MARTIJN VAN TEFFELEN

Fear to get near: personal space in individuals with psychopathic traits

Original Paper

Past literature theorized that personal space -a physical boundary in which a person experiences discomfort when another person intrudes it- might depend on personality. This study hypothesized, that higher scores on psychopathic personality measures would lead to a larger personal space in individuals. Furthermore, as personal space is thought to function as an intraspecies aggression regulator, this study also hypothesized that personal space tends to be larger towards dominant individuals, than towards non-dominant individuals, as dominant other might be seen as possibly more aggressive. Results indicate no direct correlation between overall psychopathic traits and personal space. However, a positive correlation is found in the relationship between one particular psychopathic personality trait –Coldheartedness- and personal space. Regarding perceived dominance, it was found that individuals tested in this study kept a larger personal space towards dominant individuals. This effect was found to be independent of score on a psychopathic personality measure.
Keywords: psychopathy, personal space, perceived dominance

Martijn van Teffelen; bachelor student year 3
Maastricht University, Maastricht, the Netherlands

m.vanteffelen@student.maastrichtuniversity.nl

INTRODUCTION

Psychopathy

The psychopathic personality is a concept that was first systematically observed and reported in "The Mask of Sanity" by Hervey Cleckley (1941). Based on this work, Cleckley outlined 16 criteria for the assessment of the psychopathic personality, or psychopathy, such as unreliability, untruthfulness and insincerity, lack of remorse or shame, inadequately motivated antisocial behavior, pathologic egocentricity and incapacity for love (Cleckley, 1941). These criteria served as the basis for the so called Psychopathy Checklist (Hare, 1980), and later the Psychopathy Checklist-Revised (PCL-R) (Hare, 1991), a clinical, observational assessment of psychopathy. The factors 'selfish, callous and remorseless use of others', and 'chronically unstable, antisocial and socially deviant lifestyle' in this measurement were derived through principal components analysis from Cleckley's (1941) original criteria (Hare, 1991). In addition, Blackburn (1975) classified two types of psychopathy using self-reports: primary and secondary psychopathy. Primary psychopaths tend to be extroverted, self-confident and low-anxious, whereas secondary psychopaths are characterized by social anxiety, moodiness, low self-esteem and social withdrawal (Blackburn, 1975; Morrison & Gilbert, 2001).

Furthermore, it should be noted that there are explicit gender differences in the general population, when men and women are measured with the Psychopathy Personality Inventory-Revised (PPI-R), a self-report psychopathy questionnaire. In this, men tend to score significantly higher than women (Lilienfeld & Andrews, 1996).

History of psychopathic measures

In their paper, Lilienfeld and Andrews (1996) outlined two points of criticism on the PCL-R, firstly concerning the absence of items assessing anxiety. Therefore, it differs from Cleckley's (1941) original concept of the psychopathic personality (Blackburn, 1975; Lilienfeld & Andrews, 1996; Morrison & Gilbert, 2001). In addition, the PCL-R is only suited to measure psychopathy in the clinical population, since the PCL-R was developed as a clinical observation scale. This does not do right to the fact that psychopathy was originally outlined by Cleckley (1941) as a personality trait, pleading for a more dimensional approach to the concept. On this account, the Psychopathy Personality Inventory (PPI, 181 items) (Lilienfeld & Andrews, 1996), and later the Psychopathy Personality Inventory-Revised (PPI-R, 154 items) (Lilienfeld & Widows, 2005) self-report measures were developed.

The PPI has two advantages compared to the PCL-R. Firstly, these measures are based on a dimensional approach as psychopathy is seen as a continuous variable. Thus it assumes that an individual can possess psychopathic personality traits to a larger or smaller extent. Secondly, the PPI contains items measuring anxiety. The PPI-R contains the subscales Stress Immunity, Fearlessness, Social Potency (e.g. dominance), Carefree Nonplanfulness (impulsivity), Rebellious Nonconformity, Blame Externalization, Machiavellian Egocentricity (aggressive exploitation) and Coldheartedness (lack of empathic concern). These subscales served to be the

variables of interest that loaded on the following three factors by derivation through principal component analysis: PPI-I, characterized as Fearless Dominance, is loaded on by Fearlessness, Social Influence and Stress Immunity; PPI-II, characterized as Self-Centered Impulsivity, is loaded on by Carefree Nonplanfulness, Rebellious Nonconformity, Blame Externalization and Machiavellian Egocentricity; and The third factor, PPI-III is loaded on by Coldheartedness alone (Lilienfeld & Widows, 2005).

