

## DIFFERENCES IN THE SIZE OF PERSONAL SPACE BETWEEN PERSONS WITH ANXIOUS AND PERSONS WITH PSYCHOTIC DISORDERS

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### SUMMARY

**Background:** Personal space is the area individuals maintain around themselves into which others cannot intrude without arousing discomfort. The purpose of this study was to establish whether patients with anxiety disorder and patients with psychotic disorder differ in personal space preferences according to experimenter sex.

**Subjects and methods:** 82 patients who met the ICD- criteria for psychotic and anxiety disorder participated in the study. Personal space was assessed using stop-distance method in which all subjects were approached by female and male experimenter from four directions.

**Results:** Personal space zone was significantly larger in the patients with anxiety disorder than in the patients with psychotic disorder.

**Conclusion:** The results of this research can be seen as possible tendencies, rather than firm indications; it is necessary to make a further research, on a larger sample, of different aspects of psychotic and anxiety patients' personal spaces in a quest for the significances in their behavior in space.

**Key words:** personal space - psychotic disorder - anxiety disorder - stop-distance method

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### INTRODUCTION

Personal space is defined as an area surrounding an individual, regarded and valued as private, inaccessible to the others without causing some sort of discomfort (Sommer 1969, Hayduk 1983). The concept of personal space has been developed in the 1950s - when the most relevant experimental study, based on the use of space of animals within the framework of individual distance, was conducted. It has been demonstrated that the distance depends on the age of animals, their body size, sex and a number of other factors (Hediger 1950, Tinbergen 1953, Hall 1966).

Some authors prefer to use the term interpersonal distance, due to the fact that this expression clearly indicates that the interaction between individuals is involved (Aiello 1987, Bell et al. 2001). Previous attempts to determine the function of personal space have resulted in emergence of many of theoretical models. In reference to the model of communication, personal space is defined as a form of nonverbal communication which describes the boundaries of intimacy between people (Hall 1966, Porteous 1977). Models of intense arousal and stress overload highlight that excessive proximity to other people causes the increase of activation levels in the organism. The individual maintains a certain distance while interacting with another person, given that it is the only way to protect itself from the overload s/he might feel due to the exposure to numerous social and physical stimuli

(Scott 1993). The model of intimacy and balance is used to interpret any interpersonal relations with an optimal level of intimacy within space that people want to maintain (Argyle & Dean 1965, Patterson 1977, Cappella 1981). It is the mechanism used to achieve desired levels of privacy in relation to other people by establishing personal boundaries (Altman 1975, Vinsel et al. 1980). Lack of ability to set such boundaries may result in unpleasant emotions and negative assessment of a person who is unable to establish or maintain those limits. Moreover, consistent with the theory of social learning, children gradually acquire the notion of appropriate distance in order to maintain contact; the learning process takes place simultaneously with the acquiring of other social skills. In time, children show greater sensitivity to the infringement of personal space and are more attentive to the limits of personal space of other people (Duke & Novicky 1972, Sommer 2004). From the neuropsychological perspective, amygdala, which processes negative emotions like anger and fear, has a central role in respecting the boundaries of personal space. The experiment, which used the top-distance method, showed that bilateral injure of amygdala can cause the inability to recognize one's own and others' margins of personal space (Kennedy et al. 2009).

Previous studies on the use of personal space call attention to a variety of factors that may affect the need for a certain degree of personal space in both mentally stable and unstable people. Inter alia, these are: age

(Lomranz et al. 1975, Hayduk 1985), sex (Aiello et al. 1979, Argle 1992, Gifford 1996, Aziraj 2005), personal traits (Williams 1971, Pedersen 1973), culture (Feldman & Saletsky 1986, Neill 1991, Aiello 1987) and the nature of the relationship between the people who are interacting (Allegier & Byrne 1973). In addition, there are environmental factors such as size of the room (Evan et al. 1996), width and brightness of the room (Cochran et al. 1984) and other “indoors or outdoors” factor (Cochran 1984). The need for greater personal space is clearly demonstrated with physically abused children (Vranić 2003).

