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Spirituality and the negative and positive effects of traumatic experiences in a group of emergency service workers

Abstract:

Objective: Studies concerning the importance of spirituality on the negative and positive effects of traumatic experiences are very rare. Our study attempts to determine the role of spirituality in post-traumatic stress disorders, approached as a negative result of facing traumatic events, and profiting from such experiences in the form of posttraumatic growth.

Method: The study covered 116 emergency service workers (only men), including 43 firefighters (37.1%), 43 police officers (37.1%) and 30 paramedics (25.8%), who experienced a traumatic event in their line of work. Those surveyed were between 21 and 57 years of age (M = 35.28; SD = 8.13). The Impact of Event Scale was used to assess the negative effects of traumatic experience, and Posttraumatic Growth Inventory for assessing the positive effects. Spirituality was measured using the Self-description Questionnaire.

Results: 61.2% of the workers displayed at least moderate symptoms of posttraumatic stress disorder, whereas 38.8% displayed low intensity symptoms. Taking into consideration the positive effects of experienced traumatic events, it was discovered that almost 40% of those surveyed displayed low levels of posttraumatic growth, 34.5% average and 25.8% high. Correlation analysis was been performed to establish the relation between spirituality and posttraumatic stress and posttraumatic growth. Posttraumatic growth predictors were determined.

Conclusions: Study results show that spirituality is not related to the intensification of posttraumatic stress symptoms, whereas it contributes to positive posttraumatic changes. Among different aspects of spirituality, harmony plays a major role.

Keywords:

spirituality, posttraumatic stress, posttraumatic growth.

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Streszczenie:

Cel badań: Badania dotyczące znaczenia duchowości w pojawianiu się negatywnych, a także pozytywnych skutków doświadczeń traumatycznych należą do rzadkości. W badaniach podjęto próbę ustalenia roli duchowości w pojawianiu się objawów stresu pourazowego, traktowanych jako negatywna konsekwencja zmagania się z wydarzeniami traumatycznymi, oraz w czerpaniu korzyści z tego wydarzenia, w postaci potraumatycznego rozwoju.

Metoda: Badaniami objęto 116 pracowników służb ratowniczych (wyłącznie mężczyzn), w tym 43 strażaków (37.1%), 43 policjantów (37.1%) oraz 30 ratowników medycznych (25.8%), którzy doświadczyli wydarzenia traumatycznego w związku z wykonywaną pracą. Wiek badanych wahał się od 21 do 57 lat (M=35.28; SD=8.13). Do oceny negatywnych skutków doświadczanych zdarzeń traumatycznych wykorzystano *Skalę Wpływu Zdarzeń*, pozytywnych – *Inwentarz Potraumatycznego Rozwoju*. Pomiaru duchowości dokonano za pomocą *Kwestionariusza Samoopisu*.

Wyniki: Wśród przedstawicieli służb ratowniczych 61.2% badanych, ujawniło co najmniej umiarkowane nasilenie objawów stresu pourazowego, zaś 38.8% wykazuje ich niskie nasilenie. Biorąc pod uwagę pozytywne skutki doświadczanych zdarzeń traumatycznych ujawniono, że blisko 40% badanych wykazuje niski poziom wzrostu po traumie, 34.5% – przeciętny i 25.8% wysoki. Przeprowadzono analizę korelacyjną w celu ustalenia zależności pomiędzy duchowością a stresem pourazowym i potraumatycznym rozwojem. Ustalono predyktory potraumatycznego rozwoju.

Wnioski: Wyniki badań wskazały, że duchowość nie wiąże się z nasileniem objawów stresu pourazowego, sprzyja natomiast pojawianiu się pozytywnych zmian potraumatycznych. Wśród wymiarów duchowości szczególną rolę pełni harmonia.

Słowa kluczowe:
duchowość, stres pourazowy, potraumatyczny wzrost

Introduction

Due to the profile of their work people engaged with emergency services, especially firefighters, paramedics or police officers are particularly exposed to traumatic event. The available literature shows that the percentage of people exposed to stressors ranges from 3.6% to 75% (Heitzman, 2011). Firefighters are most exposed to such events (Corneil et al. 1999; Koniarek, Dudek, 2001; Ogińska-Bulik, Langer, 2007; Ogińska-Bulik, Kaflik-Pieróg, 2013). Also police officers and paramedics display a high percentage of traumatic events (Dudek, 2003).

Without a doubt, a traumatic event brings many negative consequences, mainly concerning mental health (Dudek, 2003). Special attention should be paid to PTSD (posttraumatic stress-disorder). Diagnosis of PTSD (Juczyński, Ogińska-Bulik, 2009; Lis-Turlejska, 2009) is on one hand related to an occurrence of a traumatic event and on the other hand to three groups of symptoms. These groups are intrusion, i.e. re-experiencing the event in the form of memories and dreams; withdrawal resulting in decreased general reactivity, avoidance of stimuli, emotions or conversations related to the trauma; psychophysiological arousal resulting in problems with sleep, anger outbursts, attention deficiency and increased vigilance.

Typical PTSD symptoms that continue for at least a month were recorded with almost 5% of firefighters (Koniarek, Dudek, 2001) and 4% of police officers (Dudek, 2003).

However, one must distinguish a clinical diagnosis of posttraumatic stress, which enables one to determine whether PTSD exists or not, from PTSD symptoms measured using self-descriptive questionnaires. Studies by Ogińska-Bulik and Langer (2007), performed on a group of firefighters from firefighting and rescue teams using the Impact of Event Scale to measure PTSD symptoms, have shown that 18% of firefighters achieve high scores.

During recent years researchers and practitioners are more drawn towards the positive effects of traumatic experiences as posttraumatic growth. The term has been introduced into the literature by Tedeschi and Calhoun (1996) in reference to positive changes in self-perception, relations with others and appreciation of life, which can appear as a result of attempts to deal with the experienced traumatic event[2]. This means that as a result of trauma, some people become stronger, more mature, they discover that they can cope better and survive in extreme circumstances. One must stress that posttraumatic growth is something more than just a return to equilibrium after a traumatic experience. This phenomena indicates that a person goes through a type of transformation and reaches a higher level of existence than before the trauma.

Emerging posttraumatic changes treated as a consequence of effectively handling the traumatic experience do not, however, exclude negative results. Furthermore, such negativity as PTSD symptoms, seems almost necessary for adapting to new circumstances and contributing to growth changes. This means that individuals experiencing growth can also display distress and a lowered sense of well-being (Ogińska-Bulik, 2013a).

Among the determinants of posttraumatic growth, apart from factors related to the trauma itself – amongst which trauma intensity plays a special role – particular attention should be paid to stress coping strategies and different social and personal resources (Ogińska-Bulik, Juczyński, 2010; Ogińska-Bulik, Juczyński, 2010a; Ogińska-Bulik, 2012; Ogińska-Bulik, 2013a; Heszen, 2013). One resource that seems to be related to the emergence of growth changes is spirituality.

Spirituality is understood in different ways, depending on the approach or branch of philosophy (Ostrowski, 2010). This term is similar to the noetic dimension of personality in psychology (Popielski, 2009). It also refers to Kozielecki's transgression construct (Kozielecki, 1987) or Antonovsky's sense of coherence (Antonovsky, 1995).

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[2] Other posttraumatic growth concepts are also known. They are described in the book by N. Ogińska-Bulik titled "Pozytywne skutki doświadczeń traumatycznych czyli kiedy łzy zamieniają się w perły" ("Positive effects of traumatic experiences, that is, when tears turn into pearls"), Difin, Warszawa, 2013.

Heszen (2010, 2013) points out two main trends in understanding spirituality. The first one connects this term to religion. The second one assumes that spirituality and religion are two rather separate constructs, yet somehow connected to each other. Spirituality is related to individual and personal experience, whereas religion is treated as a social and institutionalized phenomena. The central concept for religion is transcendence, that is, moving beyond *oneself*. Irrespective of how spirituality is understood, it is always stressed that spirituality is a complex and multidimensional construct. In psychological research spirituality is treated as a human attribute. At the same time this means giving up the ontological assumption that the source of spirituality is supernatural. According to Juczyński (2010), treating spirituality as an attribute enables one to be active and to understand life's meaning and its sense, to experience the freedom and responsibility for taken decisions.

Available data concerning the relation between spirituality/religiousness and negative traumatic effects do not provide a clear picture of dependencies between variables (Chen, Koenig, 2006). The majority of studies appear to indicate that spirituality protects against developing posttraumatic stress symptoms or at least lowering their intensity (Krejci et al., 2004; Watlington, Murphy, 2006). On the other hand it is pointed out that spirituality/religiousness can contribute to pathologies following a traumatic experience (Hassouneh-Phillips, 2003). Traumatic experiences can also lower the sense of religiousness (Fontana, Rosenheck, 2004).

Heszen (2010), indicating a positive relation between spirituality and health, stresses that applying coping strategies is important. Spirituality favors coping with meaning, and this form of coping is treated as the basic source of positive emotions that can coexist with stressful situations (Folkman, Moskowitz, 2006; Heszen, 2010). Coping through finding sense in suffering in a situation where one is struggling with chronic disease, especially with poor prognosis, can be the only form of coping left (Heszen, 2010, 2013). Studies confirm the positive relation of spirituality with adaptive coping strategies and its negative consequence – however small – with maladaptive strategies (Heszen, 2008), and also spirituality's role in lowering the intensity of depression and anxiety (Heszen-Niejodek, 2003).

Spirituality, treated as one's resource or disposition towards coping through referring to religion can have an important impact for positive changes after a traumatic experience. This outcome results from studies carried out on a group of young adults, who experienced trauma (Calhoun et al., 2000). A positive relation between spirituality/religiousness was also shown in studies carried out on a group of adults, which has shown forgiveness playing a strong role (Schultz et al., 2010). Furthermore, the relation between forgiveness and posttraumatic growth was mediated by the level of spirituality.

Results of studies carried out on a group of people who experienced losing someone close, are an indirect proof of the relationship between spirituality and positive posttraumatic changes. They indicate a positive relation between posttraumatic growth and noodynamics, that is, between spiritual dynamics and a sense of coherence, especially the aspect of meaningfulness (Felcyn-Koczewska, Ogińska-Bulik, 2012) or sense of life (Ogińska-Bulik, 2013a).

One should add that spirituality/religiousness is related to a person's individual resources that become activated during a crisis, above all hope and optimism, which can additionally contribute to growth changes.

Purpose and method of the study

The purpose of our study is to establish the role of spirituality in the occurrence of negative (posttraumatic stress symptoms) and positive (posttraumatic growth) effects of experienced traumatic events in a group of emergency service workers. The following research questions were asked:

- To what level do the emergency services workers experience posttraumatic stress symptoms?
- What types of positive changes do the studied workers see in themselves?
- Do age and occupation have any impact on the level of positive and negative effects of traumatic experiences?
- Is spirituality related to intensification of posttraumatic stress and posttraumatic growth?
- Which spirituality aspects enable one to predict negative and positive consequences of a traumatic event?

Our study covered 200 employees representing emergency services (from the Podkarpacie, Łodź and Warsaw regions)[3]. Prior to the study all those surveyed and their superiors consented. Our purpose was explained to the participants and they were informed about the anonymity of the study. Before filling out the forms, the participants answered the question (in writing) as to whether they had experienced a work-related traumatic event. One hundred and sixteen workers admitted that such an event had taken place. This group, constituting 58% of all studied individuals, was the basis for further research. The group consisted only of men, including 43 firefighters (37.1%), 43 police officers (37.1%) and 30 paramedics (25.8%). The participants of the study were between 21 and 57 years of age (M=35.28; SD=8.13).

[3] Survey conducted by a participant of MA seminar, Bartłomiej Dziuba.

The Impact of Event Scale was used to assess the negative effects of the traumatic experience, and Posttraumatic Growth Inventory for assessing the positive effects. Spirituality was measured using the Self-description Questionnaire.

The Impact of Event Scale is a Polish adaptation of the revised Impact of Event Scale (IES-R), by Weiss and Marmar, developed by Juczyński and Ogińska-Bulik (2009). It contains 22 statements and takes into consideration three aspects of PTSD: 1. Intrusion, in the form of re-occurring images, dreams, thoughts or perceptive sensations related to trauma; 2. hyperarousal in the form of increased vigilance, anxiety, impatience, attention deficiencies and 3. avoidance, in the form of efforts to move away from thoughts, emotions or conversations related to the trauma. According to the instructions, the person must first describe a negative event (in this case an event related to his line of work) and then assess the symptoms using a 5-degree Likert-type (0−4) scale. The purpose of this scale is to determine the subjective sense of discomfort related to the specific event that occurred. This tool has good psychometric parameters. The Cronbach's *alfa* index is 0.92 for the whole scale (for individual factors between 0.78 and 0.89).

Posttraumatic Growth Inventory – PTGI by Tedeschi and Calhoun (1996) has been adapted to Polish conditions by Ogińska-Bulik and Juczyński (2010). The tool consists of 21 statements describing different positive changes following an experienced traumatic event (for example: "I changed my priorities about what is important in life"), to which a given individual must relate, by selecting answers from *I did not experience this change as a result of my crisis* (0 points) to *I experienced this change to a very great degree as a result of my crisis* (5 points). The higher the score the greater the change intensity. With the Polish version the Inventory assesses four aspects comprising posttraumatic growth: changes in self-perception, changes in relations with others, greater appreciation of life and spiritual changes). The overall result is the sum of all four aforesaid factors. The tool achieved satisfactory psychometric properties. Cronbach's *alfa* index is 0.93 (for individual factors between 0.63 and 0.87), and is somewhat higher than in the original version.

The Self-description Questionnaire by Metlak, Heszen-Niejodek and Gruszczyńska (Heszen-Niejodek, Gruszczyńska, 2004) was used to measure spirituality. This is a 20-question questionnaire scored between 1 – definitely not, and 5 – definitely yes. The questionnaire measures three aspects of spirituality: 1) religiousness (seven questions), which is the level of religious practices in everyday life, 2) ethical sensitivity (seven questions), concerning the ethical attitude and 3) harmony (six questions), expressing a sense of belonging to the world, seeing the world as friendly, feeling internal peace and happiness. The tool achieved satisfactory psychometric properties. The higher the index the higher

the level of spirituality sensed by the subjects. Cronbach's *alfa* index is 0.91 (for individual factors between 0.81 and 0.90).

Study results

Once distribution normality of the analyzed variables was checked – by the Kolmogorov-Smirnov test: for the overall result of The Impact of Event Scale $d=0.07$, $p>0.20$; kurtosis $=-0.87$, skewness $=-0.00$; for the Posttraumatic Growth Inventory $d=0.07$, $p>02$; kurtosis $=-0.39$, skewness $=-0.48$, for the Self-description Questionnaire $d=0.08$ $p>0.20$, kurtosis $=1.18$, skewness $=-0.67$) – we calculated the mean values and their standard deviations. Age and professional role were also taken into consideration. in respect to negative and positive effects of experienced traumatic events. Student's t-test and test F of analysis of variance (one-way Anova) were used to establish the differences between averages. After that we determined relations between variables, using Pearson correlation coefficients, and checked which spirituality aspects (explanatory variable) are predictors for posttraumatic stress and posttraumatic growth symptoms, treated as dependent variables. Regression analysis (forward stepwise) was conducted to establish the predictors.

Negative and positive effects of traumatic events[4]

Table 1. *Mean values of PTSD and posttraumatic growth symptoms.*

	M	SD	Min	Max
Posttraumatic stress symptoms – total	38.32	19.09	0	78
1. Intrusion	14.46	7.87	0	29
2. Hyperarousal	11.69	6.77	0	28
3. Avoidance	12.16	6.24	0	26
Posttraumatic growth – total	56.14	21.24	5	99
Factor 1. Changes in self-perception	23.75	9.23	0	43
Factor 2. Changes in relations with others	18.21	8.44	0	35
Factor 3. Appreciation of life	9.34	3.94	0	20
Factor 4. Spiritual changes	4.84	2.81	0	10

M – mean; SD – standard deviation; Min – minimum value; Max – maximum value.

The mean values of posttraumatic stress do not deviate from normalization studies (Juczyński, Ogińska-Bulik, 2009). Assuming that 1.5 is the limit value for PTSD, and

[4] The results of negative and positive effects of traumatic experiences in this group were also described in N. Ogińska-Bulik's text (2013b). Negative and positive effects of traumatic experiences in a group of emergency service workers – the role of personal and social resources, *Medycyna Pracy [Occupational Medicine]*, 64(4), 463−472.

recommended for the IES-R – for this purpose the received overall result of IES-R was divided by the number of statements comprising it – 71 people, constituting 61.2% of the group, display at least moderate intensity of posttraumatic stress symptoms, whereas 45 people (38.8%) display low intensity.

Age does not differentiate the general PTSD result: younger (up to 35 years of age; n=67) – M=37.28, SD=18.64; older (35 years of age and more, n=49) – M=39.73; SD=19.80), nor any of its components. Correlation analysis has confirmed the lack of any relationship between age and intensity of posttraumatic stress disorder (for the overall result of The Impact of Event Scale r=0.06, intrusion r=−0.01, hyperarousal r=0.04, avoidance r=0.15).

The professional role also is not related to the intensified PTSD symptoms. An analysis of variation for the general result of The Impact of Event Scale did not show significant differences between means (F=1.95; df=2): firefighters – M=33.93 (SD=18.82), police officers – M=39.97 (SD=22.05), paramedics – M=42.23 (SD=13.44). However, significant differences were detected in respect to avoidance (F=3.15; df=2; $p<0.05$). Paramedics displayed a significantly higher avoidance intensity (M=14.17; SD=4.33) in comparison with firefighters (M=10.53; SD=5.84; $p<0.05$).

The mean value of posttraumatic growth achieved by the workers corresponds to 5 sten; therefore it is an average result not significantly different from results achieved with normalization studies (Ogińska-Bulik, Juczyński, 2010). 46 (39.7%) of workers display a low level of posttraumatic growth, 40 (34.5%) display average, and 30 (25.8%) display high.

There were significant differences in the levels of posttraumatic growth factors. The average values (obtained by dividing individual growth aspects by the number of corresponding statements) are 1. changes in self-perception – M=2.63 (SD=1.02); 2. changes in relations with others – M=2.60 (SD=1.20); 3. appreciation of life – M=3.13 (SD=1.31); 4. spiritual changes – M=2.42 (SD=1.41). The group represents a higher level of appreciation of life than other analyzed posttraumatic growth factors (factor 1−3 t=−4.58, $p<0.0$,. factor 2−3 t=−5.22 $p<0.001$, factor 3−4 t=−5.46 $p<0.001$).

The age of the men does not differentiate posttraumatic growth intensity. The mean value for younger emergency service workers is 55.98 (SD=21.31) and statistically is not significantly different (t=−0.09) from the average obtained by older workers: M=56.37 (SD=23.78). No differences in individual posttraumatic growth aspects were stated either. Correlation analysis confirmed the lack of any relationship between age and intensity of posttraumatic growth (for the overall result of Posttraumatic Growth Inventory r=0.05, factor 1 r=0.11, factor 2 r=0.06, factor 3 r=0.11, factor 4 r=0.09).

We also checked whether the occupation (firefighter, police officer, paramedic) is related to the level of positive posttraumatic changes. The men, regardless of their occupation, represent similar levels of positive changes after experiencing a traumatic event (F=1.06; df=2); firefighters: M=59.84 (SD=17.42), police officers: M=53.46 (SD=24.42), paramedics: M=54.70 (SD=21.31). No significant differences in posttraumatic growth intensity were stated either.

The mean values obtained for measuring spirituality are: for the general index: M=72.18 (SD=12.97), religiousness: M=24.92 (SD=6.38), ethical values: M=26.70 (SD=4.79), harmony: M=20.55 (SD=4.48).

Relation between spirituality and positive and negative effects of traumatic experiences

The relation between spirituality and negative and positive effects of traumatic events was established using correlation coefficients, specified in Table 2 and 3.

Table 2. *Correlation coefficients between spirituality and PTSD symptoms.*

	PTSD – total	Intrusion	Hyperarousal	Avoidance
Spirituality – total	0.01	−0.05	0.01	−0.03
Religiousness	0.01	−0.05	0.04	0.02
Ethical sensitivity	−0.03	−0.01	0.02	−0.01
Harmony	−0.08	−0.05	−0.07	−0.07

The correlation coefficients presented in table 2 indicate a lack of correlation between spirituality and posttraumatic stress symptoms. No component of spirituality correlates in any statistically significant way with PTSD symptoms.

Table 3. *Correlation coefficients between spirituality and posttraumatic growth.*

	PTGI	F 1	F 2	F 3	F 4
Spirituality – total	0.40***	0.26**	0.45***	0.22*	0.54***
Religiousness	0.35***	0.20*	0.40***	0.20*	0.55***
Ethical sensitivity	0.23*	0.15	0.25**	0.12	0.29**
Harmony	0.41***	0.30***	0.46***	0.22*	0.45***

Designations:
PTGI – Posttraumatic Growth Inventory total result
Factor 1. Changes in self-perception
Factor 2. Changes in relations with others
Factor 3. Appreciation of life
Factor 4. Spiritual changes
*** p<0.001, ** p<0.01, *p<0.05

The results indicate a statistically significant positive relation between spirituality and posttraumatic growth. This applies to all aspects comprising the Posttraumatic

Growth Inventory. Spiritual changes exhibit the strongest correlation with spirituality, which is understandable. A rather strong relation exists also in relations with others, whereas there is a weaker one with the changes in self-perception and appreciation of life. From all aspects comprising spirituality, harmony and religiousness proved to have the strongest relation with growth.

Our next step was to investigate which spirituality aspect performs a significant role in predicting negative and positive effects of experienced traumatic events. For this purpose we used regression analysis (forward stepwise). Both the general and individual results of the Posttraumatic Growth Inventory were considered as explained variables in regression analysis. Only final models were taken into account for presentation of results. Collinearity of the explanatory variables (which are spirituality factors) was also examined. The tolerance coefficients (harmony = 0.756, religiousness = 0.756, ethical sensitivity = 0.608), as well as the variance inflation factor VIF (harmony = 1.322, religiousness = 1.322, ethical sensitivity = 1.643) indicate a weak association between the variables.

No spirituality factor has a predictive role for posttraumatic stress symptoms. This applies both to the general result, measured using the Impact of Event Scale, and to individual symptoms; whereas spirituality allows one to predict positive posttraumatic changes (Table 4).

Table 4. *Posttraumatic growth predictors.*

	Beta	B	Error B	t	p
Harmony	0.32	1.49	0.45	3.26	0.001
Religiousness	0.20	0.65	0.32	2.05	0.05
Constance		9.05	9.03	1.00	ni

$R = 0.45$; adjusted $R^2 = 0.21$
Designation:
R – correlation coefficient
R^2 – determination coefficient
Beta – standardized regression coefficients
B – non-standardized regression coefficients
Error B – non-standardized regression coefficients error
t – value of test t
p – significance level

Two aspects comprising spirituality, namely harmony and religiousness, proved to be predictors of posttraumatic growth for the studies groups. Both support positive changes after experienced trauma. Harmony has a stronger impact, as it explains 17% of variance of dependent variable.

In searching for predictors of individual growth, it has been determined that harmony enables one to predict positive changes in self-perception (*Beta* = 0.31), explaining 10%

of dependent variable variance. For relations with others, two spirituality factors proved to be predictors of positive changes – harmony (*Beta*=0.35), which predicts 21% of changes and (*Beta*=0.30), which explains 4% of dependent variable variance. Whereas greater appreciation of life is explained by harmony (*Beta*=0.16) – however, to a small extent of only 5%. Predictors of positive changes of spirituality proved to be religiousness (*Beta*=0.45), explaining 29% and harmony (*Beta*=0.29) explaining 5% of the dependent variable variance.

We have also checked whether there is a correlation between posttraumatic stress disorder intensity and posttraumatic positive changes. Correlation coefficients showed that the overall result of The Impact of Event Scale is not associated in a statistically significant way with the overall Posttraumatic Growth Inventory result ($r=0.17$). However, there were found some weak correlations between different factors of analyzed variables. Intrusion was positively correlated with changes in the relationship with others ($r=0.21$, $p<0.05$) and appreciation of life ($r=0.26$, $p<0.05$). Hyperarousal was positively associated with appreciation of life ($r=0.21$, $p<0.05$). In contrast, avoidance did not correlate with any posttraumatic growth factors.

Summary

In the studied group of emergency service workers 61.2% displayed at least moderate posttraumatic stress intensification symptoms, whereas 38.8% displayed a low intensification level. However, one should stress that this is not a clinical diagnosis of PTSD. Yet, our results testify to high stresogennic properties in their line of work. Taking into consideration positive effects of experienced trauma, it should be pointed out that almost 40% displayed a low posttraumatic growth level (34.5% – average and 25.8% high).

Spirituality proved to be related only with positive effects of experienced traumatic events. It has a positive connection with all posttraumatic growth aspects, with strongest relations, obviously, to positive changes in the spiritual sphere, and weakest to the appreciation of life. Among the aspects of spirituality, the most important role must be attributed to harmony, whereas the role of religiousness is somewhat smaller. Harmony, expressing internal peace and happiness, and having a place in the world and seeing the world as a friendly place, enables one to predict positive changes in all posttraumatic growth aspects, mainly in spirituality and relations with others. A similar significance, yet somewhat smaller, is attributed to religiousness, expressing the tendency to religious practices in everyday life, which mainly supports positive changes in the spiritual sphere.