Personal space and aggression

It is assumed that every human being posits a personal space (PS), or a physical boundary in which people experience discomfort when another person intrudes it (Sommer, 1959). This would mean that individuals with a large PS tend to keep larger physical distances between themselves and others, compared to individuals with a small PS. It is proposed that this area functions to reduce intraspecies aggression, as intrusion of this space could lead to aggression (Pfeiffer, 1969). According to that, it has been suggested that personal space invasions of individuals with a larger personal space and a tendency to react with fight rather than flight –a psychophysiological response towards threatening stimuli-, might result into assaultive behavior (Eastwood, 1985). This is supported by clinical observations of psychopathologic individuals. For example, PS is supposedly greater in schizophrenics (Sommer, 1959), but also in violent offenders (Kinzel, 1970; Newman & Pollack, 1973; Wormith, 1984) - both prone to assaultive behavior. In practice this means that these individuals have a reduced tolerance towards individuals who come physically close to them.

A study by Eastwood (1985) contradicts these findings, as it did not find evidence for correlation between PS and violent behavior. However, the study found an interaction-effect between violent behavior, PS and psychoticism – referring to aggressiveness and interpersonal hostility, found in one's personality (Eysenck & Eysenck, 1975). This suggests an individual's PS might not only be dependent on one's violent nature, but also on certain personality traits.

Research on the topic is rather limited. Preliminary studies in prison populations by Kinzel (1970) and Newman and Pollack (1973) did not mention personality, nor it's possible correlation with PS. A study by Wormith (1984) reported mild negative correlations between personal space and empathy, (r = -.37, p < .01), and acceptance of others (r = -.33, p < .05). Wormith concluded from this finding, that violent offenders with a large PS seem to be less empathic and less acceptant to others.

Personal Space and Dominance

Recent studies show renewed interest in studying PS in relation to a specific personality trait, called dominance (Hall, Coats, & LeBeau, 2005), as the amount of research in the preceding years seems limited on search engines such as PsycInfo and PubMed. A meta-analysis by Hall et al. (2005) suggests that PS is negatively correlated to dominance, with correlation coefficients ranging from -.08 to -.22. This suggests that individuals with a high level of dominance tend to have a small PS. Although psychopathic traits in this meta-analysis were not discussed, it seems

to contrast findings seen in psychopathic individuals, who are presumed to be dominant and tend to have a large PS (Kinzel, 1970; Lilienfeld & Widows, 2005; Newman & Pollack, 1973).

However, it is currently unknown in which way an individual`s PS relates to the perceived dominance of others, and how psychopathic traits might have an influence on this. When PS indeed regulates intraspecies aggression, it should then be expected that when a highly dominant individual approaches, one's PS enlarges, as dominant others might be seen as an aggressive threat.

The present study

Past research suggests that a possible interaction-effect might exist between PS, violence, and aggressive personality traits (Eastwood, 1985; Kinzel, 1970; Newman & Pollack, 1973; Wormith, 1984). However, support for this claim is limited up to this date. In addition, observations were made mainly in clinical populations, while more recent research suggests that aggressive personality traits are continuous rather than dichotomous, and should therefore also be present in nonclinical populations. As aggressive personality traits such as psychopathy are presumably of continuous nature, and these traits are possibly linked to personal space, it is reasonable that a relationship might exist between these traits and PS in both clinical and non-clinical populations. The present study therefore hypothesizes that psychopathic personality traits in healthy male adults are positively correlated with their PS. Subsequently, this study hypothesizes that PS is larger in healthy male adults when a dominant male adult approaches, than when a non-dominant, or even submissive male adult approaches.

