

Relationship between Social Response to Virtual Avatar and Symptom Severity of Patients with Schizophrenia

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Schizophrenia

- One of the most devastating disorders in psychiatry, as it seriously affects higher mental functions, such as thinking, feeling, and perceiving
 - Life time prevalence rate : 0.2% - 1%
 - Annual incidence : 0.14-0.7 %
 - 16% in the mental disorders
 - 50% in the inpatients
 - suicide : over 10%
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Symptoms of Schizophrenia

Positive symptoms

Positive symptoms are those that appear to reflect an excess or distortion of normal functions

Delusion

Excitement

Conceptual disorganization

Grandiosity

Hallucinatory behavior

Suspiciousness

Hostility

Negative symptoms

Negative symptoms are those that appear to reflect a diminution or loss of normal functions

Blunted affect

Difficulty in abstract thinking

Emotional Withdrawal

**Lack of spontaneity and
flow of conversation**

Poor rapport

Stereotyped thinking

Passive/apathetic social withdrawal

Social function and schizophrenia

- ❑ The schizophrenic individual's poor social functioning is associated with the presence of negative symptoms (Hamilton et al, 1989)
 - ❑ Nonverbal behaviors that are part of a negative symptom profile are important for social communication (Ekman and Friesen, 1975)
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Social Skill Training in schizophrenia

- ❑ Teaching schizophrenics how to handle interpersonal situations
 - ❑ Learning to improve social skills through a combination of role-playing, modeling & positive reinforcement
 - ❑ Four traditional approaches
 - Operant conditioning: reinforcement, punishment, shaping
 - Coaching: verbal instruction, guided rehearsal
 - Social learning: modeling, role-playing, reinforcement
 - Cognitive behavioral approach
 - ❑ Programs typically focus on skill acquisition, enhancing skill performance, reducing interfering behaviors and generalizing skills across environments (Gresham, 1998)
 - ❑ Assumption: problems are the result of knowledge deficit and can be taught
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Social Behavior

□ Interpersonal space

- The personal space is important role in social interactions, providing a 'security zone', that, when intruded, initiates a perception of threat for psychological or biological integrity of the individual

□ Flow of conversation

- makes few attempts to initiate the conversation.
 - maintain the conversation.
 - responds smoothly to pauses in the conversation
 - shows genuine interesting the partner
 - follows up on the partner's remarks with warmth or enthusiasm.
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Social Behavior & Schizophrenia

□ Interpersonal space

- Chronic schizophrenic patients establish a larger interpersonal distance from surroundings (Duke & Mullens, 1973)
 - Schizophrenic's demand for greater interpersonal space is specific to nonaroused facial affect expressions (happy, sad, neutral), (Pratima Stivastava, 1990)
 - The negative syndrome of schizophrenia attenuates the difference between interpersonal distances from generally close and distant persons, (Yakov Nechamkin, 2003)
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Virtual Reality and Human Behavior

- VR: providing a realistic 3D world generated by computer graphics, with which the user can interact (navigate within and manage the virtual world)

 - Recent improvements in graphic and animation technology have made it possible for the avatars used in these visual images to appear increasingly human-like.
 - A virtual environment with avatar could be a powerful tool to investigate human behavior (Blascovich, 2002).
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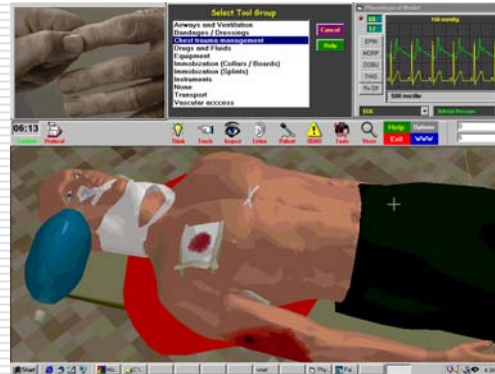
Applications of VR : training social skills

