





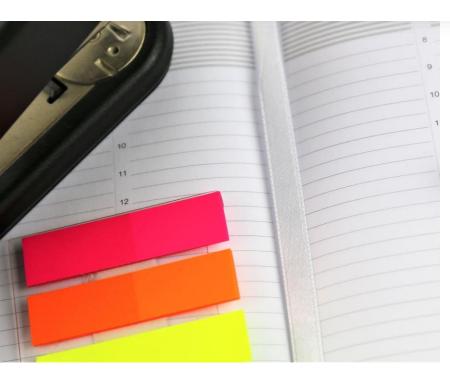
Time use diary design for our times - an overview, presenting a digital diary instrument

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CENTRE FOF TIME USE RESEARC

Introduction



- We present an online diary instrument that retains the visual simplicity of the 'light diary' design, but uses online functionality to offer expanded lists of activities and multiple fields via drop-down menus and pop-up boxes
- Making use of this technology, we are able to adapt the light diary visual design to collect the same information as the HETUS diary, the most advanced pen and paper diary design.

HETUS: The 'gold standard' time-use pen and paper diary

ime: 7an Aorning	n – 10am			Day 1 Time: 7am – 10am	Were	-	Mark al	l relevan	mebod it boxes	 know?	
Time: 7am-10am Morning (am)	What were you doing? Please write down one main activity.	If you did something else at the same time, what else did you do?	Did you use a smartphone tablet, or computer?	Where were you? Location, or mode of transport	Alone	Spouse / Ju	Mother Mother	Father Father	Child aged 0-7	Others you know	How much did you enjo this time? 1 =not at all 7 =very muc
7am-7.10	Woke up the children			At home							5
7.10-7.20	Had breakfast	checked emails									6
7.20-7.30	27 27	Talked with my famíly									5
7.30-7.40	Cleared the table	Listened to the radio									4
7.40-7.50	*	*									
7.50-8am	Helped the children dressing	Talked with my children									
8am-8.10	27 27			•							V
8.10-8.20	Went to the day care centre	•		on foot							1

Use an arrow or quote marks to record that an activity lasted longer than 10 minutes.

- Notice the visual simplicity and ease of completion characteristic of the HETUS design, based on decades of pen and paper diary design development
- As a 'diary' should, it resembles a day's activities......

Principles of the 'light' diary: a brief history

Following design work in the 1990s the UK Office of National Statistics pioneered the 'light' diary design with the time use diaries attached to their 'omnibus' surveys of 2001 and 2005. The fundamental principles were:

- Pre-coded reduced list of activities (for speed of collection)
- Visual attractiveness and intuitive simplicity of design
- Independence of diary fields

Office of National Statistics Omnibus Survey 2001 (pen and paper)

Activity		Activity codes and descriptions							Early	mor	ning								М	orni	ing					
groups		(Also see notes on right hand page)		4am			5ar	m		6am		7an	n		8am	1		9am			10am		11am		12pm	
					I	30			30		30			30			30		30			30		30		30
Personal	1	Sleeping		хх	x	хх	хx	хх																		
care	2	Resting (doing nothing, 'time out')	2																							
	3	Washing, dressing/undressing, etc	3						x x x																	
	4	Eating or drinking/ having a meal (at home)	4							хх																
Eating, drinking																					XXX				X X	
	5	Preparing food and drinks, cooking, washing up	5																							
Housework	6	Cleaning, tidying house	6																							
and other	7	Washing, ironing or mending clothes etc	7																							
household tasks	8 9	Maintenance of house, DIY, gardening Other household tasks	8 9																							
10515	J		5																							
	10	Travelling	10								(X X	x														
Travel	10a		10a								ит т	т														
								: :								:			·	: :						
Work for paid job	11	Work for job (include paid and unpaid overtime and work brought home)	11							 		~	vv	v v .		v v	ххх	v v	~ ~	~ ~		v v v		xxx		xxx
				:	:	: :		: :			::	^ :				^ ; ^				: ^ : ^	: :				: :	
Education	12	Formal education	12																							
and courses	13	Recreational courses and study	13																							
Voluntary work	14	Voluntary work for or on behalf of an organisation, charity or sports club	14																							

