

# A square world: Exploring the use of automated wearable cameras to measure screen use in adolescents

Smith C<sup>1</sup>, Galland B<sup>1</sup>, de Bruin W<sup>2</sup>, Taylor R<sup>2</sup>

<sup>1</sup> Department of Women's and Children's Health, <sup>2</sup> Department of Medicine, University of Otago

## Aims

Tablets, computers and mobile phones are an important aspect of modern living, however there is concern that excess recreational use of these devices increases sedentary activity and adversely affects sleep.

The aim of this research was to pilot the use of the Brinno TLC120 automated camera to investigate their potential to measure evening screen use in adolescents.



## Methods

### Sample

- n=15 (4 boys; 9 girls)
- Dunedin, New Zealand teens
- 13 to 17 years
- Recruited via posters, Facebook posts and word of mouth

### Camera

- Automated camera (Brinno TLC120)
- 15 sec interval
- 3 evenings: 5pm to bed
- Actigraph (wGTX-BT)- 7 days and nights

### Coding

- TimeLapse2 open source software
- Type of device e.g. TV, phone
- Activity e.g. gaming, social media
- Environment e.g. living room, bedroom bed

## Camera

- Weighs 101g
- 60x60x35mm
- 112° field of view
- Battery capacity 10 days with a 15sec interval
- Memory card up to 32GB and can take photos in a low light
- Processes images into a timelapse video
- Date and timestamped

## Results

Table 1 Compliance to wearing camera until bedtime

	n	Mean	(95% CI)
<b>Wear time (mins)</b>			
Evening 1	13	296 <sup>a</sup>	(241, 350)
Evening 2	13	288	(234, 342)
Evening 3	11	244 <sup>b</sup>	(188, 299)
<b>Wear time (%)<sup>1</sup></b>			
Evening 1	12	78 <sup>a</sup>	(65, 90)
Evening 2	12	67	(54, 80)
Evening 3	10	51 <sup>b</sup>	(38, 64)

<sup>1</sup> Wear time as a percentage of potential wear time (5pm until bed)  
<sup>a, b</sup> Numbers with differing superscript letters are significantly different (p<0.005)

