

The challenge of implementing SDH in immersive media: a reception study

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This study is focused on 360° videos

main

challenges

Main challenges

- Position
- Guiding mechanisms
- Freedom to explore
- Avoid breaking immersion
- Readability and usability
- Scalability (editing tools)

ImAc Project



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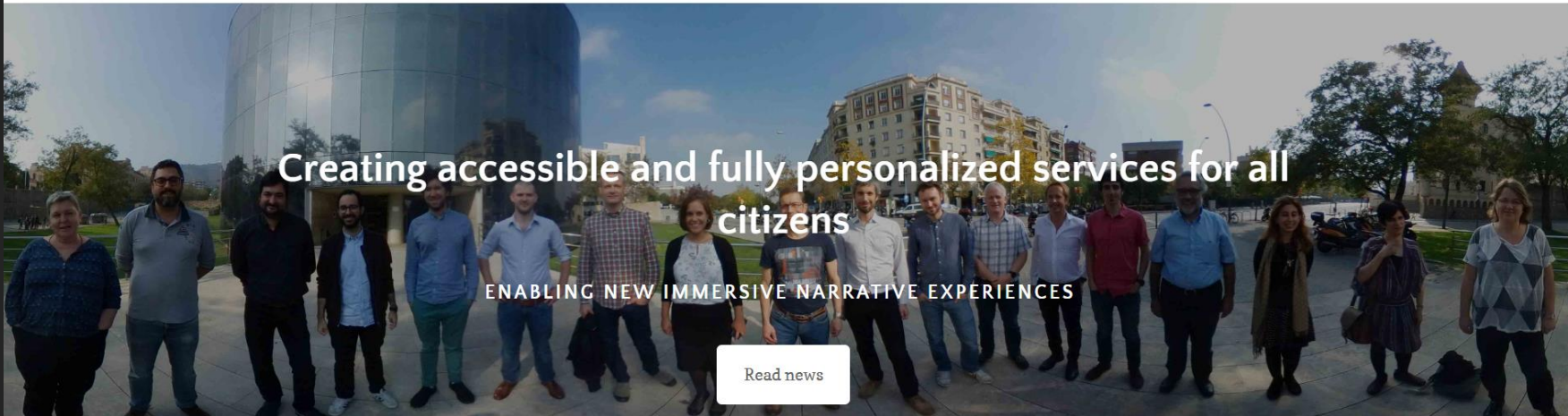
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Based on...

- State-of-the-art (BBC/TNYT)
- Related work (BBC WP/Sylvia Rothe et al)
- Users' feedback
 - Focus groups
 - Prepilots (trial and error)
 - Testing with end users

...We developed different solutions

reception study

Who?



20 HoH | 20 hearing

26 ♀ | 14 ♂

[Age] sd=14.8, mean=37.4, median=37 (from 18 to 70)

[VR device owners] 5 participants

13 never use [=] | 27 use [=]

What?

Stimuli

- One clip for acclimatization
- Four clips for testing – two comparable pairs
- Two episodes of Holy Land by Ryot (documentary, narrator)
- “I, Philip” by ARTE (sci-fi, different characters) split in two parts
- Duration: around 5 minutes each clip
- Without sound

Variables

- Position: Always visible vs Fixed in three positions
- Guiding: Arrows vs radar



How?