Full list of activities

Activity		Activity codes and descriptions					Early	mornii	าต		
groups		(Also see notes on right hand page)		4am		5am		6am	-9	7am	
3,0493		(-1011	30	Jani	30	vann	30	, ann	30
Personal	1	Sleeping, resting	1	ххх	XXX	ххх					
care	2	Washing, dressing/undressing, etc	2				XXX			1.1	
Eating,	0		0		. : :		. : :	v v	:::		
drinking	3	Eating or drinking/ having a meal (at home or away from home)	3					хх			
uniking											
	4	Preparing food and drinks; cooking; washing up	4								
Housework	5	Cleaning, tidying house	5								
and other	6	Washing, ironing or mending clothes etc	6								
household	7 8	Maintenance of house, DIY, gardening Pet care	7								
tasks	8	Pet care	8		1 : :		1 : :	: :	:::	:::	1 : :
				1							
	9	Travelling	9					х	ххх		
Travel	9a	How you travelled (enter letter - see right page)	9a					W	ТТТ		
	9b	Purpose of journey (enter letter - see right page)	9b					0	0 0 0		
	10	Work for job outside home (ordinary working arrangements)	10							ххх	ххх
Paid work	11	Work for job outside nome (ordinary working arrangements)	11								
	12	Additional work for job (overtime, work brought home etc.)	12								
-											
Education	13	Formal education	13								
and courses	14	Recreational courses and study	14								
Voluntary work	15	Voluntary work for or on behalf of an organisation or charity	15								
		, nem er er er benan of an organisation of onding									
				I		I					
	16	Caring for/ looking after and playing with own children	16								
Caring for	17		17								
children and adults	18 19	Helping or caring for adults who live with you Helping or caring for other adults who don't live with you (not as	18 19								
und addits	10	voluntary or paid work)	10				1 1 1				
				I							
Shopping and	20	Shopping, banking, post-office	20								
appointments	21	Appointments with the doctor, dentist, hairdresser, DSS	21								
		plumber, etc			1 : :						
	22	Watching TV and videos/DVDs, listening to radio or music	22	1							
		, j									
	23	Reading	23								
Laioura	24	Playing sports, exercising	24								
Leisure	25 26	Visiting/going out with friends, family, neighbours Spending time with friends, family, neighbours at your home	25 26								
		Contact with friends and family by telephone, email, or letter	20								
	28	Visits to cinema, theatre, concerts, sporting events,	28								
		museums, galleries, historical monuments, library etc.									
	29		29								
		religious meetings, praying alone, attending political or other meetings									
	30	Hobbies and other leisure activities	30								
	50										
	31	Accessing the internet/emailing (see note below 32)	31								
Computer	32	Using a computer (not internet)	32								
and internet use		31 & 32: Internet and computer use to be coded as secondary activity only.									
430		Code what they were using computer for as main activity (see									
		right hand page).									
Other	33	Other activities not listed (please write in below)	33								

Office of National Statistics Omnibus Survey 2005

Note:

- Introduction of continuous line
- Possibility of independent secondary activities (indicated by a • rather than a x)