Table 1: Participant demographics

N	70
Mean age (SD)	29.67 (13.56)
Occupation	
Unemployed	0
Employed	30
Student	39
Retired	1
Highest completed education	
primary school	0
high school	28
college/university	42
Native language	
Dutch	68
German	2

METHODS

Participants

Participants selected for this study were adult men from the non-clinical population (age 18-65), participating for either a monetary reward of €15,-, or course credit if they were students. They were approached either through poster-distribution at Maastricht University, or by receiving a phone call if they had registered themselves in a participant database.

In total, 93 participants participated in the experiment. The first one participated in test trials of the experiment, and was not included in the final analyses. Based on the Chauvenet's Criterion to detect outliers, two other participants were excluded (Chauvenet, 1960). Furthermore, eight participants were excluded from the data, as they did not pass the manipulation check – discussed in the materials section. Another eleven indicated during the manipulation check that they doubted the manipulation at some point during the experiment. For this reason, analyses were carried out without these cases on a total of 70 data sets. Table 1 shows participant demographics.

Materials

Psychopathy Personality Inventory Revised

To assess psychopathic personality traits, the PPI-R (Lilienfeld & Widows, 2005) was used. This self-report questionnaire consists of 187 items, with three underlying factors –Fearless Dominance, Self-Centered Impulsivity, and Coldheartedness. Methodologically, satisfactory internal (PPI-R Total, α = .91; PPI-I, α = .91; PPI-II, α = .89; PPI-III, α = .79), construct (correlates ranging from r = .18-.68 with other psychopathy measures), and external validity has been reported for PPI-R factors (Uzieblo, Verschuere, Van den Bussche, & Crombez, 2010). Additionally, research by Sandler (2007) investigated the test-retest reliability between PPI-R factors and PPI-R total scores. Sandler reported the test-retest reliability for each factor and for PPI-R total score: PPI-total, r = .93; PPI-R I, r = .91; PPI-R II, r = .90 and PPI-R III, r = .76)

Stop-distance method

PS is used as the main outcome measure in this study. To measure participants' PS, we subjected them to the so-called "stop-distance procedure" by Newman and Pollack (1973). This test was derived from the so-called 'body buffer zone- test' by Kinzel (1970), and was originally designed to measure the PS construct in violent offenders, as discussed in the introduction section. The PS can be commonly depicted in an ellipsoid way, representing mean distances of all directions, derived from the following formula (Wormith, 1984):

$$Personal\ space = \frac{\pi\ (F + B + 1)\ (R + L + 1)}{4}$$

In this formula F represents proxemic distance front, B represents proxemic distance behind, R represents proxemic distance right and L represents proxemic distance left. Subsequently the mean distance per direction (frond, behind, left and right), and PS score are calculated, and used as outcome measures. Proxemic distances are defined as the distance between the individual that is being approached, and the approaching other individual.

Job-interest interview

To manipulate perceived dominance, a job-interest interview took place with a dominant confederate, and a non-dominant confederate. The job-interest interview had the following structure for each participant. Participants were asked to pick one of three job preferences: 1) a non-interactive job (i.e. truck driver on long distances, night-time security guard), 2) a supervising job (i.e. head of a department), and 3) a non-supervising social job (i.e. bank employee). Then they were asked to explain why they had chosen this option, and what would make them qualified for this job, or why they would not be qualified. After this, nine hypothetical questions were asked, on what they would do if they were a supervisor/employee, independent of their initial choice -(i.e. "what would you do if you were a supervisor and you had an insecure employee who underestimated his capacities). This interview was developed for this study. To test the hypothesis whether dominance affects personal space, participants were exposed to two male confederates, confederate 1 acting submissive, and confederate 2 acting dominant. Confederate 1 acted submissive by keeping a closed, insecure attitude. He acted as if this was his first time leading a test and that he was insecure of how to act and what to do, talking soft, and literally reading everything from a provided script. Confederate 2 acted dominant by keeping an open, extraverted attitude, overruling confederate 1 during interaction. In interacting with the participant, confederate 2 talked loudly, looked the participant straight in the eyes and pro-actively followed and maintained the conversation (e.g. by often nodding or humming when the participant spoke). Confederate 1 was introduced as student, while confederate 2 was introduced as supervisor. The role of confederate 2 was carried out by three different fluently Dutch speaking adult men. The role of confederate 1 was carried out by one of the fluently actors throughout the experiment.