Studies on the effects of psychological status and the size of personal space suggest that psychiatric patients with psychotic disorders have greater need for personal space (Horowitz et al. 1964). This is substantiated by the fact that personal space of people with schizophrenia is significantly higher than with mentally healthy people (Sommer 1959, Ziller et al. 1964, Ziller & Grossman 1967, Holahan 1982, Duke & Mullens 1973, Srivastava & Mandal 1990, Deuš & Jokić-Begić 2006). Also, there is a significantly higher variability of personal space in this population than in mentally healthy people (Blumenthal & Meltzoff 1967). A study, examining personal space in virtual environments, has shown that people with schizophrenia have greater personal space and larger angles compared with the normal population (Sung-Hyouk 2009). What's more, it was found that the boundaries of their personal space are reducing with the functional declining of the nuisance, based on which they had been admitted to hospital care (Horowitz 1964).

Their need for greater personal space is associated with negative symptoms of schizophrenia (Nechamkin et al. 2003). Specifically, the presence of negative symptoms has a significant impact on the distance, but also on the orientation on the behavior within certain interactive situations (Sung-Hyouk 2009). The researchers elucidate that individuals with schizophrenia have a greater need for personal space because otherwise they feel uncomfortable in close interpersonal situations (Bellack et al. 1997). The difference in size of personal space between people with paranoid type of schizophrenia and people with residual type of schizophrenia has not been proven significant (Deuš & Jokić-Begić 2006). Greater personal space with people suffering from psychotic disorders may be a result of cognitive deficits (Braff et al. 1992). Men with schizophrenia encompass more difficulties in expressing appropriate responses to various social situations than women with schizophrenia, which suggests the existence of differences in social functioning with reference to sex (Nisenson & Berenbaum 1998, Hafner 2003). Nonetheless, there were no significant differences in the size of personal space with reference to the sex of the people (experimenters) they were approached by (Aziraj 2011). Also, a number studies point toward the need for a greater personal space with people who had experienced anxiety disorders (Patterson 1977,

Brody & Walker 1978, Gifford 1996). There was a high correlation found between the size of personal space and anxiety (as a personality trait) (Fromme & Schmidt 1972, Patterson 1973, Greenberg et al. 1977, Aziraj 2005). Two experimental studies have confirmed a need for significantly greater personal space in the anxiety-induced situations (Brady & Walker 1978). If one threatens the boundaries of personal space of individuals, it might result in feelings of anxiety and discomfort (Patterson et al. 1971). People with post-traumatic stress disorder (PTSD) have a greater personal space (Brown & Yantis 1996). Given that PTSD is often associated with social anxiety (Crowson et al. 1998, Hofmann et al. 2003, Orsillo et al. 1996), it is reasonable to assume that these people with have considerable trouble in interacting with their environment (Cook et al. 2004, Ruscio et al. 2002).

The concept of personal space invasion anxiety level (PSIAL) refers to the degree of anxiety generated from invasion of someone's personal space (Nassiri et al. 2004). The existence of this phenomenon supports the hypothesis of the protective function of personal space (Hall 1969). There has not been a study which observed differences in the size of personal space between people with psychotic and people with anxiety disorders.

Our research departs from alternative hypothesis which states that people with anxiety disorders will differ in the size of personal space than people with psychotic disorders. We have approached the study of differences in personal space between these two sample groups with reference to sex of the study subjects (participants) of the research and the sex of experimenters who induce the personal space of study subjects. Limitations of previous studies in this field are mainly related to the use of methods which did not involve provoking of personal space on the basis of interaction in real life situation, but only the displayed photographs (Srivastava & Mandal 1990, Nechamkin 2003), and virtual reality (Sung-Hyouk et al. 2009).

