

# Evaluation of Haptic Feedback in Android Widgets

## An explorative user study

Haptics, Tactile and Tangible Interaction

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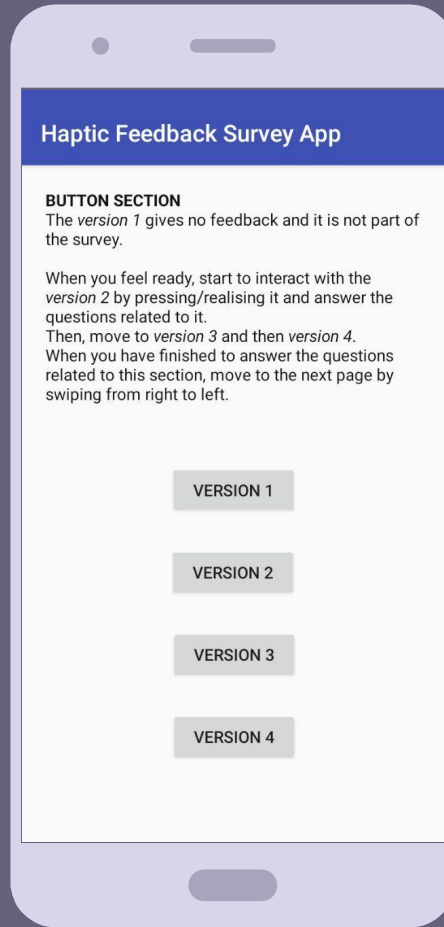
# Motivations & goals

- How do we design haptic feedback for interaction with Android widgets?
- What are the most suitable vibration patterns?
- What are some of the differences between different Android platforms?
- What are some rules of thumb developers should always follow?



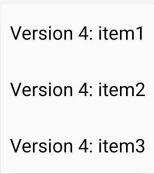



# Mobile app

Developed in Android  
Studio, 8 fragments in total.



# Widgets

	BUTTON	SEEK BAR	CHECKBOX	SWITCH	SPINNER	RATING BAR
Image						
Version 2 (ms)	10 - 0	Progress*1.5	10 - 0	30 - 0	Position*20	Rating*10
Version 3 (ms)	10 - 10	4	30 - 10	10 - 10	50	100
Version 4 (ms)	30 - 10	4 when pressed and released	10 - 30	30 - 10	50,50,50, 50	Rating*40

Version 1 does not have any feedback pattern assigned. Therefore it is omitted from this table.

# Online survey

1. Instructions
2. General questions
3. Widget evaluation

Evaluation of haptic feedback applied to different Android© widgets

\* Required

Widget 1 of 6: Button

For each of the three aspects, please assign a value in a scale from one (1) to five (5) to each of the four different versions, with 1 being the minimum and 5 being the maximum. For validation purposes, a control version with no haptic feedback has been included amongst the ones presented.

6. How "natural" did the vibration feel when interacting with the Button, in a scale from 1 to 5? \*

	1	2	3	4	5	Not applicable
Version 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Version 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Version 3	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Version 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

# Three aspects were considered



1

## Natural-ness

How "natural" did the vibration feel when interacting with the Widget, in a scale from 1 to 5?

2

## Effectiveness

How effectively is the vibration tied to the specific action of interacting with the Widget, in a scale from 1 to 5?