groups	(Also see notes on right hand page)							E	R		y	m	0	r n	in	g				ſ
	(viso see notes on hynematic page)		1	6an		80		7 a		30			8	am :	30		9	am	30	
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Personal care	1 Sleeping		1^					^												
Personal care	2 Resting (doing nothing, 'time out')	2																	L.	
Fating	3 Washing, dressing/undressing, etc	3					-	Ľ	Т	*				+	11				L	
Eating, drinking	4 Eating or drinking/ having a meal (at home or away from home)	4										x	х							
	5 Preparing food and drinks, cooking, washing up	5									х									
Housework	6 Cleaning, tidying house	6																		
and other household	7 Washing, ironing or mending clothes etc.	7																	L	
tasks	8 Maintenance of house, DIY, gardening	8																		
	9 Pet care (including walking the dog)	9							L										L	
	10 Travelling	10											2	×		x			Г	
	10a How you travelled (enter letter - see right page)	10a											1	N	/ т-	т				
Travel	10b Type of trip (enter letter - see right page)	10ь												E P	+++	Р				
Work for paid job	11 Work for job (include paid and unpaid overtime and work brought home. Exclude lunch and other breaks)	11														×				
Education and courses	12 Formal education	12																		
	13 Recreational courses and study	13																		
Voluntary work	14 Voluntary work for or on behalf of an organisation, charity or sports club	14																		
	15 Caring for/looking after and playing with own children	15						•	╋	\vdash	┝┤	+	╉	•						
Caring for children and	16 Caring for/looking after other children	16														Y				
adults	17 Helping or caring for adults who live with you	17																		
	18 Helping or caring for other adults who don't live with you (not as voluntary or paid work)	18											1	j)						
Shopping and appointments	19 Shopping (ind. internet shopping), banking (ind internet banking), post-office, appointments with the doctor, dentist, hairdresser, plumber etc.	19												Ŷ						
	20 Watching TV and videos/DVDs, listening to radio or music	20																		
	21 Reading	21							0	1				•						
	22 Playing sports, exercising	22						H												
	23 Spending time with friends, family, neighbours at home or at their homes	23			<	2														
Leisure	24 Going out with friends, family, neighbours (e.g. to the pub, restaurant etc.)	24																		
	25 Contact with friends and family by telephone, text, e-mail, instant message or letter	25																		
	26 Visits to cinema, theatre, concerts, sporting events, museums, galleries, historical monuments, library etc.	26																		
	27 Attending church, temple, mosque, synagogue, or other religious meetings, praying alone, attending political or other meetings	27																		
	28 Hobbies and other leisure activities	28																		
Computer and internet use	29 Using a computer or accessing the internet - Record what the computer is being used for above e.g. internet shopping or banking code 19, playing games code 28. e-mailing friends code	29																		

v morning

Activity codes and descriptions

Activity

Understanding Society Wave 7 (2014)

Activity groups		Activity codes and descriptions (Also see notes on right hand page)					Early n	nornin	9		
				4am		5am		6am		7am	
					30		30	3	0		30
	1	Sleeping	1	x—		x					
Personal care	2	Resting (doing nothing, 'time out')	2	^		^					
	3	Washing, dressing/undressing, etc	3			X	×				
Eating, drinking	4	Eating or drinking/ having a meal (at home)	4				X	х			
	5	Preparing food and drinks, cooking, washing up	5				Х				
Housework	6	Cleaning, tidying house	6								
and other household	7	Washing, ironing or mending clothes etc	7								
tasks	8	Maintenance of house, DIY, gardening, pet care	8								
	9	Other household tasks	9								
Travel	10	Travelling	10					X	X		
Travel	10a	How you travelled (enter letter - see right page)	10a					PP	ТТ		
Work for paid job	11	Work for job (include paid and unpaid overtime and work brought home)	11						×		×

Extending the light diary online

• First example the Millenium Cohort Study, Wave 6 (age 14)