A positive impact of spirituality/religiousness on posttraumatic growth can result from coping strategies related to the third coping function, which is concentration on meaning. Among the strategies performing this function – used usually when struggling with chronic

somatic disease – special importance must be attributed to positive redefinition of values and religious coping. The role of these strategies on positive posttraumatic changes has been shown in many studies (Calhoun et al., 2000; Schultz et al., 2010; McIntosh et al., 2011; Ogińska-Bulik, 2013a). Confirming the importance of spirituality in posttraumatic growth would require further studies conducted on other groups, also encompassing women.

No aspects comprising spirituality enable prediction of posttraumatic stress symptoms. This suggests that spirituality treated as a subjective value, plays a somewhat different role in respect to other personal and social resources. Studies on a group of workers exposed to professional stress (Ogińska-Bulik, 2006) have shown that such resources as sense of coherence, self-efficacy, life optimism, emotional intelligence, and social support protect against negatively experienced stress. So, why isn't spirituality connected to posttraumatic stress symptoms? This can be related to the type of experienced events, for which the workers are, or at least should be prepared. These situations are usually controllable. And this means that emergency service workers faced with them, will first of all undertake active coping strategies aimed at handling the situation, and not escaping from stress towards God, religion, and so on. Presumably this is also related to gender, as men reach towards religion to cope with stress decisively less often. One could assume that when emergency service workers confront traumatic experiences in their line of work, a more important role will be attributed to other resources, mainly to the feeling of self-efficacy, resiliency and also received social support, especially from superiors (Ogińska-Bulik, 2013b).

One should stress the need for differentiating such concepts as spirituality and religiousness, which are most often associated with each other. This seems important in the study results indicating an ambiguous relation between them and negative consequences of trauma. A study by McIntosh and others (2011) shows that in case of intrusion, religiousness played the weaker predictive role, whereas spirituality proved to be the stronger predictor of this symptom.

One should also point out so-called negative spirituality or negative religious coping. This type of spirituality/religiousness is related to dissatisfaction with God, attributing blame or responsibility for what has transpired to God. Such spirituality can result in persistent PTSD symptoms. As shown by Wortmann and others (2011), spiritual struggle, relative to negative convictions relating to God were additionally related to strengthening PTSD symptoms.

Summarizing, we should point out the limitations of our studies. The studies were cross-sectional, which does not permit statements concerning the existence of cause and effect relationships. Therefore, it cannot be unequivocally stated that spirituality supports positive posttraumatic changes. The reverse impact is also possible, namely that effective coping with traumatic experience, in the form of posttraumatic growth, increases the spirituality level. One

must also pay attention to the possibility of a common source for the variance of spirituality and posttraumatic growth (one posttraumatic growth aspect is positive changes in respect to spirituality). Furthermore, the assessed negative and positive effects of experienced trauma were conducted on a self-descriptive basis. Thus, one cannot exclude the impact of changing social approval, that is, the subjects' urge to present themselves in better light, especially in respect to posttraumatic growth. The study also does not take into consideration the importance of experienced traumatic event, nor the time that passed since its occurrence.

Despite the limitation specified above, our studies are significant and their results must be stressed. On one hand they contribute new content related to experienced trauma, on the other hand they can be used in practical applications. They suggest that forming a feeling of internal peace, satisfaction, belonging to the world and perceiving it as a friendly place – with other people who have experienced trauma – can favor benefiting from trauma, especially in the spiritual sphere and in relations with others.

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What are you saying when you are talking about…? Procedure for isolating a hidden story in a monologue about the author's own life[4]

Abstract:

Our article describes and illustrates a procedure for isolating a hidden story from a monologue on an assigned topic. The procedure involves four stages: 1) collecting data and preparing transcripts; 2) identifying out-of-key elements; 3) analysing and interpreting a text by means of linguistic and literary theory devices; 4) formulating a hidden story. In deducing a hidden story from narratively out-of-key elements, the vital part was identifying the rules of speech and analysing the contexts in which they were used in the monologue. The hidden story was reconstructed as a one-level narrative pattern on the basis of information inferred from different contexts of using speech rules, as well as from information explicit in the monologue. Our article also discusses the theoretical and clinical value, and new trends in the research on hidden stories.

Keywords:

hidden story, narrations, rules of speech

Streszczenie:

W artykule opisaliśmy oraz zilustrowaliśmy na przykładzie procedurę wyodrębniania opowieści ukrytych z wypowiedzi monologowych na zadany temat. Procedura obejmowała cztery etapy: 1) zebranie danych i przygotowanie transkrypcji; 2) wyszukanie elementów wyróżniających się narracyjnie; 3) analizę i interpretację tekstu z wykorzystaniem narzędzi lingwistycznych i teoretycznoliterac-

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kich; 4) sformułowanie opowieści ukrytej. We wnioskowaniu o opowieści ukrytej na podstawie elementów wyróżniających się narracyjnie kluczową rolę odgrywała identyfikacja reguł mówienia oraz analiza kontekstów ich użycia w monologu. Opowieść ukryta była odtwarzana w postaci jednowątkowego schematu fabularnego na podstawie informacji wywnioskowanych z kontekstów użycia reguł mówienia oraz jawnie zawartych w monologu. W artykule omówiliśmy również teoretyczną i kliniczną wartość oraz dalsze kierunki badań nad opowieściami ukrytymi.

Słowa kluczowe:
opowieść ukryta, narracje, reguły mówienia

Theoretical and methodological introduction

The aim of our article is to describe a procedure for isolating a hidden story from a monologue on an assigned topic. We define "hidden story" as a story about the author's own life, which is accessible to the monologue recipient "indirectly" by conclusions derived from the rules of speech usage, verifiable in linguistics and the theory of literature (see Okopień-Sławińska, 1987).

Hidden stories seem to be an extremely attractive area of psychological study. Firstly, unlike stories told "directly", they are not influenced by the author's auto-presentation, which is analogous to implied versus explicit self-esteem (see Bosson, Swann and Pennebaker, 2000). Secondly, being auto-narrations, they serve as identity and motivational mechanisms (Trzebiński, 2002). Thirdly, since suppression is involved, hidden stories generate cognitive bias, thereby, paradoxically, becoming more accessible (see Wegner, Erber and Zanzakos, 1993) and meaningful in self-regulation. If the hidden content (which is usually emotionally important to the author) is not presented as a coherent, complete and plausible story, the result is that the author's motivation for building such a story is still there (because it has not been used or satisfied), which disrupts the construction of comprehensible auto-narrations about other important life aims (see effect Zeigarnik – Zeigarnik, 1927/1983; "broken stories" – Angus and Bouffard, 2004; "untold stories" – White and Epston, 1990; "unfinished businesses" – Greenberg, 2002; "untold stories 'relating themselves' through symptoms" – Grosz, 2014). This might be why uncovering and telling patients' hidden stories by patients is one of narrative psychotherapy's aims (e.g. Grosz, 2014; McLeod, 1997; Milner and O'Byrne, 2007; Morgan, 2011). Despite their obvious psychological and clinical importance, hidden stories have not as yet been subject to regular studies.

So far, within phenomenologically and linguistically oriented narrative psychology, researchers have analysed the hidden meaning of words or sentences conveyed in narrations (among others Cierpka, 2013; Chądzyńska, 2012; Dryll, 2008; van Dijk, 1993).

These analyses, however, do not lead to isolating hidden stories. Direct results of such analyses are usually formulated as the frequency rate of key words or topics. On the one hand, such an approach favours objectivity of results, but on the other hand, it severely limits them, as the meaning of an utterance, which is defined through its narrative situation, is lost. As for phenomenological and hermeneutic analysis (e.g. Smith, Flowers and Larkin, 2012; Straś-Romanowska, 2008), it aims at a detailed interpretation of an utterance and is supposed to grasp its original meaning. Yet, in the researcher's practice it is by no means an easy task because he or she is supposed to strike a balance between being emphatic in reconstructing the subject's experience by viewing it from this person's perspective, and describing this experience on his or her terms, which he or she sets himself or herself a priori. Unfortunately, phenomenological and hermeneutic methodology offers too much discretion as to how the analysed material should be organised. In order to overcome these limitations, researchers employ methods which draw upon the theory of literature and are orientated towards analysing story types (e.g. Sternberg, Hojjat, Barnes, 2001) or their structures (e.g. Trzebiński, 2002). Measurement accuracy in the first approach comes from using psychometrically-tested questionnaire tools, and in the second from including the quantitative agreement rate of competent judges. Unfortunately, neither approach has devised tools enabling researchers to examine stories which do not manifest themselves directly but which are hidden under an openly presented layer of meanings.

Our suggestion as to the method for reconstructing a hidden story from a monologue, in brief, draws on the phenomenological and hermeneutic approach. In our analysis we concentrate on revealing meanings hidden in monologues. We, however, work them out from the rules of language usage, identifiable in linguistics and literary theory, which are used by the speaking person (see Culler, 2000; Okopień-Sławińska, 1987; 2001), and not from empathising with what the speaker communicates, or from assigning the content of an utterance a priori to a particular psychological category. Moreover, assuming that important personal experiences have a narrative structure (Bruner, 1991; Trzebiński, 2002), we try to "read" a story hidden in a monologue from the inferred meaning and present it in the form of a narrative pattern (Markiewicz, 1984; see Propp 1928/1976).

Following Wimsatt and Beardsley (1954) and Culler (2002), we assumed that the validity of our interpretation is not determined by the speaking person's intention (what he or she wants to convey) but by the meaning carried in an utterance (what he or she manages to convey). The author of a monologue, similar to a patient talking about himself at a therapeutic session, is not necessarily going to say what he or she says indirectly. It does not mean that an utterance can be interpreted freely, or that there are many

plausible interpretations. According to Culler (2000, p.81), a person who is doing the interpreting should be able to convince other people that his or her interpretation is correct. We applied this principle in our procedure. Two psychologists analysed and interpreted the monologues, while the other two team members (a specialist in Polish studies and another psychologist) judged their results. In the next part of the article we present how we prepared, analysed and interpreted the monologues and in what way we formulated the hidden story.[5] Then we proceed to describe our approach in greater detail, focusing on one monologue about life changes as an example. For the sake of the article, from a set of thirty monologues we chose the shortest one. The following procedure applies to each monologue analysed by us.

Description of procedure

Stage 1. Collecting data and preparing transcripts

The subject was asked to speak for ten minutes about "the most important changes which have recently happened in his or her life". The researcher (who also recorded the monologue) was supposed not to ask any additional questions so as to minimise his influence on the course of the monologue. In case of possible questions asked by the subject (e.g. What else shall I say? Can I finish now?), the researcher could only give brief predetermined responses: "As you wish." or "It's up to you". The next step was to prepare an accurate transcript of the monologue which included punctuation marks, interjections (so-called language supports e.g, *well*), sounds of hesitation (e.g. *er, yyy*) as well as distinct extra-verbal elements (e.g. drumming your fingers on the table).

Stage 2. Identifying out-of-key elements

At least two team members (one of the psychologists and the specialist in Polish studies) read a monologue a few times in order to isolate narratively out-of-key elements. We assumed that they comprise everything that, in the context of a monologue, general rules of language usage or instructions given to the subject, seems "different" or "doesn't fit", "doesn't sound", "attracts attention" or "jars". We concentrated mainly on the language aspect of a monologue, avoiding snap judgements and interpretations. Subsequent analysis involved all the elements which had been found distinguishable by at least one of the researchers.

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[5] The procedure described here was adopted in the analysis of monologues on being brought up and bringing up children (Kuncewicz, Sokołowska, Sobkowicz, 2014b, 2015). Also, within our graduate seminars dissertations are being prepared in which students analyse monologues about relationships, life changes, motivation to help and the process of "building up" femininity.

Stage 3. Analysing and interpreting the text using out-of-key elements

We assumed that some elements of a monologue stand out because they are traces left in the language material of the author's intentions to emphasise or conceal certain topics from the recipient (see Dryll, 2014, p.74). These traces are observable because in order to realise his or her intentions, the author uses – in an individualised way – the rules of language usage which are universal in his or her environment or violates these rules (see Grice, 1975; vanDijk, 1997). We think that average language sensitivity and reading a text carefully is enough to recognise some of these traces. Nevertheless, to determine what this individualisation or violation of language usage conventions is requires philological knowledge. Therefore, we accomplished this stage under the supervision of our expert in Polish studies. We also consulted a number of dictionaries (Polish, foreign words, literary terms and a phraseological dictionary) as well as monographs on linguistics and literary theory. Ways of utilising key literary theory devices (among others: types and changes of narration, the author's style, defining time, location and events) in psychological analysis and monologue interpretation were described by Kuncewicz, Sokołowska and Sobkowicz (2014a, 2014b, 2015).

First, we determined if the distinctiveness of a given element refers to any linguistic or literary theory category, and if so, what function it serves in common language usage (Why is it usually used or not used?). Next, we analysed the narrow and broader context of using a particular category in a monologue (Why does the speaker use it right here?). The narrow context comprises the content located immediately "in front of" or "behind" an out-of-key element, whereas the content within the wider context is located further from this distinctive element and is included in the instruction. Analysing the textual contexts of using or violating established speaking conventions allowed us to draw valid conclusions about the speaking person, that is, the author of a monologue.

We reached our conclusions by following "the quantitative rule", according to which the credibility of an interpretative hypothesis depends on the amount of coherent information which is explicit as well as implicit in a monologue. It means that if there are a few alternative plausible interpretative hypotheses, we choose the one with the greatest amount of coherent information as more credible and thus superior to the others. Our assumption corresponds to Markiewicz's thesis (1984), according to which the larger the surface area of a text and the greater the number of its components, the more valid an interpretation is.

At this stage the feedback we received was presented to us orally. We heard arguments in favour of individual interpretative hypotheses. The psychologist and the Polish studies specialist, who provided the feedback, were supposed to find gaps and flaws in the choice of arguments (including linguistic and literary theory ones) and in the line

of reasoning. Interpretative hypotheses accepted by all the team members, both these who did the interpreting and those who gave the feedback, are referred to as interpretative conclusions.

Stage 4. Formulating a hidden story

The result of analysing and interpreting out-of-key elements by means of speech rules and contexts in which they were used in a monologue was a collection of interpretative conclusions about the author. Even at this stage of analysing and interpreting the text, the information contained in interpretative conclusions and explicit in a monologue constituted a meaningful whole. Therefore, the final stage of the procedure was to present this whole as a straightforward one-level narrative pattern (see Markiewicz, 1984). In order to accomplish this pattern, we drew on a collection of inferred information as well as information explicit in the monologue to form short simple sentences reflecting motives (events) in which the main character's position changes significantly in terms of his fate, personality or knowledge (ibid; see Friedman, 1967). Following Markiewicz (1984), we presumed that the motives included in the narrative pattern might be external (physical) or internal (mental), mutational (directly causing changes in the character's situation) or static (concerning his states or qualities). Considering the language aspect, we made sure that the formed sentences contained the narrator's vocabulary and syntax, as they are irreplaceable means of conveying personal meanings. We also incorporated words, phrases or even whole sentences which originally had not been used in a monologue only if we thought they represented a particular motif more precisely. Next, we put the isolated motifs in chronological and cause-and-effect order to obtain a relationally and referentially coherent structure constituting a hidden story (see Sławiński, 2010).

This hidden story was presented to the team members responsible for feedback, who gave their suggestions, and subsequently modified it according to their suggestions. The appraisal of the hidden story involved the legitimacy of isolating particular motifs, the accuracy of wording, its narrative coherence and emotional sense. Hidden stories are usually hidden because they contain personal subject matter which is emotionally important to the narrator. Therefore, a reconstructed hidden story cannot be banal. It carries weight (after all, it is about human life) and somehow should arouse the recipient's emotions.

Hidden stories, like any fictional pattern, can be further analysed in terms of their constructive features. Following Markiewicz (1984), we classified stories according to: the main character (active or passive), the situation (modifying the character's fate, personality or knowledge), and the change contour (gradational, contrastive and stabilising). Slightly modifying Markiewicz's terminology, the gradational contour of a story can be considered *positive* when the character`s situation, which is initially good, gets

better (+) → (+ +); and *negative* when his situation, which is initially bad (–) → (– –) gets worse. The contrastive contour is *positive and negative* when an initially good situation turns into a bad one: (+) → (–); it is *negative and positive* when an initially bad situation transforms into a good one: (–) → (+). The stabilising contour can be *positive* when the character`s situation, which is initially good, remains good (+) → (+); or negative when a bad situation remains bad: (–) → (–). Alternative possibilities of analysing and classifying hidden stories are provided by the phase model of narration, which can be divided into three phases: the commencement, the development and the denouement of action (see e.g. Sławiński, 2010a) or the self-narrative schema (Trzebiński, 2002), which comprises the main character`s intentions, complications which arise when he tries to realise his intentions and possibilities for overcoming these complications.

An example of using the procedure

Data on the subject and the study

The subject was a 32-year-old male, a science teacher in a lower secondary school. He had been married for five years. The man was asked to deliver a ten-minute-long monologue on the following theme: "Tell me about the most important changes in your life". The recording time was two minutes and forty seconds.

Transcript of the monologue

Now then. So in my life little has changed. I mean, nothing has changed. First, a child wasn't born because it was to have been born but wasn't. Things were to have changed but didn't change. Second, as for the job, again there are problems as there were before. If truth be told, we found a tenant but it means, generally, the thing is that as it was unstable and was without, without, er, well, it's hard for me to say, for example to look into the future farther than half a year, isn't it? And this is probably the greatest problem of all because, because it is hard for me to say if I will stay in my current job longer than half a year, if the tenant won't back out and… Shall I speak in such a way that , er, that everybody can understand, okay then, if the tenant won't back out and if there won't be any problems again, er. And when for example Iwona has a change of heart, er… and wants to have a child, er. Besides, granny has fallen ill, it was at home in Jasło my granny, she will also be moving out of this world, rather, yet it's hard to say because she has such a strange illness, I mean a strange illness of a senile type that one rather suffers from it than dies. Well, er, I don't know what else I can say about changes… We have bought a Kindle, haven't we. Is it already ten minutes? Oh, Jesus, so I don't know what else I should say. I have already exhausted the most important topics. And shall we for ten minutes… are you going to keep recording for ten minutes? Okay, thanks then.

Analysis of text interpretation

In each of the following tables, in the first paragraph we placed an out-of-key element or a sequence of a few such elements, set in bold type, together with their immediate context. In the next paragraph we included short linguistic and/or literary theory descriptions of the out-of-key elements and their possible functions in common language usage. Under the tables we recapitulated the consecutive stages of inferring the hidden story from the functions of the out-of-key elements as well as the narrow and wider context in which they were used. We ended each stage with one or more interpretative conclusions about the author of the monologue. We marked them with the letter C in bold type and numbered them in order of being formulated.

Table 1.

elements, context	***Now then. So in my life little*** *has changed. I mean,* ***nothing*** *has changed. First, a child wasn't born because it was to have been born but wasn't. Things were to have changed but didn't change.*
description [functions]	* ***Now then*** (a rough translation of Polish ***teraz tak***): an expression which includes the adverb of circumstances *teraz* (*now*) [defines the circumstances of an event which here, in the research situation, is the act of speaking] and the adverbial pronoun *tak* (*in this way, like this*) [answers the question "how?", relates to the activity defined by *teraz* (*now*), i.e. speaking], a directive act of speaking [performs the function of an imperative determining the manner in which an act of speaking is done]; * ***Now then. So in my life***: a parallel change of the sender [from the author of the utterance to the chief narrator] and of the recipient [from the chief narrator in the role of the recipient to the addressee of the narration]. * ***So***: a conjunction at the beginning of a sentence [starting to enumerate activities, events, etc.]. * ***little (…) nothing***: correcting oneself [gradation, heightening the uncompromising character of judgement]

According to the instruction (*Tell me about the most important changes in your life*), the author was supposed to talk about important changes in his life. In the first sentence he orders himself as the chief narrator that *now* (in the research situation) he should talk about these changes *tak* (Polish: in a specific way). Starting the next sentence with *so* implies that this particular way of talking about changes might consist in enumerating them. However, the author says that *little* has changed in his life, and after that he further strengthens the uncompromising character of his utterance by saying that *nothing* has changed. Next, he goes on to specify *what was to have changed but didn't*.

Why does the author, contrary to the researcher's instructions, order himself to speak about changes in his life in a rather peculiar manner of listing life situations that have not changed? The directive character of the speech act (*Teraz tak* – literally: *Now in this way*) implies that the author wants to control his way of talking about the changes. If he was not controlling it, he could speak about the changes in his life which have recently

been the most important to him, thereby "revealing himself" to the recipient. He does not want to talk about it, which suggests that he refuses to disclose something that is personally important to him. Imposing on himself the manner of speaking which is in disagreement with the instructions indicates that the thoughts about the absence of changes are easily accessible to the author from the very start of the monologue. Presenting them in the extreme categories of "everything or nothing" suggests that they are very difficult to judge, which indicates their distinctly emotional character. Summing up, the thoughts related to *what was to have changed but didn't change* are personally important to the author, easily accessible and distinctly emotional **(C1)**.

Table 2.

elements, context	*Nothing has changed**. First**, a child wasn't born because it was to have been born but wasn't. Things were to have changed but didn't change. **Second**, as for the job, again there are problems as there were before.*
description [functions]	* ***First (...) second**:* using the rhetorical [persuasive function] and/or scientific style [emphasising the "logic" of the argumentation]

The author tries to convince (the listener? himself?) that something bad is happening in his life and that the situation has not improved, as *nothing has changed*. He gives more arguments to prove lack of anticipated changes: *a child wasn't b*orn *(…) again there are problems with the job as there were before.* Although the thoughts about what *was to have changed but didn't* are personally important, easily accessible and distinctly emotional (see C1), the author concentrates on the facts and "logic" of the arguments and not on their emotional aspect. Thus, he avoids a direct expression of emotions connected with what *was to have changed but didn't* **(C2)**.

Table 3.

elements, context	*First, **a child wasn't born because it was to have been born** but wasn't.*
description [functions]	* ***because***: a conjunction [connecting two autonomous sentences, introducing a sentence which explains the meaning of the previous sentence]; * ***was to have been born***: the potential form of the verb *be born* in the past tense [expresses reference to prior expectations, agreements, plans or intentions]; * ***a child wasn't born because it was to have been born***: relational incoherence [the fact that the child was to have been born implies that the child wasn't born]

The author explains the fact that the child was not born by referring to the plan or intention, according to which it *was to have been* born. In other words, he accounts for the non-occurrence of a certain fact by saying that it was planned. This explanation is illogical. It is lacking in some additional information which would enable us to understand how the plan or intention, according to which a child *was to have been born* is connected with the fact that eventually it wasn't born. Did something happen that thwarted the

plan? Or maybe the plan itself changed? Whose plan? The author's or his partner's? Or perhaps it was their joint plan? Omitting the key information about the reason why the plan failed suggests that this information is of a rather personal character and that the author would rather not reveal it in the research situation. However, at the general level it can be speculated that *a child wasn't born* because something happened which made it impossible to carry out the plan according to which it *was to have been born* **(C3)**.

Table 4.

elements, context	*a child wasn't born because it* ***was to have*** *been born but* ***wasn't. Things were to have changed but didn't change*** *(...) as for the job,* ***again there are*** *problems* ***as there were before****. (...)* ***as it was*** *unstable* ***and was*** *without, without, er, well, it's hard for me to say*
description [functions]	* ***was to have (…) but wasn't (…) were to have changed*** *(...) but* ***didn't (…) again there are (…) as there were before (…) as it was (…) and was***: repetitions typical of syntactic parallelisms [expressive function, enhancing the message]; * ***Things were to have changed but didn't***: in the Polish version of the sentence the subject is omitted [vagueness or an attempt to hide information about "things" that were to have changed]

Syntactic parallelisms enhance the emotional charge of the message about the absence of anticipated changes, which assumes the character of a lament: a piece of writing expressing crying, anguish and helplessness in the face of adversity (Kostkiewiczowa, 2010). Thus, the statement about the absence of anticipated changes expresses the crying, anguish and helplessness felt by the author **(C4a)**. Yet, the object of the author's lamentation is not clearly defined. Although the author explicitly speaks about unfulfilled expectations concerning a child and his job, he completely leaves out the information about what changed in his life in connection with it. At the same time the sentence: *Things were to have changed but didn't*, immediately follows the sentence: *A child was to have been born but wasn't*. It suggests that a child's birth was to change something in the author's life but he is not explicit about it **(C4b)**.

Table 5.

elements, context	*First, a child wasn't born because it was to have been born but wasn't. Things were to have changed but didn't change. Second, as for the job, again there are problems as there were before.* ***If truth be told,*** *we found a tenant* ***but*** *it means, generally, the thing is that as it was unstable and was without, without, er, well, it's hard for me to say*
description [functions]	* ***If truth be told***: an expression in the function of an adversative conjunction [the information preceding the conjunction undermines the information following it]; * ***but***: an adversative conjunction [the information preceding the conjunction undermines the information following it]

At first, the author questions the gravity of his problems concerning the job saying that they *found a tenant*. Next, he proceeds to question the significance of finding a tenant, as this fact does not solve a more general problem connected with instability and with something the author finds difficult to talk about (*generally, the thing is that as it was unstable and was without, without, er, well, it's hard for me to say*). The author does not question, however, the significance of the fact that a child wasn't born. On the contrary, he emphasises it when he starts his line of argument about the absence of changes with this very fact (*First, a child wasn't born*) and adds (*because it was to have been born but wasn't*). Thus, it can be concluded that the author is much more concerned about the fact that the child was not born than about his problems with the job or the tenant **(C5a).** Thus, the general problem of instability refers rather to his personal than professional life. It has to do with the fact that the child was not born and with the absence of something the author finds difficult to talk about **(C 5b)**.

