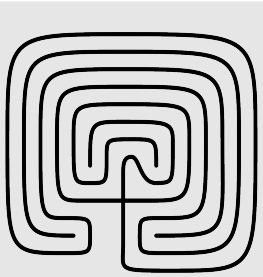
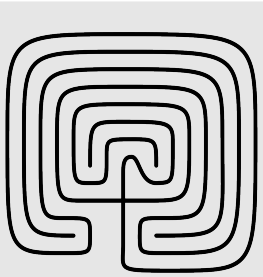


Out of Sight

Navigation and Immersion of Blind Players in Text-Based Games

Katharina Spiel

Defence to acquire the academic title
'Bachelor of Science'
26th of October, 2012
Bauhaus-University of Weimar



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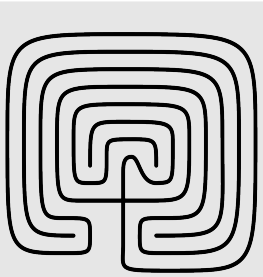
1. Terms and Concepts
2. Hypothesis and Design of Research
3. Study Results
4. Interpretation of Results



Terms – Text-Based Games

Room Description

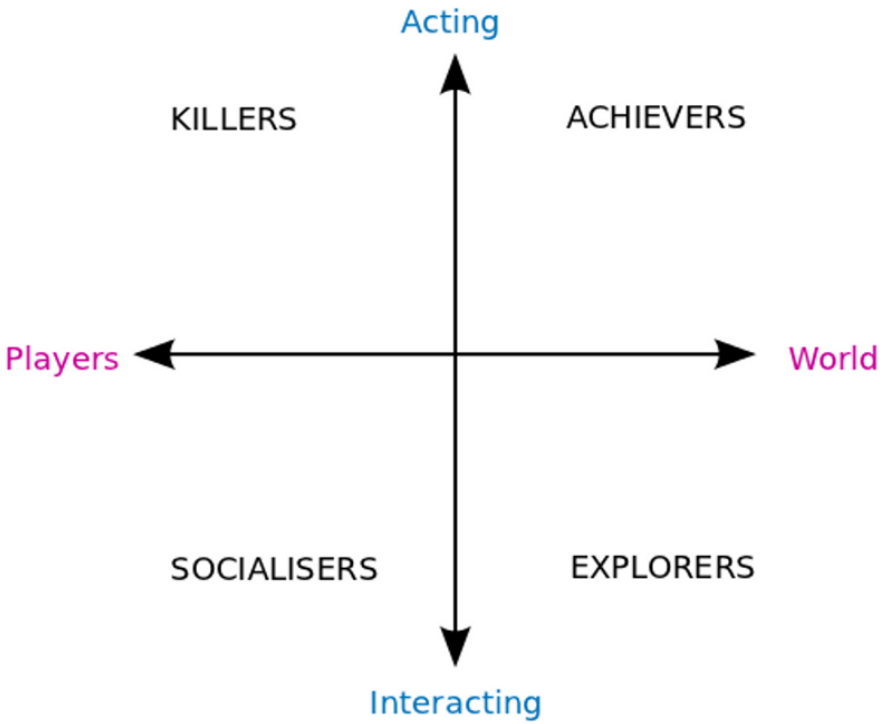
Exits

Objects

Interaction

```
[defense room]
This is the examination room, where defenses are held
occasionally.  It is full with several tables and chairs.
There are a few people sitting on them.  Some of them are
even sleeping.  The projector is running and the light is
dim, so that everyone is able to see the presentation being
given.
There are two obvious exits: left and right.
Two stern-looking examiners are present.
> flee
I don't understand what you mean.
> RUN AWAY
What?
> sigh
You sigh.
> continue presentation
You continue giving your presentation.
```

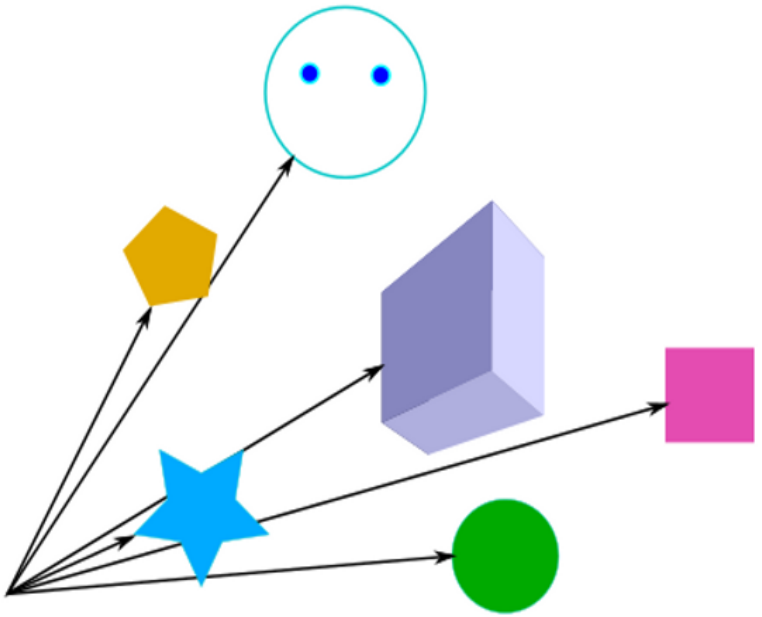
Terms – Playstyles



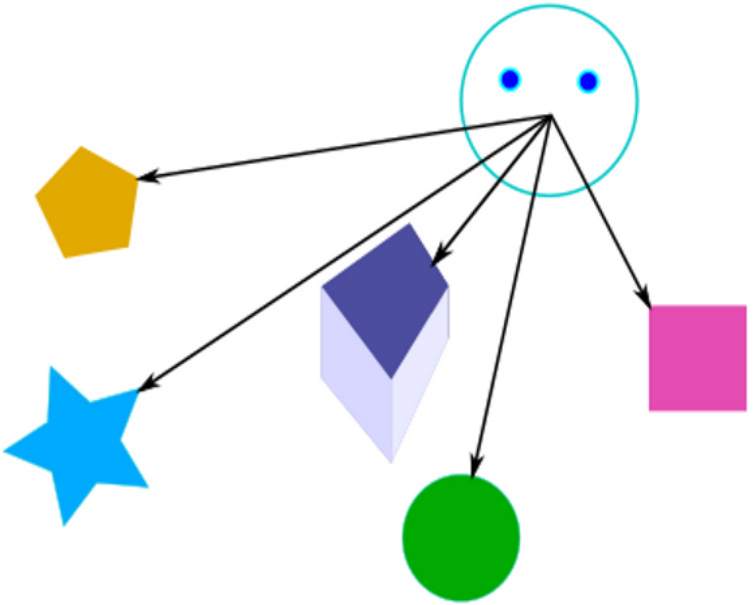
Playstyles that occur in MUDs

adapted from Bartle (1996)

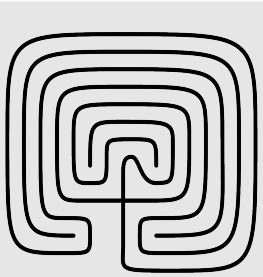
Terms – Navigation



Allocentric Representation



Egocentric Representation



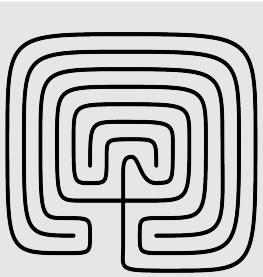
Terms - Immersion

Immersion involves a certain feeling of presence within the game environment and not the actual world the player is in.

Immersion includes the identification with ones avatar or character.

Immersion is easily disrupted.

Immersion only occurs if the player accepts the rules set by the game, be it social rules, physical rules or others.



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Immersion includes the identification with ones avatar or character.