Collected 3 modes: paper, 'web-based' and app versions

Millenium Cohort Study (MSC) Light diary Wave 6 (age 14): Paper version

WHAT WE	RE YOU DOING?	1000	30.3	0.65	50	5am	6am	30 40 56	7am	8am	9am 30.2030-4050	10am	ttam.	30 45 55	WHAT WERE YOU DOING?	
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ersonel care	Perional care lincluding taking a shower/bath, prioriting, setting dreased etc.)		_	_	-				_						Personal care likeliading taking a thowardhath, graoning, gatting dressed etc.)	personal car
	History	44	-		-										Phitterwork	and the second
chool,	fri clana	44	-	-	-										br (Sana	School.
omework, nd educetion	Schaol breaks				++										Schuld bracks	homework, and education
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	Detertion														Detention .	-
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urk.	Unpold wink for fursity or other conclusionfuld members long, help in Sensity business).					이 가 잘 못 할 수									Uppend work for lamity or other non-buildehold members (e.g. hergein Gemily Insteamed	work
hores.	Cooking, charring, and shopping for the household		1.1												Cooking, cleaning, and shopping for the flousehold	Chores.
DUSEWORK,	Comp (tangs around the bound, fixing take, gardening														Faring theraps account that foreign, living takes, gambering	housework
mé looking	Lanking after brothers, siglers, other shidren in the household														Looking after brothers, sisters, other children is the towarhold	and looking
ther people or	Esolvery after parent or other adult in the household (medical or personal care)														Looking after parent or other adult in the household (medical or personal care)	after people
and the second s	Looking after animals														Looking after animale	animals /
REALERSON	Cableg or driving in a restaurant occulti-														Ealing or drividing to a multisurate or calif	0780-008135
ating and rinking	Esting a mart														Estina a meal	Eating and
rinking	Calong a smack or having a drink.														Kalleng a snack or hering a drink	drinking
	Cycling		-		-	_									Cycling	-
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mining on the local division																Provide Law
trysical exercise nd sports		1.1												111	Angpeng, running, walking, haking	Physical ex and sports
and apprend	Team hall garrees and training last Austitual, Rectiny)														Dean ball games and training is g. hotball. Acciegh	down sports
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lociuding walking	Trainif by car, weri declusting whiches mered by Triends and Tamity)														Praverily cor, even linchuding setticles awared by trienats and family?	(Including w
a school)	Travel by physically active means (acilis, take atc.)														Travel by physically active means soals, blue etc.3	to school)
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locial time and amily time	Shepping Orichalong window shepping, hanging out at shepping central	11													Shopping Orchabing window shopping, hanging wat at shopping centrell	Social time family time
and a second	Speaking on the phose terchating Skype, when calld														Speaking on the phone (including Skape, video calls)	
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internet, TV.	Browsing and updating social networking sites (e.g. Twitter: Facebook, BIIM, Snapcharl)	-		_											Browsing and updating social networking sites (e.g. Twitter, Facebook, 88M, Snopchat)	Internet, T
and digital	Centeral Infernet tenesting, programming that time on social heteorieing stati			1100											Ceneral Warned Snaeshs, programming that time on social networking shep	and digital
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	Playing electronic games and Apps														Playing electronic games and Apps	a street of
	Watch TV, DVDs. downloaded videos					10 C									Walsh TV, DVDs, -Investoated videos	1
bos prinestrule	Volunteening														Weinbering	Volumbeering
elipious activities	Daliginus activities decluding geing to places of worship, proying etc.)														Religious activities (incluting gains to places of workto, proving etc.)	religious act
toboirs and	the suffers, part relating borned, walting	T									Colorador a colorador do				End outband, post relating, house, watering	Hobbies and
other free time	Holdans, arts and crafts, musical activities, writing storws, poetry etc.														Hobbies, arts and crofts, musical activities, writing stores, postry etc.	other free t
activities.	Reading (net for school)					ch the second second					and the second se				Reading that for school	activities
any other artikity	Other activities not failed	+++	-	-										_	Other achieves and taken	Any other ac
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	At home	4		111				101010							At home	
	Sidoors, Sul will at home														Indoors, but not at home	
	Outdoors .	111													Outdoors	
		14	im			5am	6am		7am	8am	9am	10am	Ham			
WHO WER	E YOU WITH?	1.1.1.1			a larre		and the second s		the second of the second second second	The state of the second s	And the second s	and the second se	and the second sec		WHO WERE YOU WITH?	
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	Mother														Mother	
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	Other adults									and the second second					Other adults	
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		t														

