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Pre-entry questionnaire and paper diary

A copy of the diary page, and the instructions provided to participants are shown below.

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DIARY CARD INSTRUCTIONS

Days of the week:

You are being asked to complete this diary on three separate days. Pages are labelled at the top with the day of the week, and colour coded to help you distinguish them. We define the day as starting **when you wake up in the morning**, and finishing **when you go to sleep**.

Locations:

Each time you change your location on a given day **to a place where other people are present** we would like you to start a new diary page, recording the time of arrival and a description of that location at the top eg **home, train, lift, office, tea room, supermarket, movie theatre** etc. If you don't have enough room on one page to record all your contacts, continue on to the next page. You can indicate that the location hasn't changed by ticking the box.

Number of People:

Every time you change location, we'd like you to make a rough estimate of the number of people sharing that space with you. This number might range from 0 during a solo car trip to 100 or more in a crowded movie theatre. **We would also like you to indicate the approximate number of people who came within arms' length at this location. For example, at the movies, this might refer to the people sitting in the seats immediately in front of and behind you, and those on either side.**

Description of Contacts:

Within each new location, we'd like you to identify the people you:

- Talk to (T) – in a two-way **or small group** exchange involving at least three words
- Contact (C) – any form of skin-to-skin contact, like a handshake or hug

We're asking you to provide us with some minimum information about these people, mainly to be able to identify repeated contacts. Where known, it would be helpful if you could include a first name and initial, occupation and suburb of residence. Regardless of whether you know the person's name, please fill in their gender and approximate age (or estimated range) and the length of time you spent with them. **While some people may spend only a few minutes with you, others might occupy the same space for hours, and chat from time to time – in this case, just enter them in the diary once and indicate how long in total you spent together.**

Please Note:

Contacts made exclusively by telephone or mobile phone should NOT be recorded.

Thank you once again for taking the time to participate in this study.
If you have any further questions, please contact:

[Research Assistant Name] on [Mobile number]

OR

Dr Jodie McVernon on [Mobile number]

Electronic diary (PDA)

The electronic diary tool used in this study was designed using the VisualCE environment for Windows CE 6 devices. All participants were supplied with a HP iPAQ 112 touch screen device, controlled using the supplied stylus and provided with extensive one-on-one training in how to use the device.

Three screens ('Location', 'Contacts' and 'Names') were used for data entry. For each screen, the user was instructed to complete details from 'top-to-bottom'. Colour coding was used to guide the user: green for areas for text or data entry, grey for clickable buttons, and red for key information for the user to ensure was correct before entering any information.

The instructions distributed to participants are shown on the next four pages.

The non-linear design of the software minimised the amount of repetition in entering required information. Demographic information for any individual contact was only entered once for the whole three day study period. In fact, upon initiation our research assistant worked with the participant to pre-fill the 'Names' database with as many likely contacts for the participant as possible, thereby minimising participants use of the 'Names' screen to only those situations in which the contact was unknown or unexpected. Note that in all analyses, only names that were recorded in the 'Contacts' database were used.

Participants could enter missed locations (and contacts therein) or missed contacts in an already recorded location by selecting entries from the appropriate table (on the 'Locations' or 'Contact' screen) and entering/updating fields. For each entry in the database, we recorded time-of-creation and time-of-last-modification. Comparison with user specified time-stamps allowed for analysis of time-delays to entry and the frequency of retrospective entry.

General instructions for using the PDA

1. To turn on the PDA, use the power button on the top right side of the unit.
2. Charge your PDA every night using the supplied power cord, even on days when you are not using it.
3. Never remove the battery – all information on the PDA will be lost instantly.
4. Only use the provided stylus to tap the screen.
5. Keep the PDA in its protective case when you are not using it for entering information.
6. Be patient when tapping buttons – if the screen doesn't change immediately give it a few seconds before tapping again.
7. Use the keyboard button in the bottom right corner of the screen to pull up the keyboard. If you can't read part of the screen, try hiding the keyboard and opening it again.
8. If none of the diary screens are displayed, tap the coloured "Windows logo" in the top left corner of the screen and select "LocationsV2" to start it again.
9. Call [Research Assistant Name] if you have any problems [Mobile number] during business hours.

Locations screen

Work from top to bottom.

Red boxes provide important status information.

Green boxes are for entering information.

