

Assessing actimeters for inclusion in the Healthy Brain Network: Supplement 1

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Table 1: Schedule of device wear times for the research team.

person	wrist	Monday, 4/3	Tuesday, 4/4	Wednesday, 4/5	Thursday, 4/6	Friday, 4/7	Saturday, 4/8	Sunday, 4/9
Arno	left	[N/A]						
	right	[N/A]		GENEActiv		Embrace		
				E4	Actigraph	E4		
					Wavelet			
Curt	left	GENEActiv		[N/A]				
		E4	Embrace					
	right	Embrace	Actigraph	[N/A]				
	Jon	left	GENEActiv		Actigraph	Embrace	[N/A]	
Wavelet			E4	Wavelet				
right		Actigraph	Wavelet	GENEActive		[N/A]		
				Embrace	E4			

Three researchers wore multiple actimeters concurrently. When actimeter placements were changed, those changes occurred during early afternoons to allow for consistent overnight wear.

Table 2: Reported battery and memory as advertised by the device manufacturers.

device	reported battery life	reported memory		sampling rate (Hz)			source of reported values
		physical	time	min	default	max	
GENEActiv Original	1 month	0.5 Gb	45 days	10	10	100	(Activinsights, 2017)
ActiGraph wGT3X-BT	25 days	4 GB	180 days	30	30	100	(ActiGraph, LLC, 2017)
Wavelet Wristband	5 days	[undisclosed]	[undisclosed]	1	10	30	(Wavelet Health, 2017)
Empatica E4	36 hours	[undisclosed]	60+ hours	1	32	64	(Empatica, 2017b)
Empatica Embrace	27 hours	8 Mb	48 hours	32	32	32	(Empatica, 2017a) (D. Bender, electronic correspondence, August 31, 2017)

Table 3: Tick marks indicate included sensors; empty cells indicate excluded sensors.

	actigraphy		heart rate		EDA	light	temperature
	accelerometer	gyroscope	PPG	ECG			
ActiGraph wGT3X-BT	✓			Polar H7 (via Bluetooth)		✓	
Empatica Embrace	✓	✓			✓		✓
EmpaticaE4	✓		✓		✓		✓
Wavelet Wristband	✓	✓	✓				
GENEActiv Original	✓					✓	✓

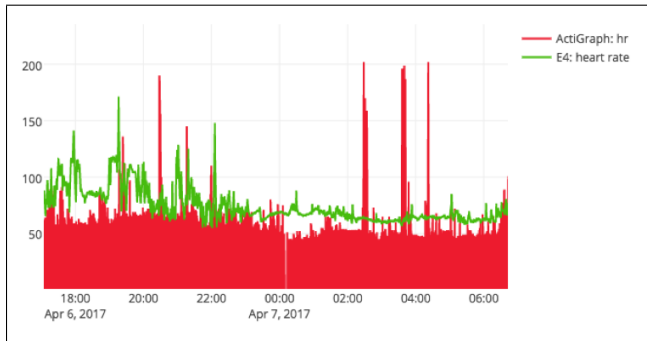


Figure 1: Simultaneous heart rate data from different devices and subjects. The envelopes may be comparable, but the raw data clearly are not.

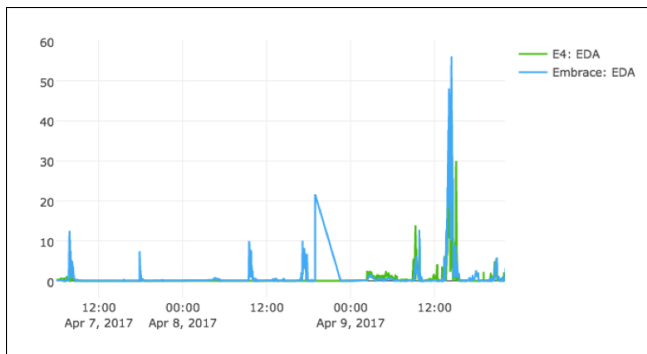


Figure 2: EDA signals from Empatica E4 and Embrace worn concurrently. Although the patterns are not identical, the two Empatica devices appear to be capturing comparable data.

References

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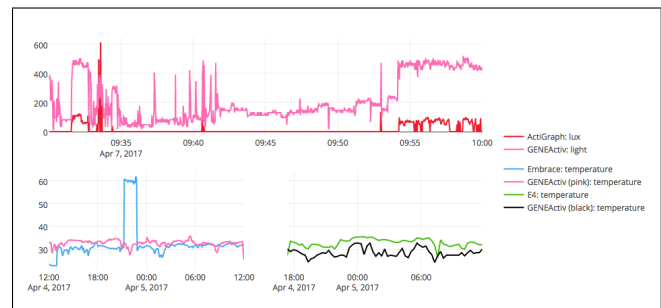


Figure 3: Light readings (top) and temperature readings (bottom). In each example plotted, both devices shown were worn concurrently, side-by-side on the same limb.

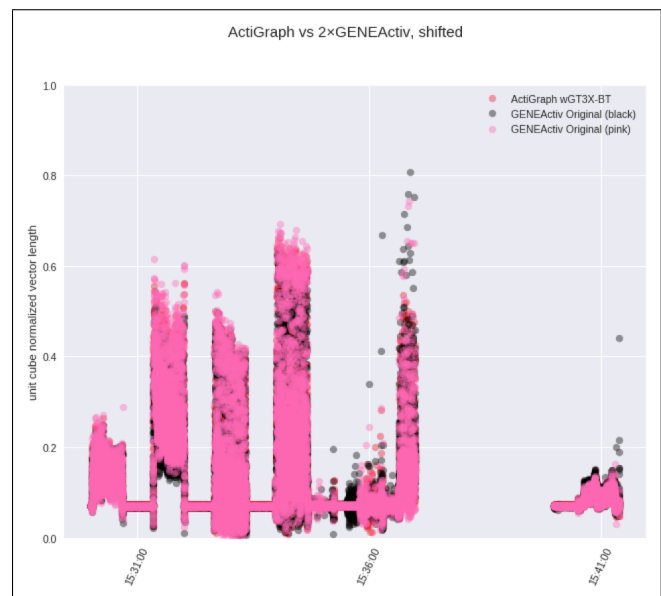


Figure 4: Accelerometry of an Actigraph wGT3X-BT between two GENEActiv Originals. The positive baseline around 0.07 persisted through the GGIR calibration.