[Device] Samsung Gear VR with Samsung Galaxy S7

[Measures] Immersion (IPQ) + Preferences

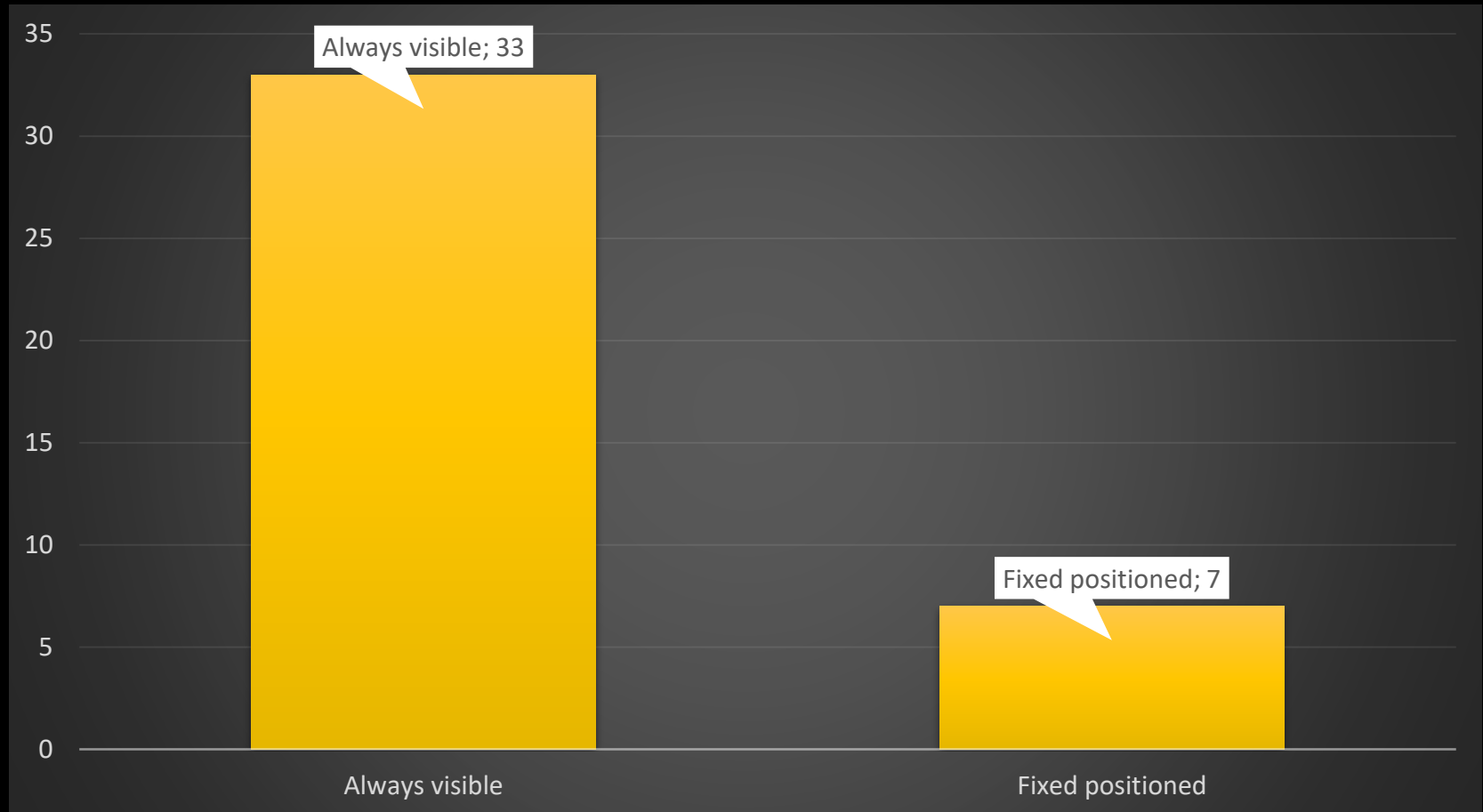
[Tools] Questionnaires (GForms)

[Tools] CVR Analyzer (by Sylvia Rothe et al)

results

position

What system do you prefer to read subtitles in 360° videos?



Always visible

More freedom
to look around

You don't miss
the subtitle
content or
parts of the
scenes

These are
more
comfortable

Fixed positioned

These can be
read better

They avoid the
dizziness effect

Which one is easier to find and to read? (7-point Likert scale)

Always-visible subtitles (mean=6.01) were considered easier to find than fixed-positioned subtitles (mean=3.92). This difference is statistically significant ($Z=-3.986$, $p=.000$, ties=5).

Always-visible subtitles (mean=5.19) were considered easier to read than fixed-positioned subtitles (mean=4.30). This difference is statistically significant ($Z=-1.919$, $p=.055$, ties=9)

Which one is less obstructive and less distracting? (7-point Likert scale)

Fixed-positioned subtitles (mean=5.71) were considered slightly less obstructive than **always-visible subtitles** (mean=4.97). This difference is **not statistically significant** ($Z=-1,123$, $p=.261$, ties=23)

Always-visible subtitles (mean=4.76) were considered less distracting than **fixed-positioned subtitles** (mean=3.00). This difference is **statistically significant** ($Z=-2,696$, $p=.007$, ties=13).

IPQ results (7-point Likert scale)

For the spatial, involvement and realness scale, the test indicated that the difference between results is not statistically significant.

However, for the **presence scale**, the test indicated that the difference between results is **statistically significant** ($Z=-2,694$, $p=.007$, ties=17).