Figure 3 Device and activity combinations

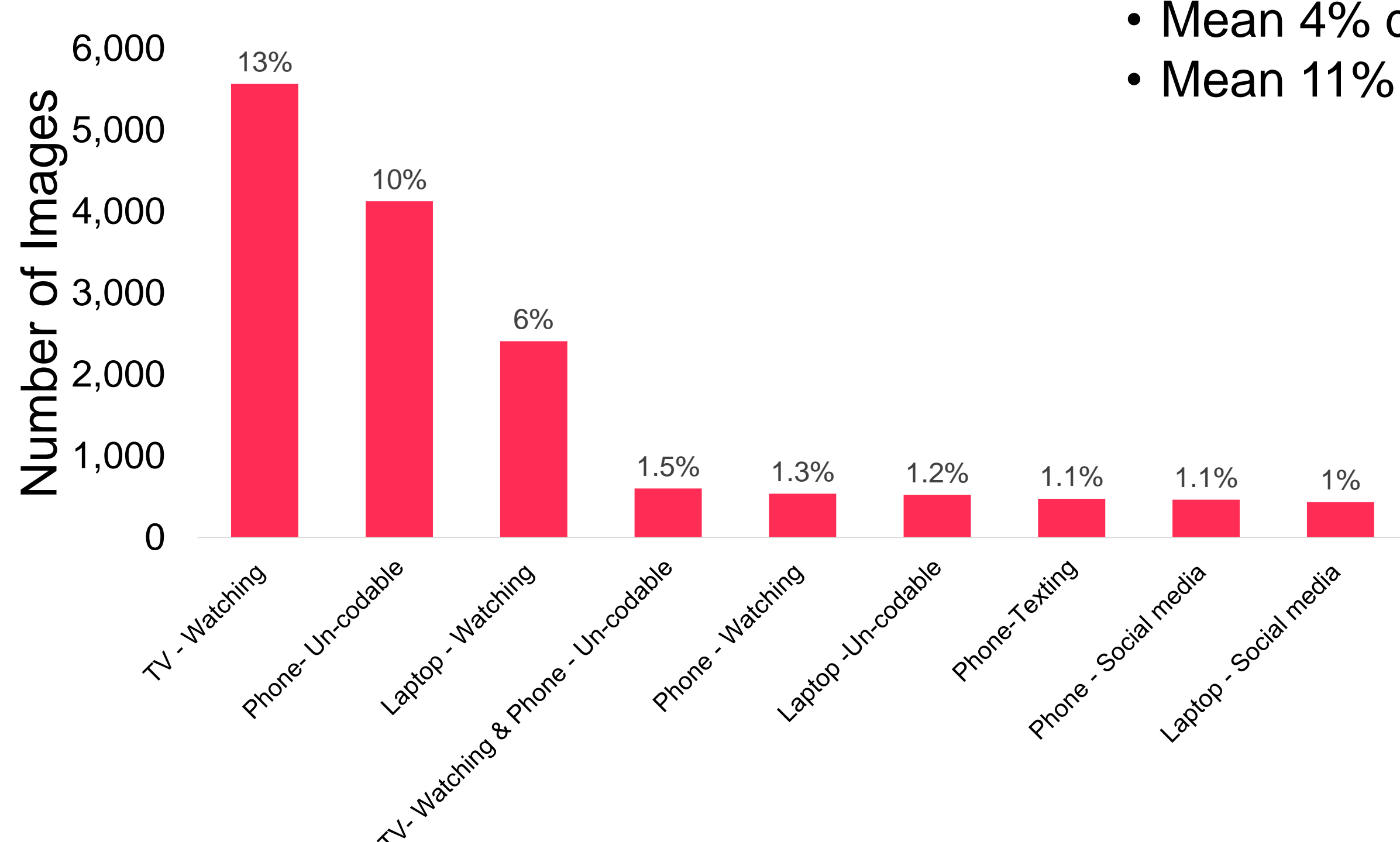
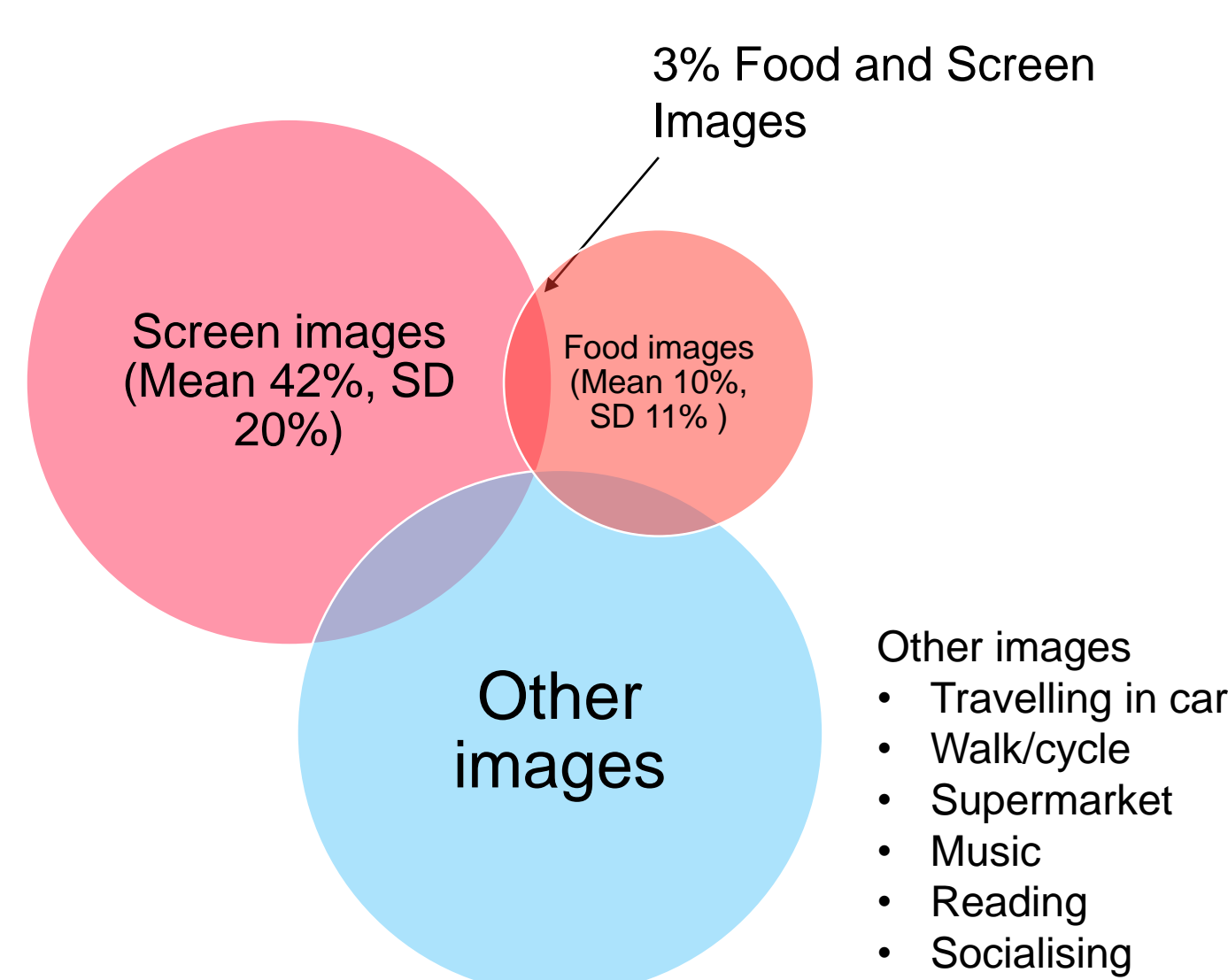