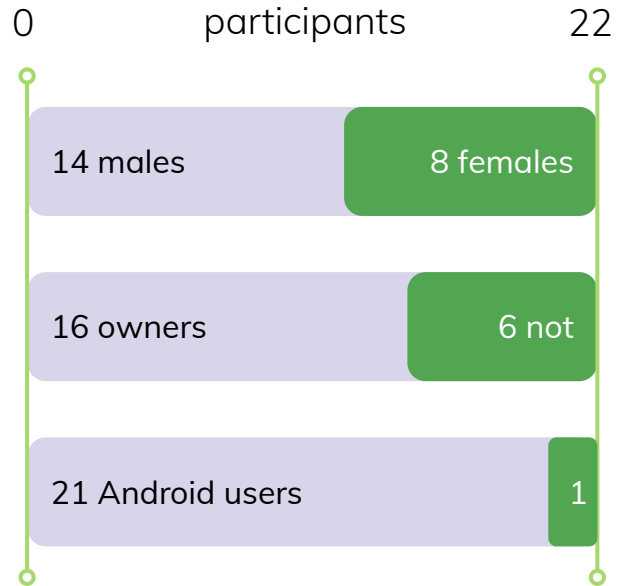
3

## Attention grabbed

How much does the vibration catch your attention when interacting with the Widget, in a scale from 1 to 5?



# The data we collected



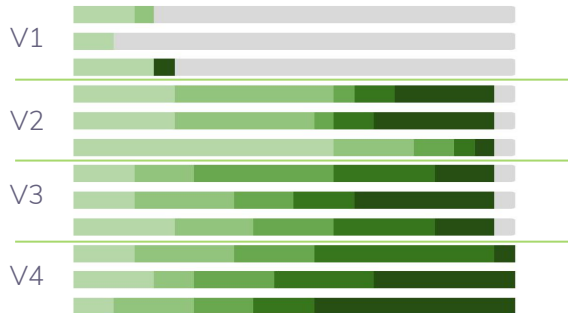
# Results



V2 and V3 of the Button were almost unperceivable, if at all.  
V4 of the Seek Bar is too soft to be perceived.

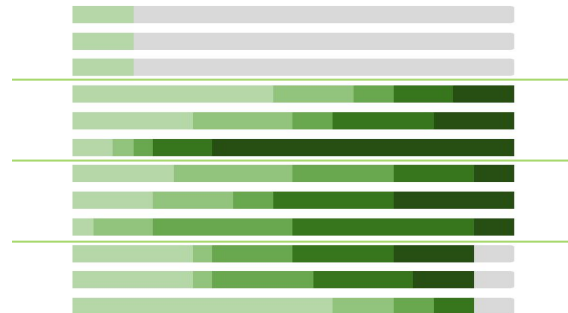
## Button

- Version 3 is the most natural.
- Version 4 is the most effective and grabs the most attention.
- Version 2 grabs the least amount of attention.



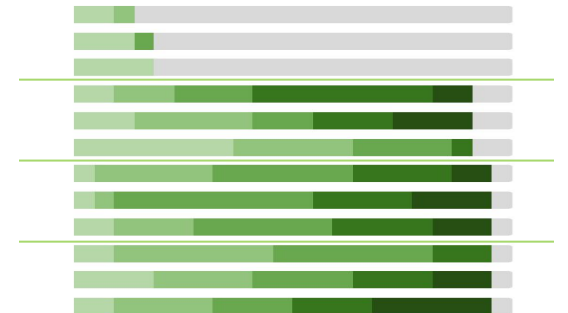
## Seek Bar

- Version 4 is the most natural and grabs little attention.
- Version 2 is the least natural, the least effective and grabs the most attention.
- Version 3 is the most effective.



## Checkbox

- Version 2 is the most natural and grabs attention the least.
- Version 4 is the least natural and grabs attention the most.
- All version are effective, the data is equally distributed.



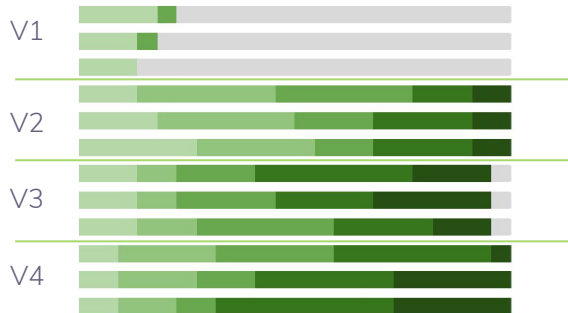


# Results

“ V2, V3 and V4 of the Switch feel all the same.  
V4 of the Spinner is annoying and irritating.