Procedure

Since testing the hypotheses required both psychopathy assessment and dominance induction, a cover story was needed to avoid socially desired answering. Subjects were told they were participating in a study about personality and job interest. For this purpose, job interest was assessed by conducting a job-interest interview, discussed in the materials section.

Participants were welcomed to the study by confederate 1, and were asked to fill in the Dutch version of the PPI-R on a computer. After this, participants were

guided to an empty room, and PS was measured by confederate 1. The room was marked by a 2x2 square, containing a 30 centimeter grid. In the center of this square, a 10x10 centimeter square was marked, and this is where the participant stood during the test. The participants were explained that they would be approached from four different directions and that they should indicate the point at where they were starting to feel uncomfortable. They were supposed to keep their gaze directed straight forward. The experimenter approached the participant from the outside of the outer square (2 meters) by steps of 15 centimeters with his gaze directed to the ground. As they looked up, they waited three seconds for the participant to signal, and stopped as soon as he or she did. Each direction had two trials, in sequence front, left, behind, right, right, behind, left, front.

After this, participants were guided back to the lab, where they met confederate 2. At this point in time, confederate 2 started an a priori set up conversation with confederate 1, where he told him in a dominant way that the interview had gone wrong (e.g. "How can this still go wrong after testing so many participants?!"). Then confederate 2 proposed to the participants to redo the interview. If they conformed –which all included participants did-, the job interview took place again, only now led by dominant confederate 2. Afterwards, confederate 2 led the participants to the empty room, where their PSs were measured a second time. Finally, a manipulation check was carried out by asking the participants to fill in a response questionnaire.

Manipulation Check

The manipulation check consisted of one item -with three possibilities to answer- assessing whether participants noticed that the experiment was staged (yes/no/doubt), and four items to assess on a visual analogue scale what participants thought of each of the different interviewers 1) "How nice did the submissive/dominant interviewer appear?", 2) How skillful did the submissive/dominant interviewer appear?, 3) "To what extent would you like this interviewer as your boss?", and 4) "To what extent would you like this interviewer as your employee?".

Statistical analyses

Statistical analyses were performed using IBM SPSS 18 statistical software package. As indicated above, two hypotheses were to be tested. The first hypothesis concerned the correlation of psychopathic personality traits with personal space. To this extent, a positive correlation is expected between PPI-R score, or PPI-R factor scores and PS score. Therefore, larger PPI-R and PPI-R factor scores should result in larger PS scores. Two sets of regression analyses were performed using proxemic scores (front, behind, left and right distances and PS score) as outcome measures. The first set was carried out using PPI-R total score as single predictor. The second set used PPI-R factor scores -I,II and III- as predictors. To this extent, variables were initially entered and eliminated backwards.

Hypothesis two was that PS would be larger when approached by a dominant male adult, than when approached by a non-dominant male adult. In both hypotheses, all proxemic scores (front, behind, left, right and PS score) were used as dependent variables. The reason to use other proxemic scores in addition to PS

score as outcome measures was that the PS score proposed by Wormith (1984) is mathematically built up out of each of the separate proxemic distances. As can be seen from the formula, each proxemic distance carries the same mathematical weight. Nevertheless we found it important also to reveal the contribution of each proxemic distance to the overall PS score. It was proposed by Kinzel (1970) for example, that front and behind distance might be influenced by personality traits, whereas left and right distance might not be. The hypothesis that there may be such differences was tested by performing a paired-samples t-test on proxemic score obtained by non-dominant confederate 1 and dominant confederate 2.

Furthermore, to check whether the experiment was confounded, it was checked if proxemic scores were affected by individual differences in confederate 2 actors. To this extent, a one way ANOVA was carried out with proxemic scores (front, behind, left, right distance and PS score) as dependent variable and confederate 2-actor (one, two or three) as independent variable.

