kväll), totalt 27 stycken utskick. Att svara på ett frågeutskick tar högst en minut.

Anmäl dig och läs mer på www.sivmobil.se

Du anmäler dig till studien på **www.sivmobil.se**, antingen från en dator eller din telefon. Vid anmälan behöver du ange koden abc123. På hemsidan kan du läsa mer om studiens upplägg.

Deltagande i SIV är frivilligt och anonymt (se bifogad information angående behandling av personuppgifter m.m.). Om du inte vill delta behöver du inte göra något särskilt för att tacka nej.

Stort tack för din medverkan!

Martin Berlin
Ansvarig forskare och kontaktperson för SIV

B Study Website

STUDIEN OM INDIVIDUELLT VÄLBEFINNANDE

Välkommen att delta i Studien om individuellt välbefinnande (SIV) – en vetenskaplig undersökning som genomförs av Stockholms universitet och Umeå universitet. Syftet med SIV är att öka kunskapen om människors vardagliga känslor av välbefinnande och livstillfredsställelse.

SIV är en mobilbaserad undersökning där du svarar på korta frågeutskick om hur du mår för stunden. Det är enkelt att delta, och det enda du behöver är en mobiltelefon med webbläsare och internetuppkoppling (smartphone). Undersökningen pågår i nio dagar fördelade på tre veckor under våren 2016.

Läs mer om undersökningens upplägg här och anmäl dig här! *Din medverkan är viktig! Som tack, till dig som deltar, skickar vi dig två biocheckar med posten (efter att undersökningen påbörjats).*

Studien genomförs av:

Start

Undersökningens upplägg

Information till deltagare

Anmäl dig här!

(c) 2016

C Smartphone Survey, Screenshot

Hur känner du dig *just nu*?

- ○ **0 = Extremt Ledsen / Nedslagen / Missnöjd**
- ○ **1**
- ○ **2**
- ○ **3**
- ○ **4**
- ○ **5**
- ○ **6**
- ○ **7**
- ○ **8**
- ○ **9**
- ○ **10 = Extremt Glad / Munter / Belåten**

⊛ **Sänd**