Table 6.

elements, context	*as it was unstable and was **without, without, er**, well, it's hard for me to say (...) if I will stay in my current job longer than half a year, if the tenant won't back out (...). And when for example Iwona has a change of heart, er... and wants to have a child, er.*
description [functions]	* ***without***: preposition [communicating the absence of something or somebody]; * ***without, without, er***: repetition of the preposition *without,* using the language support *well*, breaking off after the word *without* [difficulty or unwillingness to talk about it]

The author explicitly (*well, it's hard for me to say*) and implicitly (repeating a pronoun, using a language support, breaking off in the middle of a sentence) expresses his difficulty in talking about something that is missing in his life and has to do with instability. He implies what it is by giving examples of problems: job insecurity (*will I stay in my current job longer than half a year*), the tenant (*won't the tenant back out*) and his partner (*And when for example Iwona has a change of heart, er… and wants to have a child, er.*). The only example concerning his partner is the one related to the fact that a child was not born. Therefore, it is legitimate to presume that the author finds it difficult to speak especially about things that refer to his partner's instability concerning her decision to have a child **(C6)**.

Table 7.

elements, context	*because, because it is hard for me to say if I will stay in my current job longer than half a year,* ***if the tenant won't back out and… Shall I speak in such a way that, er, that everybody can understand****, okay then,* ***if the tenant won't back out*** *and if there won't be any problems* ***again****, er. And when for example Iwona has a change of heart, er… and wants to have a child*
description [functions]	* ***if the tenant won't back out (…) if the tenant won't back out***: repetition typical of anaphora [expressive or delaying function, heightening text coherence]; * ***tenant won't back out and…***: stopping in mid-sentence and pausing [difficulty in talking about certain things, problems with constructing and selecting structures and language elements]; * ***Shall I speak in such a way that, er, that everybody can understand***: change of the communication level to extratextual [increasing the distance to the content of the monologue]; * ***again***: a particle [expressing impatience with the repetitiveness of the event]; * ***er***: a language support (interjection) [difficulty or unwillingness to talk about something

The author stops enumerating arguments (problems with the job and the tenant) and makes a pause, which signals his problem with talking about instability in his life. Next, he dissociates himself from what he is saying and offers to speak to an indeterminate wide audience (*Shall I speak in such a way that, er, that everybody can understand, okay then*) Thanks to the pause and moving to the extratextual communication level he gains time to consider his next words and give his speech a "public", less personal character. The author's return to the intratextual level starts with repeating the last phrase (*won't the tenant back out*) in order to increase the coherence of utterance. Yet, once again he reduces the personal character of the speech by saying *any problems*. Using the particle *again* with reference to *any problems* indicates the author's impatience, and thus a distinctly personal and emotional reaction to the repetitiveness of an event. Putting the interjection *er* after the phrase *any problems* reflects the author's difficulty in talking in a personal manner about what makes him impatient. In the next sentence (*And when for example Iwona has a change of heart, er… and wants to have a child*) the author gives an example, which signals that eventually he has made up his mind to expand on his utterance about what he finds difficult to talk about and what makes him impatient. Summing up, the author finds it difficult to talk about something that makes him impatient and is connected with his partner; namely that she might have a change of heart about having a child **(C7).**

Table 8.

elements, context	*if the tenant won't **back out** and if there won't be any problems again, er. And when for example Iwona **has a change of heart, er**… and wants to have a child, **er**. Besides, granny has fallen ill*
description [functions]	* ***back out*** (translation of Polish ***zbiesić się***): an Old Polish word [formerly meaning "become infuriated", "go into a rage", now has evolved into: "decide not to do something you were planning to do or promised to do]; * ***has a change of heart*** (translation of Polish ***odwidzi się***): a colloquial word [meaning "she will change her attitude", "she will no longer like it", "she will be fussy"] untypical to use when referring to somebody's readiness to have a child]; * ***has a change of heart, er…***: a pause [problems with constructing and selecting structures and language elements]; * ***er (…) er***: two interjections (language supports) in close proximity [either particular difficulty or unwillingness to talk about something]; * ***this*** (an approximate equivalent of the Polish word ***ten***): a shortened form of "ten tego" (this and that) [applying to an activity, situation, fact or state which the sender does not want or cannot define]

Both untypical words: *zbiesić się* (*back out*) and *odwidzieć* (*have a change of heart*) have a lot in common: close proximity in the text, the theme of instability (the tenant's and the partner's) and the power to weaken emotional expression. In the first case, the emotional expression is undermined by the word's archaism – nowadays it is rarely used to denote the state of going into a rage or getting annoyed. In the other case the emotional expression is weakened due to the untypical use of the word *odwidzieć* (*have a change of heart*). This word usually refers to a whim or a change of a liking, which does not lead to any far-reaching consequences. However, in the monologue it was used to define rather important changes which occurred in their relationship concerning his partner's intention not to have a child. The aforementioned findings suggest that the author's emotions connected with the tenant's and his partner's instability are negative and stronger than their manifestation in the monologue **(C8a)**. Using the language support *ten* (*this*) after the words *odwidzi* (*has a change of heart*) and *child*, making a pause after the phrase *odwidzi ten* (*has a change of heart, er…*) and obviously wandering off the subject (*besides, granny has fallen ill*) after the word *a child* all imply that the author finds it particularly difficult to speak or might not want to speak about the changes concerning his partner's intention of having a child **(C8b)**.

Table 9.

elements, context	*Iwona has a change of heart, er… and wants to have a child, er. Besides, granny has fallen ill, it was* ***at home in Jasło my*** *granny, she will also be moving out of this world, rather*
description [functions]	* ***at home in Jasło***: a parenthetic remark [exposing information which is important to the author], the only specification of place in the text [indicates its significance to the author or the need to provide the listener with more details because another home or house is also being talked about], the only description in the text [presents static elements of the presented world]; * ***home***: an ambiguous noun [its prototypical meaning: flat, house, building, household, family or the whole of matters related to the family and household]; * ***my***: the only possessive pronoun used with reference to a person [what is expressed by the noun following this pronoun belongs to, applies to, or is particularly liked by the speaker]

Applying the pronoun *my* only to granny and specifying only her place of living *(at home in Jasło)* suggests that the author likes his grandmother in particular. Thus, *home in Jasło* has a personal meaning to the author (household, family); it does not signify merely a building or a flat. It holds positive associations for him. Moreover, being described in the greatest detail and, in consequence, as the most static element of the presented world, *home in Jasło* can be associated with something stable. However, the home in Jasło, from which his grandmother *will be moving out* as well as the one ”built” with his partner, who might *have a change of heart* about having a child are currently not stable in the author's perception. Parallelism, close proximity of both themes concerning instability, difficulty in speaking explicitly about his situation, his partner or a child (see C8b) all suggest that the author, while speaking about his grandmother's moving out, might be inexplicitly referring to something that has to do with the instability of his relationship with his partner **(C9)**.

Table 10.

elements, context	*My granny* ***will also be moving out of this world, rather, although*** *it's hard to say because she has such a strange illness, I mean a strange illness of a senile type* ***that one rather suffers from it than dies.***
description [functions]	* ***also***: referential incoherence [it is unclear to whom the inclusive particle *also* refers; * ***will be moving out of this world***: an euphemism for “die” [a phrase softening a “stronger” definition you want to avoid]; * ***rather***: a particle [expresses the speaker's hesitation over what judgement he should make; it also serves to cancel the previous judgement and replace it with a new one which better characterises a given fact]; * ***although***: an adversative conjunction (the information preceding it undermines the information following it]; * ***one rather suffers from it than dies***: a shift from the third person to the impersonal form, in the Polish version using the reflexive pronoun *się* [universalising judgement, applied to a community doing an activity]

The author does not specify who else, apart from his grandmother, *will be moving out of this world*. The phrase *move out of this world* is a euphemism for the word "die", so the particle *also* might refer to a child who had died before it was born (e.g. as a result of miscarriage or abortion). However, the sentence *will be moving out* is formulated in the future tense, which might suggest that the child has already "moved into" this world and is currently staying here. Yet, the author stresses twice that a child *wasn't born* (see Table 3), which means that it "didn't move into" this world and is not staying here. And if it is not staying here, it cannot be moving out of it. So who and from where should be *also* moving out?

If the author, while talking about his grandmother moving out, is implicitly communicating something that is related to the instability of his relationship (see C9), he might as well mean that either he or his partner is going to move out of the relationship. The premise that the partner will be moving out of the relationship might be based on the instability of her intention to have a child (see C8b) or acting against the author's plan to have a child be born (see C3). The premise that the author will be moving out of the relationship might be his impatience with his partner's instability concerning a child (see C7) or his disappointment at the absence of an important change which would be brought about by a child's birth (see C4b). The second thesis is better proved in the text. On speaking about his grandmother's suffering, the author "slides" into the impersonal form, accompanied – in the Polish version – by the reflexive pronoun *się* (*one rather suffers than dies*), which suggests that he does not mean merely his grandmother's suffering. The only person whose distress he (indirectly) expresses in the monologue is himself (see C4a). Therefore, it can be concluded that the author, when speaking about his grandmother's suffering, means his misery as well **(C 10a)**. The particle *also* most probably applies to the author himself. If this is the case, the author has considered the possibility of "moving out" of his relationship **(C 10b)**.

If the author, while talking about his grandmother's suffering, indirectly refers to his own misery, we must presume that he is unlikely to *move out of* his relationship. It is proved by his using the conjunction *although*, which undermines the statement about moving out (*will be moving out […] although it is hard to say*) and using the particle *rather* twice. The first *rather* signals hesitation (*will be moving out […] rather*), the second one revokes the judgement about moving out in favour of a painful continuation of the present situation. Summing up, the author is unlikely to move out of his relationship. He will continue his relationship, even if it is painful **(C 10c)**.

Table 11.

elements, context	*that you rather suffer from it than die.* ***Well, er, I don't know what else I can say about changes… We have bought a Kindle****, haven't we. Is it already ten minutes?* ***Oh, Jesus****, so I don't know what else I should say. I have already exhausted the most important topics. And shall we for ten minutes, are you going to keep recording for ten minutes? Okay, thanks then*
description [functions]	* ***Well, er, I don't know what else I can say about changes…***: a change from the intratextual to extratextual communication level [increasing the distance to the content of the monologue]; a pause in the speech [problem with constructing and selecting structures or language elements]; * ***We have bought a Kindle***: a single short narration (in the first person) conducted at the lowest intratextual level, included in the longer narration at the extratextual level [a short-lasting reduction of the distance to the content of the monologue]; * ***Oh, Jesus***: a prepositional phrase which functions as an exclamation [expresses strong emotional states or the speaker's state of will]

After the utterance indirectly referring to suffering in his relationship (see C10c), the author explicitly (*Well, er, I don't know what else I can say about changes*) and implicitly (breaking off) expresses that it is hard for him to continue speaking about the changes. Consequently, with the exception of the short sentence: *We have bought a Kindle*, he stays outside the presented world until the end of his monologue and directly addresses only the researcher. At the same time there is tangible tension between the author's attempt to fulfil the researcher's expectations (*Is it already ten minutes? Oh, Jesus, so I don't know what else I should say*) and his avoidance of talking about matters which are difficult for him. In the context of disagreement between the partners about a child (see C3, 9,10b), the sentence about buying a Kindle (an e-book reader) seems to be inadequate and trivial. It implies a ridiculous story about a relationship in which the partners are united not by their child but by an object of individual use. Purchasing a Kindle follows the convention of auto-irony, in which blatant banality points to the protagonist's hidden tragedy. Using auto-irony suggests the speaker's distance to the content of the monologue and his attempt to presented it in a creative way (Okopień-Sławińska, 2010). Summing up, the author manages to maintain distance from the difficult experiences in his relationship and transform them in a creative way; which proves that he has effective means of coping with these problems **(C11)**.

Table 12.

elements, context	*We have bought a Kindle, haven't we. Is it already ten minutes? Oh, Jesus, so I don't know what else I should say. I have already exhausted the most important topics.* ***And shall we for ten minutes (…), are you going to keep recording for ten minutes?*** *Okay, thanks then*
description [functions]	* ***And shall we for ten minutes (…)***: breaking off after the word *minutes* [problem with constructing and selecting structures and language elements]; * ***shall we (…) are you going***: correcting himself by changing the personal form "we" to "you" [increases the adequacy of using a personal form when addressing the researcher]; * ***for ten minutes, for ten minutes***: repetition [expressive function, gaining time to correct the personal form]

The author breaks off a sentence made in the personal form "we" and corrects himself, using the form "you." Why? He could ask the researcher for example the following question: *And what shall we* "do" *for ten minutes*? (as the topics have been exhausted and the recording time has not finished). The adequacy of such a question would not be lower than the question he eventually asks (*are you going to keep recording for ten minutes?*). The author might consider the form "we" inadequate to refer to himself and the listener because he has just applied it to himself and his partner when he mentioned buying a Kindle together. Furthermore, he might realise the inadequacy of the question he has just asked the researcher because the content of the statement about his relationship is still active and is mixing with the content of the question. He could put the same question to himself and his partner; for example *And what shall we do next?* (meaning: How shall we continue our life together? Living together in one place but apart, taking turns in reading e-books?).

Since the changes awaited by the author have not taken place so far (see C4a) and since the changes concern the need for stabilizing the relations with his partner (see C5b, 6, 9), it can be concluded that the relationship has gone through a difficult phase before **(C 12a)**. In line with the earlier findings, a new child was supposed to significantly change something in the author's life (see C 4b). Thus, it can be reasonably presumed that a child, at least in the author's intention, was to have been born to cause that the couple no longer stayed apart and to ensure the stability of the relationship **(C 12b)**. The author's lamentation over the absence of the anticipated changes (see C4a) suggests that he is embittered about the fact that the child failed to fulfil its "relationship-cementing" stabilising role **(C 12c)**.

Formulating a hidden story

Analysing the consecutive out-of-key elements we concluded that: 1) The thoughts related to *what was to have changed but didn't change* are personally important to the author, easily accessible and of a distinctly emotional character; 2) The author avoids a direct expression of emotions connected with what *was to have changed but didn't;* 3) *A child wasn't born* because something happened which made it impossible to carry out the plan according to which it *was to have been born*; 4a) The statement about the absence of anticipated changes expresses the crying, anguish and helplessness felt by the author; 4b) A child's birth was to change something in the author's life but he is not explicit about it; 5a) The author is much more concerned about the fact that the child was not born than about his problems with the job or the tenant; 5b) The general problem of instability refers rather to his personal than professional life. It has to do with the fact that the child was not born and with the absence of something the author finds difficult to talk about; 6) The author finds it difficult to speak especially about things that refer

to his partner's instability concerning her decision to have a child; 7) The author finds it difficult to talk about something that makes him impatient and is connected with his partner; namely that she might have a change of heart about having a child; 8a) The author's emotions connected with the tenant's and his partner's instability are negative and stronger than their manifestation in the monologue; 8b) The author finds it particularly difficult to speak or might not want to speak about the changes concerning his partner's intention of having a child; 9) The author, while speaking about his grandmother's moving out, might be inexplicitly referring to something that has to do with the instability of his relationship with his partner; 10a) The author, when speaking about his grandmother's suffering, means his misery as well; 10b) The author has considered the possibility of "moving out" of his relationship; 10c) The author is unlikely to move out of his relationship. He will continue his relationship, even if it is painful; 11) The author manages to maintain distance from the difficult experiences in his relationship and transform them in a creative way; which proves that he has effective means of coping with these problems; 12a) The relationship has gone through a difficult phase before; 12b) A child, at least in the author's intention, was to have been born to cause that the couple no longer stayed apart and to ensure the stability of the relationship; 12c) The author is embittered about the fact that the child failed to fulfil its "relationship-cementing" stabilising role.

On the basis of the aforementioned conclusions we isolated narrative motifs and put them in the chronological and cause-and-effect order. We designated them in the following way: A, B, C, E, F, G, H. In order to ensure the story's coherence we incorporated Motif D, which had been isolated from the information which was explicit in the monologue. Below we present a general outline of the hidden story, together with references to the key interpretative conclusions, on which we based our story:

A. We were apart in our relationship (1, 12a)

B. A child was supposed to unite us / provide stability (2, 3, 4b, 5a, 7, 8, 9, 12b)

C. But Iwona had a change of heart about a child (3, 6, 7, 8a, 8b, 10a)

D. And a child was not born

E. Inside me is a plaintive cry, suffering and helplessness (1, 3, 4a, 10a, 12c)

F. We are apart again (1, 12a)

G. I am going to move out of this relationship (9, 10b)

H. Yet, I will rather stay in this relationship (10c, 11)

Utilising Markiewicz's typology (1984), it can be concluded that the main character of the story is initially passive and later he becomes active. His personality undergoes modification (a sequence of events E→F→G→H) with a positive contrastive contour (G→H). However, his fate does not receive modification. It has a definite negative sta-

bilising contour (A=F). On the basis of the phase model of narration (see Sławiński, 2010, pp.147−148) it can be concluded that Motifs A and B constitute the commencement, C, D and E – the development and the climax and F, G and H – the denouement of action, while the teleological model of the self-narrative schema (Trzebiński, 2002) enables us to infer lack of definite intention by the main character; obvious complications (C, D) and a negative outcome (E, F).

Final conclusions

The described procedure of isolating hidden stories from monologues has great potential both for scientific research and clinical diagnosis: it seems to be of potential usefulness especially in psychotherapy. On the one hand, it engages mental processes which are applied in therapeutic work. On the other hand, it utilises linguistic and literary theory devices to verify these processes. Moreover, it provides concept frames which, in our opinion, are useful in narratively explaining the mechanisms of mental disorders as well as planning therapeutic strategies.

Developing the procedure for isolating a hidden story from a monologue will allow its extensive use in psychological research. We would like to adopt this procedure to check, among other things, if there are connections between the structure and content of a hidden story, and different types of mental disorders. Considering that one monologue can include a few stories which are hidden with varying degrees, it would be worthwhile to examine if they perform different functions in self-regulation. In the interpersonal area it would be interesting to look at relations between different aspects of hidden stories and the quality of close relationship.

Although the proposed procedure lies within the scope of qualitative research, it aspires to aims which are usually attributed to quantitative methods. We think, however, that the role of qualitative methods does not have to be limited to "exploring the area" at the service of quantitative research (see Paluchowski, 2010), especially if studies concern speech-related mental phenomena. Yet, including qualitative methods in the research field requires conducting studies which would verify the reliability and validity of methods adopted to analyse textual material. We hope that these studies will help to construct and verify theoretical models of high heuristic value for psychological practice.

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Psycho-social determinants of sexual satisfaction in young, middle and late adulthood

Abstract

Numerous studies demonstrate that, regardless of the adulthood stage, sexual satisfaction is crucial to the general opinion on life quality. The models of sexual satisfaction presented in the subject literature display underlying differences in its determinants between men and women; little, however, is said about potential variations, which can occur at different stages in an adult's life. The results presented in our article are extensively researched fragments regarding the psycho-social determinants of sexual satisfaction, conducted on 90 women and 77 men, aged 21−72.

Our study attempted to determine the extent to which age affects:

- The sexual satisfaction level in women and men,
- The relationship between psycho-physical attractiveness, close relationship satisfaction, and intensification of sexual practices; with the level of sexual satisfaction for both women and men.

The assessment was based on original questionnaires as well as on the Intimacy, Passion and Commitment Questionnaires by Acker and Davis.

Neither age nor gender influenced the sexual satisfaction level. However, they both affected the relationship between sexual satisfaction and psychosocial variables.

Keywords:

sexual satisfaction, psycho-physical attractiveness, satisfaction with close relationship, sexual practices

Streszczenie

Liczne badania dowodzą, że satysfakcja seksualna jest ważna dla ogólnej oceny jakości życia na każdym etapie dorosłości. Modele satysfakcji seksualnej prezentowane w literaturze przedmiotu wskazują różnice w jej uwarunkowaniach pomiędzy kobietami i mężczyznami, niewiele jednak mówiąc o potencjalnych zmianach, mogących wystąpić na różnych etapach dorosłości. Prezentowane w artykule wyniki są fragmentem autorskich badań dotyczących psychospołecznych uwarunkowań satysfakcji seksualnej, przeprowadzonych na 90 kobietach i 77 mężczyznach w wieku 21−72 lata. Celem badania było ustalenie w jakim zakresie wiek różnicuje:

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- poziom satysfakcji seksualnej kobiet i mężczyzn,
- związek oceny atrakcyjności psychofizycznej własnej i partnera, zadowolenia z bliskiego związku, nasilenia ars amandi z poziomem satysfakcji seksualnej kobiet i mężczyzn.

W pomiarze wykorzystano autorskie kwestionariusze oraz Kwestionariusz Intymność, Namiętność, Zaangażowanie autorstwa Ackera i Davisa.

Wiek ani płeć nie różnicowały poziomu satysfakcji seksualnej. Różnicowały jednak siłę związków zadowolenia z życia seksualnego ze zmiennymi psychospołecznymi.

Słowa kluczowe:

satysfakcja seksualna, atrakcyjność psycho-fizyczna, satysfakcja z bliskiego związku, praktyki seksualne

Introduction

Sexuality is undeniably inscribed in human nature, and for most people sex plays an important role. Sexual practices may lead to many positive results; including being the source of positive emotions. Sexuality aspect is closely related to the quality of life and its appreciation (Rosen, Bachmann, 2008; Bancroft, 2009; Dolińska-Zygmunt, Nomejko, 2012; Kuczyńska, 1998). Due to its subjective character, sexual satisfaction is a term quite difficult to operationalize. Sexuality itself is defined as an aspect of the human condition manifesting itself in lust or desire, and the accompanying, physiologically determined, sexual responses and behaviors, leading to orgasm or, at least a pleasurable state of arousal, occurring often between two people, yet not infrequently practiced alone (Bancroft, 2011, p. 19).

Sexual satisfaction is defined as:

- An emotional response to a subjective evaluation of positive and negative aspects, related to sexual life (Lawrance, Byers, 1995);
- A highly personalized feeling, relating strongly to past sexual experiences, present expectations and future aspirations (Davidson ,1995, after: Haavio-Mannila, Kontula, 1997);
- A personal, subjective evaluation of one's own sexual relations (Ji, Norling, 2004);
- A subjective evaluation at the level n which an individual is satisfied with their sexual life (Pinney, Gerrard, 1987, after: Holt, Lynes, 2007).

The definitions mentioned above accentuate sexual satisfaction's subjective dimension and its cognitive and/or emotional evaluation. The definition of satisfaction, adopted for the purposes of this article, is closest in definition to that formulated by Pinney and Gerard. Sexual satisfaction is, in their light, understood as a cognitive-emotional evaluation of the sex life satisfaction level.

Models of sexual satisfaction determinants

Reaching sexual satisfaction depends on many factors, which may often be non-sexual in character. According to Lew-Starowicz (1997, 2010) the level reached is influenced by biological, psychic and socio-cultural factors. Amongst the biological factors Lew-Starowicz mentions genetics, hormones, neurotransmitters, anatomy and sexual physiology. The psychological agents are psycho-sexual development, needs, expectations, attitudes, one's self perception, erotic creativity, personality, and partner relations. The socio-cultural category encompasses such notions as norms, education, fashion, stereotypes, gender roles, erotic art and pornography. Holt and Lyness (2007) suggest a concept, according to which sexual satisfaction is assessed sexual practices when viewed as desire and sexual functioning. Desire is defined as cognitive and affective interest in sexual activity with a particular individual and readiness for this activity. Sexual functioning is a biological component, which constitutes various stages of intercourse: lust, arousal and orgasm and their physiological manifestations. Davis (2006) suggests a trenary model in which global evaluation is affected by physical and emotional satisfaction, and satisfaction with control when and if sexual intercourse occurs. Haavio-Mannila and Kontula (1997), in their studies, have distinguished five key aspects crucial to a satisfying sex life:

- Social background: age, atmosphere surrounding sexuality and religion in the house where you were brought up, resources relating to education and when you had your first sexual experiences;
- Personal views related to sex: its importance against the importance of life's other aspects, sexual assertiveness, perception of own sexual skills, sexual activeness and attractiveness;
- Emotional ties between partners: being loved and loving one's partner;
- Sexual techniques and practices: using sex gadgets and materials, frequency of intercourse and multiple techniques and positions;
- Orgasm: frequency in completing intercourse with intense pleasure.

The American Center for Martial and Sexual Health (after: Leiblum, Rosen, 2005) portrays a model of sexual satisfaction which accentuates psycho-social factors. Sex life is always set in a context: the quality of close relationship, overall health, having children, professional satisfaction and stage in life. The elements mentioned above greatly determine the sexual relation and its satisfaction level.