Starting presumption of this particular research was the real interaction between two people is the best measure of spatial behavior (Bell et al. 2001). It is expected that the results of this study contribute to answering dilemmas on socio-emotional sphere of people who are suffering from above named disorders and create new approaches of the treatment. In other words, the basic idea is to find an alternative way of helping and assisting people with these disorders to function better, not only within the hospital, but also after leaving it.

## SUBJECTS AND METHODS

### Participants

The research sample consisted of 82 participants who had been diagnosed with mental disorder and hospitalized at the Department of Neuropsychiatry. All

participants met the diagnostic criteria of mental disorders according to ICD - 10 classification system. Diagnosis for each patient was based on psychiatric interviews conducted by attending psychiatrist who had them previously admitted to the hospital.

Out of 82 participants, 29 (%) of them were hospitalized for the first time, while 52 (%) of participants were subjects of re-hospitalization. They were treated exclusively with pharmacotherapy (they had never previously participated in the psychotherapeutic process). Patients took part in the experiment the day before they were discharged from the hospital; after the satisfactory point of the disease remission has been reached. The entire sample was divided into two subsamples. The first subsample encompassed the patients who were suffering from psychotic disorder (N=36); their diagnoses were categorized under code F-20 - F-29. The second subsample encompassed patients suffering from anxiety disorders (N=46) and their diagnoses were categorized under code F-40 - F48.

The diagnostic structure of the subsample with patients suffering from psychotic disorders reflects the following ratio: most of the patients suffered with schizophrenia (N=31), followed by schizoaffective psychosis (N=4) and finally with delusional disorder (N=1). The diagnosis structure within subsamples of participants with anxiety disorders shows that the most patients suffer with post-traumatic stress disorder (N=42), followed by generalized anxiety disorder (N=1) and finally obsessive-compulsive disorder (N=3).

Criteria for inclusion of the patients in the study were: age limit (21-60), residency in Bosnia and Herzegovina, medical records which did not confirm either the presence of one or more psychopathological disorders (chronic organic brain syndrome, substance abuse and alcohol and other comorbidity), absence of low mental ability or other mental deterioration.

## Measures

The following equipment and instruments were used in the study: medical records of participants, tape measure (length 3 m), scotch tape (length 5 cm) marked with centimeters and the protocol log used to enter the measured lengths.

## Procedure

The data were collected as part of research on masters' thesis conducted by first author, in the time period between January 2009 and December 2010. The trial was conducted in two parts for each participant. In the first part, essential socio-demographic data were collected by examining both patient's medical records and the information on the diagnosis of mental illness. In the second part, a "stop - distance" method was applied as the measure of the size of personal space (Dosey & Meisels 1969).

Internal consistency in this study (for the whole sample) was  $\alpha=0.78$ . The data collection was carried in an empty, spacious room (dimensions length 7 m, width 5 m) during the daylight. Two adhesive strips (5 cm in width) were glued to the floor, each at the right angle. The line, which marked dashes in every 5 cm of distance in length, was drawn in middle of the tape. The intersection of the tapes was the point where the participant should have been standing at the commencement of measurements of distances between from the participant and assistant experimenter who was approaching him/her.

Participants were entering the experiment room one at a time. They were given instructions to stop at the intersection of two strips so that their feet would be positioned in the middle of the horizontal line. They were told that they will be approached by one, anonymous, female person and then by another, again anonymous, male person by the side of four different directions - from the front, back, left and right. Subsequently they were told that their task is to say "stop" at the moment they felt that the distance between them and the approaching person was making them feel uncomfortable.

They were explained that there was no "right" or "wrong" answer to this; because all people have different perceptions of distance from another person which triggers their sense and makes them feel uncomfortable. After assuring that the participants were properly standing on the line, the lead experimenter gave a sign to assistant experimenters to commence the implementation of the experiment. Assistant experimenters were previously trained to implement this study on a considerable sample of study subjects. During the provocation of personal space (assuming that awareness of personal space exists only in the case of interaction with another person), the assistant experimenters have maintained a neutral facial expression, did not smile or speak, and did not look participants in the eyes, but at their collar.