RESULTS

Dominant confederates

A one way ANOVA revealed that proxemic scores differed significantly between the different people who acted as confederate 2. Front distance ($F(2,78) = 6.68$, $p = .002$), behind distance ($F(2,78) = 3.66$, $p = .03$) as well as PS score ($F(2,78) = 3.61$, $p = .03$) differed significantly between actors. The scores for left distance ($F(2,78) = 2.35$, $p = .10$) and right distance ($F(2,78) = 2.45$, $p = .10$) were not significantly influenced by the different people who acted as confederate 2. One person that acted as confederate 2 in particular tended to get higher scores than the other two, meaning that he could approach the participants less closely.

In addition, a one way ANOVA was performed with dominant interviewer as independent variable, and score on manipulation check items as dependent variables (see methods section, for questions 1-4 regarding the dominant interviewer). This resulted in non-significant results for each question (Question one: $F(2,88) = 1.50$, $p = .23$; Question two: $F(2,88) = 1.48$, $p = .24$; Question three: $F(2,88) = 1.50$, $p = .23$; Question four: $F(2,88) = 1.53$, $p = .22$), meaning that the different people who acted as confederate 2 had no influence on how the questions were overall answered by the participants.

Since a significant effect of confederate 2-actor on proxemic scores was found, this has to be taken into account in the analyses regarding PS. Consequently, two regression analyses were run. One for the participants that were tested by the actors who did not lead to significant results and one for the participants that were tested by the one who lead to significant results. As a direct result statistical power dropped from .96 at N=81 (analyses including SDC cases), to .86 at N=51 (analyses excluding SDC cases).

Psychopathic traits and Personal Space

The first hypothesis was that PPI-R total score and PPI-R factor scores possibly correlate positively with proxemic scores. Results are reported in table 2. Regression analyses performed excluding the SDC with PPI-R total score as single predictor, yielded a significant result. In this case, behind distance correlated positively with PPI-R total score ($\beta = .30$, $t(49) = 2.19$, $p < .05$) in the dominant condition. This would mean that individuals with larger PPI-R total scores show a larger distance on their backside towards dominant others, when both border cases –those participants that did not believe the manipulation- and SDC are controlled for. No significant correlations between PPI-R total score and other proxemic scores are found, neither when border cases are included, or excluded. In table 2, results of regression analyses with PPI-R factor scores as predictors are reported. When PPI-R factor scores are used as predictors, and the analyses yield a significant correlation, factor III –Coldheartedness- is the only remaining predictor in the statistical model. Table 2 demonstrates that when SDC is controlled for, PPI-R factor III shows a significant positive correlation with behind distance and PS score. This indicates that individuals that score high on Coldheartedness show significantly larger distances towards others on their backsides, and show a significantly larger personal space overall. This relationship seems independent of whether the approaching individual is dominant or submissive, as behind distance and PS score appear significant in both the dominant and non-dominant condition.

Furthermore, table 2 demonstrates that factor III only positively correlates to right distance when it is assessed by a submissive interviewer. This finding differs per condition and therefore seems inconsistent, as it would indicate that individuals that score high on Coldheartedness show a larger distance towards others on their right sides, but not on their left sides. This relationship would also be dependent on the dominant/submissive nature of the individual that encroaches and/or whether border cases are included or excluded, and therefore might indicate a possible interaction effect. Additionally, table 2 demonstrates no significant correlation between PPI-R factors and front distance or left distance.

Effect of perceived dominance on Personal Space

Hypothesis two tested whether PS is larger when it is assessed by a dominant male adult than when it is assessed by a non-dominant male adult. Table 3 shows the results of the performed paired sampled t-tests that compared proxemic scores. As a result of the confounding effect of the statistically differing confederate (SDC), a t-test was performed excluding SDC cases (N=51). As table 3 demonstrates, front distance, left distance and PS score differ significantly, and behind distance and right distance do not differ significantly. This indicates that front distance, left distance and PS score tend to be larger –thus, distance between individuals is larger- when it is assessed by a dominant male adult, than when it is assessed by a non-dominant male adult. Subsequently, behind distance and right appear unaffected by dominance in male adults.

Table 2: Results of regression analyses, with PPI-R factors as predictors. PPI-R factor III –Coldheartedness- was the only remaining factor when the regression analysis yielded significant results. Numbers flagged with * are significant at p<.05, numbers flagged with ** are significant at p<.01.