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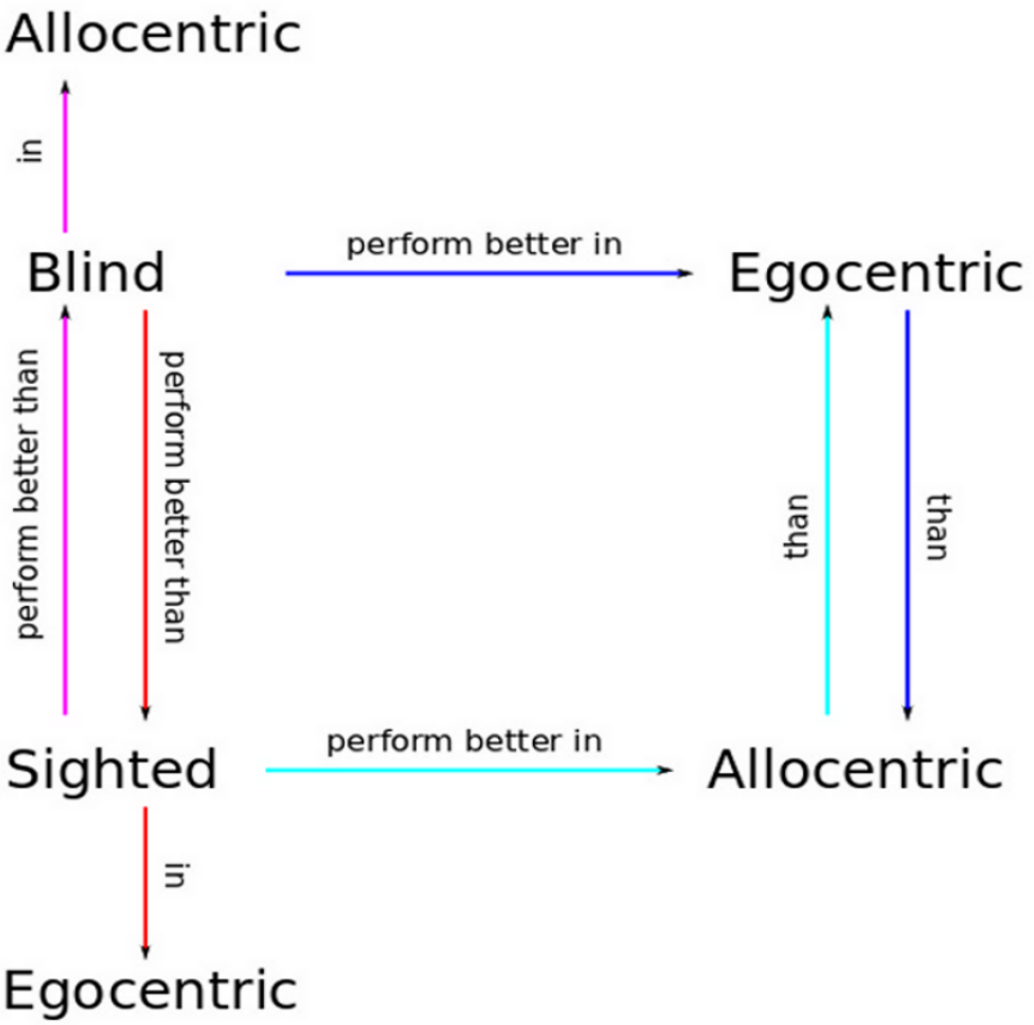
Immersion only occurs if the player accepts the rules set by the game, be it social rules, physical rules or others.

Immersion is the player's undisrupted and focused engagement with the game they are playing.

Hypothesis


Allocentric
in
Blind
perform better in
Egocentric
perform better than
perform better than
than
than
Sighted
perform better in
Allocentric
in
Egocentric