Self-assessing psycho-physical attractiveness

Many other scientists emphasize the relation between self-esteem and the quality of sex life (Bancroft, 2009; Baumeister and others, 2003; Pujols and others, 2010; Izdebski, 2012). The sexual reaction model by Rosemary Basson (2000, 2005) stipulates that, high

self-esteem is an important psychological condition for reaching sexual satisfaction, and the need to maintain or raise thislevel of self-appraisal and attractiveness is a frequent (beyond-sexual) motif for engaging in sexual activity. Our own studies have also demonstrated a strong link between sexual satisfaction and self-esteem (Dolińska- Zygmunt, Nomejko, 2012). According to Gossmann and others (2003), people convinced of their sex appeal are more prone to initiate sexual practices and more satisfied with them. Meltzer and McNulty's studies (2010) also show that sexual attractiveness strongly correlates to the assessment of one's body, weight, and physical condition. Physical fitness, however, is greater in importance for men than women (Kedde, Berlo, 2006). The studies, conducted in American universities, indicate that amongst young men an important predicate of sexual satisfaction is their self-assessed musculature (Daniel, Bridges, 2012).

Evaluating the partner's psycho-physical attractiveness

An important element in evaluating a close relationship is to evaluate one's partner's attractiveness. Attractiveness plays a significant role, particularly, in the relationship's initial stage and it frequently determines whether it will continue. Men seek women who are younger and healthy (shiny hair, clear complexion, full lips, healthy teeth, shapely figure), and energetic (correct tonus, resilience, expressiveness); women tend to concentrate on a man's strength and wealth, and other characteristics which predispose men to provide resources in the future (ex. intelligence). The evolutionary concept of sexual satisfaction indicates that, especially in women, orgasm and satisfaction stemming from intercourse are signals for choosing the proper individual for mating and procreation (Buss, 2007). The partner's assessment of a woman's attractiveness is closely connected with how frequently there is sexual activity and sexual satisfaction, and how content his partner will be with marriage (Meltzer, McNulty, 2010). Studies by Nęcki (1990) prove that the relation between a partner's attractiveness and sexual satisfaction is positive in cases of men. When taking women into consideration, one notices that perceiving the partner as unattractive lowers sexual satisfaction. High evaluation of the partner does not, however, relate to high satisfaction from sexual practices. Women, in order to achieve high sexual satisfaction, need to feel certain about the way they are perceived by their partners (Davis, 2006).

Satisfaction with a close relationship

The importance of the bond between partners and satisfaction with the relationship that benefits a satisfactory sex life is also underlined by Kuczyńska (1992, 2001), Nęcki (1990), Gossmann and others, (2003), and Meltzer and McNulty, (2010). Satisfaction with the relationship is especially important for the woman's evaluation of sex life (Rosen, Bachmann, 2008); however, it also indirectly affects men. In a couple it is the woman who, most often, decides how frequent their sexual contacts will be, and they are

more frequent when the woman is satisfied with the entire relations with her partner. The Kinsey's Institute studies (after: Bancroft, 2009) show that the women's contentment with their sex life is greatly influenced when they are aware that their partners are being sexually satisfied and when they themselves are desired by their partner. In the studies conducted by Izdebski (2012) on a population of 2720 Poles, aged 18−49, sexual satisfaction correlates most intensively with their satisfaction in being in a close relationship.

Sexual practices

Sexual practices are an important element to determine sexual satisfaction. Even works of art originating before our era depict complex, rich sexual practices understood as a way to reach happiness (Lew-Starowicz, 1987). Likewise, contemporary sexology often concentrates on enriching sexual techniques. Studies show that satisfaction with intimate relations rises accordingly to the frequency of alterations in sexual practices (Burke, Yung, 2012). It is especially important for women (Kratochvil, 2002; Leiblum, Rosen, 2005). Females who are satisfied with their sex lives, when compared to the discontented ones, find the more sophisticated practices more pleasurable (Kuczyńska, 1992).

Gender

Research regarding the relationship between sexual satisfaction and quality of life among young adults demonstrated that, in the case of women, sexual satisfaction is strongly related to quality of life, both globally and in particular. Among men, sexual satisfaction was related only to the psycho-physical dimension (Dolińska-Zygmunt, Nomejko, 2011). The results gathered confirm the viewpoint of sexologists, according to which a woman's sexual satisfaction is determined not by physical changes that the body undergoes, but by mental factors. It is the context that decides whether excitation will be perceived and interpreted as sexual (Nowosielski, 2010). The circular model of woman's sexuality, put forth by Basson (2005), stipulates that, while being sexually aroused, an individual evaluates information coming from three sources: cognition, emotions and genitals. Women often omit genital information and concentrate on cognitive and emotional evaluations. This is connected with anatomy and socialization. Physical pleasure and fulfilling one's physiological needs are only one of the motivations of sexual activity. Intimacy, positive emotions, feeling attractive and being satisfied with the relationship, which can be reinforced by sex, are also very important. Reaching satisfaction in the mentioned areas affects the level of sex life satisfaction. It often happens that women engage in intercourse in order to fulfill those needs, regardless of the fact that they do not, initially, experience arousal. Arousal can, however, be initiated by stimulation – and after erotic stimuli have started. Due to cognitive changes, the stimuli, understood initially as neutral, begin to be perceived as strongly arousing.

Age

Most studies regarding sexual satisfaction determinants concern young adults. Sexuality of the middle-aged and elderly is an area veiled both by social taboo and scientific neglect. The majority of theories of psycho-sexual development are restricted to the period between birth and young adulthood. Yet, according to life-span psychology, a human being's psycho-sexual development lasts a whole lifetime. Depicting sexual satisfaction determinants at various stages of adulthood is, therefore, very important. Even more so if one takes into account extended life spansof ageing societies. Studies show that people who stay sexually active in late adulthood, enjoy good health and happiness (DeLamater, 2012). Subject literature signalizes that the frequency of sexual intercourse decreases with age; however, sexual satisfaction stemming from it does not. On the contrary – the level can, in fact, increase (Kivela, 1986, after: Cichocka, 2006; Delamater, 2012). With age, particularly among women, awareness of personal sexuality and the needs connected with it rises, alongside with the ability to communicate one's sexual expectations. In middle and late adulthood, psycho-sexual development is connected with adapting to changes stemming from interaction between various factors, for instance biological and cultural. With regard to these changes the sexual satisfaction determinants can undergo alterations. With age more sexual-organ-related dysfunctions occur in both women and men. At this point one can witness the increasing need to diversify and intensify sexual stimuli, or sexual practices. When considering older people, one can witness decreased interest with the sexual act, understood in the conventional manner as penetration. In return the need for caressing and foreplay grows (Adams, Turner, 1988). Growing older, people tend to gain perspective on sexual fitness (Izdebski, 2012). Interest in genitalia decreases and sexual dysfunctions become less difficult to accept (Leiblum, Rosen, 2005).

Purpose and hypothesis

On the basis of subject literature analysis, one can conclude that relatively few studies regarding human sexuality are set in a functional-holistic paradigm and salutogenetic orientation. Even less space is devoted to researching the predictors of a satisfying sex life among the middle-aged and people in late stages of adulthood (Cichocka, 2007; Izdebski, 2012). This translates to significant shortages in medical knowledge by doctors, psychologists and other people who want to improve health and life-quality among these particular groups. Our research objective was to determine the relation between the chosen psycho-social variables and sexual satisfaction among both women and men in early (21−35 years of age), middle (36−50) and late (above 50) adulthood.

The following research questions were formulated:

1. What is the level of sexual satisfaction among women and men, with regard to their age?
2. What is the relation between psycho-social variables (assessing one's own and partner's attractiveness, satisfaction with a close relationship and sexual practices) with sexual satisfaction, and how does age modify this relationship?

The following hypotheses were formulated:

1. Age does not affect the sexual satisfaction level of women and men.
2. Psycho-social qualities are related to the sexual satisfaction level. The higher one's self-assessed psycho-physical attractiveness, the partner's evaluative psycho-physical attractiveness, the intensified particular declared sexual practices, and the close satisfying relationship; the higher the sexual satisfaction level.
3. Age modifies the relations between psycho-social variables and sexual satisfaction. With age, the importance of sexual practices and satisfaction with a close relationship rises for both men and women.
4. Sexual satisfaction among women is strongly related to sexual practices, to how they evaluatef their partner's psycho-physical attractiveness and satisfaction with a close relationship, and among men with self-assessment of psycho-physical attractiveness.

Method

Participants

Two hundred individuals took part in our study. Due to imprecisely completed questionnaires by some individuals, the results are based on answers gathered from only 90 women and 77 men. The subjects' ages ranged between 21 and 72 years (average 40, 82). In the young adult age group (ages 21−35) there were 30 women and 30 men, middle age (36−50) included 29 women and 25 men, and late adulthood (51−72) 31 women and 22 men. The participants described their orientation as heterosexual and declared that they remained in heterosexual relationships spanning from six months to 42 years (average = 14.1). Forty-six percent were in informal relationships, and 54% were married). Seventy-seven percent lived with their partner. Every person who underwent the survey had received education – three percent primary, 14% professional education, 20% secondary education, 22%incomplete higher education, and 43% higher education. The majority of the subjects declared that they were practicing their faith (see Table 1).

Table 1

Differentiation of the test group based on Age, Duration of Relationship and Type of Relationship

Age group	Duration of relationship in years	Formalization (marriage)	Sex	Frequency
21–35 (n=60)	1–4 (n=44)	Formalized relationship (n=2)	F	2
			M	0
		Non-formalized relationship (n=42)	F	19
			M	23
	5–20 (n=16)	Formalized relationship (n=8)	F	4
			M	4
		Non-formalized relationship (n=8)	F	5
			M	3
36–50 (n=54)	1–4 (n=10)	Formalized relationship (n=1)	F	0
			M	1
		Non-formalized relationship (n=9)	F	8
			M	1
	5–20 (n=25)	Formalized relationship (n=19)	F	12
			M	7
		Non-formalized relationship (n=6)	F	1
			M	5
	>20 (n=19)	Formalized relationship (n=0)	F	0
			M	0
		Non-formalized relationship (n=19)	F	8
			M	11
51–72 (n=53)	1–4 (n=6)	Formalized relationship (n=3)	F	1
			M	2
		Non-formalized relationship (n=3)	F	2
			M	1
	5–20 (n=12)	Formalized relationship (n=6)	F	5
			M	1
		Non-formalized relationship (n=6)	F	1
			M	5
	>20 (n=35)	Formalized relationship (n=32)	F	19
			M	13
		Non-formalized relationship (n=3)	F	3
			M	0

Source: own work

Procedure and Design

The study was conducted in Poland, in 2012. The participants were recruited via the snow-ball method. The majority of participants fit into the chosen criteria, they belonged

to the agreed age groups, sexual activeness, and remained in their relationship. The subjects answered the provided questions anonymously. The questionnaires took 20 minutes to complete, and were preceded by the following instructions:

"The following inquiry regards various aspects of close relationships and sexuality. The survey is anonymous and the results will be utilized for the use of science. Please answer every question. Otherwise, the results will not be usable in further analysis. You need to provide one answer for each question. The answers should be submitted by inserting words/numbers or an "X" in the appropriate columns. While answering the questions please keep your current relationship in mind.

Measures

Sexual Satisfaction Questionnaire

The Sexual Satisfaction Questionnaire (Nomejko, Dolińska-Zygmunt, 2014) was formulated in 2010. On the basis of subject literature, 35 questions were prepared. Of these the judges listed 28 as appropriate for the survey. These questions were included in the pilot version. For the benefit of further analysis, it was decided to use only these questions which demonstrated discriminatory power below 0.4. We also eliminated those questions between which a significant, two-sided Pearson correlation was discernible, assuming that they might be too similar and thus carry similar meanings. To evaluate the adjusted model, we used the RMSEA index, which reached 0.073. In this case, values below 0.05 signified a precise adjustment of the model, lower than 0.08 were understood as satisfactory, and higher than 0.1 represented lack of adjustment. The method's validity e was measured by Cronbach's alpha coefficient, which attested to a high coherence of the questionnaire, while its value reached 0.83. Ultimately, the method included 10 items. The surveyed individual related to the questions using a four-level Likert scale. The gathered result informed about the sexual satisfaction level. The Sexual Satisfaction Questionnaire was confirmed by the correlation between its results , and the results stemming from the other questionnaire application, whose results should, in theory, be the same in relation to the level of sexual satisfaction (Nomejko, Dolińska- Zygmunt 2014).

Psycho-Physical Attractiveness Questionnaire

Our method used to measure the self-assessment of personal, psycho-physical attractiveness and the evaluation of the partner's psycho-physical attractiveness was established in 2012. In an internet survey one question was provided – "*what makes your partner attractive to you*". Fifty-one individuals took part in the survey. The most frequent answers were grouped into 12 categories. The individual's task was to evaluate their own attractiveness and their partner's. Answers were based on a five-level Likert scale. Fac-

tor-analysis demonstrated the existence of three dimensions, which were defined as image attractiveness (facial features, complexion, clothing style, scent, hygiene), physical attractiveness and vitality (body measurements, movement, coordination), and mental attractiveness (character traits, intelligence, interests). Each coefficient sum amounts to a self-assessed global image of psycho-physical attractiveness and the partner's psycho-physical appeal. The method's accuracy was measured using Cronbach's alpha coefficient and signifies high questionnaire coherence(see Table 2).

Table 2

Statistics Showing Self-Assessment Accuracy of Psycho-Physical Attractiveness and in Evaluating the Partner's Psycho-Physical Attractiveness Questionnaire

Cronbach's alpha coefficient		
	Evaluation of Partner's Psycho-Physical Attractiveness	Self-Assessment of Psycho-Physical Attractiveness
Global result	0.89	0.87
Mental attractiveness	0.74	0.67
Attractiveness of physical fitness and vitality	0.83	0.83
Attractiveness of image	0.85	0.83

Source: own work

Sexual Practices Questionnaire

We understand sexual practices, as does Lew-Starowicz (2003), as the art of sexual intercourse, which comprises techniques of fore-play and sexual arousal.

The questionnaire was designed using the Scale of Sexual Stimuli by Z. Lew-Starowicz (1997). The method includes 13 items. The participant marks his answer on a five-level scale. The subject declares the frequency with which sexual intercourse coincides with particular sexual practices. Factor-analysis showed the existence of three factors called hereafter as fore-play (cuddling, kissing, caressing the body), the sexual act (touching and arousing the genitals, oral sexs, introducing the penis into the vagina, change of position) and quasi-perverse behavior (arousing one's own genitals using hands, erotic gadgets, realizing fantasies). Cronbach's alpha coefficient signifies a high level of test coherence (global result $\alpha=0.91$; fore-play $\alpha=0.90$; the sexual act $\alpha=0.89$; quasi perverse behavior $\alpha=0.74$).

Intimacy, Passion and Commitment Questionnaire

The Intimacy, Passion and Commitment Questionnaire was used to asses one's satisfaction with a close relationship. Assisted by a questionnaire designed by Acker and Davis

(1992) one can measure the intensity level of three love constituents: intimacy, passion and commitment. The method uses three scales enlisting 36 items: intimacy, passion and commitment. The results indicate the particular factor's intensity. For our study a Polish version adapted by Wojciszke (2005) was used. The statistical analysis took only the global result into consideration, for which Cronbach's alpha was 0.97.

Results

Data analysis

From among 200 participants tested, we received 167 completed questionnaires. These were submitted to further statistical analyses. Every analysis was conducted using SPSS 17 and Microsoft Excel.

Descriptive statistics

The following Table (see Table 3) comprises descriptive statistical data of the measured variables. Participant sex did not affect the sexual satisfaction levels of any age group – the youngest (21−35) $t(58) = -0.468$; $p = 0.64$; middle (36−50) $t(52) = -1.4$; $p = 0.16$ or oldest (51−72) $t(51) = -0.65$; $p = 0.5$. The individuals tested declared satisfaction of their sex life. Moreover, we found no evidence of age influencing sexual satisfaction in women $F(2,87) = 1.25$; $p = 0.29$; nor in men $F(2,74) = 0.48$; $p = 0.6$.

Table 3

Descriptive Statistics of the Measured Variables

		Women					Men				
Age	Variables	n	Minimum	Maximum	Average	Standard deviation	n	Minimum	Maximum	Average	Standard deviation
21−35	Sexual satisfaction	30	12	40	32.97	6.810	30	25	40	33.67	4.551
	Satisfaction with close relationship	30	81	180	149.87	20.544	30	115	180	150.60	19.685
	Partners attractiveness – global result	30	32	60	52.83	6.215	30	45	60	53.33	4.852
	Partners attractiveness – image	30	14	25	22.80	2.552	30	20	25	23.37	1.712
	Partners attractiveness – physical fitness and vitality	30	10	20	17.00	2.505	30	12	20	17.07	2.333
	Partners attractiveness – mental attractiveness	30	8	15	13.03	2.025	30	10	15	12.90	1.583
	Own attractiveness – global result	30	34	58	48.43	6.317	30	39	60	49.87	5.399

	Own attractiveness – image	30	16	25	21.50	2.886	30	16	25	21.10	2.524
	Own attractiveness – physical fitness and vitality	30	9	20	15.23	2.849	30	11	20	15.97	2.414
	Own attractiveness – mental attractiveness	30	7	15	11.70	1.878	30	9	15	12.80	1.648
	Sexual Practices global result	30	19	60	46.33	8.066	30	32	64	48.93	6.807
	Foreplay	30	8	25	22.00	3.677	30	12	25	22.03	3.124
	Sexual act	30	8	25	18.27	3.965	30	14	25	19.90	2.881
	Quasi-perverse behaviour	30	2	11	6.07	2.599	30	4	15	7.00	2.560
36−50	Sexual satisfaction	29	15	40	31.38	6.417	25	24	40	33.64	4.966
	Satisfaction with close relationship	29	106	179	148.55	19.599	25	36	180	142.28	28.777
	Partners attractiveness – global result	29	38	60	49.90	6.576	25	40	60	51.76	5.607
	Partners attractiveness – image	29	17	25	21.48	2.544	25	16	25	22.76	2.538
	Partners attractiveness – physical fitness and vitality	29	7	20	15.93	3.184	25	12	20	16.20	2.398
	Partners attractiveness – mental attractiveness	29	9	15	12.48	1.765	25	11	15	12.80	1.323
	Own attractiveness – global result	29	34	60	48.52	5.488	25	30	60	48.76	7.019
	Own attractiveness – image	29	17	25	21.59	2.212	25	12	25	20.64	3.522
	Own attractiveness – physical fitness and vitality	29	8	20	14.93	2.789	25	8	20	15.12	2.804
	Own attractiveness – mental attractiveness	29	9	15	12.00	1.439	25	10	15	13.00	1.384
	Sexual Practices global result	29	20	61	40.41	10.432	25	20	59	42.80	10.962
	Foreplay	29	9	25	18.90	4.601	25	10	25	19.16	4.460
	Sexual act	29	6	25	16.03	4.740	25	7	24	17.60	5.354
	Quasi-perverse behaviour	29	3	13	5.48	3.135	25	3	12	6.04	2.715

51−72	Sexual satisfaction	31	22	38	30.65	4.231	22	21	39	31.45	4.788
	Satisfaction with close relationship	31	62	178	135.74	24.136	22	50	180	131.23	31.181
	Partners attractiveness – global result	31	22	60	45.65	7.521	22	42	60	49.18	5.439
	Partners attractiveness – image	31	8	25	19.55	3.940	22	17	25	21.18	2.403
	Partners attractiveness – physical fitness and vitality	31	7	20	14.32	3.249	22	12	20	15.86	2.642
	Partners attractiveness – mental attractiveness	31	5	15	11.77	2.291	22	6	15	12.14	2.145
	Own attractiveness – global result	31	34	59	48.94	5.112	22	35	60	46.50	6.850
	Own attractiveness – image	31	17	25	21.68	2.023	22	14	25	19.59	2.594
	Own attractiveness – physical fitness and vitality	31	9	20	15.03	2.846	22	7	20	15.09	3.517
	Own attractiveness – mental attractiveness	31	8	15	12.23	1.499	22	9	15	11.82	1.918
	Sexual Practices global result	31	18	65	37.58	11.477	22	21	59	41.32	10.947
	Foreplay	31	9	25	18.42	4.745	22	9	25	19.91	4.319
	Sexual act	31	5	25	13.42	5.458	22	5	25	14.64	6.075
	Quasi-perverse behaviour	31	3	15	5.74	2.852	22	3	14	6.77	2.910

Source: own work

Correlation between psycho-physical attractiveness of oneself and the partner, satisfaction with a close relationship, intensified sexual practices, and sexual satisfaction of women and men with regard to age

For the youngest women (21−35) sexual satisfaction was strongly related to the partner's image appeal, his mental attractiveness and the self-evaluated mental attractiveness (see Table 4). Women aged 36 to 50 correlated their with all variables except their own physical fitness and vitality. The variables considered most important was foreplay, the sexual act and satisfaction stemming from being in a close relationship (see Table 4). In the 51−72 age group, sexual satisfaction was related to foreplay, self-assessment of physical fitness and vitality and the partner's image attractiveness (see Table 4).

Table 4

Spearman's Correlation between sexual satisfaction and independent variables in women's and men's groups, with regard to age

	Women			Men		
Age	21−35 (n=30)	36−50 (n=29)	51−72 (n=31)	21−35 (n=30)	36−50 (n=25)	51−72 (n=22)
Sexual Practices global result	0.41*	0.68**	0.49**	−0.03	0.6**	0.4
Foreplay	0.26	0.74**	0.59**	−0.13	0.52**	−0.3
Sexual act	0.35*	0.62**	0.34	0.12	0.59**	0.49*
Quasi-perverse behaviour	0.26	0.48**	0.2	−0.06	0.31	0.48*
Own attractiveness – global result	0.5**	0.45*	0.3	0.41*	0.75**	0.53*
Own attractiveness – image	0.43*	0.4*	0.24	0.2	0.64**	0.04
Own attractiveness – physical fitness and vitality	0.28	0.3	0.4*	0.41*	0.61**	0.52*
Own attractiveness – mental attractiveness	0.53**	0.46*	0.11	0.28	0.79**	0.58**
Partners attractiveness – global result	0.71**	0.5**	0.18	0.07	0.72**	0.32
Partners attractiveness – image	0.7**	0.49**	0.4*	0.15	0.66**	0.07
Partners attractiveness – physical fitness and vitality	0.46**	0.43*	0.16	0.07	0.64**	0.4
Partners attractiveness – mental attractiveness	0.64**	0.46*	0.07	−0.1	0.63**	0.08
Satisfaction with close relationship	0.49**	0.66**	0.27	0.07	0.42*	0.06

** Correlation is relevant on the level of 0.001 (two-sided)

* Correlation is relevant on the level of 0.05 (two-sided)

Source: own work

Results gathered from the youngest male group (21−35) indicated that sexual satisfaction was in relationship only with self-assessment of one's own attractive physical fitness and vitality (see Table 4). For the middle-age group (36−50), sexual satisfaction correlated with each of variable, except for quasi-perverse behavior (see Table 4). Men aged 51 or more, revealed that sexual satisfaction in their case was strongly related to self-assessed mental attractiveness and their physical fitness and vitality (see Table 4).

Predictors of sexual satisfaction among women and men

The model for these predictors was well suited (see Table 5), better, however, for women ($F(4.85)=17.15$ $p<0.001$) than for men ($F(4.72)=8.42$ $p<0.001$).

Table 5

Variance analysis for dependent variable – sexual satisfaction and independent variables – psycho-physical attractiveness of oneself and the partner, satisfaction with close relationship, intensification of sexual practices

Gender	Model	Sum of Squares	df	Mean Square	F	Sig.
Women	Regression	1393.691	4	348.423	17.152	0.001
	Residual	1726.631	85	20.313		
	Total	3120.322	89			
Men	Regression	557.809	4	139.452	8.422	0.001
	Residual	1192.139	72	16.557		
	Total	1749.948	76			

Source: own work

Among women the strongest predictor occurred to be sexual practices (beta=0.36; $p<0.001$), then close relationship satisfaction (beta=0.3; $p<0.008$) and one's own psycho-physical attractiveness (beta=0.29; $p<0.004$). Among men the only predictor of the sexual satisfaction level was psycho-physical attractiveness of oneself (beta=0.37; $p<0,001$). See Table 6.

Table 6

Analysis of regression for dependent variable – sexual satisfaction

Gender	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
women	(Constant)	0.96	4.473		0.215	0.831
	Sexual practices	0.199	0.059	0.357	3.385	0.001
	Own attractiveness	0.307	0.104	0.29	2.945	0.004
	Partners attractiveness	−0.078	0.109	−0.097	−0.717	0.476
	Satisfaction with close relationship	0.079	0.029	0.297	2.712	0.008
men	(Constant)	12.631	4.626		2.73	0.008
	Sexual practices	0.072	0.054	0.15	1.332	0.187
	Own attractiveness	0.365	0.097	0.49	3.751	0
	Partners attractiveness	−0.003	0.118	−0.004	−0.029	0.977
	Satisfaction with close relationship	−0.003	0.018	−0.015	−0.141	0.888

Source: own work

Discussion

The innovativeness and value that our study has of the psycho-social determinants of sexual satisfaction is related to its holistic-functional foundation, broad scope insight

(the determinants were studied at every adult stage), and to the possibility that the results can be implemented therapeutically and medically.

As our study's hypothesis assumed, age did not influence the level of sexual satisfaction for either women and men. Biological changes related to aging were not synonymous with loss of sexual values, and sometimes even tend to develop new ones, including the person's becoming more attractive and appreciative. Also a loss of testosterone due to aging does not have to influence desire and passion. Biological and physiological events related to being in love are the same regardless of age (Lew-Starowicz, 2000).