The screenshot shows the 'Visual CE - LocationsV2.vce' application window. It features a menu bar (File, Edit, Form, Control, Help) and a toolbar with icons for file operations and editing. The main interface is divided into several sections:

- Location Entry Section:** A green box labeled 'Location' contains the text 'Sleep'. To its right is an 'Enter' button. An arrow points to this green box with the text: "Type your location name here and tap 'Enter'. The drop down box lets you use a previously stored name again."
- Table Section:** Below the entry section is a table with two columns: 'Start time' and 'Location name'. The first row contains the values '6/08/1612 5:46:11 A' and 'AAA AAAA'. An arrow points to the table with the text: "The table allows you to update details from a previous location. Tap once on the relevant entry to update details."
- Status Section:** A red box labeled 'Location' is positioned above the input fields. An arrow points to this red box with the text: "The red box tells you what location you are updating – always check it before entering information in the green boxes below."
- Input Fields Section:** Below the red box are three green input fields: 'Date, time' (containing '17/03/2008 12:21:00 PM'), '# in location', and '# arms length'. An arrow points to the 'Date, time' field with the text: "Tap on the 'Date, time' green box if you need to change the time for this location."
- Buttons Section:** Below the input fields are two buttons: 'Update' and 'Add contacts to location'. An arrow points to the 'Update' button with the text: "Enter the number of people and the number of people within arms length."

At the bottom of the window, a status bar displays 'LocationsV2 (sorted on LocationID) 2,48 230x79'.

Tap "Update" to see your changes in the table above.

Tap "Add contacts to location" to change to the Contacts screen.

Contacts screen

Work from top to bottom.

Red boxes provide important status information.

Green boxes are for entering information.

Name	Hrs	Mins	T
AAA AAAA AA AAAAA	0	0	X

The red box reminds you of your current location.

The green drop down box allows you to select a person to enter as a contact. Select their name and the tap “Enter”. If the person is not in the list, tap the “Need a new name?” button to jump to the Names screen.

The table allows you to update details for another contact in this location. Tap once on the relevant entry to update details.

The red box tells you which contact you are updating – always check it before entering information in the green boxes below.

Enter the total time you have spent with this person in this location.

Select the “Touch” box if you made physical contact with the person.

Tap “Update” to see your changes in the table above.

Tap “Change location” to go back to the Locations screen.

Names screen

Work from top to bottom.

Red boxes provide important status information.

Green boxes are for entering information.

The screenshot shows the 'Visual CE - NamesV2.vce' application. It features a menu bar (File, Edit, Form, Control, Help) and a toolbar with icons for file operations. The main interface is divided into several sections:

- Name Entry:** A green box for entering a new name, followed by an 'Enter' button.
- Table:** A table with columns 'Name', 'Occupation', 'Sex', and 'Age'. The first row contains placeholder text 'AAA AAAA A AAA AAAA A AAA'. A red box highlights the first row, indicating the person being updated.
- Form Fields:** Below the table, there are green boxes for 'Occupation' (set to 'Unknown'), 'Home suburb' (set to 'Unknown'), 'Age range' (a dropdown menu), and 'Sex' (radio buttons for 'Male' and 'Female').
- Buttons:** 'Update' and 'Back to contacts' buttons are located at the bottom of the form.
- Status Bar:** At the very bottom, it displays 'NamesV2 (sorted on NameID) 2,48 230x69'.

Annotations with arrows point to specific elements:

- An arrow points to the green box for entering a new name, with the text: "Enter the name of the new person in the green box and tap 'Enter'".
- An arrow points to the table, with the text: "The table allows you to update details for a previously entered person. Tap once on the relevant entry to update details."
- An arrow points to the red box highlighting the first row of the table, with the text: "The red box tells you which person you are updating – always check it before entering information in the green boxes below."
- An arrow points to the 'Occupation' and 'Home suburb' dropdowns, with the text: "Enter the person's occupation and home suburb if known. Otherwise leave it as 'Unknown'. Previously stored entries are available by using the drop down box."
- An arrow points to the 'Age range' and 'Sex' fields, with the text: "Select an age range and gender for the person."

Tap "Update" to see your changes in the table above. If you wish to add another person, return to the top of this screen and enter a new name and tap "Enter".

Tap "Back to contacts" to go back to the Contacts screen where any newly entered people will now be available.

Statistical analyses

Results from a univariate analysis on all recorded encounters are shown in the table below. We apply a negative binomial model, with over-dispersion (α) a function of the mean number ($\exp(x_j\beta)$) of contacts for the j^{th} observation:

$Contacts_j \sim \text{NegBin}(\exp(x_j\beta), \alpha)$, with covariate x_j and parameter β .

We clustered by participant as each individual provided data for 9 days (3 pre-entry questionnaire days, 3 paper diary days and 3 PDA diary days).