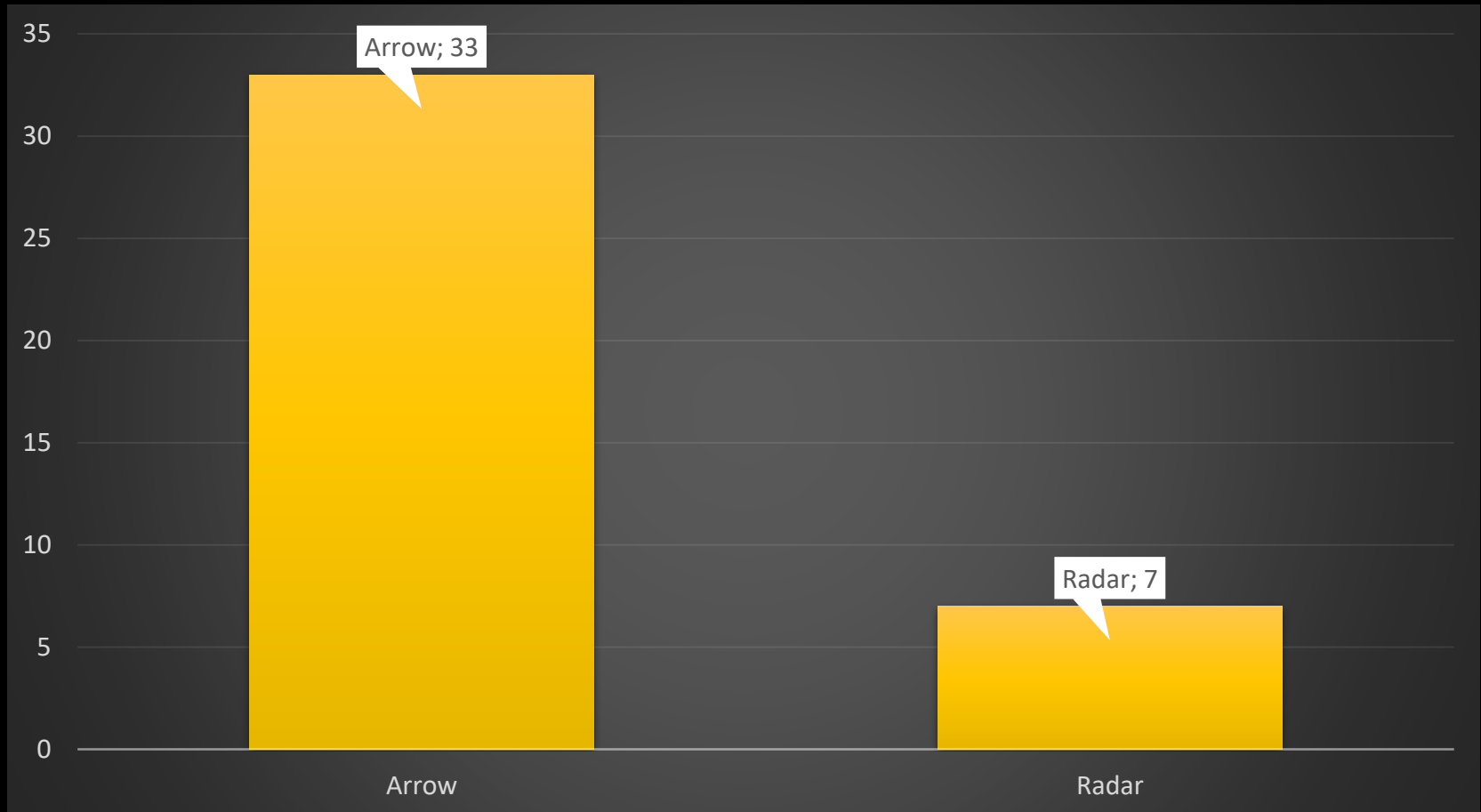
This means that the **fixed-positioned subtitles had a negative impact on the presence** of participants.

According to their comments in the open questions, this could be because they felt **less free to explore the 360° scene** and claimed to have **missed parts of the subtitles content**.

Moreover, as reported above, participants found **more difficult to find and read subtitles** in this mode, and also considered them **more distracting**.

results
guiding

Which system do you prefer to indicate the location of the character speaking?



Arrows

More intuitive,
direct and
comfortable

Less invasive
and distracting

Don't get the
radar at all

Radar

More accurate
and spatial
information

Maybe adding
a tutorial at
the beginning

Place the radar
in the center
and down, not
on a side

With which one is easier to find speaker? And which one is less distracting? (7-point Likert scale)

Arrows (mean=5.95) were considered easier to find the speaker than the radar (mean=3.20). The difference is statistically significant ($Z=-4.166$, $p=.000$, ties=10).

Arrows (mean=6.31) were considered less distracting than the radar (mean=3.04). The difference is statistically significant ($Z=4.125$, $p=.000$, ties=12).

IPQ results (7-point Likert scale)

Even if the arrows were preferred by users and also considered an easier method to find the speaker as well as less distracting than the radar, that had **no impact on the immersion of the participants.**

in a
nutshell.

Subtitles in 360° - Position

- it is important for viewers to have freedom to explore the scenes. it is important for immersion, as it has been proved.
- it is also important that subtitles are easy to find and read and do not distract the audience. that is why placing subtitles where audience are expecting them is a good idea.

Subtitles in 360° - Guidance

- split attention is intensified in 360° videos so less is more. arrows are the simplest, most intuitive mechanism and users prefer them.
- even more: some users would prefer nothing, if the movie is well post-produced.

Future steps

- **studies on cognitive load: is it possible to read subtitles with the current CpS and still pay attention to the 360° video? is it enjoyable? do viewers understand the content? do we need shorter subtitles?**
- **studies with eye-tracking: where are viewers looking at? can we place subtitles elsewhere to improve the user experience? or would users prefer to have subtitles always in front of them?**

ImAc Player

[=] [>] [·] [o]

Enjoy immersive contents with access services by selecting the video you want to watch. To customise your experience, go into settings or select a video and then go to the player menu.

Show/Hide content info



Liceu Opera Piece 1



Liceu Opera Piece 2



360° Abendschau



Desconcert "Leyre"



Thank you

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Disclaimer

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