Women's satisfaction strongly related to remaining in a close relationship, evaluating their own psycho-physical attractiveness, and being involved in intense sexual practices. For men it related mostly to how they assessed their own psycho-physical attractiveness. Many scientists point to the differences in determinants influencing women's and men's sex life evaluation. Nowosielski (2010), among others, emphasizes that a woman's sexual satisfaction is not necessarily connected with orgasm; women are more prone to focus on emotional aspects of their close relationship. In their perspective, the broader, more complex context – situational, social and mental – holds greater importance. Men, however, more often relate sexual satisfaction to the physiological aspect of sex. Zhang and others (2012) claim, that women perceive their sex life as satisfactory only when a various psychological criteria (security, intimacy, bond between partners) are met. Kuczyńska and Kaczmarek (2001) and Kedde and Berlo (2006) share this view. According to them, most women consider a quality relationship as an important predicate for sexual satisfaction. Men tend to ascribe a stronger meaning to fitness and vitality, and the lack of sexual dysfunctions.

Age influenced the relations between psycho-social determinants and sexual satisfaction. For women aged 21−35 sexual satisfaction was strongest with their evaluation of the partner's attractiveness. Those aged 36−50 correlated it to sexual practices and satisfaction in a relationship; and women from 51−72 connected it with sexual practices and their assessment of their partner's and their own personal attractiveness. When considering men, regardless of age, the level of sexual satisfaction remained strongest with their self-assessed psychophysical attractiveness. Differences in the relation between sexual satisfaction and psycho-social variables in all tested age groups can be explained by the maturity level reached at various stages of psycho-physical development. According to Lew-Starowicz (1998), sexual maturity relates to biological, mental and relationship maturity. It is characterized by the ability to control one's sexual reactions, familiarity with their personal and partner's erogenous zones, being able to adjust sexual practices to their personal and the partner's needs, to treat sex as

an important, yet, not crucial sphere of life, and by the ability to treat sexual difficulties with proper perspective.

Differences between the three age groups can be also explained by social changes, which have a strong influence on the sexual sphere. Cultural, environmental and social influences cooperate with psychological and biological factors, adjusting sexual needs and behavior (Imieliński, 1990). Research was conducted on three generations of Polish people, who grew up in different surroundings and had different approaches to sexuality. Women's position in society has changed, birth control has disseminated the level of sexual culture and expectations between sexual partners have risen, and boundaries of sexual freedom are wider.

Limitations

Our study is not without limitations. Its weakness is, firstly, a small number of test subjects and the unrepresentativeness of the test group. Moreover, in cultures which put a taboo over sexuality, and the Polish, Catholic culture is just such a one, people refrain from discussing their sexuality and therefore are reluctant to take part in similar studies. As such, the people who are open with their sexuality, as our group members were, are often satisfied with it.

Additionally, the 50+ age group was characterized by extensive dispersion, where the oldest participant was 72. Unfortunately, we were unable to form an additional group for the oldest participants. We came upon significant difficulties in recruiting test subjects older than 65. In Poland it is often considered unnatural for older people to be sexually active, and irrelevant in terms of life quality (Cichocka, 2007; Izdebski, 2012). This translates to significant deficiencies of knowledge by doctors, psychologists and other individuals who deal with health and life quality issues of this age group. Sexuality during late adulthood is considered taboo, not only in common discourse, but also among many Polish specialists.

Our subsequent study will include additional variables determining the level of sexual satisfaction, such as communication in a close relationship, existing sexual dysfunctions, being able to experience pleasure from sexual acts, and evaluating a partner's pleasure.

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Explicit and implicit attitudes toward academic cheating and its frequency among university students

Abstract:

Our study examines the relation between explicit and implicit attitudes toward academic cheating and the frequency of committing it among students of different faculties (pedagogy and psychology, and law and administration). The implicit attitudes were measured using two methods – the Implicit Association Test (IAT) and Implicit Relational Assessment Procedure (IRAP). As hypothesized, the explicit attitude toward academic cheating was positively related to the its frequency. Results indicate that the implicit measures did not predict the frequency of self-reported academic cheating behaviours. The field of study itself was not a differentiating factor for any studied variables. The methodological problems related with using IAT and IRAP as measures of implicit attitudes toward cheating and the study's possible limitations were discussed.

Keywords:

academic cheating, explicit attitude, implicit attitude, Implicit Association Test (IAT), Implicit Relational Assessment Procedure (IRAP)

Streszczenie:

W prezentowanym badaniu analizowano relacje między jawną i utajoną postawą wobec oszustw akademickich oraz częstością ich popełniania wśród studentów różnych kierunków (pedagogiki i psychologii oraz prawa i administracji). Pomiar postaw utajonych został dokonany za pomocą dwóch metod – Testu Utajonych Skojarzeń (IAT) oraz Procedury Utajonych Skojarzeń Relacyjnych (IRAP). Zgodnie z przewidywaniami jawna postawa wobec oszustw akademickich wykazywała pozytywny związek z częstością popełniania oszustw akademickich. Uzyskane rezultaty wskazują na to, że utajona postaw wobec oszustw akademickich nie była predyktorem deklarowanej częstości oszustw akademickich. Kierunek studiów nie był czynnikiem różnicującym w przypadku żadnej z badanych zmiennych. Problemy metodologiczne związane z wykorzystaniem IAT i IRAP jako metod pomiaru utajonych postaw wobec oszustw akademickich oraz potencjalne ograniczenia badania zostały omówione w podsumowaniu.

Słowa kluczowe:

oszustwa akademickie, postawa jawna, postawa utajona, Test Utajonych Skojarzeń (Implicit Association Test IAT), Procedura Utajonych Skojarzeń Relacyjnych (Implicit Relational Assessment Procedure, IRAP)

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Introduction

Academic cheating has been researched for more than eighty years: one of its first analyses – conducted by Parr in 1936 – was measuring the frequency of dishonest behaviours and identifying factors that determine or were related to them. Interest in academic cheating is, on the one hand, a wish to learn the factors which determine taking ethical or moral decisions, and on the other hand, to learn more and more about cheating itself in academic and business circles as revealed in recent years (Wieczorek, 2011). Hence, learning possible ways to help develop ethical and moral attitudes as well as ways to eliminate cheating pathologies is not only a theoretical matter but is also a practical response to reputed public demand.

In our research we analyze previously unstudied relations between attitudes toward explicit and implicit academic cheating and its frequency among students of different faculties (law and administration, and pedagogics and psychology). The results benefit not only theoretical knowledge about dishonesty among students but also create practical, effective intervention programs. Moreover, our research introduces readers, for the first time, in Poland to the implicit attitude measurement method (Implicit Relational Assessment Procedure, IRAP) and to compare its predictive accuracy with the one obtained by using another method with an already well established research background (Implicit Association Test, IAT).

Academic cheating

Academic cheating can be generally defined as behaviours aimed at the reception, transfer or acquisition of information from others, using unacceptable materials or information, and avoiding the adopted assessment process (Fauchner & Caves, 2009). Within this broad category we can identify behaviours connected with a particular student's knowledge acquisition and its further verification by university workers, for example, as exam cheating, namely, the "hidden use of information obtained from sources other than one's own knowledge and work, aimed at achieving the desired exam result" (Niemierko, 2006, p. 40).

Previous research, focused on academic cheating, presents quite a varied image, but the research generally confirms that it is common among university students (cf. Diekhoff, LaBeff, Shinohara, & Yasukawa, 1999; McCabe, Trevino, & Butterfield, 2001; Vandehey, Diekhoff, & LaBeff, 2007; Whitley, 1998). In a study by Jurdi, Hage and Chow (2011) carried out in Canada, 52.5% students admitted cheating, forgery or plagiarism, and an analysis by Trost (2009) proved that Swedish students most often lied about medical or other circumstances (e.g., they claimed that they or their family mem-

bers were ill) to obtain special treatment during an exam (81%) or postpone the deadline for submitting a written work (79%). Yang's research (2012) showed that between 4.4% and 28.3% of Taiwanese students have at least once behaved dishonestly, and 12.4% of Irish students participating in a study by Ballantine, McCourt, Larres and Mulgrew (2013) did not agree with the statement that "I think honesty is more important than getting good marks".

In Poland, studies on academic cheating popularity were conducted among others at the University of Warsaw and concerned judgements made by the university's Disciplinary Board between the academic years 1996/1997 and 2001/2002. Among the 52 analysed cases, 32 (61.5%) belonged to the broad category "forgery", involving behaviours such as raising a positive examination mark, alloting unjustified credit, falsifying a confirmation of tuition fee payment, using mobile phones during tests, plagiarism and substituting another person for an exam (Dębek et al., 2003). In addition, research among university students conducted by Gromkowska-Melosik (2007) showed that only 6% had never engaged in cheating during an exam.

Predictors of academic cheating

Attitudes towards academic cheating

Attitudes are well known predictors of social behaviours (Aronson, Wilson, & Akert, 2006). However, recent developments in implicit cognitions has shown that the relation between explicit and implicit attitudes toward particular behaviour and actual behavioural activity is more complex than expected (Maliszewski, 2005).

In academic dishonesty positive explicit attitudes – meaning relatively constant, consciously declared evaluations (Maliszewski, 2011) – were predictors of academic cheating in 16 studies analysed by Whitley (1998) with effect size $d = 0.811$. In Bolin's (2004) study they accounted for nearly 40% of dishonest acts, leading to taking advantage of perceived opportunities to cheat, and according to the author's model were clearing the way for individuals with high self-control to deliberately commit dishonest acts and to those with low self-control to cheat impulsively. Explicit attitudes towards behaviour are also important in predicting intentions to take actions in reasoned action model (Ajzen, 1991). According to this model, positive attitudes toward academic cheating – as aggregated behavioural beliefs concerning behavioural outcomes and their evaluations, together with favourable subjective norms and perceived behavioural control – lead to stronger intentions to perform dishonest acts (Ajzen, 2012). Studies which have considered the relationship between attitude and intention to commit academic dishonesty (cf. Alleyne & Phillips, 2011; Beck & Ajzen, 1991; Harding, Mayhew, Finelli, & Carpenter,

2007; Stone, Jawahar, & Kisamore, 2010) showed that explicit positive attitudes significantly predict an individual's intention to cheat in an academic context.

Unlike explicit attitudes, implicit ones have so far not been extensively studied by researchers, who used to describe cheating as a rational choice, subject to volitional control (Harding et al., 2007). However, scientists who study implicit cognition show that automatic behaviours occur in situations in which standards concerning a particular action are ambiguous or poorly structured, which demonstrates their significance in studies focused on moral issues (Greenwald, Uhlmann, Poehlman, & Banaji, 2009). In accordance with implicit attitudes, defined as unidentified (or wrongly identified) traces of past experience, they can significantly affect an individual's reactions, even if the experiences are not remembered and accessible consciously (Greenwald & Banaji, 1995). Furthermore, studying an implicit attitude allows one to explain many cases dealing with lack of coherence between explicit beliefs and behaviour, and points out an additional, previously ignored aspect and its regulatory role (Greenwald, McGhee, & Schwartz, 1998; Maison, 2004; Maliszewski, 2005, 2009, 2011). Previous studies showed a significant relation between implicit attitude and dishonesty (Silva & Barnes-Holmes, 2013), between implicit beliefs concerning ethics in business and beliefs concerning the economy (Reynolds, Leavitt, & DeCelles, 2010) as well as implicit theories about the nature of moral beliefs (Chiu, Dweck, Tong, & Fu, 1997).

The premise to compare explicit and implicit attitudes toward academic cheating arises when in socially sensitive matters like moral transgressions or stereotypes, people often tend to hold socially or politically correct explicit attitudes while showing different evaluations implicitly (Chybicka, Kosakowska, & Karasiewicz, 2008; Huntsinger, 2013). Since implicit attitudes are introspectively inaccessible, are less susceptible to social desirability concerns, and reflect older convictions acquired through longer social experiences (Echabe, 2013), it is possible that incorporating them to models designed to explain cheating behaviours among students will allow us to predict actual dishonest behaviours to a greater extent (cf. Carpen, Jia, Rydell, 2012).

Field of study

Research investigating the connection between academic cheating and academic field showed more dishonesty among business students in relation to students of other faculties (Crown & Spiller, 1998). They had lower moral development and reasoning scores than psychology students (Bernardi et al., 2004) and had more lax attitudes on what constitute cheating (Klein, Levenburg, McKendall, & Mothersell, 2006). Apart from business students, technical faculty students also demonstrated a high level of academic cheating. In comparison with liberal arts students, they reported a higher level of cheating during exams and when preparing individual assignments (Harding et al., 2007).

In extensive research by Newstead, Franklyn-Stokes and Armstead (1996), science (e.g., chemistry, biology, geography) and technical (e.g., IT, engineering) students reported the highest frequencies of cheating, followed by the social sciences (e.g., sociology, psychology, law, economics), liberal arts and pedagogy. Students of faculties connected with social work and health protection had the lowest scores. The reasons for these differences are sought in student motivation for studying (Newstead et al., 1996; Whitley, 1998), in university authorities' attitudes to academic cheating (McCabe, Butterfield, & Trevino, 2006), the nature of the courses themselves (Frank, Gilovich, & Regan, 1993; Harding et al., 2007) and individual traits leading to the selection of a particular profession (Tang & Tang, 2010).

With regard to the students enrolled in law and administration or pedagogics and psychology, the differences between academic cheating are attributed to the above-mentioned nature of the course and the individual's characteristics, such as attitude toward dishonesty, which are either shaped by exposure to specific contextual factors common to a particular field or are specific from the beginning for individuals studying it. Chodkowska et al. (2010), examining the understanding of morality among students on various faculties, showed several significant differences between law and pedagogics undergraduates. The differences involved understanding morality as acting in accordance with personal values (higher for pedagogics students) and as an obligation to do good and avoid evil (higher for law students). Moreover, law students, when compared to pedagogical students, connected morality in social life more to striving to make right and wise decisions and less to promoting the welfare of others. Furthermore, research conducted at the Law and Administration Faculty at the University of Warsaw showed that only 23% of students strongly agreed that unethical acts should be condemned by students (Raczkowski, 2005) and only 23% agreed that students from their faculty are trying to achieve high academic performance only through their knowledge even if there are other possibilities to acquire good grades (Boryczka, 2005).

Research project objectives and hypotheses

Three basic goals were adopted in our study. The first involved looking for significant relations between explicit and implicit attitudes to academic cheating and the frequency of committing various academic dishonest acts. The second goal was to compare students from different faculties regarding explicit and implicit attitudes to academic cheating and the frequency of committing it. Previous empirical evidence indicates differences between students and graduates of business and non-business courses in attitudes to academic cheating and the behavioural tendency to it (e.g., Whitley, 1998; Hard-

ing et al., 2007). However, frequency of academic cheating and attitudes to it are practically absent from Polish literature (Chudzicka-Czupała, in press). The third goal was to compare implicit attitudes measured with two computer-based chronometric methods with a different theoretical background: IRAP (used for the first time in Polish conditions) and IAT. Former studies comparing IRAP and IAT (e.g., Barnes-Holmes, Murtagh, Barnes-Holmes, & Stewart, 2010; Barnes-Holmes, Waldron, Barnes-Holmes, & Stewart, 2009; Chan, Barnes-Holmes, Barnes-Holmes, & Stewart, 2009; Cullen & Barnes-Holmes, 2008) point out the advantage that IRAP has as an experimental procedure. IRAP makes it possible to investigate one's attitude to a certain object directly (unlike IAT, where the contrast is used), and it has higher predictive accuracy than IRAP regarding behaviours (Roddy et al., 2011). It was assumed that measured implicit attitudes using IRAP and IAT, in contrast to self-descriptive questionnaires not based on automatic reactions, would not only determine whether implicit attitude affects one's behaviour (the declared frequency of committing various academic cheating acts) but also would compare the impact strength of explicit and implicit attitudes on cheating, as well as to find out if it is a better behavioural predictor (explains greater variance) when connected with academic cheating.

The following hypotheses were formulated on the basis of the literature:

H1: A more positive attitude toward academic cheating (both explicit and implicit) will be related to its higher committed frequency it.

H2: Explicit and implicit attitudes toward academic cheating will be predictors for determining how frequently academic cheating is committed.

H3: There will be statistically significant differences between explicit and implicit attitudes toward academic cheating and its frequency among students of different faculties.

a) Law and administration students will have more positive (explicit and implicit) attitudes toward academic cheating than pedagogy and psychology students.

b) Law and administration students will more often commit academic cheating than pedagogy and psychology students.

H4: There will be statistically significant differences concerning observable relations, when the implicit attitude is measured using IAT or IRAP.

Materials and Methods

Academic Dishonesty Scale

The behavioural measure for academic cheating was an original version of the Academic Dishonesty Scale by Kevin Eastman, Jacqueline Eastman and Rajesh Iyer (2008).

The questionnaire is used to determine how frequently declared forms of academic cheating are committed. It lists16 academic cheating acts, including the first 11 statements out of the 12 mentioned in the ADS (McCabe & Trevino, 1993, 1997), e.g. "Using crib notes on a test", "Receiving substantial, unpermitted help on an assignment". In the questionnaire there are also five additional questions concerning Internet cheating and using other modern technologies to do it, for example, to "Browse Internet sources for ideas without giving the source.", "Submit another's material as your own – from another student, a book, or the Internet – without giving credit". The first two are taken from the multi-dimensional questionnaire Independent School Health Check (ISHC, http://www.independentschoolhealth.com/), used in a nationwide study of approach to academic cheating in the USA, and the next three, from the SNA by Eastman et al. (2008). A respondent is asked to use a 5-point Likert scale to answer how often he or she has committed certain forms of academic cheating while at university (from never – 1 to many times – 4). Despite identifying different ways to cheat among students, in our study academic dishonesty (in accordance with its previous conceptualizations) is treated as a one-dimensional construct. The higher the score obtained in the questionnaire, the higher the frequency of academic cheating during one's university education. Cronbach's α coefficient of internal consistency for SNA was 0.89.

Attitude Toward Cheating Scale

The explicit attitude to academic cheating was measured with The Attitude Toward Cheating Scale by Gardner and Melvin (1988), translated by ourselves, upon receiving consent from the tool's authors to use it for research purposes. The questionnaire comprises 34 statements written in third person, 20 of which reflect tolerance to cheating. The answers are given in a 5-point Likert scale (from 1 – I completely disagree to 5 – I completely agree). The respondent's task is to assess various forms of academic cheating among students: assess the attitude to cheaters (e.g. Most students who cheat are unethical people), evaluate moral judgements about cheating (e.g. Cheating on college tests is morally wrong) and explain academic teacher behaviours (e.g. If a teacher leaves the room during a test, that teacher is in effect okaying cheating). The higher the score in the ATC 34 test, the lower the tolerance to cheating. In the reported study, the tool had a satisfactory validity level ($\alpha = 0.84$).

Neither SNA nor ATC 34 were adapted to the Polish conditions. Before the study, both tools were translated into Polish by ourselves and evaluated by two competent jurors. The collected opinions were used to draw up the tool's final versions.

Implicit Association Test (IAT)

The two-category IAT, testing the strength of associations between different positively or negatively evaluated concepts, was used to measure the implicit attitude to academic

cheating (Greenwald et al., 1998; Greenwald, Nosek, & Banaji, 2003; Maliszewski, 2005). In IAT, measuring implicit attitude was carried out using a computer, which records the response time and the correct way to perform the task. The respondent classifies a series of stimuli appearing on the computer screen into two categories, using two keys (in this case: E and I).

In our study, the key stimuli (concepts) were expressions belonging to two categories: academic dishonesty (cheating during an exam, copying homework, plagiarism, making up references, using crib sheets) and academic honesty (studying before an exam, preparing a bibliography, providing references to others' input, providing your own arguments, submitting your own works, citing sources). The other two stimuli (attributes) categories involved words with both positive and negative emotional connotations (love, pleasure, joy, happy, laughter, great on one hand and death throes, horrible, failure, disgusting, bad, hurt on the other). The test procedure included five parts: the first two involved simple categorizations, whereas the third and fifth, complex categorizations, being elements combined from the first two tasks. The D-IAT effect, resulting from the difference in averaged response times in test blocks concerning the complex categorization, is the index of implicit attitude to academic cheating. If academic honesty is positively associated by the respondent, it should have a shorter response time in the third test task than in the fifth one, which indirectly indicates the implicit positive attitude to academic honesty. In the reported study, IAT was carried out using Inquisit software.

Implicit Relational Assessment Procedure (IRAP)

A tool alternative to IAT, used to directly measure implicit attitudes, is IRAP: a computer-based study method with behavioural background, developed by a team of researchers directed by Barnes-Holmes (e.g., 2006, 2009). IRAP methodology directly refers to one fundamental Relational Frame Theory assumption, which says that the basic elements of cognition and language are relational. Thus, this approach concentrates on single relations between stimuli situated within broader relational networks (relevant relational-response, R-R) instead of the stimulus-reaction (S-R) response used in IAT. Just as in IAT, IRAP is based on response time but also includes elements characterising the Relational Evaluation Procedure drawn up by the same team of researchers, and involves presenting certain relational terms (here: "true" and "false" on the computer screen) to evaluate relational properties between the exposed key stimuli and label stimuli. Just as in IAT, what matters is the quickness and accuracy of the answers provided by the respondent (Power, Barnes-Holmes, Barnes-Holmes, & Stewart, 2009; Nicholson & Barnes-Holmes, 2012).

Two label stimuli ("it is good to" and "it is bad to") and related key stimuli, referring to examples of academic honesty and dishonesty, were presented using IRAP. One

set included expressions with a positive tinge, exemplifying work done by the student personally (citing sources, preparing bibliography, studying before an exam, submitting your own works, and referring to others' input). The other set were expressions with a negative tinge, being short examples of academic dishonesty (plagiarising, cheating, using crib sheets, cheating during an exam, making up references, and copying homework). The respondents were to determine whether the stimuli (the key and label) complied or not with the rule presented at the beginning of the task, pressing key D for the answer "true" and K for the answer "false", respectively.

The IRAP procedure began with doing between two and six trial blocks. Achieving the pre-set index of response accuracy (min. 80%) in these blocks, combined with an average reaction time not exceeding 2,000 ms, was the condition for proceeding to the test part including six blocks. In the test blocks, the respondents had to give answers following two alternating rules: (1) "academic honesty is right, and academic dishonesty is wrong" or (2) "academic dishonesty is right, and academic honesty is wrong". Calculations in IRAP, just like in IAT, is be done with an adjusted algorithm by Greenwald et al. (2003), referred to as the IRAP effect and being a difference in latency time in each test block between the answers given in accordance with the rule in which academic honesty is evaluated positively (the rule 1) and the rule evaluating it negatively (the rule 2). Apart from estimating the total result for IRAP, in order to interpret the results properly, the authors of the method recommend separately calculating the D algorithm for the results in each trial types ($IRAP_1$, $IRAP_2$, $IRAP_3$, $IRAP_4$). The test was carried out using a computer program developed by Barnes-Holmes (http://irapresearch.org/downloads-and-training/).

Participants

Students of the University of Silesia in Katowice were participants in the two-step study (N = 53). In the first part, 25 students from the Faculty of Law and Administration (further: FLA) took part, and in the second, 28 from the Faculty of Pedagogy and Psychology (further: FPP). Nineteen individuals (35,8%) studied pedagogy, 19 law as well, nine (17%) psychology, 5 (9,4%) administration, and 1 (1,9%) business. Participant age was between 19 and 25 (M = 21,43; SD = 1,69). The dominant groups were women (W = 45; M = 8), as well as those in the second year of study (21 persons) or in the first year (14 persons), in total 66%. Concerning the psychology students only those who studied at the first or second year were included in the sample in order to exclude a possible strong interfering variable: they already knew the experimental methods based on response time measurement and the personality questionnaires.

Procedure

Our anonymous and voluntary experiment was conducted individually in the laboratory (FPP students) and in a specially prepared and soundproof room (FLA students). The researcher arranged the time with individual interested students by e-mail or met them before classes and told them about the study. The qualified persons first did a computerized IRAP test, measuring implicit attitudes. Those who had completed the trial and test procedure in IRAP were then asked to do a computerized IAT test, treated as an indirect measurement of implicit attitudes. The questionnaires concerning academic cheating (measuring explicit academic cheating attitudes and their behaviour) were scheduled as the last part so as not to suggest the aim of the study to the participants. The study procedure took between 30 and 40 minutes. The respondents did not receive any financial reward for taking part in the study.

Results

Correlation analysis (Pearson's r coefficient) was used to verify hypothesis 1. Testing hypothesis 2 was based on multi-variable regression analysis conducted with the entry method. Hypotheses 3 and 4 were verified on the basis of t test results for independent groups. All statistics applied in the study were calculated with SPSS Statistics 21 software. Descriptive statistics, correlations (Pearson's r correlation coefficients, bilateral tests) between the studied variables and Cronbach's alpha coefficients of internal consistency (diagonally, in brackets) for self-descriptive measurements are shown in Table 1.