Game Setup

Stables

Hallway

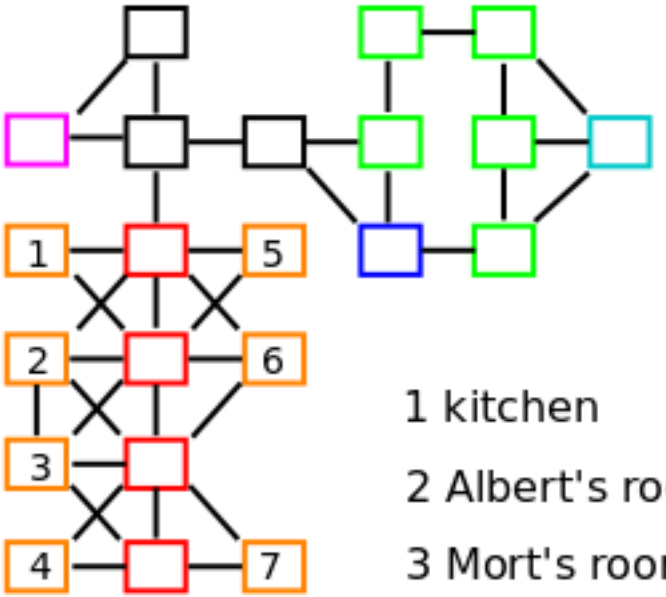
Rooms in the house

Outside rooms

Pond

Garden

Pit



1 kitchen

2 Albert's room

3 Mort's room

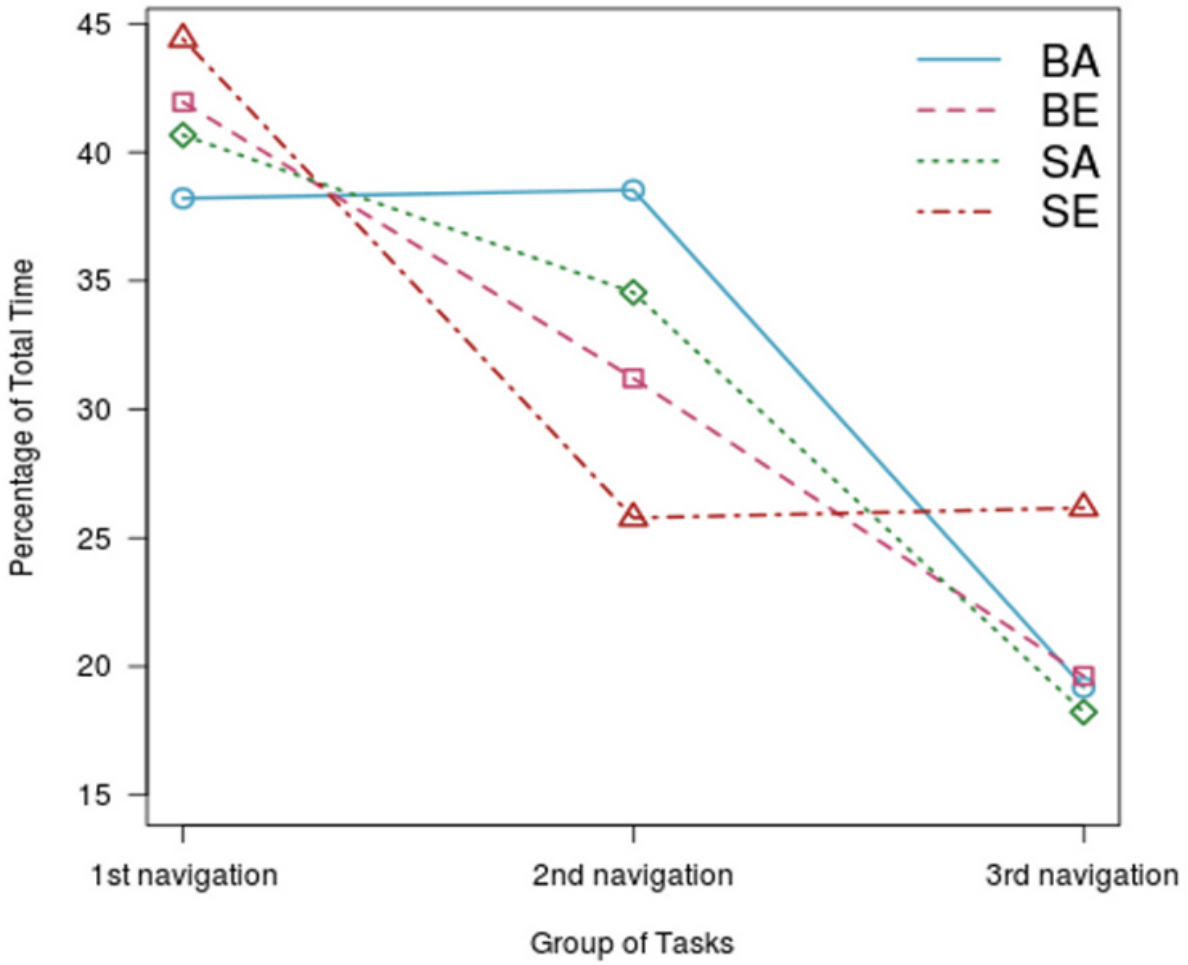
4 bathroom

5 top of stairs

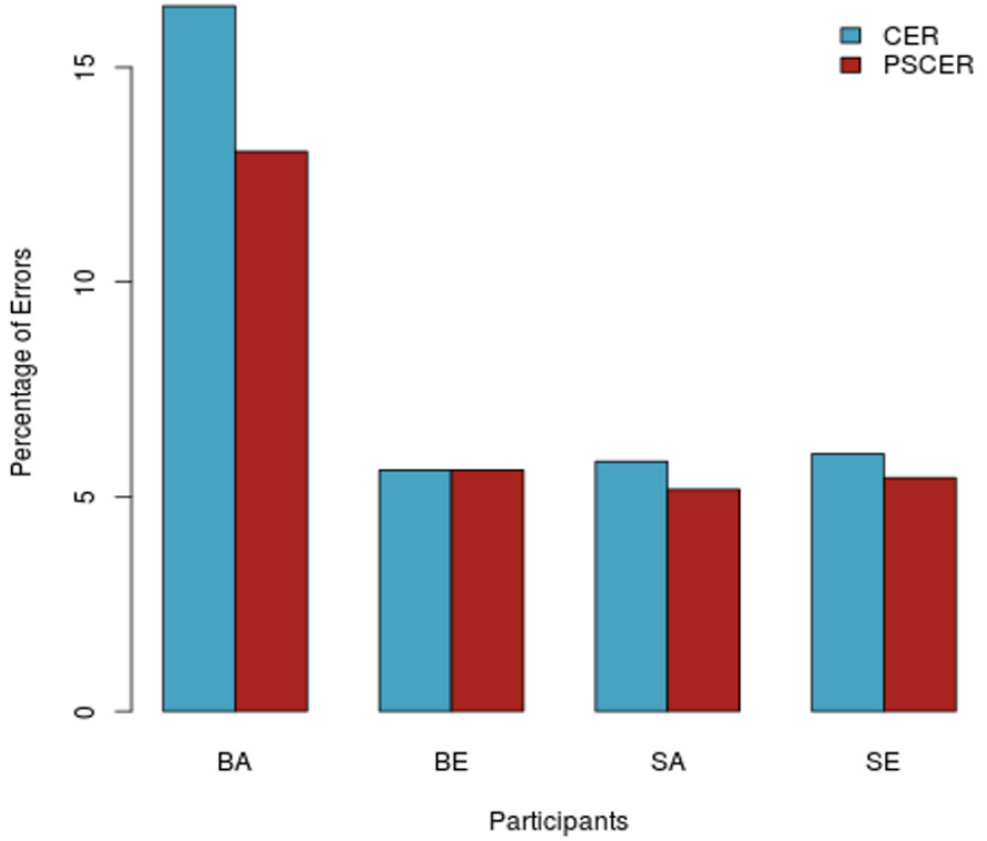
6 Death's study

7 Ysabell's room

Main Study - Findings



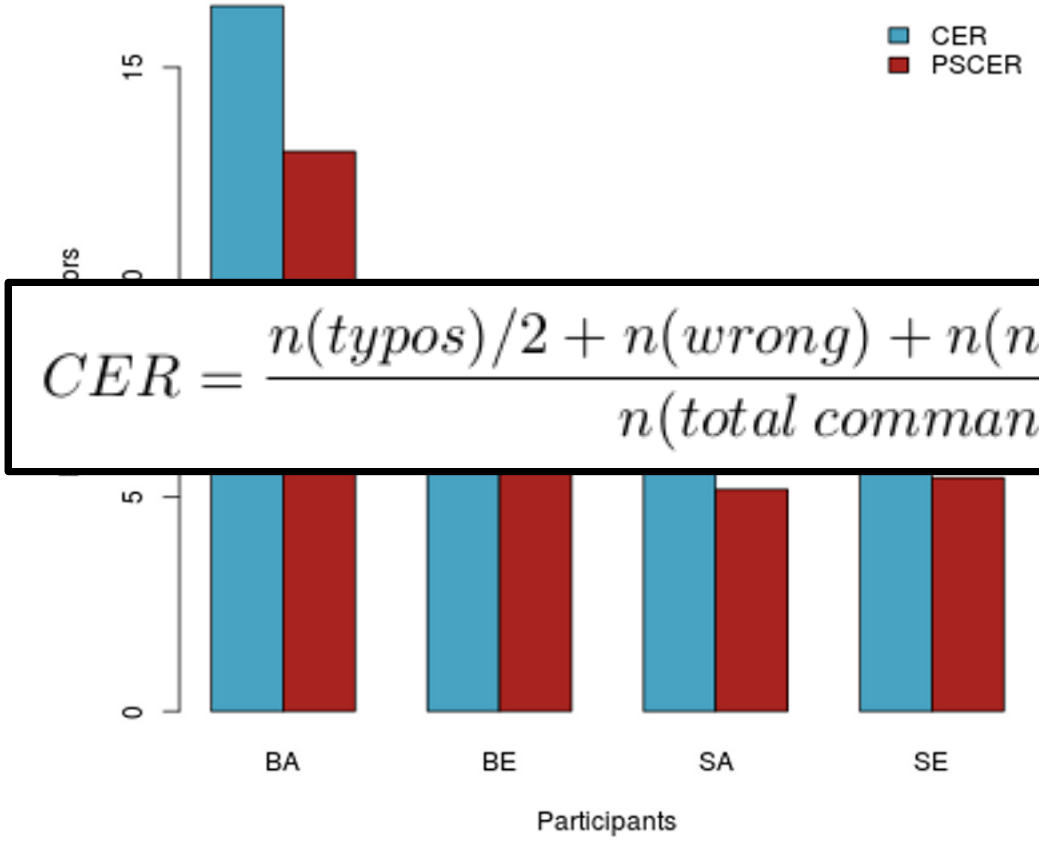
Main Study - Findings



CER =
Command Error Rate

PSCER =
Player Side Command Error Rate

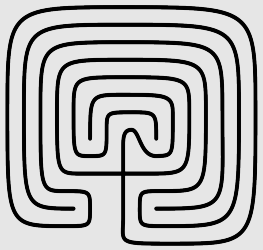
Main Study - Findings



$$CER = \frac{n(typos)/2 + n(wrong) + n(not\ implemented)}{n(total\ commands)}$$

CER =
Command Error Rate

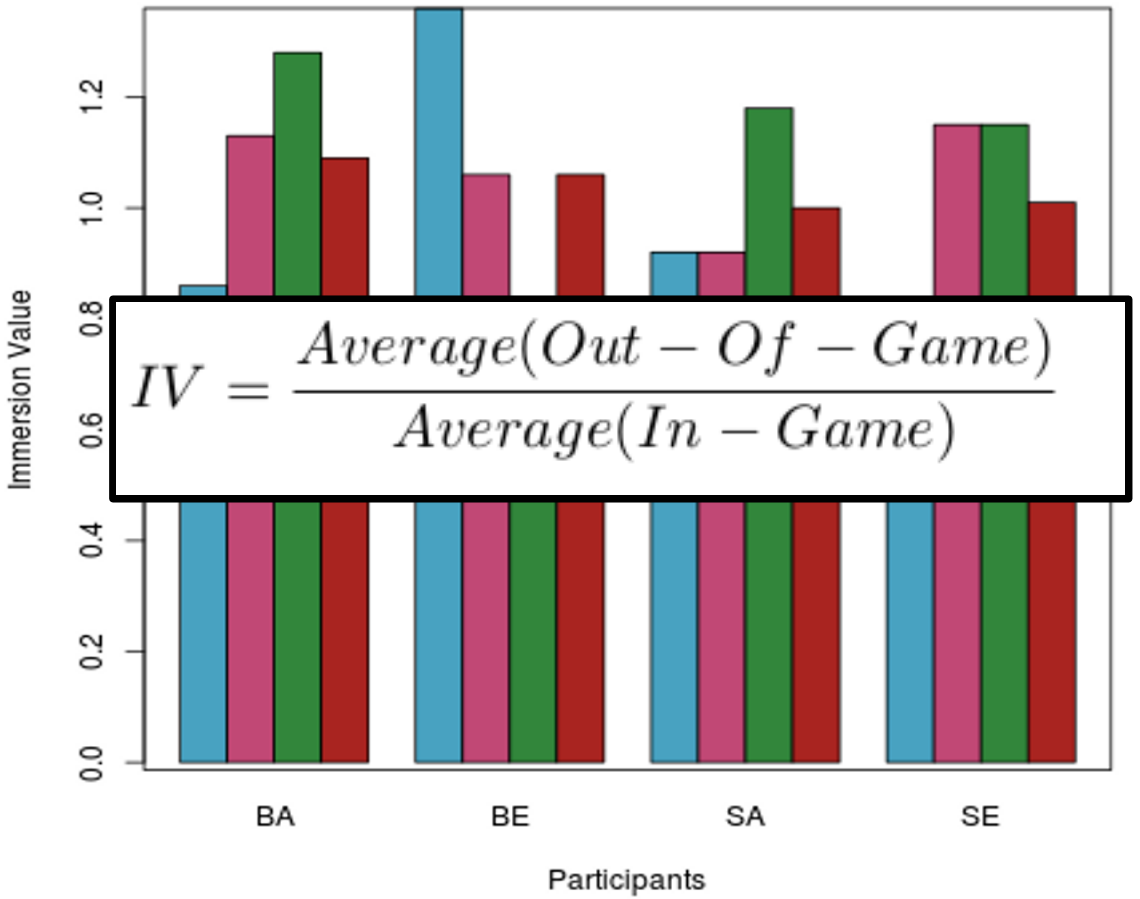
PSCER =
Player Side Command Error Rate



Main Study - Findings

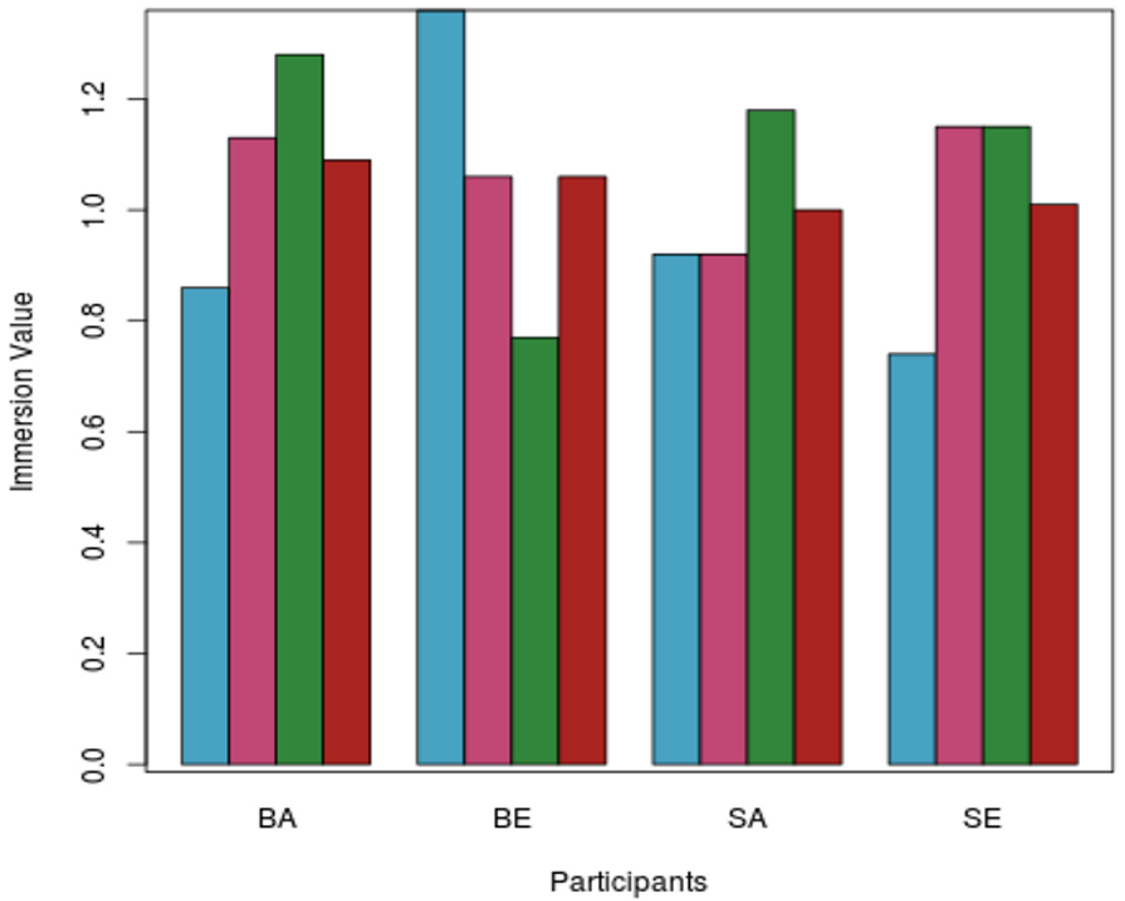
Parti-cipant	In-Game	Meta-Game	Out-Of-Game	Silence
BA	40.54%	18.84%	0.24%	40.38%
BE	16.75%	18.36%	0.77%	64.12%
SA	40.69%	13.46%	0.09%	45.76%
SE	21.65%	7.62%	0.08%	70.66%

Main Study - Findings

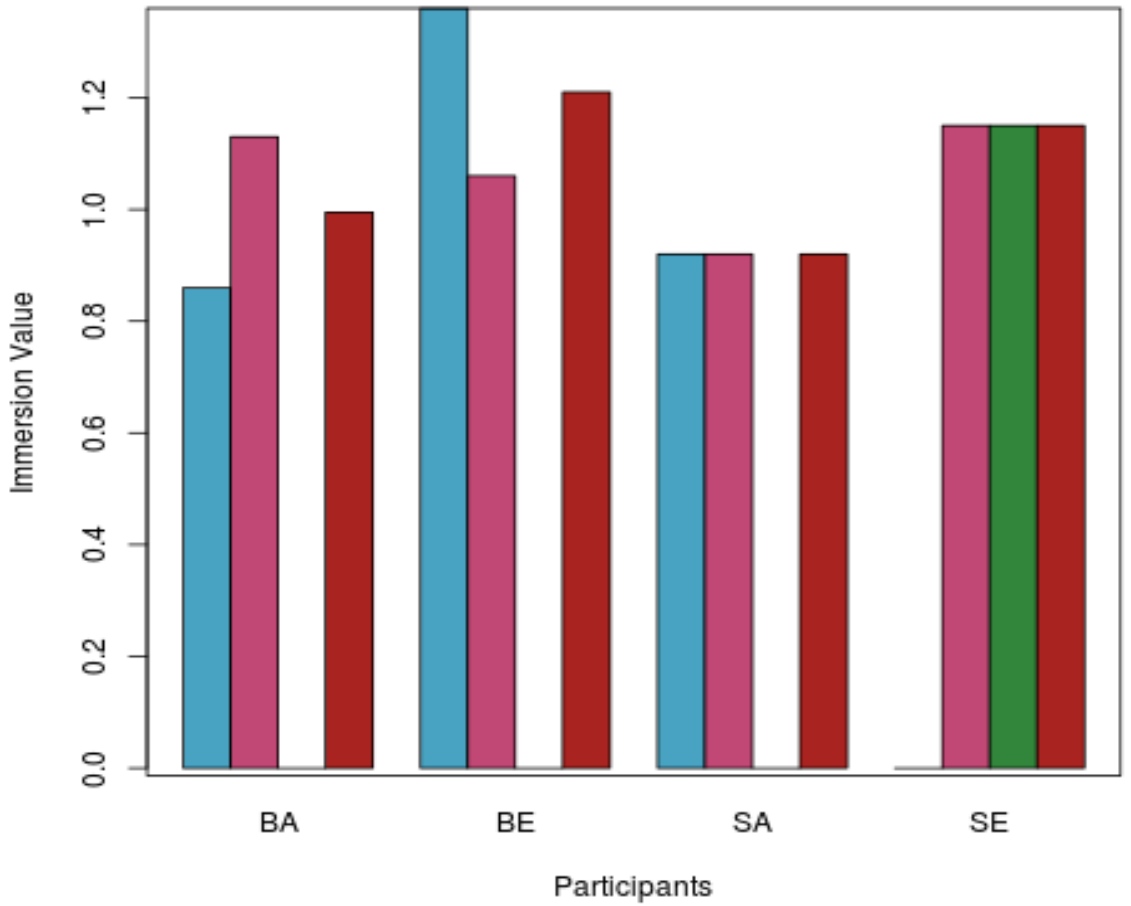


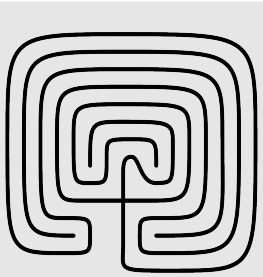
$$IV = \frac{Average(Out - Of - Game)}{Average(In - Game)}$$

Main Study - Findings



Main Study - Findings