MSC Wave 6: Online version

		Early r				
Activities	4am	5am	6am	7am	8am	9am
What were you doing?	10 20 30 40 50	10 20 30 40 50	10 20 30 40 50	10 20 30 40 50	10 20 30 40 50	10 20 3
			·			
 Sleep and personal care 						
Sleeping and resting (including sick in bed)						
Personal care (including taking a shower/bath, grooming, getting dressed etc.)						
 School, homework, and education 						
Homework						
In class						
School breaks						
School clubs						

inteering and rengious activities																								
	4ar	n			5ar	n			6ar	n			7	am				8a	m				93	
es and other free time activities	10	20 3	0 40	50	10	20 3	80 40	50	10	20	30 4	0 50	1	0 20	30	40	50	10	20	30	40	50	1	
ther activity																								
e were you?																								
out not at home																								
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r other young people																								
brother or sister)																								
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much did you like it?																								
ly liked																								
r disliked or liked																								

the app-based diary, in contrast, was constructed in survey-style, with multiple repeated questions asking about the duration of each primary activity through the day, then iterating through the other diary fields for each duration of those primary activities.....

MCS App

••••• EE 🗢 08:39 🖌 🛪 🍋

What were you doing at 4:00am?

Please select one option only

Sleeping and resting (including sick in bed)

Personal care (including taking a shower/bath, grooming, getting dressed etc.)



••••• EE 🗢 08:39 🗗 🖇 💶

What time did you finish sleeping and resting?

07	59	
08	00	
09	01	



●●○○○ EE 🗢 08:39

Where were you while you were sleeping and resting between 4:00am and 08:00?

◀∦∎⊃

Please select one option only

At Home

Indoors, but not at home

Outdoors

Don't want to answer



●●000 EE 훅	08:40	1 ∦ ∎⊃
and restir and 08:00		
Please select	one option only	
1 - Strongly	liked	
2 - Liked		
3 - Neither li	iked nor disliked	
4 - Disliked		
5 - Strongly	disliked	

 \equiv

<

Next activity.....etc. etc.

●●000 EE 🔶 08:39 1 ∦ ∎⊃ What were you doing at 8:00am? Please select one option only School, homework, and education Paid or unpaid work Chores, housework, and looking after people or animals



MCS Instrument comparison

'Using new technologies for time diary data collection: instrument design and data quality findings from a mixed-mode pilot survey', *Social Indicators Research*, 2018, vol. 137, pp. 379-390. Chatzitheochari, S, Fisher, K, Gilbert, E, Calderwood, L, Huskinson, T, Cleary, A and Gershuny, J.

- 3 methods were compared: the pen & paper version; the web-based diary and the app-based diary
- after controlling for observable characteristics associated with diary mode selection and adolescent time-use, the web and app diaries were shown to yield higher quality data than paper diaries.