Table 1. *Means, standard deviations, reliabilities and correlations among measured variables (N = 53).*

Variable	M	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) D-IAT	−0.88	0.26	–									
(2) IRAP honesty	0.37	0.28	−0.11	–								
(3) IRAP dishonesty	0.22	0.30	−0.04	0.40**	–							
(4) D-IRAP	0.29	0.24	−0.09	0.82***	0.85***	–						

(5) $IRAP_1$	0.40	0.33	−0.24	0.72***	0.22	0.54***	–					
(6) $IRAP_2$	0.14	0.44	−0.07	0.32*	0.87***	0.73***	0.29*	–				
(7) $IRAP_3$	0.35	0.39	0.05	0.82***	0.39**	0.71***	0.18	0.21	–			
(8) $IRAP_4$	0.29	0.31	0.02	0.34*	0.71***	0.64***	0.01	0.28*	0.47***	–		
(9) Frequency of academic cheating	28.11	8.73	−0.13	−0.14	−0.02	−0.10	−0.04	0.09	−0.17	−0.18	(0.89)	
(10) Explicit attitude to academic cheating	97.58	14.19	0.02	0.01	0.09	0.06	0.13	0.19	−0.09	−0.10	0.34*	(0.84)

Note. D-IAT – D index for the total IAT score; IRAP honesty – the mean time of evaluation of academic honesty in IRAP; IRAP dishonesty – the mean time used to evaluate academic dishonesty in IRAP; D-IRAP – D index for the total IRAP score; $IRAP_1$ – D for the first test block in IRAP; $IRAP_2$ – D for the second test block in IRAP; $IRAP_3$ – D for the third test block in IRAP; $IRAP_4$ – D for the fourth test block in IRAP. Cronbach's alpha coefficients of internal consistency for self-descriptive measurements are on the Table's diagonal (in brackets).

* $p<0.05$; ** $p<0.01$; *** $p<0.001$.

Explicit and implicit attitudes toward academic cheating as frequency predictors for committing academic cheating (verification of hypotheses 1 and 2)

Correlational analysis revealed only a positive relation between the explicit attitude to academic cheating and its frequency in being committed it ($r=0.34$; $p<0.05$). Contrary to expectations, no statistically significant relations were found between the tendency to commit academic dishonesty and the implicit attitude to cheating, both measured with IAT and IRAP.

In the next stage a number of linear multivariable regression models were constructed with the entry method in order to find out whether attitudes towards academic cheating (implicit and explicit) can predict the frequency of committing academic cheating (Table 2).

Table 2. *Multiple Linear Regression Models for the dependent variable: frequency of academic cheating in the university student sample.*

Independent variables	beta	t	p	Regression summary
Model I				
Explicit attitude to academic cheating	0.35	2.67	0.01	Adjusted R^2=0.10 F=2.97 p<0.05
D-IAT	−0.15	−1.13	0.26	
D-IRAP	−0.13	−0.99	0.33	
Model II				
Explicit attitude to academic cheating	0.35	2.62	0.01	Adjusted R^2=0.10 F=2.36 p>0.05
D-IAT	−0.16	−1.17	0.25	
IRAP honesty	−0.17	−1.17	0.25	
IRAP dishonesty	0.01	0.11	0.94	
Model III				
Explicit attitude to academic cheating	0.32	2.33	0.02	Adjusted R^2=0.08 F=1.73 p>0.05
D-IAT	−0.16	−1.14	0.26	
$IRAP_1$	−0.15	−0.99	0.33	
$IRAP_2$	0.12	0.78	0.44	
$IRAP_3$	−0.06	−0.40	0.69	
$IRAP_4$	−0.14	−0.90	0.37	

Note. D-IAT – D index for the total IAT score; IRAP honesty – the mean time for evaluating academic honesty in IRAP; IRAP dishonesty – the mean time for evaluating academic dishonesty in IRAP; D-IRAP – D index for the total IRAP score; $IRAP_1$ –D for the first test block in IRAP; $IRAP_2$ – D for the second test block in IRAP; $IRAP_3$ – D for the third test block in IRAP; $IRAP_4$ – D for the fourth test block in IRAP.

In the first equation, the behavioural tendency to cheat (frequency) academically was adopted as the dependent variable, whereas attitudes to academic cheating (D statistics in IAT and IRAP as well as the score obtained in ATC 34), were adopted as the predictors. The tested regression model proved to be statistically significant ($F(3, 49)=2.97$; $p=0.04$). Regression analysis showed that there is no relation between implicit attitudes and the behavioural tendency to commit academic cheating. There is only a significant relation between the explicit attitude to cheating and its frequency (beta = 0.35; $p<0.05$). In the next step statistics "IRAP honesty" and "IRAP dishonesty" ($F(4, 48)=2.36$; $p=0.07$), or alternatively, results obtained in individual test blocks ($F(6, 46)=1.73$; $p=0.14$) instead of D statistics calculated for the total score obtained in IRAP, were entered into the equation as predictors. Both regression models proved to be statistically insignificant.

Explicit and implicit attitudes to academic cheating and its frequency in being committed among students of different faculties (verification of hypothesis 3)

In order to verify differences in the explicit and implicit attitudes toward academic cheating among FLA and FPP students, as well as the declared frequency in committing it, t tests were used for independent groups. Results indicate that there is no statistical significance between students of different faculties in the quantity of committed acts ($t(51)=0.24$; $p>0.05$; $d=0.07$), the explicit ($t(51)=-0.72$; $p>0.05$; $d=-0.20$) and implicit ($t(51)=0.69$; $p>0.05$; $d=0.19$) attitudes to cheating both for IAT and the D index for the total IRAP score ($t(51)=0.03$; $p>0.05$; $d=0.01$). The means and standard deviations for each variable obtained in the student groups, the values of t-Student tests and Cohen's d coefficient are presented in Table 3.

Table 3. *Means, standard deviations among FLA (N = 25) and FPP students (N = 28), the values of t-Student tests and Cohen's d coefficient.*

Variable	FLA		FPP		t	df	d
	M	SD	M	SD			
D-IAT	−0.90	0.29	−0.85	0.23	0.69	51	0.19
IRAP honesty	0.38	0.30	0.36	0.26	−0.25	51	−0.07
IRAP dishonesty	0.20	0.26	0.23	0.35	0.28	51	0.08
D-IRAP	0.29	0.23	0.30	0.26	0.03	51	0.01
Frequency of academic cheating	27.80	10.76	28.39	6.62	0.24	51	0.07
Explicit attitude to academic cheating	99.08	14.75	96.25	13.80	−0.72	51	−0.20

Note. D-IAT – D index for the total IRAP score; IRAP honesty – the mean time for evaluating academic honesty in IRAP; IRAP dishonesty – the mean time for evaluating academic dishonesty in IRAP; D-IRAP – D index for the total IRAP score.

*p < 0.05; **p < 0.001.

Differences in measuring the implicit attitude with IAT or IRAP (verification of hypothesis 4)

Analysis results in this area mostly focused on comparing the IAT effect and D index for the total IRAP score (obtained by measuring response time to the key stimulus and the number of correct answers) in two groups (FLA and FPP students) depending on the explicitly preferred academic dishonesty and declared frequency of committing it. As for the results (D index values) obtained in IAT and IRAP (both for the total score and for particular test blocks), they were not correlated, which partially sanc-

tions theoretically separating the two study methods (e.g., Barnes-Holmes et al., 2006; Power et al., 2009). The t tests conducted for independent groups (Table 3) also did not confirm the contrastive character of academic cheating patterns among students from different faculties depending on the applied method for measuring implicit attitudes. The differences between FLA and FPP participants regarding implied academic cheating preferences or self work were statistically insignificant, regardless of whether the estimation was carried out with IAT or IRAP.

Discussion

The basic aim of our study was to determine the character of relations between the explicit and implicit attitudes towards academic cheating and its frequency. The results partially confirmed the initial assumptions. There were only weak correlations with the expected directions between the explicit attitude to cheating with the frequency to commit it. Contrary to expectations, implicit attitudes did not allow a significant prediction of the behavioural tendency to cheat, which suggested that there existed a more complex pattern between the variables. Academic cheating involves a wide behavioural spectrum, motivated both by personality factors and contextual factors, related to certain external goals being accomplished (cf. Johnson & Gormly, 1972; Murdock & Anderman, 2006; Rettinger & Kramer, 2009; Whitley, 1998). In literature, it is approached from the cognitive perspective (resulting from a failure to master the effective learning strategies), the developmental (as a result of developmental differences connected with acquiring cognitive abilities, shaping values and learning to function socially and educationally), and the motivational (as a consequence of assuming positive or negative attitudes to cheating and reflecting individual differences in the control and self-efficacy) (Anderman & Murdock, 2007). As a result the attitudes toward cheating may not play the decisive role in dishonest behaviour throughout one's studies, as either planned or spontaneous. The results can also suggest that possible moderators may be important for their predictive power in measuring implicit motives, which is consistent with previous findings (e.g., Friese, Hofmann, & Schmitt, 2008; Greenwald et al., 2009; Nosek, 2005).

In our study divergent relational patterns were expected between the tested variables for students of different faculties. It was anticipated that preference for academic cheating (both declared and implicit), combined with the number of declared acts, would be higher among law and administration than among students of pedagogy and psychology. Contrary to expectations, significant disproportions between the par-

ticipants from different educational fields were not observed, which can be connected with our sample's relative small size and homogeneity.

Due to considerable sensitivity toward tolerance for academic cheating and the inclination to commit it as a 'socially approved' variable, two computer-based methods were used apart from the questionnaire measures, based on measuring response time and calculating the proportions of correct answers – IAT and IRAP. The choice of two alternative tools for measuring implicit attitudes was primarily to maximise predictive accuracy. Comparing the results did not allow for definitive confirmation of significant differences between the investigated variables depending on the applied study method.

There are several possible reason why IAT and IRAP were not particularly successful in measuring implicit motives in our study. Results when IAT and IRAP are compared may be the effect of IRAP's test character as a method used to measure implicit attitudes adopted from English. Because measuring explicit attitude was not based on stimuli used in IRAP, the failure to achieve a correlation may also result from the measurement of different properties referring to academic cheating at the explicit and implicit levels. What is more, the considerably complex construct 'attitude to academic cheating' may make the study of its implicit level difficult or even impossible. Thus it seems that the selected stimuli adequately representing different manifestations which violate academic honesty would require both a considerably greater number of unethical acts and clearly moderating the negative tone of some expressions used in our study.

The last methodological issue which could affect the IAT and IRAP scores refers to our study's procedure. Its length and many stages may have distorted the results, especially since tiredness, stimulation and motivation play a significant role in studies based on the response time (Golombek, Zdybek, & Ogonowski, 2012). Using repetitive measurements (first in IRAP and then in IAT) may have additionally affected preciseness. The answers in the successive trial and test blocks in both study methods may have been learnt. This effect may especially refer to the scores obtained in IAT to a greater extent, as this tool was used in the study after using IRAP, and previous research suggests that the IAT effects are fakeable (Röhner, Schröder-Abé, & Schütz, 2011).

Our study was not free from limitations. First of all there were methodological problems connected with measuring the inclination to unethical behaviours among students. Issues concerning morality, questions referring to religion, voting preferences, sexual behaviours and drug or alcohol abuse belong to the basic "socially sensitive" research areas, particularly susceptible to giving distorted, biased results (Tou-

rangeau & Yan, 2007). So as to minimize interference for fear of disclosing one's nature, social approval and following one's impressions, in former questionnaire-based empirical studies concerning academic cheating, Internet use or paper-and-pen surveys ensuring complete anonymity were most popular. As an alternative, in order to maximize external validity, a computer analysis of cheating committed during the academic year was carried out post factum in the studied groups, and natural or laboratory experiments were designed simulating real exam situations. The respondents were each time informed about the study's anonymity and the impact their responses would make on the marks in the subject the experiment referred to. Although the authors took analogous steps aimed at ensuring the full participant anonymity individual contact with the researcher was necessary involving computer-based chronometric methods (IRAP and IAT), which might have contributed to activating self-presentation behaviours directed at shaping oneself's positive image and increasing the reluctance to report some forms of academic cheating, especially the socially condemned ones, such as plagiarism or cheating during exams.

Another important factor that may have distorted our results was participant selection, especially the failure to observe the principle of step one – randomisation. Volunteers and women (85% of all participants) dominated in the sample. Problems with selecting respondents also occurred at the IRAP stage, since the attrition rate exceeded 10%, considered to be the author's acceptable level for the method. The sample itself may be another factor which could affect the results. Distribution analysis of the estimated questionnaire measurement variables may indicate considerable homogeneity of both subgroups. It should also be emphasized that due to the sample's low numerical strength, only simplified statistical analyses were carried out.

It seems justified to take into consideration the above-mentioned methodological and theoretical doubts in future studies. When designing future experiments devoted to analysing student dishonesty, it is worth considering extending the study plan to incorporate additional cultural, situational, demographic, motivational, cognitive, personality and ethical factors into the model, as they may be decisive for developing attitudes towards academic cheating and its frequency (McCabe et al., 2001; Miller, Murdock, Anderman, & Poindexter, 2007; Newstead et al., 1996). It would also be good to conduct studies by using a particular theoretical model concerning academic cheating (e.g., Murdock & Anderman, 2006), and attitudes or ethical behaviour in an organisation. In the light of empirical evidence showing that much academic cheating (especially the form assuming direct interaction) occurs in dyads (Nathanson, Paulhus, & Williams, 2006), interesting research perspectives would also appear when including the dual character of academic cheating in the research pattern. Especially an analysis

of different personality traits and attitudes between students who cheat during exams, and those who make it possible by making their own work available for others would not only have important theoretical implications but also practical ones. A more comprehensive approach would make it possible to develop more effective ways to prevent dishonesty among students.

The study procedure itself should also be modified. Dividing it into stages spread out over some time would help minimize interference of factors connected with tiredness or motivation drop in the respondents. And engaging trained research assistants, who could conduct the individual study of implicit attitudes, would contribute to reducing the impact of variables connected with the researcher on the results. Another issue is the problem of social approval in questionnaire-based studies devoted to ethical behaviour. Although IAT and IRAP did not eliminate it completely, apparently it would be justified to include in self-descriptive questionnaires a cheating scale or a way to measure explicit attitudes that would allow the respondent to autonomously administer this part, for example, using the computer without the researcher or other persons being present. This would maximize anonymity – of a key importance for answering the questions concerning unacceptable explicit attitudes. As an alternative, in replicating this study, we might completely abandon the traditional self-descriptive methods based on the respondents' declarations and use computer-based methods and measurements of actual behaviour in natural or laboratory situations.

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Order effects in attributions of sporting abilities in team handball

Abstract:

Our study explores the role of order effects when making attributions of ability of a performer in team handball. Participants of the study were asked to view a video footage of a handball player performing a passing and throwing task ten times. Although for everyone the footage consisted of the same ten clips, half the participants viewed a declining (successful to unsuccessful) performance pattern, whereas the other half viewed an ascending pattern. After that, participants rated the observed player's sporting abilities. The results have shown recency effects in the attributions of ability when the judgment was made by players (for most descriptors) and by coaches (for some descriptors).

Keywords:

recency effect, sporting abilities, judgment, decision making, team handball

Streszczenie:

Celem niniejszej pracy było zbadanie roli efektów kolejności w dokonywaniu atrybucji umiejętności sportowych zawodnika piłki ręcznej. Uczestnicy badania zostali poproszeni, aby obejrzeć materiał filmowy, na którym sportowiec dziesięć razy wykonuje ćwiczenie związane z podawaniem i rzucaniem piłki. Każdy uczestnik obejrzał film składający się z tych samych dziesięciu powtórzeń ćwiczenia, z tym, że połowa uczestników obejrzała opadający wzorzec wykonania (od dobrego do słabego), natomiast druga połowa obejrzała wznoszący wzorzec wykonania (od słabego do dobrego). Następnie, uczestnicy badania oceniali umiejętności sportowe oglądanego zawodnika. Wyniki ujawniły efekt świeżości, gdy ocena była dokonywana przez zawodników (dla większości umiejętności) oraz trenerów (dla niektórych umiejętności). Nie było natomiast żadnych efektów kolejności w grupie laików (nieznających się na piłce ręcznej).

Słowa kluczowe:

efekt świeżości, umiejętności sportowe, ocena, podejmowanie decyzji, piłka ręczna

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Introduction

It is interesting to know what influences people's judgments about others and what can be done to maximize the chances of being evaluated well or at least accurately and objectively. Does the order of information about a performer received by the observer have an impact on the assessment? Sometimes when performing a task, people start well but decrease their execution over time, and finish poorly. In other situations, they may begin badly but gradually ascend their performance, and finish well. It is, therefore, interesting to determine what is more profitable in terms of an overall evaluation at the end of a task: to start well and finish poorly or vice versa? Or perhaps, the assessment depends on how familiar the task is with the person making the judgment? These questions are related to the research area on primacy and recency effects – jointly called the order effects (e.g. Asch, 1946). Although, there is a growing body of knowledge related to this area, the conclusions are far from unequivocal (e.g. Chapman, Bergus, & Elstein, 1996; Newtson, & Rindner, 1979). Further, even common knowledge seems to support both primacy and recency similarly. For example, saying "Well begun is half done" stands in favor of primacy effects. On the other hand, "All is well that ends well" supports recency effects. However, there are also sayings suggesting that there are no order effects: "Quale principium, talis et clausula" (Engl.: the way you begin, the way you will end), or warning against order effects (e.g. "never praise a ford till you get over"). Therefore, it is still unclear which situations favor primacy, and which recency effects; and what other factors may influence the appearance, direction, and intensity of order effects.

In the sporting context, primacy effect may indicate that the beginning of a performance is of a greater value than its end in terms of evaluating an athlete's overall sporting abilities. On the other hand, the recency effect suggests that the end of a performance has a greater and more decisive value. Both coaches and athletes are frequently evaluated by club owners, media, and fans. It is thus important to understand, how these judgments are made and what biases might occur in this type of data processing and decision making. Plessner and Haar (2006) have reviewed potential cognitive mistakes in this area. Order effects has been identified as one such bias in the sporting environment (e.g. Greenlees, Dicks, Thelwell, & Holder, 2007). Other unconscious biases in sports include: heuristic reasoning (Miller, Rowe, Cronin, & Bampouras, 2012), prior exposure effects (Ste-Marie, Valiquette & Taylor, 2001), expectation effects (Buscombe, Greenlees, Holder, Thelwell, & Rimmer, 2006), or halo effects (Moormann, 1994). This knowledge may be used to develop strategies that protect judgments from being biased. Our current study aims to extend the findings related to judgment and decision-making by bringing new elements (e.g. new sport discipline, different stimulus material, new evaluation method) to the hitherto research on order effects in sport.

Origins of order effects

A lot of the early studies relating to order effects were conducted within the research on human memory (e.g. Atkinson & Shiffrin, 1968; Ebbinghaus, 1885; Glanzer & Cunitz, 1966). In this area, important findings were shown in relation to both primacy and recency effects (e.g. Curley, Young, Kingry, & Yates, 1988; Ley, Bradshaw, & Walker, 1975; Miller & Campbell, 1959). However, our current study is linked primarily to the impression-formation research started by Asch (1946). This author, one of the most influential in social psychology, carried out a study in which he asked participants to view six adjectives (intelligent, industrious, impulsive, critical, stubborn, envious) that described a non-existing person. The order of the adjectives was manipulated between two groups: the first group viewed the positive to negative order (as above), and the second one viewed the adjectives inversely – negative to positive. Subsequently, they were asked to give their impressions of the viewed person. It appeared, that the first group (positive to negative order) evaluated the person more favorably than the second group (negative to positive order), indicating primacy effects. These findings have brought a lot of research attention to this area (e.g. Anderson, 1965; McKelvie, 1990), but has also brought a broad critique related to the methods used in Asch's study (Luchins,1948).

In the literature, there are at least three explanations for the emergence of order effects in relation to impression formation. The first, proposed by Loftus and Loftus (1976), suggests that along with the sequence of elements, people gradually devote less attention to them. The second explanation is related to the cognitive dissonance theory (Festinger, 1957). The third explanation is related to gestalt psychology, and suggests that the first information we receive about a person creates a context for interpretation (anchor, expectancy), to which subsequent elements are added and adequately adjusted (e.g. dull and hard working vs. smart and hard working; Asch, 1946). This explanation seems to be the most convincing in relation to impression formation, as on its ground it may be predicted when primacy effects fade, or get replaced by recency effects. Referring to this explanation, Hogarth and Einhorn (1992) proposed a belief-adjustment model which includes six factors that are to account for the appearance and direction of order effects. This model has received significant confirmation in order effects research (e.g. Adelman, Tolcott, & Bresnick, 1993; Chapman, Bergus, & Elstein, 1996). However, some studies have shown findings which were inconsistent with the described assumptions (e.g. Greenlees, Dicks, Thelwell, & Holder, 2007). Thus, the level of correctness of this model needs to be further investigated.

Order effects in sport and other areas

In one study in the realm of medicine, Curley, Young, Kingry, and Yates (1988) found that primacy may occur when making decisions about the probability of a disease. On the other hand, Chapman, Bergus, and Elstein (1996) identified recency effects. As for jury decision making, both primacy and recency effects have been identified (Miller & Campbell, 1959; Insko, 1964). A number of studies focused on revealing order effects in making ability attributions (e.g. Allen & Feldman, 1974; Benassi, 1982; Jones, Rock, Shaver, Goethals, & Ward, 1968; Newtson & Rindner, 1979). Most of these results have shown strong primacy effects.

In sport, Greenlees, Dicks, Thelwell, and Holder (2007) investigated order effects in making judgments about soccer abilities. Their participants (soccer coaches, soccer players, and non soccer-players) viewed a video footage presenting a control and target soccer player performing a passing task. For the control player, all participants viewed the same footage in the same order, and there were no differences in judging this player. As for the target player, there were two versions of the footage, to which participants were randomly assigned. Both versions comprised the same clips, but inversely. The first version presented an ascending performance pattern, whereas the second presented a declining performance pattern – similar to the methodology used by Jones et al. (1968). The results have shown primacy effects in all the participants' soccer abilities, regardless of their soccer experience and judgment mode (end of sequence vs step by step; Hogarth & Einhorn, 1992). Participants viewing the declining performance pattern rated the target player higher than those viewing the ascending pattern. It was unexpected that non-soccer players, although inexperienced in soccer, rated the target player in a similar way as coaches and soccer players. This was inconsistent with Hogarth and Einhorn's model (1992) which suggests that high complexity of the task should lead to recency effects.

In another study it was found that warnings given to observers about possible biased judgments due to order effects may eliminate those effects (Greenlees, Hall, Filby, Thelwell, Buscombe, & Smith, 2008). Soccer coaches were the only group of participants in this study. Further methodology was based on that used by Greenlees et al. (2007). Primacy effects were found in those participants who did not receive warnings and those that received warnings just before rating the player. In the group that was given warnings before viewing the footage, no order effects were found.

In the third study on order effects in sport, a new discipline was considered (ultimate frisbee) and some modifications in the judging procedure were introduced (Smith, Greenlees, & Manley, 2009). The results revealed that order effects were eliminated only in the group where the step by step mode with a long delay after each clip was present. In all other groups primacy effects occurred, as the initial information had a greater im-

pact on the overall rating of the target player's sporting (ultimate frisbee) abilities. As suggested by Greenlees et al. (2007) research on order effects should include new sport disciplines, new methodologies, and so on. However, earlier works (e.g. Tyszka & Wielochowski, 1991) should also be taken into consideration.

In relation to the hitherto research on order effects in sport, several research questions have been put forward. Their aim is to verify the existing findings, and attempt to explore new ones. First, do order effects influence the judgment of the target handball player? Second, can the influence of order effects on judgment depend on how familiar the task is? And third, is there a relationship between the target player's handball ratings and the ratings of his maximum sporting potential?

Materials and Methods

Participants

There were 182 participants in our study, from three different groups. The first group consisted of 44 handball coaches (35 men, nine women); Their mean age (in years) was $M_{age}=39.09$; $SD=8.68$, and their coaching experience (in years) was $M=13.61$; $SD=9.41$. For this group, the study took place at a hotel during a training/conference for handball coaches organized by The Polish Handball Association. The second group included 66 (all male) junior handball players aged (in years) $M_{age}=15.47$; $SD=0.6$, with handball experience (in years) $M=5.06$; $SD=1.42$. These participants took part in the study during a handball tournament. The third and last group contained 72 laypersons (people who never practiced handball regularly). These were all males (mostly students) aged (in years) $M_{age}=22.14$; $SD=2.82$, with no handball experience. They participated in the study at The Warsaw University Library. All 182 participants were Polish. Finally, no ethical contraindications were put forward in relation to our current study.

Materials

The stimuli used in this study to cause potential order effects included two versions of a video footage. These were filmed with a Sony PD 170 video camera in one venue (sports hall) and later edited using the CyberLink PowerDirector v8 computer program. Both footage versions present an 18 year-old male team handball player from a leading team. On both videos the player performs a handball task ten times (ten clips). The task consists of running, passing the ball twice, receiving the ball twice, jumping, and throwing the ball in the middle of an empty goal. No participant in the study declared knowing the player shown in the stimuli material. The ten clips that form both videos include four poor examples of task execution, two moderate examples, and four good examples (Table 1). Further, both versions last the same length of time (1 minute and 8 seconds) and

comprise exactly the same clips (examples of task execution). The only difference is that the clips within these videos are placed in inversely. In one version there is an ascending performance pattern (from poor to good task execution), and in the other one there is a declining performance pattern (from good to poor), similar to the methodology used by Greenlees et al. (2007).

It is important to note that the poor, moderate and good task executions were categorized on the basis of a pilot study which involved competent raters, particularly 20 senior male handball players, aged (in years) $M=24.85$; $SD=4.25$, with handball experience (in years) $M=12.35$; $SD=4.2$. They were asked to evaluate 32 examples of task execution, described previously, in terms of their quality. This judgment was given on a 10-point Likert-type scale (ranging from 1– very poor execution, to 10 – very good execution). Using a one-way ANOVA: $F(31, 589)=42{,}86$, $p<.001$, $\eta_p^2=.69$, from among the 32 task examples, 10 were chosen for the stimuli material utilized in the main study. Because Mauchly's test was significant and the sphericity assumption was not met, the Greenhous-Geisser correction was utilized. Follow-up post hocs using a Bonferroni correction revealed that the task's four poor executions , two moderate executions, and four good executions differed in quality in a statistically significant manner (each category differed from the other two, and there were no statistically significant differences within the categories). Table 1 presents the content of the two video versions that were utilized in the current study.