Main Study - Findings

- Encoding of 'forward' as 'north' for sighted players
- No equivalent for that for blind players

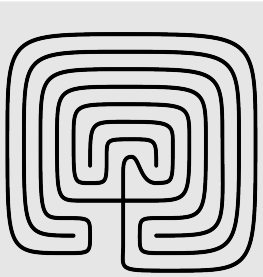
Task	BA	BE	SA	SE
Time Est. Precision	0.2347	0.0015	0.0103	0.0060
Room Est. Accuracy	2.00	2.44	2.60	2.87
Egocentric Loc. Correct	0.33 (6/9)	0.33 (3/9)	0.83 (7/9)	2.17 (9/9)
Allocentric Loc. Correct	2.33 (9/9)	0.17 (2/9)	1.67 (7/9)	1.17 (8/9)

Interpretation - Limitations

- Language of the game vs. native language of test participants

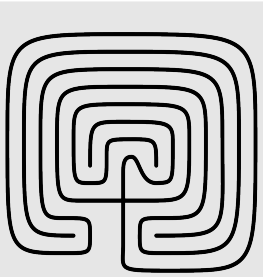
- Test sessions recorded by only one person
- Data evaluation by only one person

  -> Bias Issues



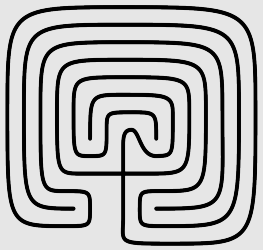
Interpretation – Validity

- Findings helpful for the developers of text-based games
  - Accessibility
  - Game Dynamics
- Findings helpful for knowledge about navigation through virtual space
- Findings helpful for the research community
  - Text-Based Games as tools for research into perception and the influence of different representations
- Future work in the development of maps that are intuitive to use by blind users



The End

Thank you very much for your attention.