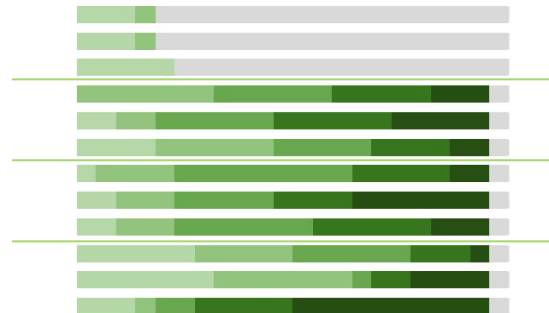
## Switch

- Version 2 is the least natural, the least effective and grabs the least amount of attention.
- Version 3 is the most natural.
- Version 4 is the most effective and grabs attention the most.



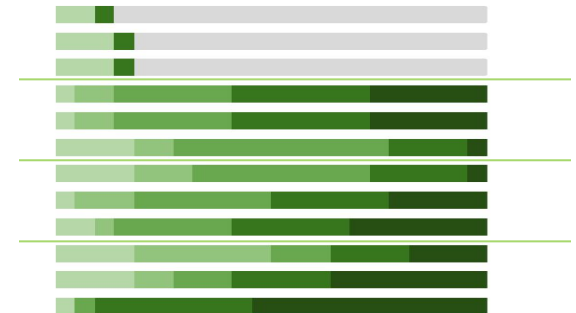
## Spinner

- Version 2 and 3 are almost equally natural and effective.
- Version 4 is the least natural, the least effective and grabs the most amount of attention.



## Rating Bar

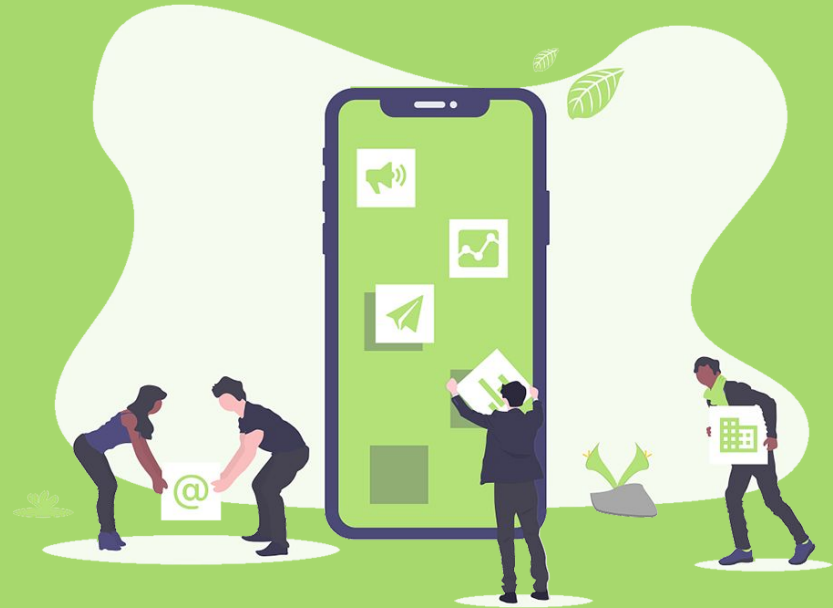
- Version 2 is the most natural and grabs attention the least.
- All versions are almost equally effective.
- Version 4 is the least natural and grabs the most amount of attention.



# Our tips

## Tip #8

1 Check that all interaction events are managed as expected, and their listeners are supported by all platforms.



# Thanks!

## Any questions?

Interested in having more details?  
Have a look at our [spreadsheet!](#)

Credits:

- Presentation template by [SlidesCarnival](#)
- Illustrations by [Undraw.co](#)

