Paper Info							Type of Paper							Measures		Design					Stimuli		IVs		DVs		Additional Notes
							Empirical						Theoretical			Study Design											
Index	Title	Link to the paper	Author	Year	Database	Notes	User Study	Case Study	Survey	Interview	Focus Group			Quantitive	Qualitative	Within	Between	Mixed	Subjects	Duration	Custom	Commercial	Variables	Levels	Variables	Operationalization	
1	Asymmetric Interface: User Interface of asymmetric virtual reality for new presence and experience	https://www.researchgate.net/profile/Hyungseok-Kim-3/publication/325170353_Asymmetric_Interface_User_Interface_of_Asymmetric_Virtual_Reality_for_New_Presence_and_Experience/links/5b0e7e1e0f7e9b97fd0e1ed6/Asymmetric-Interface-User-Interface-of-Asymmetric-Virtual-Reality-for-New-Presence-and-Experience.pdf	Jaeng, K. and Kim, J. and Kim, M. and Lee, J. and Kim, C.,	2020	Scopus		User study							Quantitive		Within			20 persons (males: 15, females: 5) between the ages of 22 and 37.		Custom		roles viewpoint	4 levels hmd non-HMD (hmd as first as all of them)	Presence - Witmer et al social interaction & positive experience module - GEQ		
2	Enhancing Communication and Awareness in Asymmetric Games	https://link.springer.com/chapter/10.1007/978-3-030-58465-8_29	Bortolaso, C. and Bourdiol, J. and Graham, T. C.N.,	2020	Scopus		User Study								Qualitative	Within			8 (four pairs, 7 male, 1 female, 18-31 years old)	10m	Custom		Role / display medium	Tablet vs. HMD	Usability, communication issues, interesting behaviours	Interview, video analysis	
3	Audio source localization as an input to virtual reality systems	https://ieeexplore.ieee.org/abstract/document/8451983/	Kerure, A.A. and Deshpande, J.	2018	Scopus		User Study (informal study)							–	–				10 participants (no any futher info)		Custom		–	–	–	–	
4	RoleVR: Multi-experience in immersive virtual reality between co-located HMD and non-HMD users	https://link.springer.com/article/10.1007/s11042-019-08576-1	Lee, J. and Kim, M. and Kim, J.	2020	Scopus		User Study							Quantitive		Within			The survey participants consisted of 20 person between 20 and 35 years old who had experience with single player VR contents, and whose average age was 25.8 years. The proposed RoleVR is played in pairs of one HMD and one Non-HMD user. Therefore, the participants were divided into 10 paired teams for this experiment.		Custom		Conditions	HMD vs non-hmd roleVR vs non-hmd-assitant vs. non-hmd-audience	Presence Enjoyment & social interaction	Witmer et al.'s presence questionnaire GEQ (positive experience, social interaction)	
5	MagicTorch: A context-aware projection system for asymmetrical VR games	https://dl.acm.org/doi/abs/10.1145/3083187.3083215	Li, J. and Deng, H. and Michalatos, P.	2017	Scopus	almost duplicate of #11	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	
6	Self-overlapping maze and map design for asymmetric collaboration in room-scale virtual reality for public spaces	https://link.springer.com/chapter/10.1007/978-3-319-73062-2_19	Seinugo, S. and Skantarova, D. and Evers, N. and Kraus, M.	2018	Scopus		User Study							Quantitive	Qualitative			Mixed Informal study in Exp.1 (excluding Experiment 2)	"In total, 18 participants between the age of 20 and 34 were tested in pairs." In Exp.1 (excluding Experiment 2)	Not reported	Custom		roles	HMD vs non-HMD	HMD and non-HMD related questions	"Exp1: HMD HQ1: To what extent did the maze allow you to freely walk in the VR environment? HQ2: I get motion sick during the experience HQ3: To what extent did the help from the person without the HMD help you progress in the maze? HQ4: To what extent did you use the guidance of the other participant without the HMD? Non-HMD NQ1: How representative was the movement of the HMD participant on the NQ2: To what degree did the sudden speeding up of the HMD participant's movements on the map affect your guidance and communication? NQ3: To what extent did the map involve you in the VR experience? NQ4: To what extent did the map facilitate collaboration between you and the HMD participant?	