The participants in the experiment were approached in small steps, slowly, approximately one step per second. The order of approximation to participants by assistant experimenters was rotated, so that the first half of the participants was approached by the female, and second by male experimenters. The order of the direction from which the experimenters were approaching was also rotated.

When the participant would stop the approaching assistant experimenter, the lead experimenter would measure the distance between the intersections of lines and a half feet of experimenter who was stopped up. The measured length was then written down in the protocol.

The data on the distance between each participant and assistant experimenters, approaching alternately from four different directions (from the front, back, left

and right) were entered in data set. These data were expressed in m<sup>2</sup>, thus allowing the calculation of the size of personal space. The size of personal space was operationalized as the sum of areas of the four rectangular triangles, whose sides were the measured distances.

Experimental control of relevant factors, which could potentially influence the dependent variable, were partly related to the situational factors, which were sought to control the objective factors of the environment, and partly to serial factors, due to which the rotation was carried out.

Stabilization of inter-individual relevant factors was aiming to achieve homogenization of participants in connection with the characteristics that are relevant to the study (age, gender, cultural background). Lead experimenter and supporting experimenters were not familiar with the main aim of the research or informed about the status of the participants with regard to psychiatric diagnosis in order to minimize their potential impact on research results.

## RESULTS

Analysis of the results was carried out with the use of SPSS for Windows, version 12.0.

The reliability coefficient of the measure on size of personal space was  $\alpha=0.81$  (Ickinger 1882, according to Ickinger & Morris 2001). Internal consistency in this study (for the whole sample) was  $\alpha=0.78$ .

The average age of participants was the 37.55 years (standard deviation was 7.96), education ranged from 8 to 16 years. The variable “size of personal space” was divided in two variables: personal space measured when the participant was approached by the male assistant

experimenter (PSM) and personal space measured when the participant approached the female assistant experimenter (PSW).

All the measured distances were within the limits of inter-personal distance (40-150 cm), according to Hall (1969). Their mean averages were mostly ranging between 40 and 95 cm for female participants within each group, while the mean averages for male participants ranged between 40 and 113 cm for both groups. The results are displayed in Table 1 and Table 2.

We used the nonparametric Mann-Whitney U test of independent sample in examining whether there is a statistically significant difference in the size of personal space between patients with psychotic and patients with anxiety disorders. Cohen's d was used to calculate the effect of the measure. The results are displayed in Table 3.

There is a statistically significant difference in the size of personal space between participants who had been diagnosed with psychotic disorder and the participants diagnosed with an anxiety disorder in the situation when they were approached by male assistant experimenters ( $U=337$ ,  $z=-4588$ ,  $p<0.001$ , Cohen's  $d=0.50$ ). Furthermore, the results show that there is a statistically significant difference in the size of personal space between these two groups of participants when they were approached by female assistant experimenters ( $U=522$ ,  $z=-2859$ ,  $p<0.001$ , Cohen's  $d=0.32$ ). The size of personal space is greater in the group of participants with anxiety disorders (M rank 52.17) than in the group of participants with psychotic disorders (M rank 27.86) when their personal space was provoked by male assistant experimenter. Also, the situation is the identical when the personal space of two groups of participants provoked by female assistant experimenter. The effect size, i.e Cohen's d is 0.50, which stands for a large effect.

**Table 1.** Arithmetic mean (M) and standard deviation (SD) of the distances between female participants and experimenters for all four directions and both male and female sex of experimenter

Personal space		Direction of convergence			
		From left	From right	Forward	Back
PSw					
Anxiety disorder	M	0.61	0.59	0.60	0.95
	SD	0.38	0.25	0.35	0.43
PSm					
Anxiety disorder	M	0.64	0.66	0.69	0.86
	SD	0.21	0.36	0.43	0.49
PSw					
Psychotic disorder	M	0.57	0.45	0.42	0.51
	SD	0.11	0.24	0.31	0.20
PSm					
Psychotic disorder	M	0.59	0.47	0.55	0.52
	SD	0.32	0.20	0.11	0.28