Univariate analysis	Variable (x_j)	Coefficient (β)	Standard Error (robust)	P value
Source	PDA (ref paper)	-0.11	0.054	0.036
	Pre-entry questionnaire (ref paper)	-0.57	0.063	0.000
Weekday	Friday (ref Wed)	0.01	0.058	0.883
	Sunday (ref Wed)	-0.18	0.082	0.029
Surveyday	Survey day 2 (ref survey day 1)	-0.04	0.057	0.475
	Survey day 3 (ref survey day 1)	-0.24	0.073	0.001
Household size (trend)		0.22	0.040	0.000
Presence of child		0.57	0.099	0.000
Age (trend)		-0.01	0.005	0.174
Age (categorised as in main text, Figure 2)		-0.06	0.054	0.252
Sex		0.03	0.126	0.806
First method		-0.03	0.119	0.786

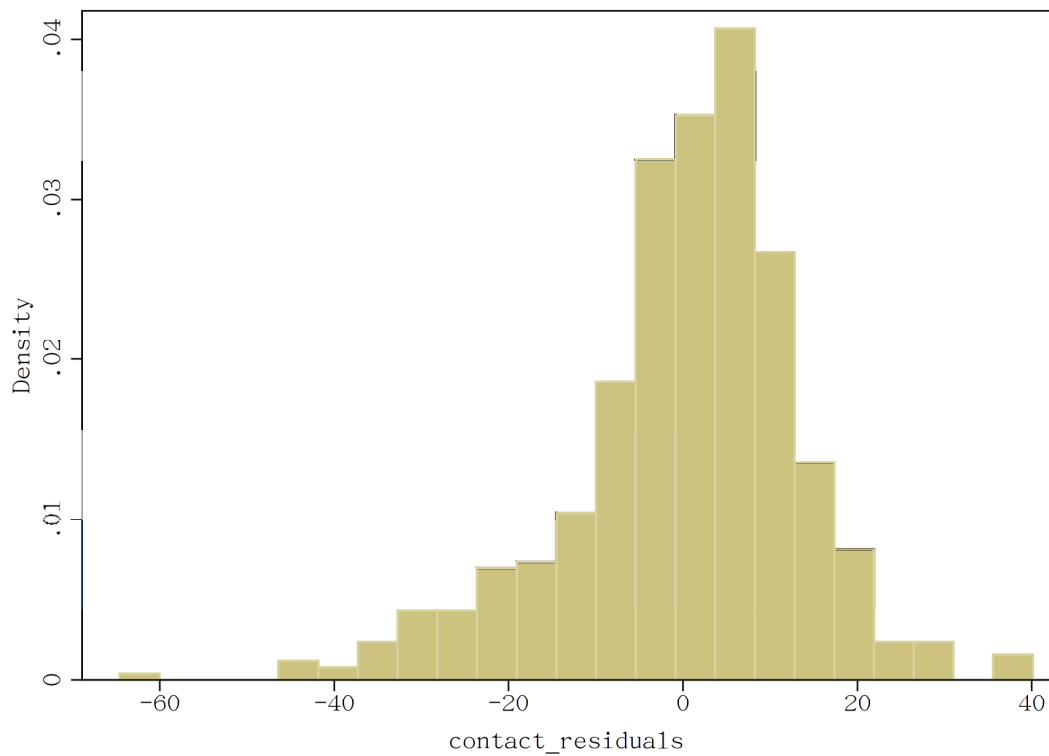
The multivariate negative binomial model presented in the main text Table 2 included terms found to be significant in the univariate analysis. The model specification, for participant j , again with over-dispersion (α) a function of the expected mean, was:

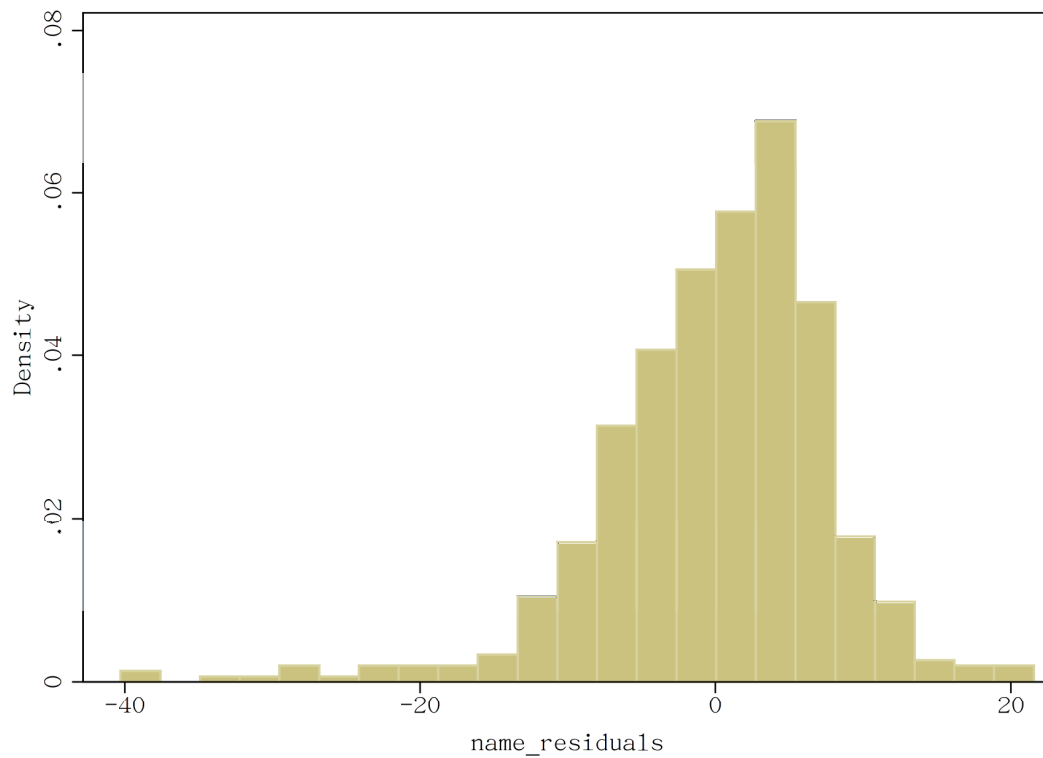
$Contacts_j \sim \text{NegBin}(\exp(x_j\beta), \alpha)$, with covariates x_j and parameters β :

- $PDA_j = 1$ if method was PDA, 0 otherwise.
- $Pre\text{-}entry_j = 1$ if method was pre-entry questionnaire, 0 otherwise.
- $Friday_j = 1$ if study day was Friday, 0 otherwise.
- $Sunday_j = 1$ if study day was Sunday, 0 otherwise.
- $Survey\ day\ 2_j = 1$ if survey day was 2, 0 otherwise.
- $Survey\ day\ 3_j = 1$ if survey day was 3, 0 otherwise.
- $Householdsize_j$, continuous trend, domain [1 – 6].
- $Child_j = 1$ if participant's household contained a child, 0 otherwise.

Again, we clustered by participant.

The figures below show the residuals from our model of all nominated individuals and individually named contacts.





Presence of child is associated with increased household size (mean with a child = 4.09, mean without a child = 2.27, Wilcoxon rank-sum test for difference $P = 0.000$). We therefore ran a multivariate model including the interaction between household size and presence of child. Coefficients and standard errors are essentially unchanged, the interaction term non-significant ($P = 0.379$).

Summary of contact data by survey day

The multivariate model in the main text shows a significant effect of survey day on the number of recorded encounters. The table below tabulates the raw data by survey day and method.

	All encounters			Nominated individuals		
	Paper	PDA	Pre-Paper	Paper	PDA	Pre-Paper
Survey day 1	28.8	22.9	15.0	17.0	13.9	9.5
	27 (18,37)	22 (11,33)	14 (7,21)	15 (11,22)	12 (7,19)	9 (5,13)
	(1-77)	(0-72)	(1-53)	(1-63)	(0-53)	(1-36)
Survey day 2	26.0	23.4	14.6	15.6	13.9	8.3
	21 (13,32)	18 (9,34)	12 (7,20)	14 (7,19)	12 (6,19)	8 (4,11)
	(5-78)	(0-93)	(0-53)	(3-62)	(0-56)	(0-21)
Survey day 3	19.7	20.2	12.5	10.8	11.0	7.1
	16 (9,29)	17 (7,29)	12 (5,17)	9 (5,15)	10 (4,17)	6 (3,11)
	(1-69)	(0-61)	(0-50)	(1-31)	(0-32)	(0-19)

Figure: Number of encounters/nominated individuals for each participant by recording source and survey day (mean; median and interquartile range; range).

Non-saturation of contacts over recording days

Figure 4 in the main text shows that the majority of participants continued to record new uniquely named contacts on day 3. Using the median across all study participants, here we show how the number of new uniquely named contacts recorded on a given week day (Wednesday, Friday or Sunday) varied by if that day was study day 1, 2 or 3. The result demonstrates that new contacts are still being made on study day 3 whether that day be Wednesday, Friday or Sunday.