Dominant condition

Step 3		Unstandardized		Standardized		
Proxemic score	**Model**	**B**	**SE B**	**β**	**T**	**p-value**
Front	(Constant)	1.01	.80		1.37	.18
	PPI-III	.03	.02	.20	1.44	.16
Behind	(Constant)	-1.29	1.38		-.94	.35
	PPI-III	.07	.03	.31	2.25	.03*
Left	(Constant)	.93	.99		.93	.36
	PPI-III	.03	.02	.18	1.31	.20
Right	(Constant)	.71	1.04		.68	.50
	PPI-III	.04	.02	.21	1.48	.15
PS	(Constant)	-8.97	16.04		-.56	.58
	PPI-III	.75	.37	.28	2.05	.04*

Non-dominant condition

Step 3		Unstandardized		Standardized		
Proxemic score	**Model**	**B**	**SE B**	**β**	**T**	**p-value**
Front	(Constant)	.75	1.06		.71	.48
	PPI-III	.01	.01	.16	1.13	.27
Behind	(Constant)	-2.53	1.43		-1.78	.08
	PPI-III	.10	.03	.40	3.05	<.01*
Left	(Constant)	.31	1.06		.30	.77
	PPI-III	.04	.02	.23	1.67	.10
Right	(Constant)	-.35	1.03		-.35	.73
	PPI-III	.06	.02	.33	2.41	.02*
PS	(Constant)	-16.99	14.41		-1.18	.24
	PPI-III	.88	.33	.36	2.67	0.01*

Table 3: Results of the paired samples t-test. * = statistically significant at p<.05, ** = statistically significant at p<.01 and ***=statistically significant at p<.001.

Proxemic distance	Mean distance (SD) dominant condition	Mean distance (SD) non-dominant condition	T	p-value
Front	2.23 (.73)	1.93 (.71)	4.31	<.001***
Behind	1.78 (1.30)	1.77 (1.39)	.08	.94
Left	2.22 (.91)	2.07 (.98)	2.61	.01*
Right	2.25 (.95)	2.11 (.97)	2.01	.05
PS Score	23.61 (14.96)	21.13 (13.80)	2.63	.01*

Results on hypothesis one indicate that psychopathy does not seem directly correlated to proxemic scores, even when confounding cases are removed. However, Coldheartedness, a specific psychopathic trait, tends to be positively correlated with personal space and behind proxemic distance. This trait also appears uncorrelated with left distance. With regard to right proxemic distance, the analyses yielded varying results which was not in line with the original expectations of this study.
The results on hypothesis two appear consistent for at least total Personal Space score and front and behind distance. PS total score and front distance seem to correlate positively by perceived dominance in adult males whereas behind distance does not. This indicates that perceived dominance enlarges one's frontal distance and total personal space towards those perceived as dominant, whereas behind distance towards perceived dominant others does not. This is in line with the original hypothesis of this experiment, that PS would enlarge as a dominant individual would approach, compared to when a non-dominant individual would approach. This result might suggest that PS would only be influenced, when the approaching dominant individual is actually in de visual field. However, results on left and right proxemic distance appear to vary.

In the experiment, three different individuals fulfilled the role of dominant interviewer. A self-report manipulation check was performed to assess whether participants perceived these confederates significantly different on liking, skillfulness, willingness to be their employee and willingness to be their boss. No significant difference was measured. However, PS score did differ significantly among the actors, as one actor in particular differed significantly from the other two, where PS score was systematically larger. One plausible explanation could be that the actor's actual height (190cm) differed ten centimeters from the other two actors (180cm). This might have influenced the participant's perception of how close they would let a dominant individual approach them.