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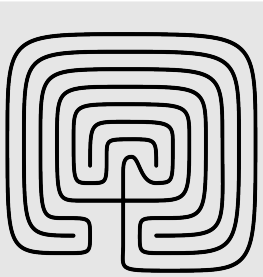
Additional Information - Pilot Study

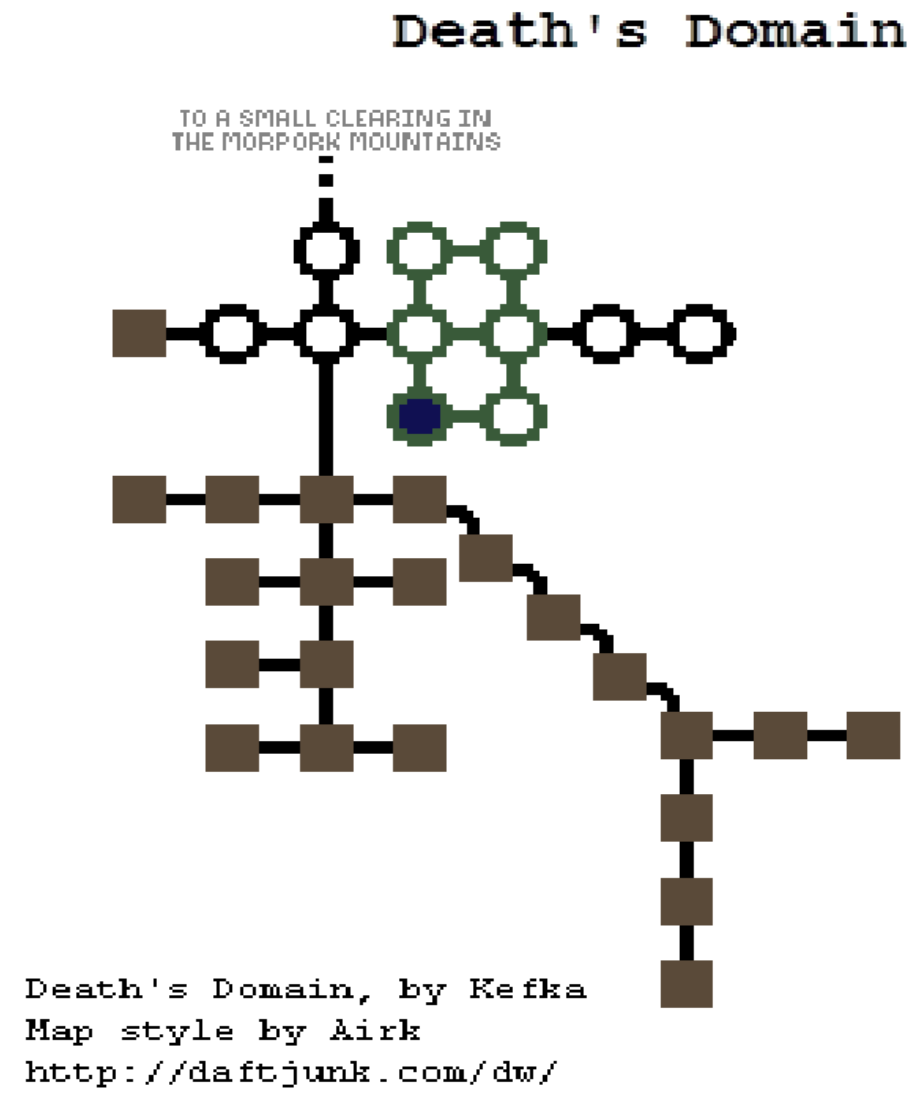
Identifier	Blind/Sighted	(Un)Experienced	Allo-/Egocentric
PB1E	Blind	Unexperienced	Egocentric
PB2E	Blind	Experienced	Egocentric
PS3E	Sighted	Unexperienced	Egocentric
PS4A	Sighted	Unexperienced	Allocentric
PB5A	Blind	Unexperienced	Allocentric
PS6E	Sighted	Experienced	Egocentric
PS7A	Sighted	Experienced	Allocentric
PB8A	Blind	Experienced	Allocentric



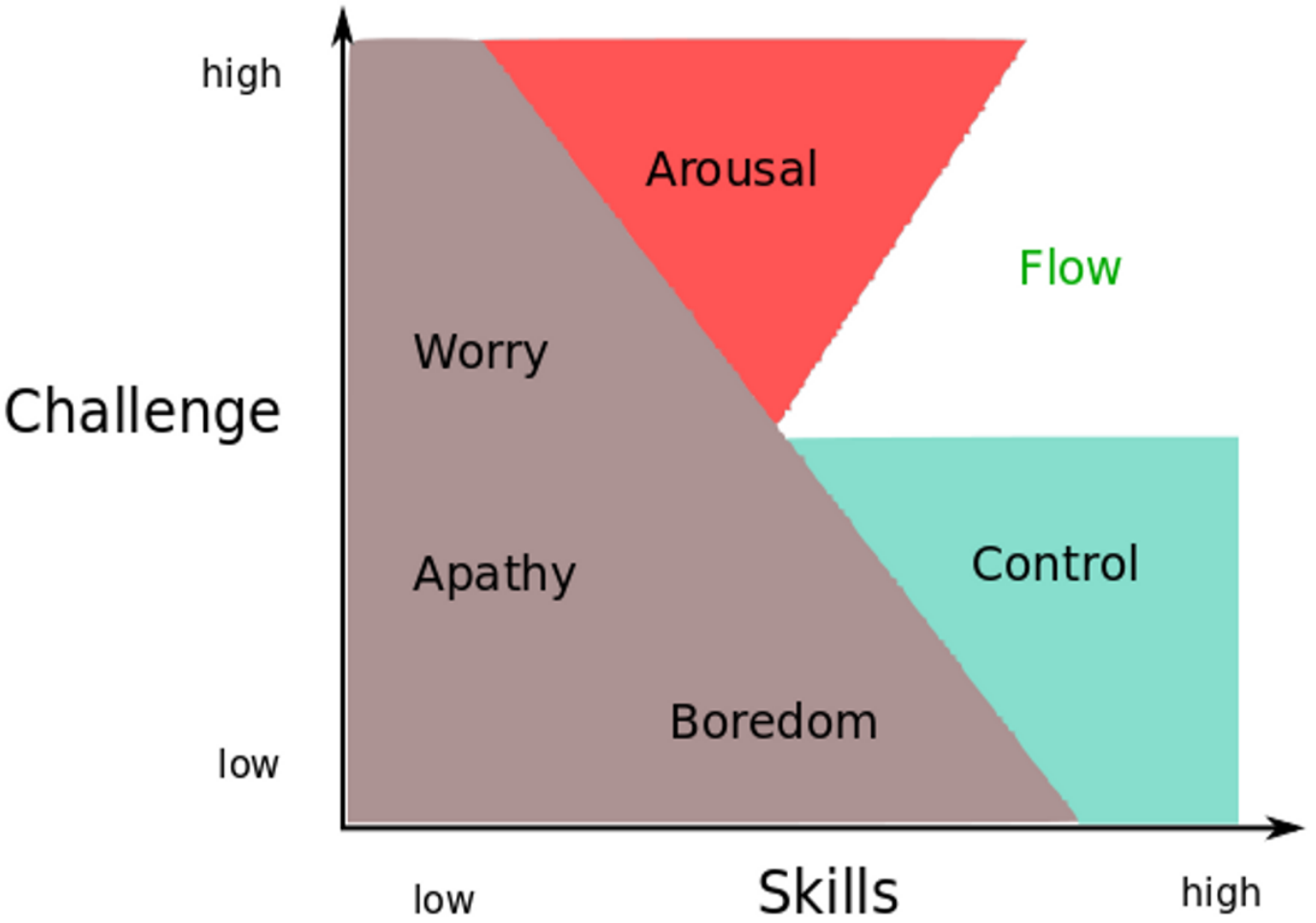
Additional Information - Pilot Study

- Experienced players should be excluded
- The task description needs narrative framing
- Time on Task shouldn't be used as a stand-alone measurement
- To produce meaningful results, the questionnaires have to be enhanced
- Log creation has to be done outside of GnomeMUD