A. Rutten et. al. Social skills training for ASD patients



RTI international

Training System using VR

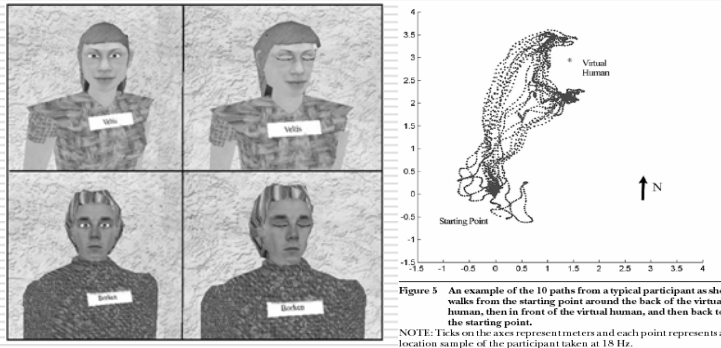


Young girl with mother

Applications of VR : Social behavior

Jeremy N. Bailenson, et. al

Interpersonal distance to a avatar

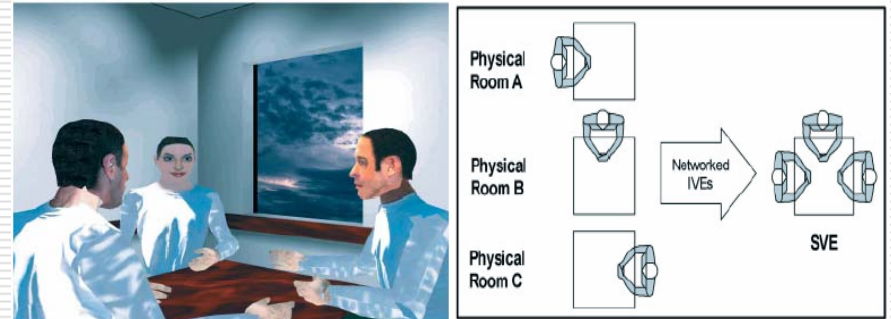


Swinth, K. R., & Blascovich, J.

Risk taking and conformity



Gaze and task performance



Laura K. James, et. al

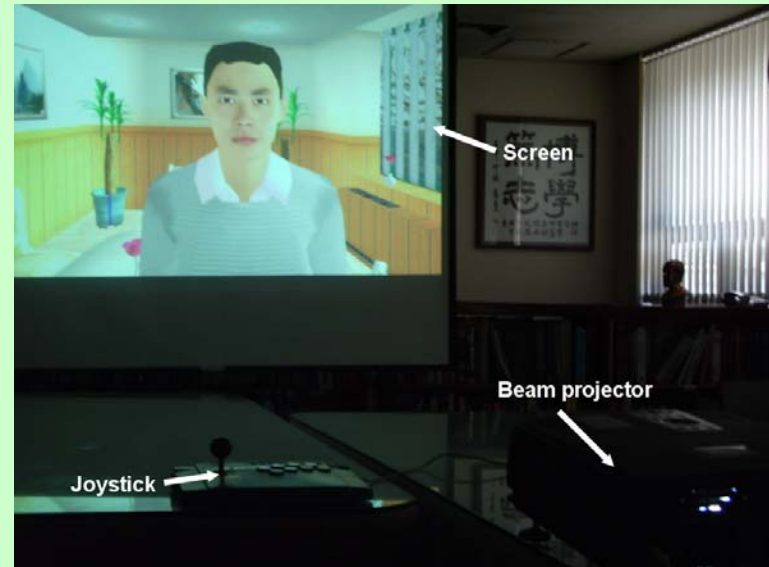
Social Anxiety



Objectives

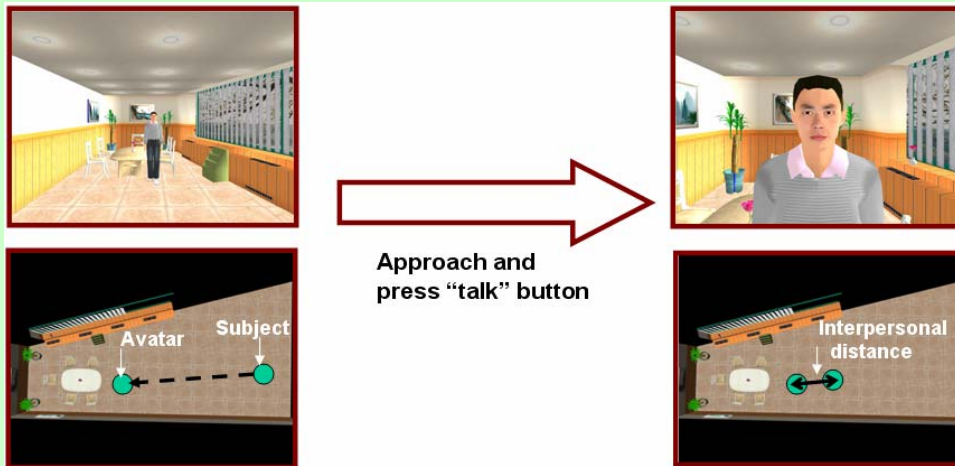
- ❑ to develop a method for assessing the interpersonal behavioral characteristics of patients with schizophrenia using VR technology.
 - ❑ to investigate how schizophrenic patients perceive and react to a virtual avatar.
 - ❑ to investigate how interpersonal behavior of patients with schizophrenia toward a virtual avatar varied with their symptom severity
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VR system



Scene of an experiment. A subject is sitting on a chair, a screen located in front of the subject and the subject controls a joystick to move and respond.

Virtual Avatar & Task



Script for a short conversation

Subject : Hello ?

Avatar : Hello. Nice to meet you. What is your name?

Subject : My name is XXX. What is your name?

Avatar : My name is OOO. How old are you?

Subject : I'm 28 years old. How about you?

Avatar : I'm 29 years old.