Abbreviations: M= arithmetic mean; SD= standard deviation; PSw Anxiety disorder= the size of personal space, measured in a situation where the assistant female experimenter approached the male participants with anxiety disorder; PSm Anxiety disorder= the size of personal space, measured in a situation where the assistant male experimenter approached the male participants with anxiety disorder; PSw Psychotic disorder= the size of personal space, measured in a situation where the assistant female experimenter approached the male participants with psychotic disorder; PSm Psychotic disorder: the size of personal space, measured in a situation where the assistant male experimenter approached the male participants with psychotic disorder.

**Table 2.** Arithmetic mean and standard deviation of the distances between male participants and experimenters for all four directions and both male and female sex of experimenter

Personal space		Direction of convergence			
		From left	From right	Forward	Back
PSw					
Anxiety disorder	M	0.71	0.68	0.73	0.98
	SD	0.40	0.33	0.28	0.39
PSm					
Anxiety disorder	M	0.69	0.86	0.92	1.13
	SD	0.15	0.22	0.31	0.47
PSw					
Psychotic disorder	M	0.63	0.54	0.49	0.69
	SD	0.32	0.19	0.41	0.32
PSm					
Psychotic disorder	M	0.65	0.50	0.57	0.61
	SD	0.20	0.32	0.18	0.24

Abbreviations: M= arithmetic mean; SD= standard deviation; PSw Anxiety disorder= the size of personal space, measured in a situation where the assistant female experimenter approached the female participants with anxiety disorder; PSm Anxiety disorder= the size of personal space, measured in a situation where the assistant male experimenter approached the female participants with anxiety disorder; PSw Psychotic disorder= the size of personal space, measured in a situation where the assistant female experimenter approached the female participants with psychotic disorder; PSm Psychotic disorder: the size of personal space, measured in a situation where the assistant male experimenter approached the female participants with psychotic disorder.

**Table 3.** The values of Mann-Whitney U test to test for significant difference between subjects with psychotic and anxiety disorders in the size of personal space with regards to approach of the experimenters of both male and female sex

Personal space	Psychiatric diagnosis	N	M of range	Sum of range	Mann-Whitney U test	Z	p	Cohen's d
PSm <sup>1</sup>	Psychotic disorder	36	27.86	1003.00	337.000	-4.588	0.000	0.50
	Anxiety disorder	46	52.17	2402.00				
	Skor		82					
PSw <sup>2</sup>	Psychotic disorder	36	33.00	1188.00	522.000	-2.859	0.004	0.32
	Anxiety disorder	46	48.15	2215.00				
	Skor		82					

Abbreviations: PSm<sup>1</sup> = the size of personal space, measured in a situation where the assistant male experimenter approached the participants; PSw<sup>2</sup> = the size of personal space, measured in a situation where the assistant female experimenter approached the participants.

## DISCUSSION

Starting hypothesis has been empirically confirmed (Table 1). As expected, the results show that people with anxiety and psychotic disorders vary greatly in size of personal space. People with anxiety disorders have larger personal space than people with a psychotic disorder. Since it has been presumed that sex is as very powerful determinant of personal space (Gifford 1996, Aziraj 2005), it is considerable to note that these results are obtained by controlling these factors, as well as other relevant factors. Pursuant to the above, this study has shown that anxiety is a key factor in determining the size of personal space, i.e. the possession of areas the individual knowingly takes when s/he is interacting with other individuals. These results are consistent with results of previous studies in the field (Brody & Walker 1978, Patterson 1977, Gifford 1996, Brown & Yantis 1996). Specifically, anxiety which occurs as a primary symptom of people with obsessive compulsive disorder (Begić 2010) is probably the reason explaining the size of personal space. In addition, we must take into account the fact that the subsample of persons with anxiety disorder was prevalent with persons suffering