7	Facilitating asymmetric collaborative navigation in room-scale virtual reality for public spaces	https://link.springer.com/chapter/10.1007/978-3-319-73062-2_7	Seinubgo, S. and Skantarova, D. and Evers, N. and Kraus, M.	2018	Scopus		User Study							Quantitive			between		"At a public library, the experiment was run for three days, with the conditions MIR, MAR, and COMB assigned on different days. 20 participants tried the MIR condition, where one was female and 19 were male with their ages esti- mated between 18 and 28 years (M = 16.55, SD = 4.6). The MAP condition was tried by 23 participants, three female and 20 male, whose estimated ages were between 4 and 40 years (M = 16.09, SD = 11.07). Lastly, 28 participants tried the COMB condition, of which 13 were female and 15 male, and their estimated ages were between 7 and 34 years (M = 15.07, SD = 7.44)."	Duration of play through not reported	Custom		Display to spectators / nonHMD participants	Mirrored HMD view / map view / combined mirrored & map view	Collaboration: utterances per role & two way communication engagement: playthroughs per participant, number and involvement of spectators	Observations	
8	Resolving spatial variation and allowing spectator participation in multiplayer VR	https://dl.acm.org/doi/abs/10.1145/2968219.2968278	Sra, M. and Schmandt, C. and Maes, P. and Caetano, A.F. and Calvo, A. and Hilton, E. and Schmandt, C.	2016	Scopus			"preliminary deployment"						–	–	–	–	"A total of 27 participants tried our system, both as the shooter and target, for a duration of about 6 minutes each."	"A total of 27 participants tried our system, both as the shooter and target, for a duration of about 6 minutes each."	Custom		–	–	–	–	
9	ShareVR: Enabling co-located experiences for virtual reality between HMD and Non-HMD users	https://dl.acm.org/doi/abs/10.1145/3025453.3025683	Gugenheimer, J. and Stemasov, E. and Frommel, J. and Rukzio, E.	2017	Scopus		User Study							Quantitive			between		Nu-16	1.5 hours	Custom		(System sHMDs Experience)	we selected System (ShareVR, Baseline), HMD (HMD, Non-HMD), and Experience (Low-Fright, Body-Sensor).	"Enjoyment arousal valence presence social interaction social engagement"	"GEQ (post-game module -> enjoyment, social interaction-> behavioural involvement) SAM Presence (SUS) 3 custom likert (enjoyment, presence, social engagement)"	
10	Aetsire: A collaborative mixed reality dance game for collocated players	https://dl.acm.org/doi/abs/10.1145/3311350.3348324	Zhou, Z. and Segura, E.M. and Duval, J. and John, M. and Isbister, K.	2019	Scopus		User Study							Quantitive	Qualitative			Mixed (within for games, between for role)	The study was composed of 15 participants, 8 women and 7 men, all between the ages of 24–30. Participants were from the northern California area. All participants had little to no experience with VR. They were separated into 5 groups with 3 people each: 1 VRin, 1 VRout, and 1 spectator. Roles were determined by the moderator, avoiding situations where friends were split between the setup as VRin and VRout. Since Audiosteld was a single-player game, we had 2 spectators. Each group was given the same description about the IOS scale and the SAM survey.	1 Custom game	Custom	2 Commercial games (AudioShield and Keep Talking Then Nobody Explodes)	Game and roles	Aetsire (custom), AudioShield, and Keep Talking Then Nobody Explodes VR in, VR out, and spectator	excitement, happiness, social engagement	Inclusion of the other in the self, SAM, interviews, video, observations, ...	