Figure 1 Types of images captured



- 42,312 images were captured
- 19,372 were images  $\geq 1$  screen
- Mean 121 min (SD: 78) of screen time per evening
- Mean 4% dark images
- Mean 11% images were ceilings

Figure 2 Types of screen images captured

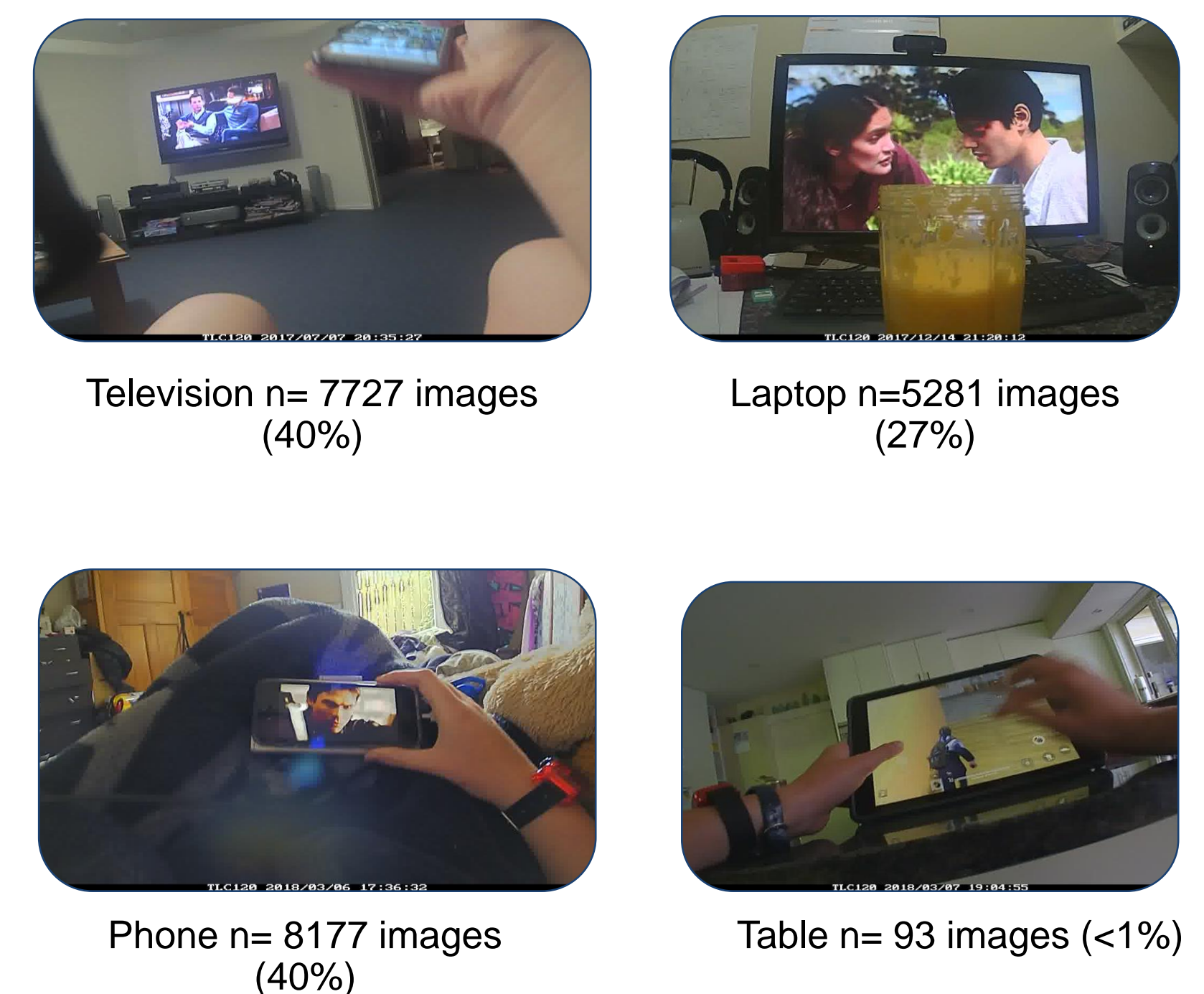


Table 2 Percent of screen images with multiple devices

TV images	+ Phone	18%
	+ Laptop	8%
Laptop images	+ Phone	11%

## Conclusions

Nearly half of evening time was spent using or watching screens. The automated cameras performed well in low light and have the potential to measure multi-tasking and intermittent screen use not easily captured in self-report. Some limitations in respect to measuring types of activities and wear time compliance were evident in this pilot trial.

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