Portrait VS Landscape

Which one is *faster* to use?

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Introduction

Touchscreen smartphones can be operated in portrait (P) and landscape (L) orientation. Previous research [1, 2, 4, 7, 8] suggests that a landscape layout is quicker to perceive but it remains unclear if it actually performs better than a portrait one and which areas are the best for positioning an element.

We investigate whether a touchscreen smartphone is faster to operate in P or L and where to put a button in each layout for best findability and operability.

How?

In line with various sources on optimum button size [3, 5], we laid out a series of 3, 5, and 8 buttons in both orientations on an HTC Sensation XE. Each button was 53 x 53 pixels in size, had a grey background and black type to minimize the effect of visual salience.

Round 1 (Normal), from left to right : *Task screen - tapping OK shows button layout in portrait or landscape. Once correct target is selected, an end-screen is shown. Zones marked in red and added in retrospect.*

First round (R1):

- 44 users to tap a target consisting of a three-letter-word, target name shown on task screen
- in portrait and landscape
- in a layout consisting of 3, 5 or 8 buttons

Second round (R2):

- same as R1, but colour names shown using method similar to Stroop effect [6] to require brief consideration of target before selection
- task screen vanishes automatically after one second
- in portrait and landscape
- in a layout consisting of 3, 5 or 8 buttons

Round 2 (Stroop-like), from left to right : *Task screen vanishes after one second, and shows button layout in Portrait or Landscape. Here the user has to tap the button labelled "blue" (the font-colour of the task). Once correct target is selected, an end-screen is shown. Zones marked in red and added in retrospect.*

Results

R1: The ANOVA showed no statistically significant difference between P and L or the target positions, only a main effect for button amount, which is expected.
$F(2,86) = 91.04$, $p<.001$. Bonferroni: alpha: .05/3 = .017

R2: The ANOVA showed three effects and one interaction:

Amount
$F(2,86)=25.205$, $p<.001$

Breakdown:

3 buttons (Median: 1170.00) ***is faster than 5 buttons*** (Median: 1302.88), $Z = 4.28$, $p < .001$;

and 5 buttons is faster than 8 buttons (Median: 1589.50), $Z = 4.81$, $p < .001$.

Bonferroni: alpha: .05/3 =.017

Orientation
$F(1,43)=36.42$, $p<.001$

Breakdown:

L (Median: 1283.00) ***is faster than P*** (Median: 1437.00), $Z = 3.54$, $p < .001$.

Bonferroni: alpha: .05/2 =.025

Position
$F(2,86)=12.53$, $p<.001$

Breakdown:

Middle (Median: 1224.25) ***is faster than End*** (Median: 1378.25), $Z = 5.59$, $p <.001$;

and End is faster than Start (Median: 1465.75), $Z = 2.69$, $p = .007$;

Bonferroni: alpha: .05/3 =.017

Interaction

3 Buttons

No statistically significant difference

Bonferroni: alpha: .05/9 =.006

5 Buttons

Middle (Median: 1102.50) ***is faster than End*** (Median: 1392.50), $Z = 4.80$, $p <.001$;

and End is slightly faster than Start (Median: 1458.25), $Z = .76$, $p = .446$ - although not statistically significant

Bonferroni: alpha: .05/9 =.006

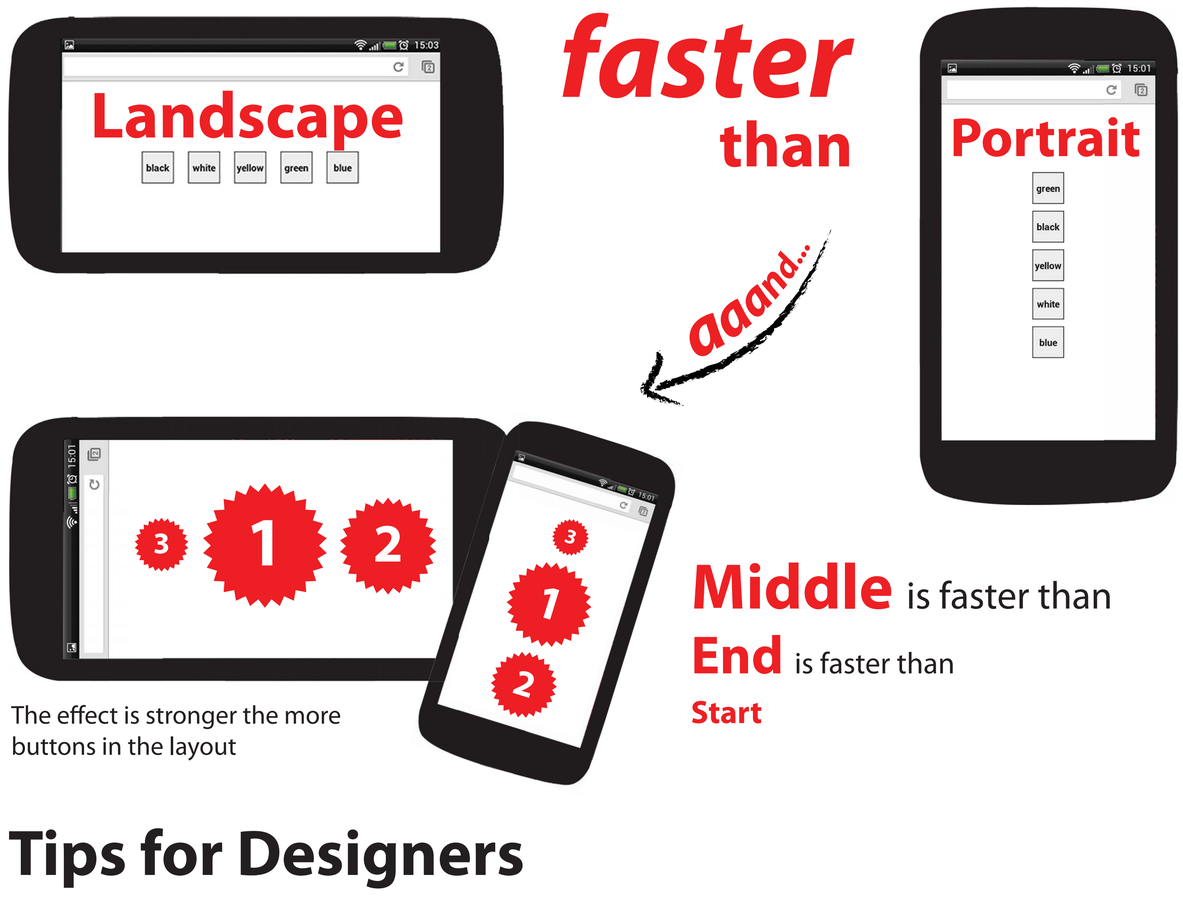
8 Buttons

Middle (Median: 1285.38) ***is faster than End*** (Median: 1715.25), $Z = 4.34$, $p<.001$

and End is faster than Start (Median: 1866.5), $Z = 2.92$, $p = .003$

Bonferroni: alpha: .05/9 =.006

Conclusion



The effect is stronger the more buttons in the layout

Tips for Designers

When designing time-critical applications, **favour landscape orientation over portrait.** In addition, the user's visual focus set by a dialogue has a higher impact on interaction time than the proximity of the finger to an element.
Therefore, put a button you would like the user to perceive first in the same place as the dialogue text. In landscape orientation, place the **secondary options to the right and the tertiary options to the left** of your preferred option. In portrait orientation, place these to the **bottom and the top** respectively.

References

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