from PTSD. It is a specific disorder caused by having extremely traumatic occurrence to which person has failed to adequately integrate in and consequently cannot deal with symptoms such as arousal, intense feeling of evasion which could have affected the size of personal space in this group of participants. We assume that their "functioning alarm" could be alerted to the situation in which they were approached by anonymous persons, one male and one female. We can not exclude the possibility that situation they were put in to interact with a stranger could provoke memories that are related with their trauma. We assume that their sense of insecurity, vulnerability and a low threshold of tolerance for frustration are further enhanced by close contact with other people. In this regard, they have probably developed a very dominant protective function of their personal space, and need for a larger area around their own bodies as a "safety zone" between them and the people who approach them. However, when we observed their general functioning and compared it with the functioning of persons suffering with schizophrenia, (prevailing N in the subsample of persons with psychotic disorder), they seem to be more adaptive in the sense that they can better regulate certain aspects of

themselves and their social behavior. For these reasons, it is possible to be significantly more adaptive to people with schizophrenia in other test situations, but our study has shown less adaptive behavior features related spatial needs. These results suggest the importance of further studies of personal space especially with patients suffering from posttraumatic stress disorder. However, regardless of the fact that many studies show that subjects with psychotic disorders often have an altered perception of reality, perception of inner and outer world, and hence the difficulty in distinguishing themselves and the environment, aggravated by social contact, access to the people as subjects, inadequate response to verbal and nonverbal stimuli (Williams 1974, Argyle 1983), there are different findings that point to the importance of using personal space with them (Srivastava & Mandal 1990, Braff et al. 1992, Nechamkin et al. 2003, Deuš & Jokić-Begić 2006). The stages of disease exacerbation, people with psychotic disorders often have a desire to reduce their contact with others. The boundary between themselves and the environment can be vague and easily permeable, hence the ability to assess potential sources of stress and danger from the environment is also weaker. In these stage, people with schizophrenia may start to feel loss of physical boundaries of the body, and in this situation, it can be compared with the "core of protoplasm with no cell membranes" (Trbović 1985). Then each potential threat to the breach of their bodies for them can mean the direct life-threatening emergency and activation of secondary defense.

Considering that our study has set a need for less personal space people with anxiety disorders would need, it can be assumed that the size of their personal space was subject to the current clinical picture - or a certain state of remission in which they were participating in the study. When it comes to people with anxiety disorders, it is assumed that dominant anxiety had the key role and was associated specific symptoms of PTSD (depending on the diagnostic composition of the subsamples).

However, the results of this study cannot be seen more as a probable tendency, but as a strong indication: on a larger sample, it is necessary to further investigate the different aspects of the personal space of the population in the quest for physical characteristics of these behaviors. Furthermore, this research could be improved by examining the current cognitive status, and current clinical picture disorders (psychological measuring instruments the satisfactory psychometric characteristics) and their possible impact on the size of personal space. This study reveals another outlet to the mysterious complex of psychological principles of people with these disorders, and we believe that it will stimulate new research in this area.

## CONCLUSION

It was found that people diagnosed with anxiety disorder have a greater personal space than people with

a psychotic disorder. Given that people with anxiety disorder are able to better "read" the reality than people with psychotic disorders, we assumed that their spatial behavior would be more adaptive of people with psychotic disorders. However, it was shown that anxiety that dominates the clinical picture of anxiety disorders has negative effects on the spatial behavior of individuals who are less adaptable. By setting the boundaries of personal space at a greater distance, people with anxiety disorders (especially with PTSD) are protected from the vague and potentially threatening situations in the social environment, which actually contributes to the development of impaired social functioning. We assume that the integration of these findings in the psychotherapeutic treatment, through experience-experiential approach to patients with these disorders, actively contributes to understanding and managing the phenomenon as a kind of adjustment mechanism. Mastering this aspect of social skills would contribute to a better remission and time advancing the quality of life of psychiatric patients.

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**Conflict of interest :** None to declare.

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