11	CatEscape: An asymmetrical multiplatform game connecting virtual, augmented and physical world	https://dl.acm.org/doi/abs/10.1145/3139131.3139162	Li, J. and Deng, H. and Michalatos, P.	2017	Scopus	refer to #5 (almost duplicate thereof)																					
12	SatisfAr: A novel collaboration interface using GVS	https://dl.acm.org/doi/abs/10.1145/3139131.3141214	Sra, M. and Xu, X. and Maes, P.	2017	Scopus		"Pilot study"							–	–	within Each participant experienced two sessions, one as VP and one as NVP.			We invited 6 participants (3 females) with an average age of 28.5 (SD = 3.5) to our pilot study using an HTC Vive headset and a Windows PC.		Custom		HMD vs Pc	2	–	–	
13	A Demonstration of ShareVR: Co-Located Experiences for Virtual Reality between HMD and Non-HMD Users	https://dl.acm.org/doi/abs/10.1145/3027063.3049605?casa_token=1dWYuuuuAAAA:0ZbwBJ7ouyvRhpd_Rukzio/publication/319888246_Demo%20ShareVR/links/5a0e0f0e0f7e9b97fd0e1ed6/Demo-ShareVR.pdf Video: https://www.youtube.com/watch?v=4ZXMU1jN5Vw	Gugenheimer, J. and Stemasov, E. and Frommel, J. and Rukzio, E.	2018	Scopus	refer to #9 (demo paper thereof)																					
14	Neomento sad-or treatment for social anxiety	https://dl.acm.org/doi/abs/10.1145/3267305.3267586	Sbeck, A. and Siegnicka, P. and Kaufaert, J. and Wolbert, T.	2019	Scopus		–	–	–	–	–	–		–	–	–	–	–	–	–	Custom		–	–	–	–	–
15	BirdquestVR: A cross-platform asymmetric communication game	https://dl.acm.org/doi/abs/10.1145/3341215.3356249	Smilovitch, M. and Lachman, R.	2019	Scopus		"early tests"							–	–	–	–	–	–	–	Custom		–	–	–	–	–
16	The influence of social entities in virtual reality games on player experience and immersion	https://dl.acm.org/doi/abs/10.1145/3139131.3139161	Lazin, S. and Emmerich, K. and Masuch, M.	2017	Scopus		User Study							Quantitive			between		"Seventy-five persons (41 females, 34 males), aged 19 to 58 (M = 25.1, SD = 7.27), participated in the study. Subjects were randomly assigned to the five experimental groups. "	Study duration unreported but: "All participants played as long as they wished, which took about 7 - 8 minutes on average. "	Custom		"the type of accompanying social entity as dependent variable"	", resulting in five groups: (i) Single-player (ii) Non-interactivegaest (iii) Interactivegaest (iv) Non-interactivsco-player (v) Interactivsco-player	presence, involvement, experienced realism empathy, negative feelings, and be-havioral involvement relatedness Cooperative social presence Simulator sickness Loneliness in virtual environment	IPQ SPQQ PENS CSP SSQ "an adopted version of the UCLA Loneliness Scale"	
17	Telesight: Enabling asymmetric collaboration in VR between HMD user and Non-HMD users	https://dl.acm.org/doi/abs/10.1145/3359997.3365693	Kovalcsek, T. and Yamamoto, G. and Sugiura, M. and Paelis, R. and Mirsamizaeva, K.	2019	Scopus			"preliminary evaluation with authors and demonstrations to visitors in several exhibitions"	–	–	–	–		–	–	–	–	–	–	–	Custom		–	–	–	–	–
18	FaceDisplay: Towards asymmetric multi-user interaction for nomadic virtual reality	https://dl.acm.org/doi/abs/10.1145/3173574.3173652	Gugenheimer, J. and Stemasov, E. and Sareen, H. and Rukzio, E.	2018	Scopus		User Study							Quantitive	Qualitative	Within			"We recruited 16 participants (4 female) in pairs so they would be comfortable playing with each other. The average age was 27.94 years (SD=3.94). Participants reported an average experience with VR devices of 17.6 months (range: 1 to 48) on a 5 point scale and tested in VR technology of 6.3 (SD=0.7) on a 7-point Likert scale.	"The study took on average 1h"	Custom		"The quantitative part of the study was conducted using a repeated measures factorial design with 2 independent variables Role (HMD User, Non-HMD User) and Experience (SpaceFace, Conductor)."	"The quantitative part of the study was conducted using a repeated measures factorial design with 2 independent variables Role (HMD User, Non-HMD User) and Experience (SpaceFace, Conductor)."	Enjoyment Affective state Presence Social interaction Player behaviour	GEQ SAM SUS GEQ-SP module Video recordings & observations	