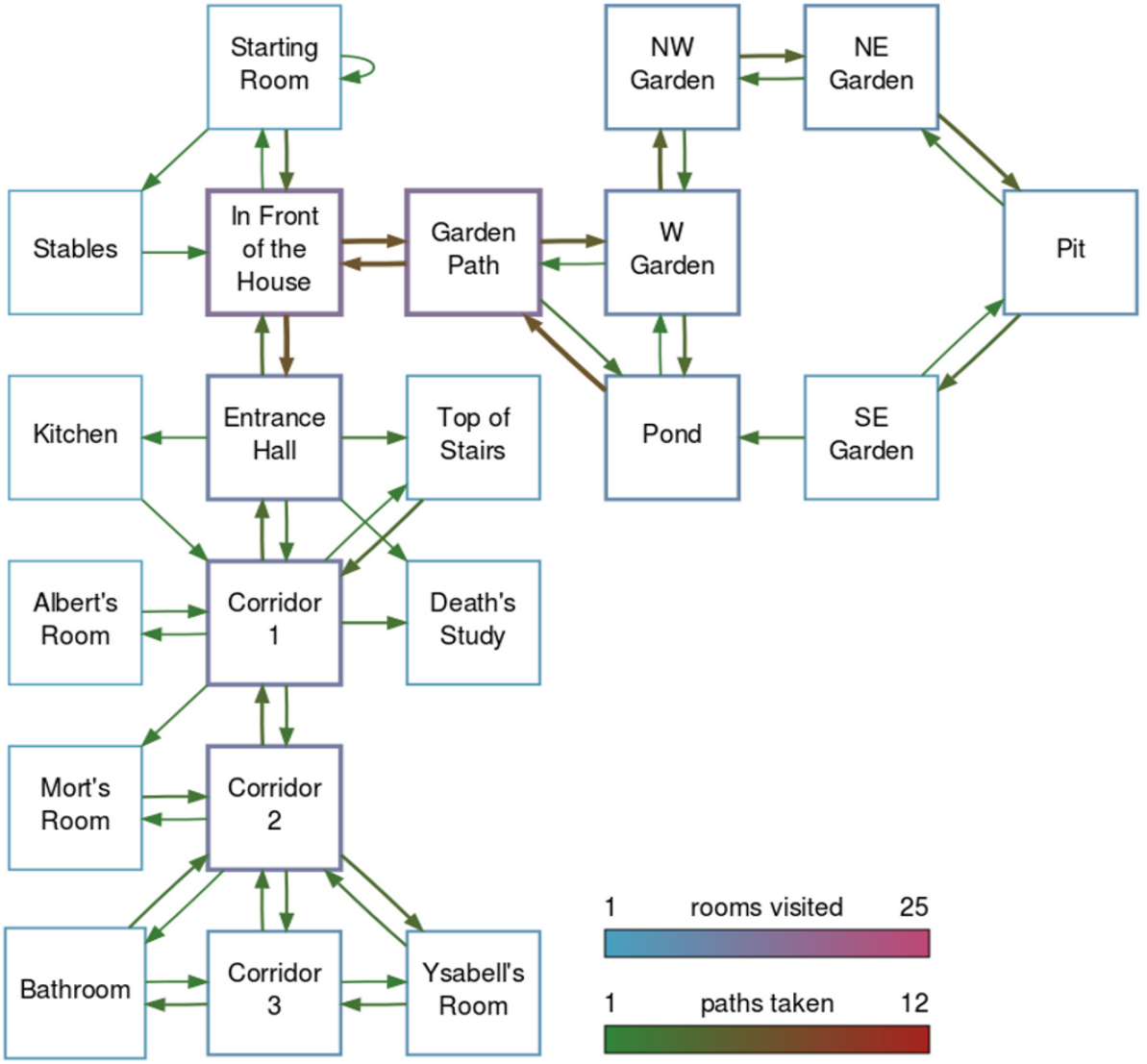
Additional Information - Layout



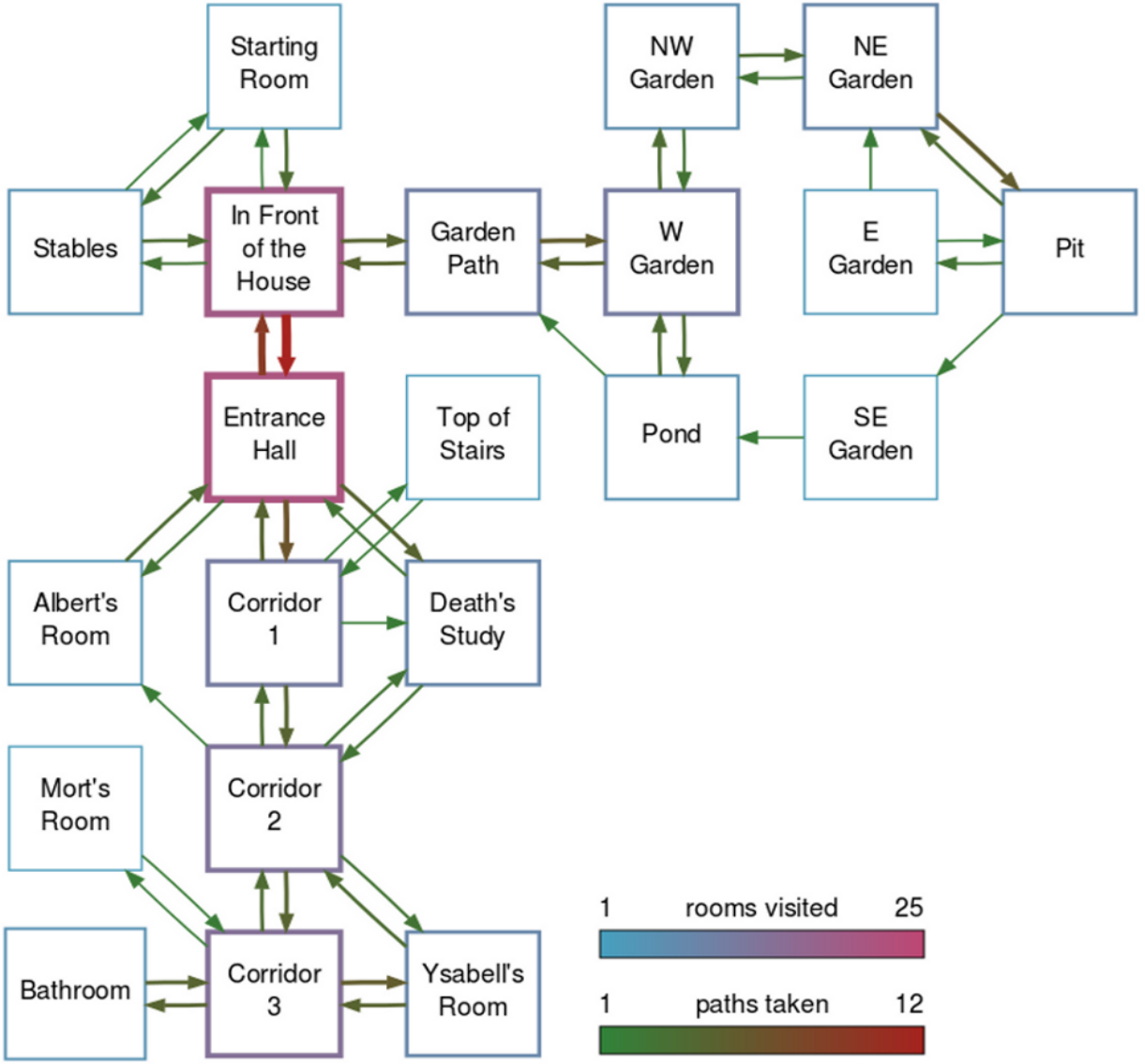
Additional Information - Flow



Additional Information – Heatmap BA



Additional Information – Heatmap BE



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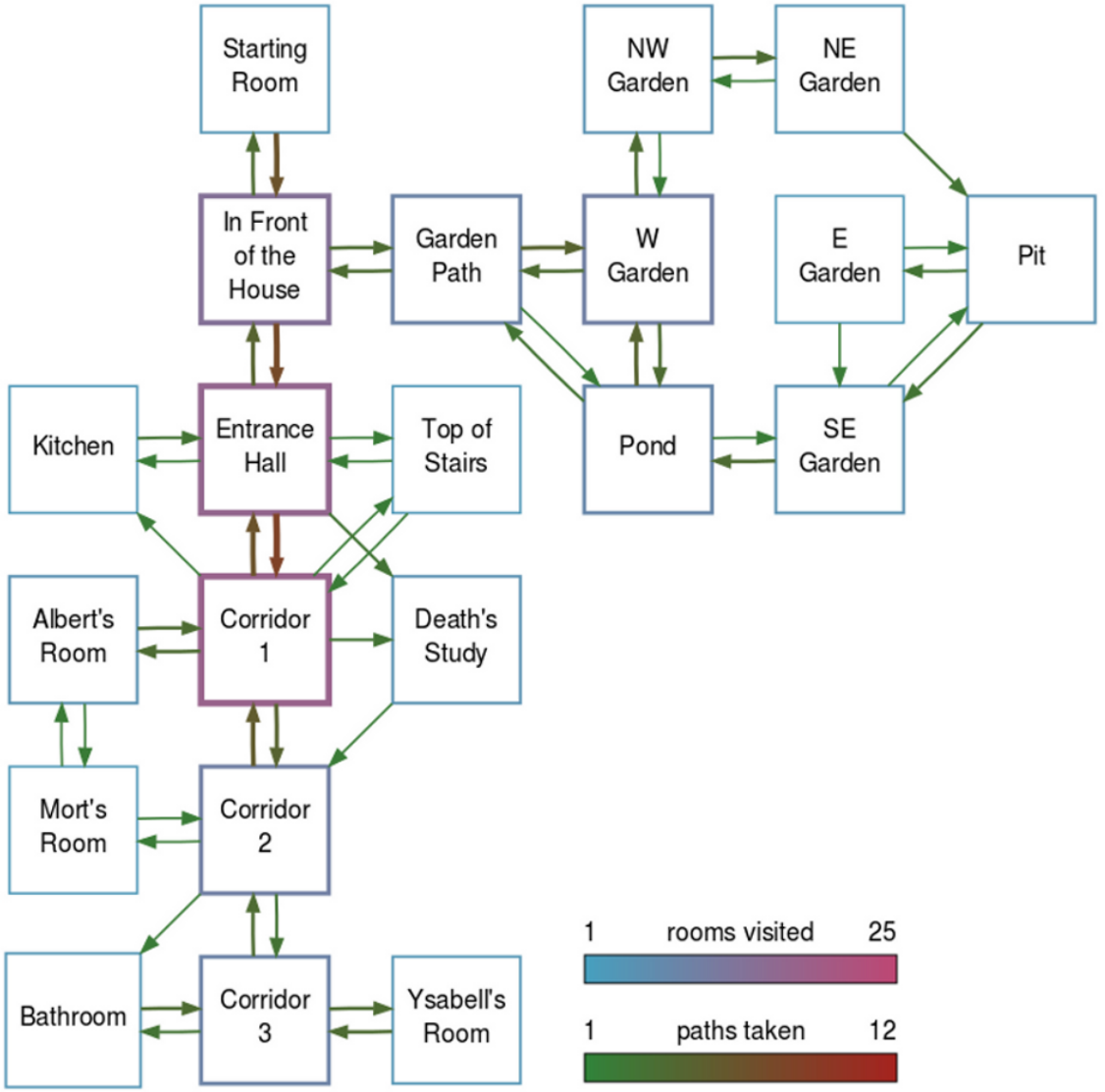