Since some proxemic scores differed significantly when assessed by the three different dominant confederates, this led to immediate methodological difficulties in testing the two hypotheses. The test on the hypothesis concerning psychopathic traits and PS also yielded varying results when the analysis was ran excluding the

participants that had been tested by the statistically differing actor. When those participants were excluded, consistent results were found with regard to PS score and behind proxemic distance, as they were shown to be predicted by the level of Coldheartedness –a specific factor and trait of psychopathy. Front proxemic distance and left proxemic distance appear to be consistent as well, as they do not seem to show any correlation with psychopathy, or any of its' specific traits. Varying results are found with respect to right distance, as it varies depending on whether the participants were assessed by the dominant or submissive confederate. When they were assessed by the submissive confederate, a positive correlation indeed was found. The disadvantage of excluding the participants that had been tested by the statistically differing actor, is a drop in statistical power. When border cases and participants that were tested by the statistically differing actor were removed from the analyses, no significant correlation was observed between psychopathy and PS. This seems to be in line with results found by Eastwood (1985), and partly contradicts results found by Kinzel (1970), Newman & Pollack (1973) and Wormith (1984). However, a significant positive correlation was observed between psychopathy trait Coldheartedness and PS, as well as between the Coldheartedness trait and behind proxemic distance. The psychopathy trait Coldheartedness mildly predicts PS score in this sample. A possible explanation for this might be that a lack of empathic concern might lead to unawareness of the fact that maintaining a larger personal space might be unsociable towards others. Another explanation could be that a lack of empathic concern might cause individuals to maintain a larger buffer zone in which they could execute fight or flight behavior, regardless the intentions of approaching individuals. A third explanation might be that individuals who score high on Coldheartedness cared less about participating in this experiment, and therefore just responded faster on this particular task, but then one would expect random and non-significant results. This possibility would be even more plausible if abnormal responding was observed in the psychopathy self-report, but this was not the case. Apart from this, a lack of empathic concern might lead to a lack of interest in participating in this experiment. The present study tested a non-clinical population, while early effects were found within a clinical population (Kinzel, 1970, Newman & Pollack, 1973). The results of this study suggest that the relationship between personality and personal space can be observed more generally in both populations.

With respect to the results on the perceived dominance hypothesis, it was observed that front distance and PS score both were significantly larger when assessed by a dominant confederate, than when assessed by a non-dominant confederate. These results seem to vary across conditions, even when confounding border cases -cases that doubted the manipulation- and SDC cases -cases that were assessed by a statistically differing confederate- were controlled for. It must be noted that carryover effects between dominant and non-dominant conditions are not controlled, due to the methodological design. As theorized, these results support the notion that PS functions as an aggression regulator (Pfeifer, 1969). Dominant individuals could be seen as possibly more dangerous or aggressive. Inherently, PS is larger, and therefore a larger safety- or buffer zone is maintained. This effect was also found in earlier studies that tested forensic populations

(Kinzel 1970; Newman & Pollack, 1973; Wormith, 1984). It must also be noted that this effect could be enlarged due to the fact that only adult men were tested. Dominance and psychopathic personality traits manifests themself more readily in men than women (Lilienfeld & Widows, 2005). Therefore, men could possibly react differently to dominance than women. With regard to the varying results found in left and right proxemic distance, a possible explanation could be the handedness of participants. As can be seen in the results, proxemic is significantly larger on the left hand side. This might supposedly indicate that participants could less easily defend themselves with their left hand. This might in turn be due to the fact that the left hand is supposedly the non-dominant hand in the majority of cases. However, this has not been measured in the experiment. Also, the latter is not supported by earlier studies (Kinzel, 1970; Newman & Pollack, 1973; Wormith, 1984; Eastwood, 1985). Taking into account the methodological limitations –relative low power and possible carryover effects, varying results due to possible handedness effects- of this study, future research could focus on possible height effects on PS. More importantly, when carryover and sex effects are controlled for, theoretical notions on both the effects of coldhearted personalities on PS, and the effects of dominance on PS, might become more plausible and evident. Also, varying results found in left and right PS distances then might be ruled out, as possible influencing factors such as handedness can be taken into account.

To conclude, this study finds varying results with respect to the correlation of psychopathic personality traits to personal space. Nevertheless, a particular psychopathic personality trait, Coldheartedness, does seem to mildly predict PS. This study's results therefore support possible personality effects on one's personal space in non-clinical populations. Subsequently, this study supports the notion that PS tends to enlarge when a dominant individual approaches, compared to when a non-dominant individual approaches.

Acknowledgements

Experimental data used in this study is property of J. Lobbestael (PhD.), employee of Maastricht University, Maastricht, the Netherlands.

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