Table 1

Summarized content of stimulus videos. Each clip (exemplifying the task) is described by its quality of execution and mean rating (along with standard deviation [SD])

Clip number	Ascending pattern		Declining pattern	
	Quality of execution	Mean (SD)	Quality of execution	Mean (SD)
1.	poor	2.55 (2.21)	good	8.25 (1.25)
2.	poor	2.15 (1.57)	good	8.3 (1.45)
3.	poor	2.6 (1.64)	good	7.75 (1.52)
4.	poor	1.6 (1.19)	good	8.05 (1.43)
5.	moderate	5.55 (1.43)	moderate	4.9 (1.65)
6.	moderate	4.9 (1.65)	moderate	5.55 (1.43)
7.	good	8.05 (1.43)	poor	1.6 (1.19)
8.	good	7.75 (1.52)	poor	2.6 (1.64)
9.	good	8.3 (1.45)	poor	2.15 (1.57)
10.	good	8.25 (1.25)	poor	2.55 (2.21)

Note.

The rating of the player in the pilot study (as well as in the main study) was performed on a scale from 1 (very poor) to 10 (very good).

Other materials used in our main study included two laptops (HP Compaq 6720s, HP Pavilion dv6) and a projector (Optoma PK201). These were necessary for the participants to view the footage with the player, and for the evaluation using the mouse paradigm, which requires two computers at the same time.

Measures

All the participants were asked to complete paper-pencil measures on sporting abilities, which involved rating the player on six variables (subscales): speed, technical ability, strength, jumping ability, work ethic, and the player's maximum sporting potential. The first five abilities were averaged to create a general variable called "sporting abilities". Maximum sporting potential was analysed separately. The answers to the questionnaire were given on a 10-point Likert-type scale. The higher the number on the scale (the closer it was to number 10), the higher the rating (i.e., 1 – very poor to 10 – very good).

In order to assess the data for multicollinearity, Pearson product-moment correlations were conducted on the dependent variables. All six variables included in the paper-pencil measures of sporting abilities were taken into consideration. In each case the correlations were much lower than .7. Therefore, following Tabacknick and Fidell (1996), it can be argued that the variables measured by the questionnaire represent different theoretical constructs. All of these correlations are presented in depth in Table 2.

Table 2

Intercorrelations between the questionnaire subscales (N = 182). All the correlations were statistically significant at the p < .001 level.

Variable (subscale)	2.	3.	4.	5.	6.
1. Speed	0.52	0.51	0.39	0.37	0.5
2. Technical ability		0.44	0.51	0.38	0.48
3. Strength			0.48	0.26	0.45
4. Jumping ability				0.43	0.52
5. Work ethic					0.6
6. Potential*					

Note.

* – Maximum sporting potential.

Procedure

At the beginning, each participant group (coaches, players, and laypersons) had been informed that the purpose of the study was to understand how different people evaluate sporting abilities in team handball. It was also mentioned that participation in the study was voluntary and that one could withdraw at any moment. The participants were also informed about the study's planned duration (approximately 10 minutes) and that they could receive the results by e-mail. Subsequently, all participants signed consent forms. Concerning under-age junior handball players, their legal guardians during the time of the tournament (their coaches) had to sign additional participation agreements.

As previously mentioned, each participant group took part in a different place. For coaches and players, the study was very similar: each person was randomly assigned to one of two groups, viewing the footage with either the ascending or declining performance pattern. For each group the footage was presented on a large screen via projector. Since each person could only view one of the footage versions, there was a need for a second room. When participants from the first group finished viewing their footage (with the ascending pattern), they moved to a nearby room, and the second group entered the room with the projector and viewed the footage with the declining performance pattern. As for the laypersons, they viewed the video individually on a laptop, and not as a group via projector. Having viewed the footage, all 182 participants was asked to complete measures on sporting abilities (end of sequence judgment). Once all participants had finished, additional questions about the details of the study were answered and full debriefing as to the nature of the study was provided.

Results

To explore the impact of order effects and familiarity on the target player's ratings, a 2 (poor-good versus good-poor) x 3 (coaches versus players versus laypersons) MANOVA was conducted. This analysis was computed for the "sporting abilities" variable (the average of 5 abilities). Maximum sporting potential will be discussed separately in the next paragraph. It appeared that the main effect for order $F(1, 176)=8.82$, $p<.01$, $\eta_p^2=.05$; main effect for familiarity: $F(2, 176)=15.46$, $p<.001$, $\eta_p^2=.15$; and interaction effect (order by familiarity): $F(2, 176)=3.26$, $p<.05$, $\eta_p^2=.04$, were all statistically significant. Due to the fact that order effects were revealed, simple effects for this variable were analyzed in depth. The outcomes appeared to be the most convincing in the junior handball players' group. Within this group, participants who viewed the footage with ascending performance pattern ($N=36$) rated the overall handball player's abilities higher than the participants who viewed the declining performance pattern ($N=36$) $t(70)=3.71$; $p<.01$, $\eta_p^2=.14$. This sug-

gests that recency effects were present in the attributions of ability in the junior handball players' group. In the group of coaches similar results were obtained, but only at the statistical tendency level. Particularly, coaches who saw the ascending performance pattern ($N=22$) rated the player's handball abilities higher than the coaches who saw the declining performance pattern ($N=22$) $t(42)=2.01$; $p=.051$, $\eta_p^2=.09$. Therefore, also in the group of coaches recency effects are likely to have appeared when making attributions of handball abilities. As for laypersons, no order effects were found in this group. Laypersons who viewed the ascending performance pattern (N=33) did not differ from the laypersons who viewed the declining performance pattern (N=33) when rating handball abilities $t(64)=0.32$; $p>.05$, $\eta_p^2<.001$.

The outcomes were similar for the ratings of the target player's maximum sporting potential. Again, a 2 (poor-good versus good-poor) x 3 (coaches versus players versus laypersons) MANOVA was used. Similarly as before, the main effect for order: $F(1, 176)=16.69$, $p<.001$, $\eta_p^2=.09$; for familiarity: $F(2, 176)=10.61$, $p<.001$, $\eta_p^2=.11$; and for the interaction effect (order by familiarity): $F(2, 176)=6.79$, $p<.01$, $\eta_p^2=.07$ were all statistically significant. Particular simple effects within the main effect of order were analyzed. Once again, both junior handball players and coaches who saw the ascending performance pattern rated the target player's maximum sporting potential higher than those who saw the declining performance pattern. The results of t-tests for this variable in the junior players' group: $t(70)=3.14$; $p<.01$, $\eta_p^2=.12$, and in the group of coaches: $t(42)=3.49$; $p<.01$, $\eta_p^2=.23$, support the findings suggesting recency effects in these two groups. What is more, in the group of laypersons, as before, no order effects occurred, $t(64)=0{,}38$; $p>.05$, $\eta_p^2<.001$. All means (and standard deviations) related to the above results can be seen in Table 3.

Table 3

The target player's mean ratings (and standard deviations) as a function of the footage (order: ascending vs declining) and handball experience (familiarity: coaches vs players vs laypersons)

Judgment*	Ascending pattern (poor-good)			Declining pattern (good-poor)		
	Coaches	Players	Laypersons	Coaches	Players	Laypersons
1. Sport Ab.	5.95 (1.37)	5.87 (1.14)	6.45 (1.32)	5.09 (1.48)	5.03 (0.97)	6.56 (0.98)
2. Speed	6.36 (1.47)	6.22 (1.4)	6.88 (1.47)	5.81 (2.11)	5.39 (1.05)	6.87 (1.19)
3. Tech. Ab.	5.68 (1.73)	4.97 (1.81)	6.24 (1.64)	4.82 (1.99)	4.83 (1.68)	6.76 (1.41)
4. Strength	6.32 (1.81)	6.67 (1.57)	6.85 (1.6)	6.18 (1.74)	5.92 (1.78)	7.12 (1.49)
5. Jump Ab.	5.82 (2.11)	5.67 (1.74)	5.88 (1.75)	4.77 (1.6)	4.89 (1.47)	5.85 (1.39)
6. Work ethic	5.59 (2.11)	5.83 (2.27)	6.42 (2.15)	3.86 (2.23)	4.14 (1.68)	6.12 (1.9)
7. Potential	7.09 (1.63)	6.53 (1.16)	7.03 (1.4)	5.23 (1.9)	5.58 (1.38)	7.18 (1.26)

Note.

* – the judgment included: speed (2), technical ability (3), strength (4), jumping abilities (5), work ethic (6), sporting abilities (1 – average of the 5 abilities), and maximum sporting potential (7).

Additionally, a strong relationship was found between the player's sporting abilities ratings (the average of 5 abilities) and the maximum sporting potential. The Pearson product-moment correlation, which included all participants ($N = 182$) revealed the following results: $r(180) = .7$; $p < .001$.

When analyzing particular components within the "sporting abilities" variable (namely: speed, technical ability, strength, jumping ability, and work ethic) it was seen that only some of them received satisfactory statistical properties regarding the appearance of recency effects. In this case we are talking about the results obtained in coaches and junior handball players, as only in these groups order effects had an impact on attributions of ability. In the laypersons' group, the results of t-tests were statistically insignificant in relation to all five abilities.

The best results were found for work ethic (players: $t(70) = 3.6$; $p < .01$, $\eta_p^2 = .16$; coaches: $t(42) = 2.64$; $p < .05$, $\eta_p^2 = .14$; laypersons: $t(64) = 0.38$; $p > .05$, $\eta_p^2 = .01$). Jumping ability showed decent statistical properties players: $t(70) = 2.05$; $p < .05$, $\eta_p^2 = .06$; coaches: $t(42) = 1.85$; $p = .071$; $\eta_p^2 = .08$; laypersons: $t(64) = .12$; $p > .05$, $\eta_p^2 < .001$). For speed, results were statistically significant in the group of players: $t(70) = 2.86$; $p < .01$, $\eta_p^2 = .11$, but not in the remaining two groups (coaches: $t(42) = 1$; $p > .05$, $\eta_p^2 = .02$; laypersons: $t(64) = 0$; $p > .05$, $\eta_p^2 < .001$). Similar properties, but only at the level of statistical tendency, were found in relation to strength players: $t(70) = 1.9$; $p = .062$, $\eta_p^2 = .05$; coaches: $t(42) = .26$; $p > .05$, $\eta_p^2 < .001$; laypersons: $t(64) = .68$; $p > .05$, $\eta_p^2 = .01$). The worse results (fully insignificant) appeared for technical ability players: $t(70) = .34$; $p > .05$, $\eta_p^2 < .001$; coaches: $t(42) = 1.54$; $p > .05$, $\eta_p^2 = .05$; laypersons: $t(64) = .4$; $p > 0.5$, $\eta_p^2 = .03$). The overall summary of statistical significance levels for all the dependent variables is shown in Table 4.

Table 4

Statistical significance levels for the differences between the target player's mean ratings of particular abilities as a function of handball experience (familiarity: coaches vs players vs laypersons)

Rating/Group	Coaches	Players	Laypersons
Sport. Ab.	#	**	*is.*
Speed	*is.*	**	*is.*
Tech. Ab.	*is.*	*is.*	*is.*
Strength	*is.*	#	*is.*
Jump Ab.	#	*	*is.*
Work ethic	*	**	*is.*
Potential	**	**	*is.*

Note.
is. – insignificant difference; # – statistical tendency; * – $p < .05$; ** – $p < .01$

Discussion

It has to be said that the most important result of our study, related to the impact of footage on the target player judgments, is quite unexpected. In general, team handball coaches and players were prone to recency effects when making their judgments, whereas laypersons' decision making was not affected by order effects. Such outcomes are not consistent with the hitherto results on order effects in sport (particularly: Greenlees et al., 2007; Greenlees et al., 2008, Smith et al., 2009). In these studies, primacy effects were dominant, in some circumstances there were no order effects, but recency effects did not occur at all. What is more, when the judgments were made by laypersons (non-football players in Greenlees et al., 2007) – they were prone to order effects in the same way as judgments made by coaches or players who were more experienced and should be more familiar with the task. This difference between the current and the previous research may be due to the fact that the study by Greenlees and colleagues (2007) referred to soccer (football), and was conducted in England which is the homeland of this sport. In that country, soccer has enormous popularity, and even laypersons may have enough knowledge about the crucial abilities required in this sport. This may be the reason for which no differences were found between the soccer coaches, soccer players and non-soccer players. By contrast, our study refers to abilities in team handball which, despite the recent successes of the Polish national handball team, is not a very popular sport in Poland, and is rarely seen on television. Thus, a layperson's knowledge in handball is much different than the knowledge of a person who is involved in this sport on a regular basis. Consequently, laypersons, who may have not understood the task, could make their judgments in a relatively random way. The abstractedness of the judging task in the laypersons' group may have weakened their motivation to perform well, which, in turn, may be linked to the lack of order effects in their decisions (Biddle, 2001; Sarrazin et al., 1996). Perhaps, increasing the laypersons' motivation to rate the target player thoroughly and accurately would make the task complex (difficult), but not abstract. This, in turn, could move the results in the direction of recency effects, as appeared in coaches and junior handball players. Additionally, creating a research situation in which participants would be accountable for their judgments could also impact on the potential appearance and direction of order effects (e.g. Cushing & Ahlawat, 1996; Kennedy, 1993).

Among the coaches and junior handball players the motivation to rate the target player's abilities correctly should be high, as it is they who can be treated as experts in that area. Consequently, when people are motivated to process data thoroughly (e.g. to view a footage with a player, and to rate it accurately), they may use the step by step mode of judgment in their minds (gradually, throughout the viewed performance), even though the real judgment appears only at the end of sequence mode (Petty & Wegener,

1998). Further, as suggested by Hogarth and Einhorn (1992), processing (and judging) in a step by step mode promotes recency effects, and in this respect would be consistent with our study's findings. What is more, we are not sure whether the judging task used in this study was an easy one (not complex enough) for coaches and players. Even though they (especially coaches) can be treated as experts in this sport, they may not have had the chance in the past to rate a target player on six aspects by having seen just a short footage (1 minute and 8 seconds). Numerous comments were made by the participants indicating they did not have enough information to rate the target player accurately; thus this task might have been difficult (and complex) even for them due to the particular research conditions of our study. In this respect, the obtained recency effects would also be consistent with Hogarth and Einhorn's (1992) belief-adjustment model.

It is a significant limitation of our study that the video footage (on basis of which the judgment was made) included only a short and relatively simple handball exercise performed by one player. Short footage duration promotes a small number of units to be processed in the observer's mind, which could also contribute to the appearance of recency effects in our study (Hogarth & Einhorn, 1992). If the footage were longer, more advanced and diverse, and included interactions between several players – the ecological validity of these results could be higher. This is a guideline for future research in this area.

Despite the fact that our study used a similar research method as the one described by Greenlees and colleagues (2007), there were also differences that could have an impact on the different directions of order effects in those two studies. First, in the study by the British authors the video footage consisted of eight clips (3 good, 2 moderate, and 3 poor task executions), lasting about 10 seconds each, whereas the footage used in our study included 10 clips (5−6 seconds each). Consequently, a single clip (one task execution) was longer (and most likely more diverse) in the British study , and thus, it may have provided more information about the target player to the participants, making the whole judging task less complex. This, in turn, as discussed before, should favor primacy effects. Another limitation of our study is that no control player was included. The ratings of such a player could decisively exclude the potential impact of specific group characteristics (as a confounding variable), on the results.

The instruction given to participants in our study was similar to the one used by Greenlees and colleagues (2007), meaning that the ratings regarded "the sporting abilities of the target handball player". However, apart from different sport disciplines used in both studies, the difference in the meaning of words "ability", and Polish "umiejętność" seems to be of more significance. The Polish word we used (even though it is a direct translation of the word "ability") describes a characteristic which is changeable, acquir-

able, modifiable, and which can be developed (but definitely is not always stable throughout life). English "ability" can be understood to be the same but, on the other hand, may also be seen as something constant, durable, or even in-born (Durand-Bush & Salmela, 2001, Gracz & Sankowski, 2000). This difference may be important in relation to the theoretical findings suggesting that individuals who perceive "ability" as something stable are more prone to primacy effects in their judgments. On the contrary, individuals who perceive "ability" as a changeable characteristic should, more likely, display recency effects in their judgments (Butler, 2000; Jones & Goethals, 1987). Because of the fact, that the Polish word "umiejętność" (with its specific meaning described above) was used in our study, this could also have an impact on the direction of the obtained order effects. Moreover, as described in the method, the target player in the footage was an 18 year-old male, thus a person who may be perceived as a youngster (still learning and unstable in terms of developing the required abilities; Jones & Welsh, 1971). This fact might also be related to the outcomes of our study.

It was also shown that order effects in the judgments of the target player influences only some measured abilities, but not all. This was not observed in the previous studies on order effects in sport (e.g. Greenlees et al. 2007), where all abilities contributing to the general variable received statistically significant order effects results . In general, in our study recency effects appeared only for work ethic, jumping ability, speed, maximum sporting potential, and strength (but only at the statistical tendency level in the group of players). Technical ability was found absolutely insensitive to the footage version manipulation. Work ethic, as the only ability in this study may be treated as more psychological than physical, and thus it could be even more difficult to rate on such short video footage. If this particular rating was a highly complex task, then, as discussed, this should favor biases in decision making that lead towards recency (Hogarth & Einhorn, 1992). Obtaining recency effects in work ethic, as well as other mentioned abilities may also be due to the fact that the quality of performance differs to the "naked eye" between poor, moderate, and good task executions (e.g. fast versus slow running). However, in respect to technical ability, these differences might not have been as visible, and the target player might have performed similarly (in terms of this particular ability) on the three performance levels. This might be the reason for the lack of order effects for technical ability. Furthermore, junior handball players appeared to be more susceptible to order effect biases (significant results for all abilities, apart from technical ability) than coaches (only work ethic, jumping ability, and maximum sporting potential). This is also reflected in the fact, that in the general (averaged) judgment of sporting abilities, the results in the coaches' group were significant only at the statistical tendency level. This could be, since the coaches were more experienced in handball than the players, and thus

could form more adequate ratings of the target player, which partly protected them from order manipulation. Besides, the coaches' group was less numerous (N=44) than the group of players (N=66), which might have had an impact on the results as well. An intuitive result that does not require long discussion seems to be the case in the strong and positive relationship between the target player's sporting abilities ratings and the ratings of his maximum sporting potential. It is natural that when we have a positive opinion about an athlete, we tend to see his future in bright colors.

Conclusions

To conclude, it is necessary to emphasize that our current work successfully approached the research questions that were put forward. Most of all, biases in the attributions of ability caused by order effects, was largely confirmed. However, the direction taken by the order effects was different from the one observed in most other studies, as recency (not primacy) effects were found. What is more, recency effects were identified only in judgments made by team handball coaches and players, but not laypersons – whose ratings of the target player were not influenced by order effects. Our study's practical implications may provide useful information to people of sport that are to be evaluated (e.g. players), and to those who make judgments of others (e.g. coaches). The results showed that biases in judgmental decision making may be made in sport settings and, therefore, some parts of an athlete's performance might be greater in value than other parts in terms of an overall evaluation. There is, however, a need for more studies within this research area to better understand the phenomena involved.

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Perceived Residential Environment Quality and Neighborhood Attachment (PREQ & NA) Indicators by Marino Bonaiuto, Ferdinando Fornara, and Mirilia Bonnes – Polish adaptation[2]

Abstract:

There have been increasing calls in environmental psychology for the standardized instruments measuring people's subjective perception of urban environment quality. One such tool is a commonly accepted and oft-cited questionnaire for measuring perceived urban environmental quality, the Perceived Residential Environment Quality & Neighborhood Attachment (PREQ & NA) Indicators, developed by a team of Italian researchers: Ferdinando Fornara, Marino Bonaiuto, and Mirilia Bonnes. This article presents the results of the PREQ & NA's adaptation study that we conducted in Poland. The adaptation project was divided into several qualitative and quantitative stages spanning April 2013 to December 2014. A total of 200 participants were examined, 99 women and 101 men aged between 18 and 89. We cooperated with six English and Italian translators. The results of our study demonstrated a factorial validity of the tool's Polish language version relative to both the Italian original and its recent Iranian adaptation, which we used for comparisons with the data obtained in a non-European cultural area. In addition to describing the entire adaptation procedure and presenting its results, we propose that a number of minor but necessary modifications be made in the Polish version, as indicated by our analyses. Following a positive verification and discussion of the Polish adaptation's convergent, discriminant, and criterion validity, we propose the final Polish version of the adapted questionnaire.

Keywords:

residential satisfaction; neighbourhood attachment; perceived residential environmental quality; urban neighborhood; Polish urban context; adaptation and validation of the instrument

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Streszczenie:

W psychologii środowiskowej coraz częściej pojawiają się postulaty ujednolicenia narzędzi do pomiaru subiektywnego odzwierciedlenia jakości środowiska zurbanizowanego. Jednym z takich narzędzi jest powszechnie akceptowany i często cytowany na całym świecie kwestionariusz do pomiaru spostrzeganej przez ludzi jakości środowiska zamieszkania: Perceived Residential Environment Quality & Neighbourhood Attachment (PREQ&NA) autorstwa włoskich badaczy: Ferdinando Fornary, Marino Bonaiuto i Mirilli Bonnes. W tym artykule referujemy wyniki przeprowadzonych przez nas polskich badań adaptacyjnych tego narzędzia. Projekt adaptacyjny był podzielony na kilka jakościowych i ilościowych etapów. Prace badawcze trwały od kwietnia 2013 do grudnia 2014 roku. Przebadaliśmy łącznie 303 osoby – 163 kobiety i 130 mężczyzn, w wieku od 18 do 89 lat. Współpracowaliśmy z sześcioma tłumaczami języka angielskiego i włoskiego. Wyniki ujawniły trafność czynnikową polskiej wersji językowej w stosunku do włoskiego oryginału oraz adaptacji irańskiej, służącej nam jako materiał porównawczy z innego kręgu kulturowego. W tym artykule, poza opisem całej procedury i przedstawieniem wyników adaptacji, zasugerowaliśmy konieczność nieznacznych modyfikacji polskiej wersji PREQ&NA w stosunku włoskiego oryginału, wynikającą z przeprowadzonych przez nas analiz. Zaproponowaliśmy także finalną wersję polskiej wersji kwestionariusza. Pozytywnie zweryfikowaliśmy i omówiliśmy trafność zbieżną, różnicową i kryterialną polskiej wersji.

Słowa kluczowe:

satysfakcja z miejsca zamieszkania; przywiązanie do okolicy zamieszkania; adaptacja narzędzia; pomiar jakości środowiska; jakość życia w miastach.

Introduction

An urban environment, as any other type of environment, has its own objective characteristics and, as such, can be described by using a variety of measures, including objective physical, social, functional, and contextual features (e.g. Aiello, Ardone, & Scopelliti, 2010; Marans, 2012). However, as they are based on the most objective possible description of environment and its quantitative characteristics (e.g. facts: there are two tram lines connecting the neighborhood with other parts of the city; there are two kindergartens and 10 ha of green areas in this neighborhood), such traditional evaluations do not allow for examining people's attitudes toward these environments. Furthermore, the objective description alone is insufficient to predict people's behavior and psychological states related to their environment (Dębek & Janda-Dębek, 2013; Marans & Stimson, 2011; van Kamp, Leidelmeijer, Marsman, & Hollander, 2003). Urban environments, like the entire world they belong to, are of course experienced and evaluated according to their relatively objective features, although these experiences are also influenced by people's subjective traits, expectations, and needs (Dębek, 2014). From a psychologically environmental perspective, however, it is only when that objective reality is confronted with individuals' subjective perception of it that significant psychological states can emerge (such as subjective life quality, place attachment, and identity). This subjective

environmental evaluation is emphasized by a substantial majority of researchers exploring human-environment relations (see, e.g., Bell, Greene, Fisher, & Baum, 2004; Gifford, 2007). Nevertheless, a review of existing research, for example, on the relationship between how individuals evaluate environmental quality and how they assess life quality (e.g. Dębek & Janda-Dębek, 2013; van Kamp et al., 2003) shows that several significant methodological problems prevail.