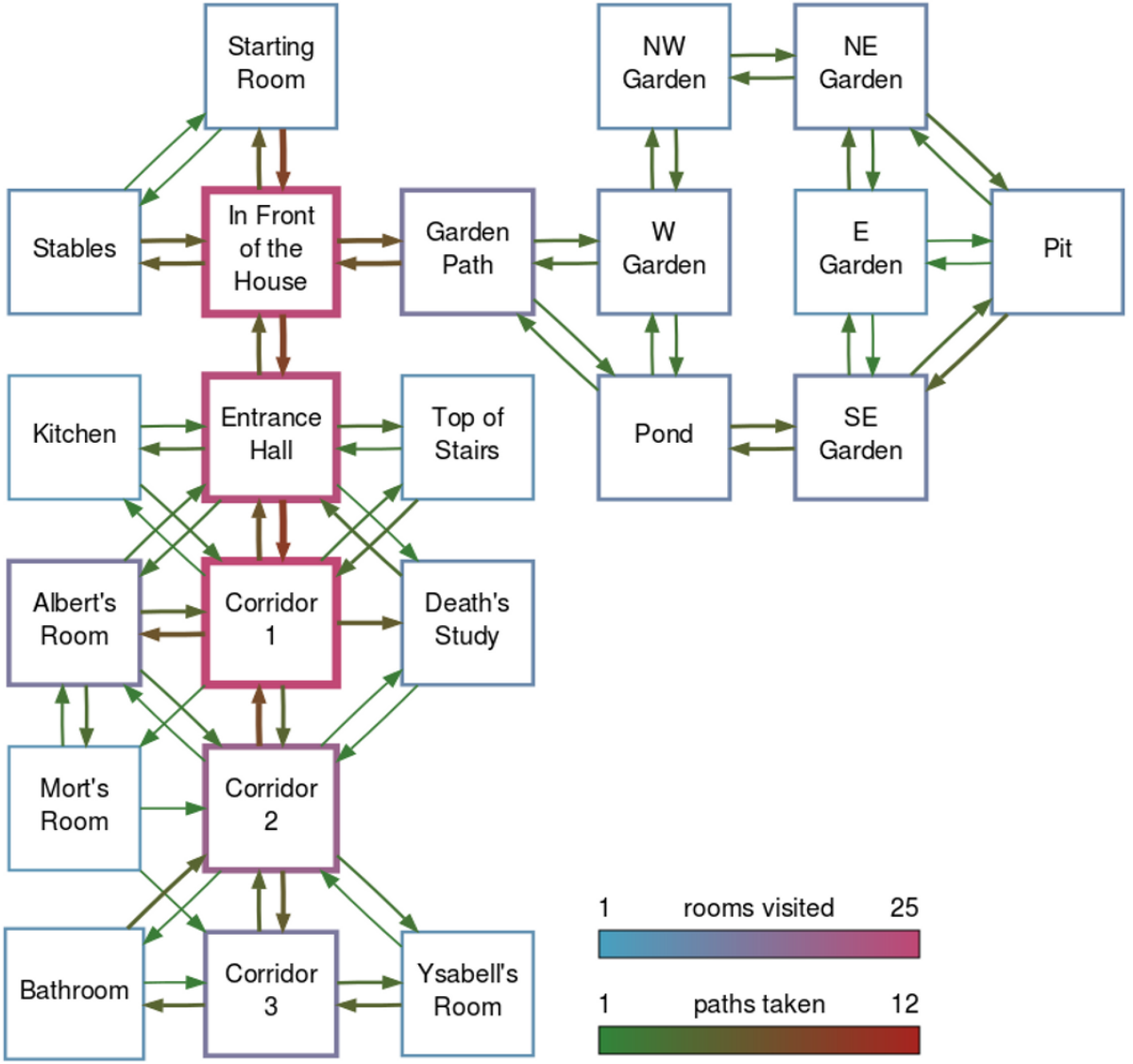
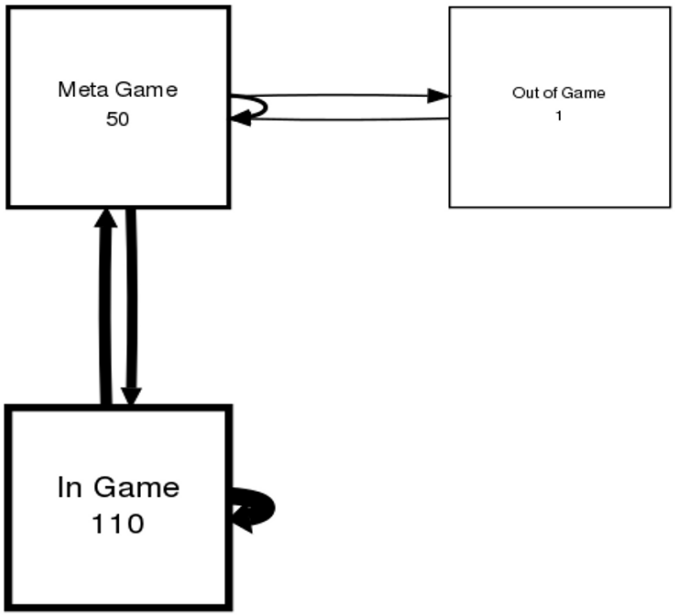


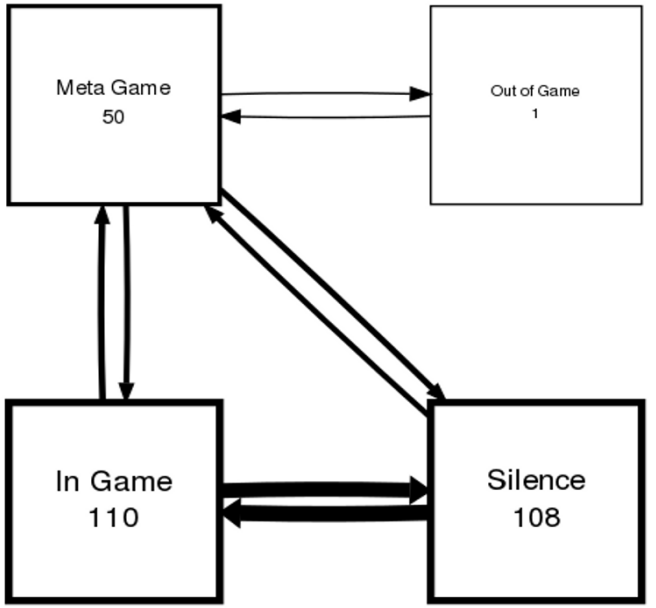
Additional Information – Heatmap SE



Additional Information – Audio BA

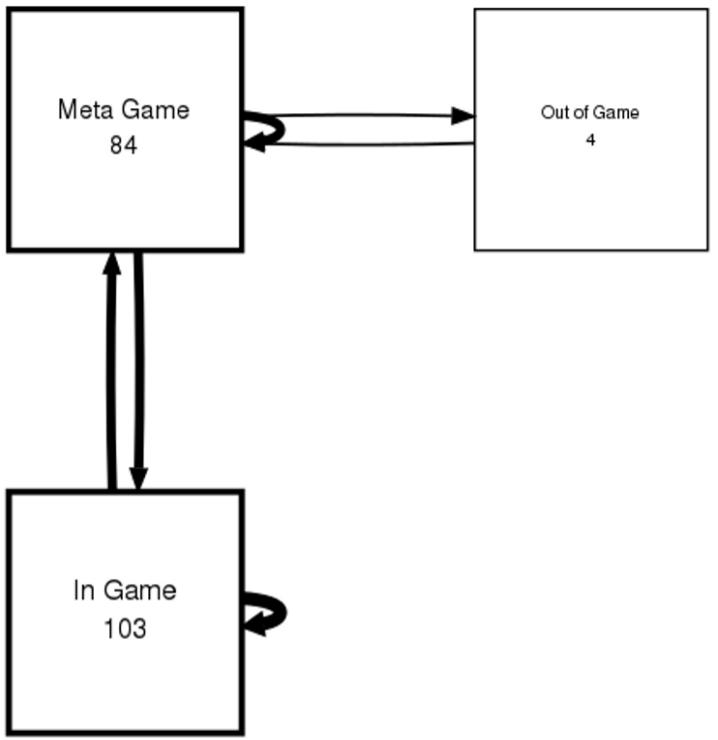


BA (Without silence)