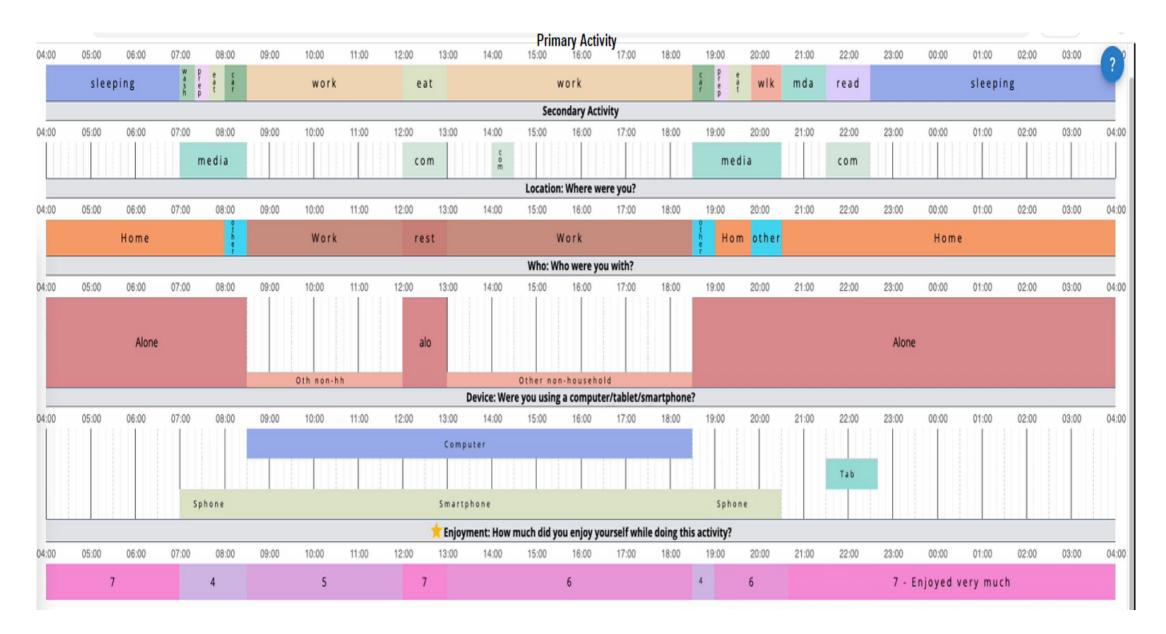
• However, compared to both paper and app diaries, the web-based design yielded a higher average of episode changes per day, and higher numbers of reported activities per day (measures of diary detail and hence quality). The authors conclude:

"our analyses show that app diarists were more likely to use the 'any other activity' code than paper or web diarists. We argue that this is associated with the markedly different diary format of the MCS app instrument, which is more cognitively demanding than the paper and the web instrument, both of which provide a visual representation of the surveyed day and the range of broad time-use domains available to the diarist." (Chatzitheochari et al., 2018)

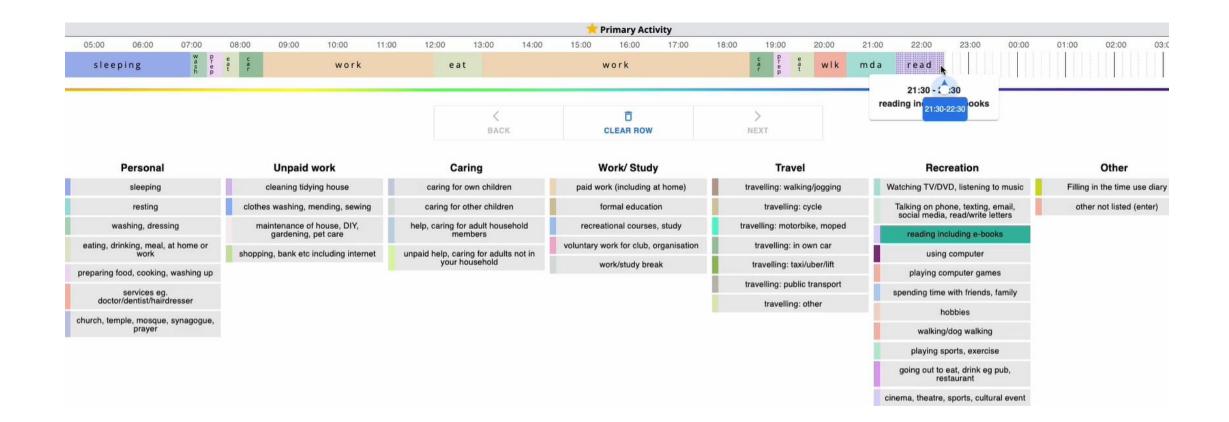
Extended Light Diary Digital Instrument (ELiDDI)