1 To approach a virtual avatar standing.

2 In order to initiate the conversation, the subject had to press the "talk" button then say "hello".

3 After initiation, the avatar and the subject exchanged questions and answers.

Demonstration



Measurements

☐ **Interpersonal Distance**

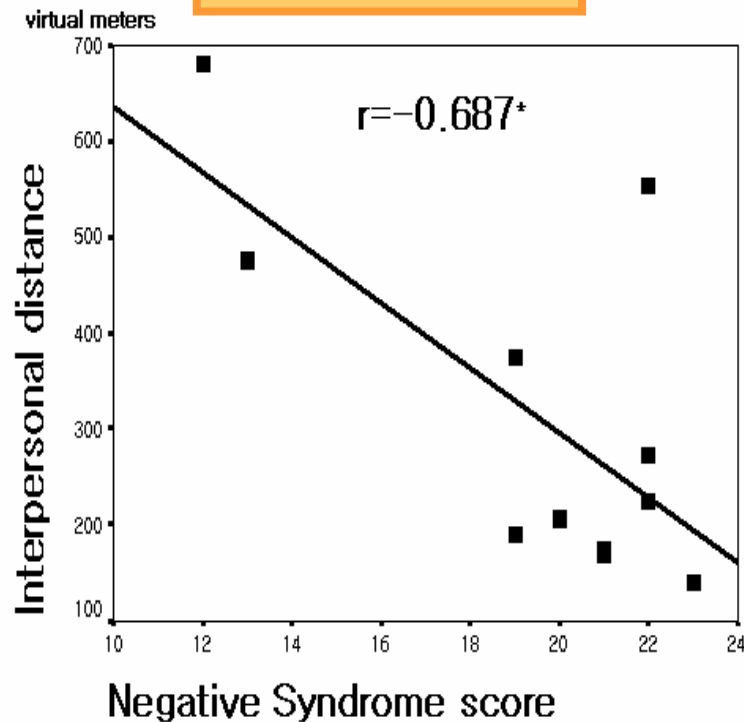
- **A virtual distance between a subject and the avatar at the moment that the subject approached and pressed the “talk” button to initiate a conversation**

☐ **Verbal Response Time**

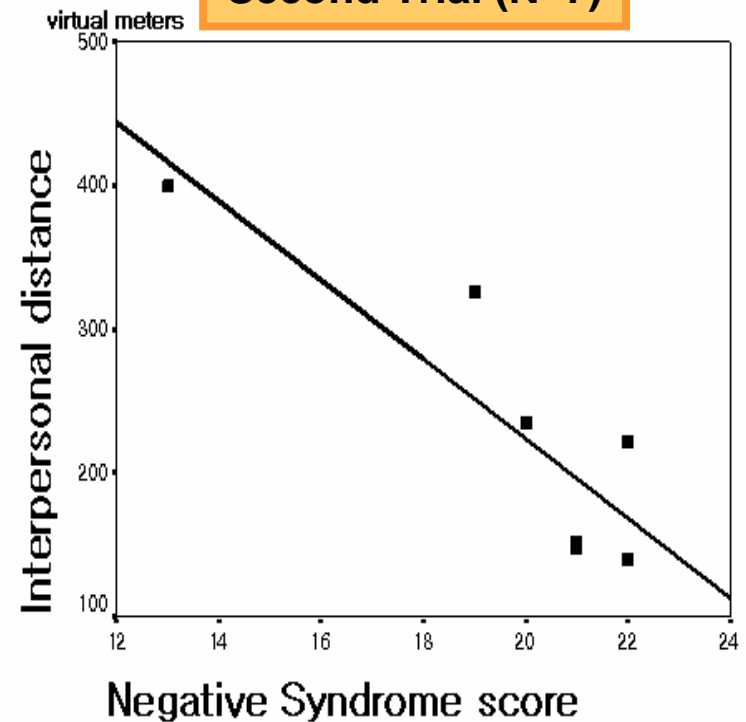
- **The time elapsed following the moment that the avatar asked the subject a question until the point that the subject commenced the answer.**
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Interpersonal distance & Negative symptom severity

First Trial (N=11)



Second Trial (N=7)



Verbal response time& Negative symptom severity

	First experience (n=11)		Second experience (n=7)	
	r value	p	r value	p
N1: Blunted affect	.638*	.035	.726	.065
N2: Emotional withdrawal	.404	.218	.585	.168
N3: Poor rapport	.615*	.044	.592	.162
N4: Passive/apathetic social withdrawal	.078	.820	-.340	.456
N5: Difficulty in abstract thinking	.400	.222	.380	.401
N6: Lack of spontaneity & flow of conversation	-.090	.792	.056	.905
N7: Stereotyped thinking	-.109	.749	.381	.398

Conclusion

- ❑ Patients' behavioral characteristics to a virtual avatar vary in accordance with their negative symptoms, and these characteristics are the same as those to a result from a study with real person (Nechamkin, 2003)
 - ❑ Applying a VR technique to the schizophrenic patients is possible, and an avatar in a VE could be used for interacting with patients with schizophrenia.
 - ❑ And, a virtual avatar is a reliable tool for measuring social function of patients with mental illness
 - ❑ It may provide the method and rationale for applying VR techniques to training or assessing the behavioral and/or cognitive characteristics of patients with schizophrenia.
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