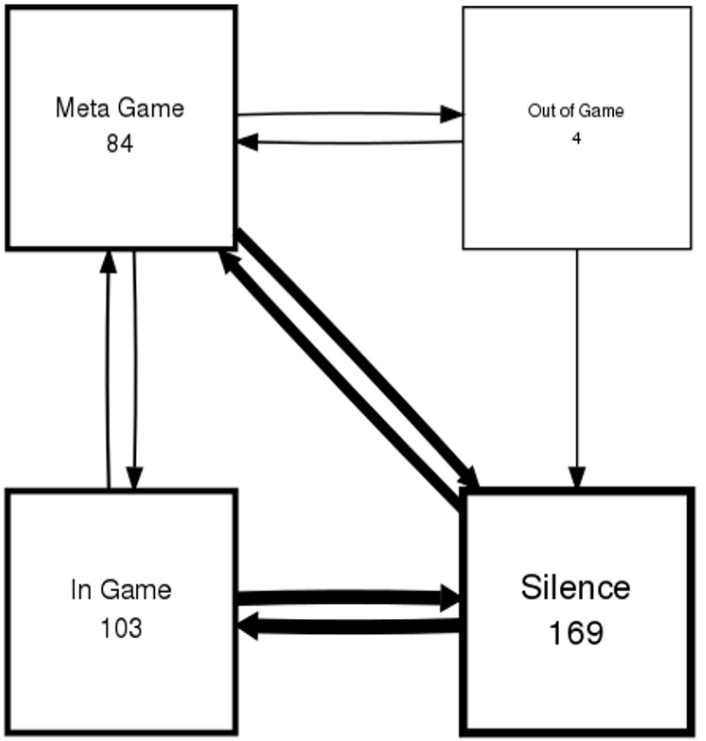


BA (Counting silence)

Additional Information – Audio BE

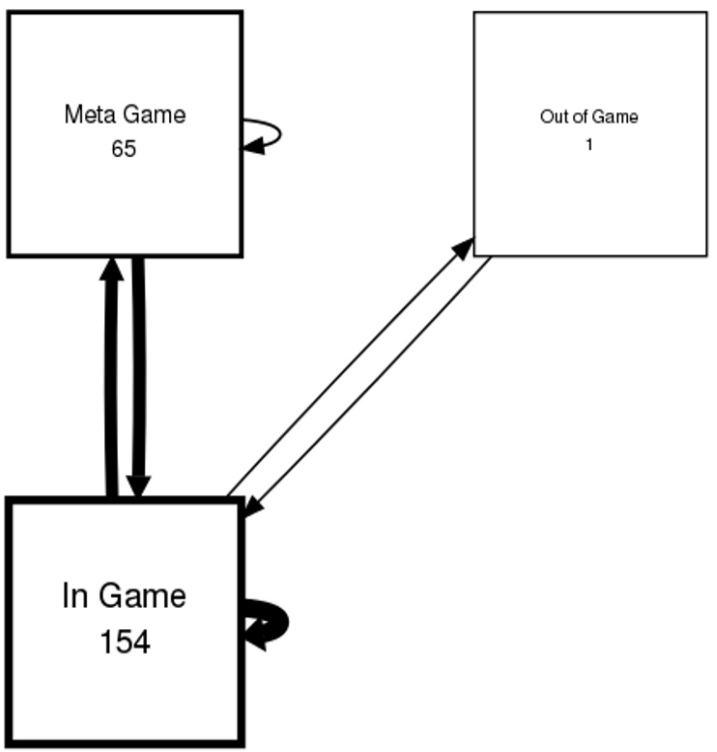


BE (Without silence)

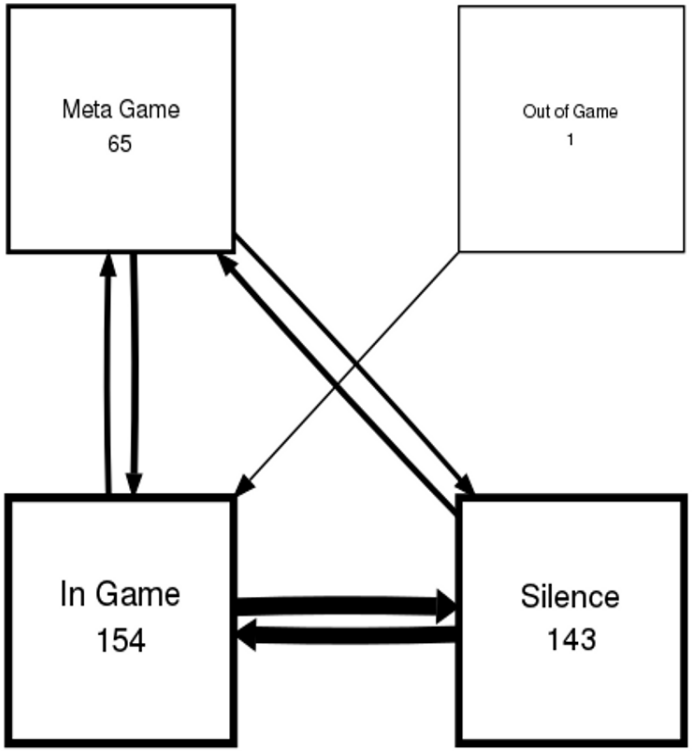


BE (Counting silence)

Additional Information – Audio SA

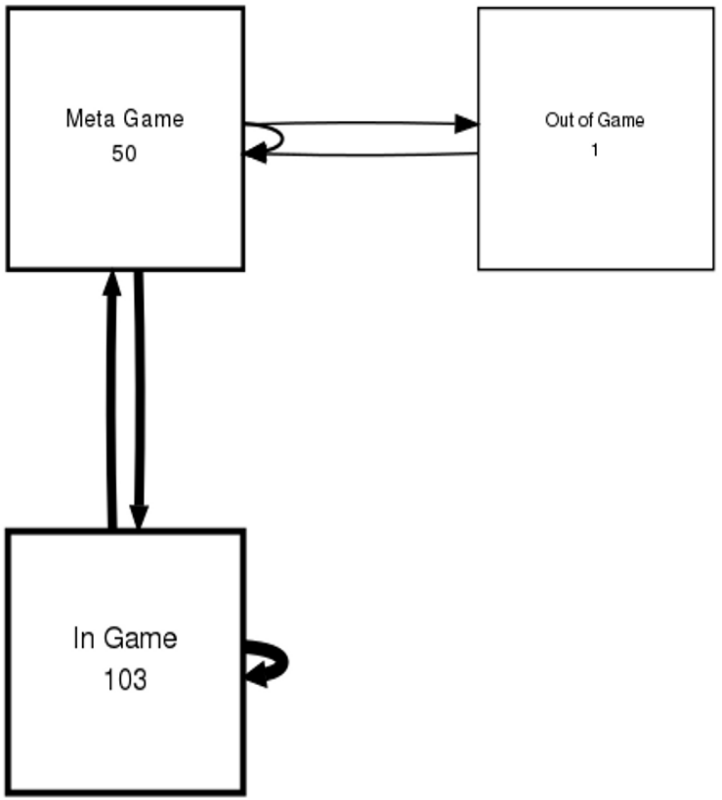


SA (Without silence)

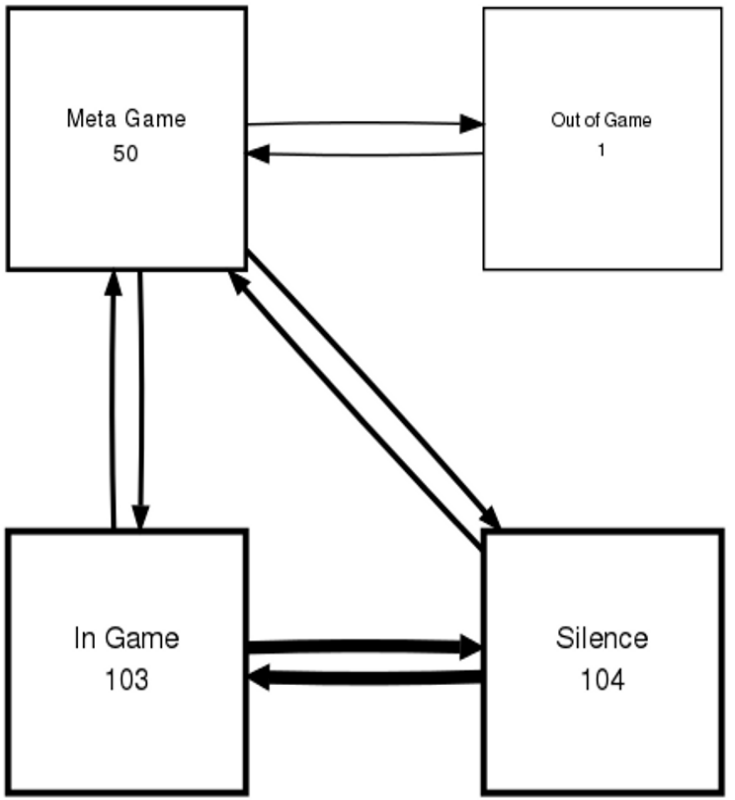


SA (Counting silence)

Additional Information – Audio SE



SE (Without silence)



SE (Counting silence)