- Digital technology enables simple extension of the light diary format to incorporate many of the features of the full pen and paper diary
 - For example, extended drop-down menus of activities
 - Pop-up supplementary questions

Completed diary day: wide screen



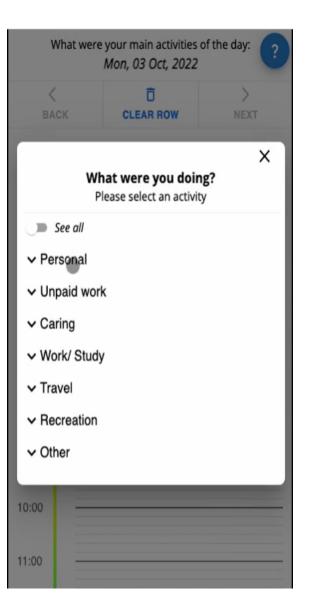
Filling in the primary activity: wide screen



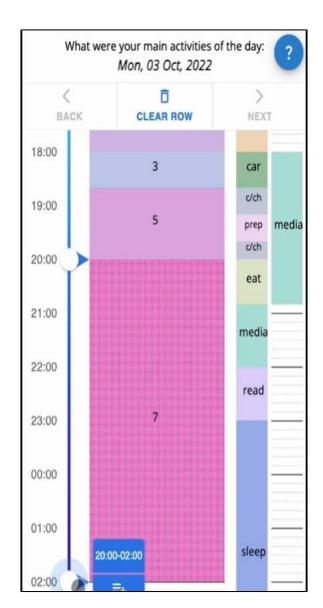
Filling in the primary activity: vertical screen



Dropdown selection



Completed diary: vertical screen



ELiDDI – horizontal and vertical versions

- <u>https://d2n88fe5uqdqty.cloudfront.net/rnd/projects/caddi/2022/assets/Desktop_short_v7_x264.mp4</u>
- <u>https://d2n88fe5uqdqty.cloudfront.net/rnd/projects/caddi/2022/assets/Mobile_cut_v2_x264.mp4</u>

Click and drag: accessibility?

- This technology is not accessible to everyone, and is listed as level AA (webpages should conform) in the latest Web Content Accessibility Guidelines (WCAG), which the UK government is committed to.
- Access can be provided, though, with use of zoom tools for the timeline, and clicking at the start and end of an activity, rather than dragging (ie click-click rather than click and drag)
- In addition, and at least as important, those not able to access the online tool at all need alternative options (e.g. CATI)

HETUS-style survey (for comparison with the UK ONS OTUS) – run in April 2023

- National population-representative sample of individuals
- Individual questionnaire completion + 2 randomly allocated diary days
- Full HETUS activity classification and diary fields
- Phone completion by interviewer offered to 'hard to reach' population
- N= 3874 diary days collected
- Data available from CTUR

Concluding.....

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The ELiDDI design mimics the visual intuitiveness and simplicity of the light diary design.



While the light diary was only able to collect a limited range of activities in order to keep to a single page/booklet, the online functionality of the ELiDDI design enables the expansion via dropdown menus to the full complexity of the HETUS diary, while maintaining the simple and intuitive light diary visuals



This makes it analogous both visually and in terms of functionality to the gold-standard HETUS pen and paper design, and maintains the built-in independence of diary fields.

CONSIDERATIONS FOR ANALYSIS: The independence of diary fields

- Standard techniques of the analysis of longitudinal data (a close analogy to time use diary sequence data) depends on field independence for the definition of episodes
- For example, intervals between births do not coincide with intervals between employment spells
- Neither do periods of co-presence coincide with activities; watching TV could be done in succession alone, with a partner or with a partner and children
- As with any longitudinally organised data, a change in any field should define a change in episode
- Multichannel methods of diary analysis require this flexibility in design