19	Walkable Self-Overlapping Virtual Reality Maze and Map Visualization Demo: Public Virtual Reality Setup for Asymmetric Collaboration	https://dl.acm.org/doi/abs/10.1145/3139131.3141224	Seinubgo, Sule and Skantarova, Denisa and Evers, Nicolaj and Kraus, Martin	2017	ACM			"The maze design and its usability was tested on users in a public library."						–	–	–	–	–	–	–	Custom		–	–	–	–	–
Added via Snowball Approach																											
20	Maze Commander: A Collaborative Asynchronous Game Using the Oculus Rift & the Sifteo Cubes	https://dl.acm.org/doi/abs/10.1145/2658537.2658693	Pejman Sajjadi, Edgar Omar Cabrera Gutierrez, Sandra Trullemans, and Olga De Troyer	2014	ACM		User Study							Quantitive	Qualitative study	Within			We had sixteen participants aged between 19 and 36 years, with an average of 23.82 years. Twelve participants were male and four female. Furthermore, three users did not have any game experience while seven mentioned that they were intermediate frequent players and six participants had an advanced level of game experience. Finally, two out of the sixteen participants were colorblind.		Custom						GEQ — IGQ, GQ, SQ [Kort et al]	
21	FaceDisplay: Enabling Multi-User	https://dl.acm.org/doi/abs/10.1145/3132787.3132804	Gugenheimer, J., Stemasov, E., Sareen, H., & Rukzio, E.	2017	ACM			using it with colleagues in our lab						–	–	–	–	–	–	–	Half-Custom Fruit Ninja clone		–	–	–	–	–
22	Designing Shared Virtual Reality g	https://hal.inria.fr/hal-01346851/document	Stefan Liszio, Maic Masuch	2016	Scopus			"Playtest sessions were character- ized by vivid game-related communication and deeply focused, engaged play. We assume that the players experienced high levels of immersion and social presence and an overall positive shared VRGK."						–	–	–	–	–	–	–	Custom		–	–	–	–	–
23	SpielRaum: Perspectives for Co	https://dl.acm.org/doi/abs/10.1145/2793107.2810293?casa_token=_MvWOqdRz-sAAAAA:QEfkvB1Y2tY4Tmu4uAuqMGa2f01Y3Gdc7Dv1SvF5aTqqQbJ0ZmDHDYLWnRbwPw	Michael Schmitz Mert Akbal Soenke Zehle	2015	ACM		"exhibition"												Both games: During an exhibition (the annual art show conducted by Academy of Fine Arts Saar, a major cultural event attracting a very diverse audience), over 300 people played the game, in teams with differing numbers up to 10 people.		Custom		–	–	–	–	–
24	Haptic Turk: A MotionPlatform Based on People	https://dl.acm.org/doi/abs/10.1145/2556288.2556961	Lung-Pan Cheng, Patrick Lühne, Pedro Lopes, Christoph Sterz, and Patrick Baudisch.	2014	ACM	See								(Predominantly) Quant		Within			"We recruited 14 participants (4 females) from our universi- ty. Their age ranged from 20 to 28 years (mean 23.6). BMI from 19-25 (mean 22.2). We recruited participants in groups of 2-4, i.e., participants were familiar with some of their actuators/co-actuators, but never all of them."	"Running a group of 2-4 partici- pants took 10 to 15 minutes."	Custom		Player role	HMD player vs. Actuator	enjoyment in general, enjoyment of specific obstacles / movements	Custom items, not clearly described	Actuators not described as players, but there is an incentive to help the main player, they have a goal and a physical challenge, they enjoyed it - can be counted as a playful / gameful experience: "A haptic turk experience may incentivize actuators to par- form their best by measuring and scoring how well they match their motion with the player's in terms of timing, position, and force— using the inertial measurement unit (IMU) in their mobile device. However, we obtain a better player experience by scoring actuators as a group, as this encour- ages actuators to synchronize during cooperative moves. Many of the participants in our user study stated that they simply enjoyed supporting the player, suggesting that the act of providing an experience to the player provides all the necessary incentive."
25	UbiBeam++: Augmenting Interactive Projection with Head-Mounted Displays	https://dl.acm.org/doi/abs/10.1145/3025453.3025723?casa_token=RZ1QE-hqAAAAA:5Jp9xTEvqAMWEhUkWzJ_Ze3Ro1Ai2HB_Ze3Ro1Ai2HB_Ze3Ro1Ai2HB