Some issues that prove most problematic today pertain to non-uniform definitions of quality of life, environment quality, residential satisfaction, and numerous other concepts (Dębek, 2014; Dębek & Janda-Dębek, 2013), causing fundamental ambiguities as to how these phenomena can be measured and gauged. In other words, researchers studying how individuals relate to their urban environment fail to agree on what needs to be measured and, indeed, how to do it. Against this backdrop, multiple attempts have been made to investigate phenomena like residential satisfaction (e.g. Ramkissoon, Graham Smith, Liam David, & Weiler, 2013; Smith, 2011; Stedman, 2002), place attachment (e.g. Lewicka, 2005, 2008, 2011, 2012; Manzo & Devine-Wright, 2014; Scannell & Gifford, 2010), sense of place (Campelo, Aitken, Thyne, & Gnoth, 2014; Easthope, 2004; Hay, 1998; Jackson, 1994; Jorgensen & Stedman, 2001; Moslemi & Ayvazian, 2014), place identity (e.g. Hernández, Martín, Ruiz, & Hidalgo, M. del Carmen, 2010; Kalandides, 2011; Lalli, 1992; Stedman, 2002), and quality of urban life (Dębek & Janda-Dębek, 2013; Marans & Stimson, 2011; van Kamp et al., 2003). In a great number of cases, however, researchers employ their own conceptual apparatus and instruments for measuring particular indicators that are deemed significant for a given, specifically defined research project. Such investigations are therefore often fragmentary in their scope and limited by a specifically conceptualized take on people-environment relationships. Still more problematic is the fact that such-obtained results frequently escape direct comparison with results from other studies, even though they might have investigated very similar, if not virtually the same, phenomena (e.g. neighborhood satisfaction and residential satisfaction). It is mainly for this reason that environmental psychologists still experience difficulties generalizing their conclusions and, consequently, expanding and transferring systematic and relatively universal knowledge on person-environment relationships.

Fortunately, this has begun to change and researchers now have at their disposal a number of fairly universal conceptualizations of selected aspects of person-environment relationships to select from that have received sound empirical verification and have also been commonly accepted. One such empirically-verified conceptualization is used in the questionnaire Perceived Residential Environment Quality & Neighborhood Attachment (PREQ & NA) Indicators developed mainly by an Italian research team: Marino Bonaiuto, Antonio Aiello, Marco Perugini, Mirilia Bonnes, Anna Paola

Ercolani, and Ferdinando Fornara (Bonaiuto, Aiello, Perugini, Bonnes, & Ercolani, 1999; Bonaiuto, Fornara, Ariccio, Ganucci Cancellieri, & Rahimi, 2015; Bonaiuto, Fornara, & Bonnes, 2003; Bonaiuto, Fornara, & Bonnes, 2006). The original PREQ & NA questionnaire (Bonaiuto et al., 1999) is a popular and oft-cited international instrument for measuring people's perceived urban environmental qualities. Complemented with place attachment indicators, the questionnaire is a reliable, multidimensional tool for evaluating residents' subjective perception of their urban environment. The original papers on PREQ & NA have received at least the following annual citations (Harzing, 2007): Bonaiuto, Aiello, Perugini, Bonnes, & Ercolani (1999) – 18 annual citations (a.c.); Bonaiuto, Fornara, & Bonnes (2003) – 14 a.c., Bonaiuto, Fornara, & Bonnes (2006) – 6 a.c.; Fornara, Bonaiuto, & Bonnes (2010) – 5 a.c. Since 1999, when the authors presented one of their first versions, the papers have received a minimal 550 citations (Harzing, 2007).

It appears that further verifying instruments that have already garnered research community acclaim , as well as working to expand and promote their use, should likely lead to promising conceptual and measuring unification for driving at least some aspects into current person-environment relationships.

For these reasons, we undertook to conduct a Polish adaptation. Apart from contributing naturally to the wider use of this doubtless valuable instrument, we wanted specifically to create an opportunity for international comparative studies aiming to compare how Poles and people inhabiting cities around the world perceive their urban environments.

Theoretical basis of PREQ & NA

One of the first PREQ & NA questionnaires comprised 126 statements concerning perceived residential environment quality (Bonaiuto et al., 1999). Its authors assumed that residential satisfaction is a multidimensional construct, an assumption grounded on the transactional-contextual approach to person-environment relationships proposed by Altman, Rogoff, and Stokols (1987). In line with this concept, subjective evaluation of a place of residence is formed by the interaction of the residents' traits and their multidimensional assessment of the place's physical quality.

Following in-depth qualitative exploration and theoretical deliberations, Bonaiuto et al. (1999) established 11 significant residential environment dimensions that need to be given subjective evaluation: (1) architectural and town-planning space, (2) organization of accessibility and roads, (3) green areas, (4) people and social relations, (5) punctual social-health-assistance services, (6) punctual cultural-recreational services, (7) punctual

commercial services, (8) non-punctual (in-network) services (transportation), (9) lifestyle, (10) pollution, and (11) maintenance/care. Subjective environmental evaluation is strongly related to place satisfaction – a construct defined by PREQ & NA's creators as "the experience of pleasure or gratification derived from living in a specific place" (Fornara et al., 2010, p. 172) and operationalized as the classical three-facet attitude. According to Fornara et al. (2010), while the behavioral component may be examined in terms of people's intentions to stay in or move from their current residence, the cognitive and affective satisfactory residential aspects may be studied by analyzing declarative residential quality assessments (Bonaiuto, 2004). Hence, apart from the 11 dimensions of residential environment, the PREQ questionnaire also comprised items for diagnosing both a specific behavioral intention to move out and a general evaluation about that environment.

The authors of the PREQ & NA questionnaire (Bonaiuto et al., 1999) posited that place satisfaction is significantly and positively related to the temporal aspects of residential experience – i.e., to how long residents live in a given place and how often they experience it (see Bonnes, Bonaiuto, & Ercolani, 1991; Bonnes, Bonaiuto, Ercolani, & De Rosa, 1991). This led to place attachment – perceived as theoretically related to the temporal dimension of people-environment relationships – being included in the studies. It was defined as the "positively experienced bonds, sometimes occurring without awareness, that are developed over time from the behavioural, affective, and cognitive ties between individuals and/or groups and their socio-physical environment" (Bonaiuto et al., 1999, p. 332). Altogether, the questionnaire comprised 11 indexes of perceived environment quality (interchangeably called "scales" by the authors), and an additional place attachment index (scale).

The PREQ & NA creators acknowledged that theoretical analyses and empirical studies in environmental psychology traditionally examined place of residence on the three levels – the city, district, and home (Bonaiuto et al., 1999; Fornara et al., 2010). Nevertheless, they consistently used the neighborhood as the basic "territorial unit", which is why the questionnaire is most accurate when used to assess the neighborhood, but it can also be effectively used for evaluating other similar-scale residential area types, such as the housing estate and the complex of districts. This also makes PREQ & NA's current form unsuitable for exploring the perceived quality of places whose scale is much greater (towns, communes, districts, and larger units) or much smaller (homes and residential complexes).

The PREQ & NA Polish adaptation

Original instrument and its abbreviated version

As mentioned above, the original PREQ & NA questionnaire comprised 126 statements (Bonaiuto et al., 1999). It had good statistical properties (Bonaiuto et al., 2003; Bonaiuto et al., 2006), although due to the large number of questions, the instrument did not prove to be very well suited for conducting a convenient screening of large population cohorts, in particular for on-street surveys, and similar research methods.

For this reason, Fornara et al. (2010) presented an abbreviated version called the Abbreviated Perceived Residential Environment Quality and Neighborhood Attachment Indicators. For clarity's sake and to avoid the different versions being confused, the abbreviated version is referred to as APREQ & NA in our paper. As was the case with the original PREQ & NA questionnaire (Bonaiuto et al., 1999), the new instrument was also divided into 11 thematic scales related to perceived environment quality (PREQ) and one neighborhood attachment scale. The researchers cut items from the original 126 down to 66, where three or four statements (the response format was a 7-point Likert-type scale) formed each of the 20 indexes that were indicators in the 12 scales of perceived urban environment quality and place attachment (11 PREQ + 1 NA). The 12 scales remained essentially the same as in the original instrument presented by Bonaiuto et al. (1999).

Additionally, APREQ & NA grouped the scales into five general dimensions: (1) architectural/urban planning, (2) sociorelational, (3) functional, (4) context, and (5) neighborhood attachment. Such a developed instrument was subjected to verification conducted on a quota sample of nearly 1,500 Italians from 11 urban areas of the country (Agrigento, Bologna, Cesena, Florence, Grosseto, L'Aquila, Latina, Matera, Palermo, Pescara, Salerno), which showed the APREQ & NA as having satisfactory statistical properties, only slightly below par as compared with the original – which was over twice as long and inconvenient to use beyond laboratory conditions (Fornara et al., 2010).

The version subject to adaptation

The Polish adaptation was APREQ & NA, that is, the 66-item abbreviated version. Launched in December 2013, the works on the Polish version were based on the English version published by Fornara et al. (2010), and on the original Italian questionnaire, which we received directly from its co-creator, Ferdinando Fornara.

Developing the Polish language version

The English version was translated into Polish individually by three translators, while the original Italian questionnaire was translated into Polish by two advanced Italian users and a professional Italian translator. All translations turned out to be very similar. The

English versions of the PL-APREQ items along with their Polish translations are given in Table A1.

Choice of translations

The first adaptation stage consisted of choosing two or three Polish translations for each item (depending on the how much divergence there was between the six available translations – three from English and three from Italian) that we thought (a) sounded most natural in the Polish language, (b) corresponded with the terms used by the Polish participants in our previous exploratory study, and (c) best captured the essence of the studied phenomena. Next, 13 Polish raters (4 women and 9 men aged 21−65) were asked to "choose from among the two or three following questions (descriptions or statements) the one that [they thought was] most unambiguous, natural, and that should be clear to most people".

Participants

Participants were 24 English Studies students at the University of Wrocław – 18 men and 6 women aged between 21 and 26 (*Mdn*=24), who were asked to participate in the study twice: in March 2014 when they filled out the English APREQ & NA version , and two weeks later when they completed the Polish version compiled of the translations chosen by the raters. Participants were not compensated financially for their involvement in the study.

Method, tools, and procedure

The study comprised two stages. In Stage 1, participants filled out the English APREQ & NA questionnaire version that comprised 66 statements concerning 11 perceived of residential environment quality and neighborhood attachment dimensions. They were to respond to these statements on a 7-point Likert-type scale. In addition, participants were asked to answer (on a 0−6 response scale) an additional question about how they generally assessed their neighborhood: "Generally, how satisfied are you with the neighborhood where you currently live?", and to declare whether they would recommend the neighborhood as a good place to live to their friends (on a 7-point Likert-type scale). Finally, participants completed a short demographic form. The study took between 10 and 12 minutes to complete. In Stage 2, which was conducted two weeks later, the entire procedure was repeated, with the only difference that participants filled out the Polish version.

Results

The results showed a high correlation between the English (test) and the Polish (retest) versions. A high correlation was observed when comparing each of the 66 paired items, with statistically significant Wilcoxon signed-rank test results present only in six cases. This minor variance did not prove problematic after we developed 20 joint indexes based on the Italian original, all of which demonstrated statistical correlations (non-significant

results in both Wilcoxon signed-rank tests and a repeated measures ANOVA with an intra-subject design). Test-retest comparisons for all indexes along with their correlations are shown in Table 1.

Table 1

Test of differences between English version of APREQ & NA and its Polish counterpart – within-subject design

	Index EN	Indeks PL	F	p	η^2	Z	p	r_S
1.	Building Aesthetics	Estetyka Budynków	2.37	>.10	ns			.84
2.	Building Density	Gęstość zabudowy	.87	>.30	ns			.84
3.	Building Volume	Wielkość budynków	2.41	>.10	ns			.85
4.	Commercial Services	Handel i usługi	.38	>.50	ns			.63
5.	Discretion	Dyskrecja-wścibskość	3.20	>.05	ns			.70
6.	Environment Health	Czystość środowiska	2.81	>.10	ns			.66
7.	External Connection	Komunikacja okolicy z miastem	1.12	<.30	ns			.77
8.	Green Areas	Zieleń	1.05	>.30	ns			.82
9.	Internal Functionality	Funkcjonalność okolicy	.13	>.70	ns			.81
10.	Relaxing vs Distressing	Relaks i stres	2.98	>.10	ns			.51
11.	School Services	Szkolnictwo	1.02	>.30	ns			.72
12.	Security	Bezpieczeństwo	3.12	<.05	ns			.90
13.	Sociability	Potencjał więzi międzyludzkich	.19	>.60	ns			.78
14.	Social Care Services	Usługi społeczne	.68	>.40	ns			$.27^{ns}$
15.	Sociocultural Activities	Kultura i rozrywka	.18	>.70	ns			.67
16.	Sport Services	Sport	.03	>.80	ns			.71
17.	Stimulating vs Boring	Stymulacja i znudzenie	3.26	>.05	ns			.72
18.	Transport Services	Komunikacja publiczna	.00	1	ns			.77
19.	Upkeep	Zadbanie okolicy	1.03	>.30	ns			.64
	Neighbourhood Attachment	Przywiązanie do okolicy				−1.47	.14	.60

Note. N = 24

r_s = Spearman's Rho in repeated measurement

Z = Wilcoxon Signed-Rank test (due to non-normality distribution)

All correlations are significant at $p < .01$, except marked as ns

One index that did prove problematic was "Social care services / Usługi opieki społecznej", with a non-significant English version correlation at $r = .27$, $p = .19$. A potential problematic source was that the English index wording comprised double negative examples in its questions-answers. The most substantial discrepancies were observed between the English version "Social services are inadequate in this neighborhood" (original wording:

"I servizi sociali del quartiere sono inadeguati") and its Polish equivalent: "Usługi społeczne są niewystarczające w tej okolicy" ($r = -.27$, $p = .19$). Similar was the English "The local health service is inadequate in this neighborhood" (original: "In questa zona l'Azienda Sanitaria Locale non è adeguata alle esigenze degli abitanti") and the Polish equivalent: "Okoliczna służba zdrowia jest niewystarczająca dla zaspokojenia potrzeb mieszkańców" ($r = .08$, $p = .68$). At the same time, it is worth emphasizing that while the entire "Social care services" index demonstrated an unacceptably low reliability, but with Cronbach's $\alpha = .44$, its Polish equivalent, "Usługi opieki społecznej", had reliability at a higher level $\alpha = .63$. Similarly, the original index versionalso yielded relatively coherent data ($\alpha = .62$) in the Italian study (Fornara et al., 2010). Given that the Polish and Italian index versions produced almost identical reliability levels , and that all the items included in the Polish version corresponded with the translations from Italian, we concluded these problems likely originated in either the English items themselves or possibly in insufficient language skills displayed by the English Studies Department students. For this reason, we decided to subject the Polish version to more detailed statistical testing in our study's further stages.

Verifying the measurement model in the Polish language version

In May and June 2014, we conducted a study to verify the statistical properties of the APREQ & NA Polish version (hereinafter referred to as the PL-APREQ & NA). The aim of our study was to test the Polish version for reliability of its indexes and dimensions, and to evaluate its factorial, criterion, and convergent validity.

Participants

To test the Polish version's data distribution within indexes and their reliability, we carried out a study involving 110 participants – 55 men and 55 women aged between 19 and 89 ($Mdn = 25$). They were part-time students in the Higher School of Banking in Wrocław, Department of Finance and Management (N = 27); part-time students the University of the Third Age (the University of Wrocław; N = 28); full-time students University of Wrocław in the Psychology Department (N = 12) and the English Studies Department (N = 12); and full-time students Wrocław University of Technology, Faculty of Architecture (N = 18). Asked about their marital status, 37% declared they were single, 31% lived in a stable relationship, 16% were married, 10% widowed, while five out of 100 participants were separated after a divorce. Nearly half the sample (45%) declared that they had completed secondary education, 40% held a bachelor's degree, and 15% a master's degree. Two participants held a university degree above the master's level. In each subgroup, male and female participants constituted 50%.

Method, tools, and procedure

Participants were asked to fill out the PL-APREQ & NA questionnaire that comprised 66 statements concerning 11 dimensions dealing with perceived residential environment quality and neighborhood attachment. They were to respond to these statements on a 7-point Likert-type scale. Furthermore, participants were asked to answer (on a 0−6 response scale) an additional question about their general assessment of their neighborhood: "Generally, how satisfied are you with the neighborhood where you currently live?", as well as to declare whether they would recommend the neighborhood as a good place to live to their friends, and whether they would like to move from their neighborhood in the near future (both on 7-point Likert-type scales). In addition to completing the PL-APREQ & NA, participants were asked to fill out the WHOQOL-BREF – a 27-item questionnaire for assessing quality of life (World Health Organization, 1998). Finally, participants completed a short demographic form, which included information about their approximate residence (so as to pinpoint the Wrocław neighborhood where they lived). The entire process took around 20 minutes to complete.

Measurement reliability – preliminary assessment in the Polish version

The Polish version demonstrated 13 of its 20 indexes to have acceptable reliability, including 10 at levels above Cronbach's $\alpha = .80$. The remaining seven indexes showed reliability below the usual level $\alpha = .70$ recommended by Kline (2000) (see Table 2). These were the indexes of discretion, transport services, internal functionality, sociocultural activities, social care services, school services, and upkeep. An index's low reliability, as measured by the α parameter, may result from a variety of causes, including (1) a small sample, (2) a low number of indicators in a given index, or (3) poor answer interchangeability , that is, a case where there is a possible heterogeneity of constructs that are theoretically measured by a particular index (see Bedyńska & Cypryańska, 2013; Field, 2009).

Some indexes could perhaps yield higher reliability levels in a study using a larger sample ($N > 1000$); admittedly, in the Italian study (Fornara et al., 2010), where the sample included nearly 1,500 participants, some indexes demonstrated slightly higher reliability levels. On the other hand, some had reliability at even lower levels than those observed in our study (see Table 2). It is also worth pointing out that Fornara et al. (2010) chose to accept three indexes with reliability levels below $\alpha = .70$: internal functionality (reliability below $\alpha = .70$ in both the Polish and Italian versions), sociocultural activities (reliability as above), and stimulating versus boring (reliability at $\alpha = .67$ and $\alpha = .76$ in the Italian and Polish versions, respectively).

Table 2

APREQ & NA: comparison of reliabilities of basic indexes in Italian and Polish version of the instrument

	Index EN[a,1]	Indeks PL[2]	№	α PL	α IT
1.	Building Aesthetics	Estetyka Budynków	3	.82	.72
2.	Building Density	Gęstość zabudowy	3	.89	.85
3.	Building Volume	Wielkość budynków	3	.87	.83
4.	Commercial Services	Handel i usługi	4	.84	.88
5.	Discretion	Dyskrecja-wścibskość	3	.59	.79
6.	Environment Health	Czystość środowiska	4	.83	.86
7.	External Connection	Komunikacja okolicy z miastem	3	.66	.82
8.	Green Areas	Zieleń	4	.71	.87
9.	Internal Functionality	Funkcjonalność okolicy	3	.66	.67
10.	Relaxing vs Distressing	Relaks i stres	3	.81	.71
11.	School Services	Szkolnictwo	3	.48	.79
12.	Security	Bezpieczeństwo	3	.91	.78
13.	Sociability	Potencjał więzi międzyludzkich	3	.74	.73
14.	Social Care Services	Usługi społeczne	3	.50	.62
15.	Sociocultural Activities	Kultura i rozrywka	3	.67	.71
16.	Sport Services	Sport	3	.80	.82
17.	Stimulating vs Boring	Stymulacja i znudzenie	3	.76	.67
18.	Transport Services	Komunikacja publiczna	4	.83	.81
19.	Upkeep	Zadbanie okolicy	4	.66	.70
	Neighbourhood Attachment	Przywiązanie do okolicy	4	.84	.82

Note. [1]N = 1488, [2]N = 110

№ = number of items; α PL = Cronbach's alpha of Polish version; α IT = Cronbach's alpha of Italian version

[a] reliabilites in Italian version of PREQ indexes reported by Fornara et al. (2010)

All indexes yielded higher reliability levels in the first, longer version of the PREQ & NA (Bonaiuto et al., 1999), in which they comprised on average twice as many items as in the abbreviated version. In this light, it appears safe to argue that the cause behind the overall low reliability of at least seven indexes (in both the Italian original and the Polish version) may likely be the sensitivity – often mentioned in the literature on the subject – of the α parameter to the items in a scale, irrespective of whether the indexes represent only one or many theoretical dimensions (Bedyńska & Cypryańska, 2013; Field, 2009).

The third possible reason for the low reliability may be the already-mentioned possible heterogeneity of constructs that are theoretically measured by an individual index. Given the above, apart from testing index reliability, we also decided to verify the theoretical assumptions underlying the measurement model accepted by Fornara et al. (2010) and chosen for the Polish adaptation.

Factorial validity of the indexes and thematic scales

Both PREQ and APREQ rely on 11 consistent thematic scales for assessing environment quality. We performed principal component analysis (PCA) for each scale in order to verify how valid this theoretical assumption would be. Each analysis included relevant questionnaire items, which constituted the primary indicators for each of the 11 individual thematic areas. The theoretical assumptions underlying established and well-documented measurement models are often tested through confirmatory factor analysis. Although ours is a less popular method, we chose PCA because it was recently used in Iran to adapt APREQ & NA, as described by Bonaiuto et al. (2015). This was done to allow us not only to compare our results with Italian study, but also with the data obtained in a non-European cultural area (Table A2).

Architectural and Urban Planning Space

In the questionnaire's original version , this scale comprised nine items that formed three indexes: (1) Building Aesthetics, (2) Building Density, and (3) Building Volume.

In line with the theoretical assumptions, three factors were distinguished in the PCA's Polish version: they corresponded with the hypothetical indexes where total variance accounted for 72%. These factors were moderately correlated ($r = .42$; $r = -.44$). Eight out of nine items were almost uniquely loaded on the factors that corresponded with their respective indexes. However, even though the scale of Architectural and Urban Planning Space proved to have an excellent total reliability factor ($\alpha = .86$), an analysis of the communalities and the correlation between the scale and its individual items showed that some items were only moderately correlated with the scale ($r \sim .50$). It follows that in order to create the most possibly consistent measure of Architectural and Urban Planning Space and, at the same time, to limit the its items to the extent possible (which is usually desired), at least several items could very well be eliminated from the scale – BD1, BV2, BV3, BA1, and BA3 (Table 3). Such a composed four-item one-factor index of Architectural and Urban Planning Space 1F would have reliability at the $\alpha = .82$ level, which is higher compared with its three-index equivalent. Importantly, this created new index would still include questions about the three key aspects of physical space that the authors perceived as significant in the original scale. Table 3 provides more detail on the indexes and the scale, in both the original and abbreviated questionnaire versions.

Table 3

Factorial Structure and Reliability of Architectural and Urban Planning Space

	Factor [a] λ			h^2	R_{CC}
	BD	BV	BA		
† BD1 Buildings are too close together in this neighborhood*	.92			.72	.50
BD2 There is enough space between houses in this neighborhood	.84			.74 (†.74)	.64 (†.71)
BD3 There is little space between buildings in this neighborhood*	.84			.85 (†.81)	.74 (†.77)
† BV2 The volume of buildings is too big in this neighborhood*		.90		.75	.53
† BV3 Buildings are too tall in this neighborhood*		.87		.75	.58
BV1 The dimension of buildings is oppressive in this neighborhood*		.78		.72 (†.50)	.65 (†.50)
† BA1 Buildings are beautiful in this neighborhood			.93	.75	.46
† BA3 Buildings have unpleasant colors in this neighborhood*			.70	.52	.51
BA2 It is pleasant to see this neighborhood	(.56)		.65 (.77)	.66 (†.57)	.69 (†.58)
Eigenvalues by factor	4.07	1.31	1.09		
Variance explained by factor	45%	14%	12%	Σ 72% (†64% [a])	
Index Cronbach's α	.89	.89	.82		
Scale Cronbach's α				.86 (.82a)	

Note. K-M-O = .78; Bartlett Test of Sphericity $\chi^2(36) = 598.39$, $p < .001$

Extraction Method: PCA and Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization. Pattern matrix is reported except loadings in brackets, which are reports of structure matrix whenever respective loadings are above .50

BA – Building Aesthetics; BD – Building Density; BV – Building Volume

h^2 – communalities (PCA); R_{CC} – corrected item-total correlation (item-rest correlations);

† – item removed from index due to low communality weakening the measurement reliability;

(†..) – results after removal of weakening item.

[a] After removal of items indicated by † the scale was unidimensional.

* inversed measures.

In the recent Iranian adaptation, Bonaiuto et al. (2015) performed PCA to distinguish two factors concerning Architectural and Urban Planning Space – (1) Building Volume, and (2)

Building Aesthetics and Building Density (Table A2), that were correlated at $r = .10$. This shows that our results clearly differ from those obtained in Iran. Furthermore, in the Polish version we stand for using the one-factor measure of Architectural and Urban Planning Space 1F.

Commercial Services

In the original instrument, this was a single four-item index. In line with the theoretical assumptions, only one factor was distinguished in the PCA, which accounted for 68% total variance. An analysis of covariance and common variance showed that the weakest item – CS4 ("Stores are not well distributed in this neighborhood") – could very well be eliminated from the index. This increased the index's already high reliability only further, up to $\alpha = .86$, and improved its consistency. Once CS4 was eliminated, the CS factor accounted for nearly 80% of total variance (Table 4).

Table 4

Factorial Structure and Reliability of Commercial Services

	Factor λ	h^2	R_{CC}
	CS		
CS1 There are all kinds of stores in this neighborhood	.83	.68 (†.75)	.68 (†.71)
CS2 Anything can be found in the neighborhood's stores	.88	.79 (†.83)	.77 (†.79)
CS3 This neighborhood is well served with stores	.88	.79 (†.78)	.77 (†.74)
† CS4 Stores are not well distributed in this neighborhood*	.68	.46	.50
Eigenvalues	2.72 (†2.37)		
Variance explained	68% (†79%)		
Index Cronbach's α	.84 (†.86)		

Note. K-M-O = .77; Bartlett Test of Sphericity $\chi^2(6) = 197.22$, $p < .001$

Extraction Method: PCA

CS – Commercial Services

h^2 – communalities (PCA); Rcc – corrected item-total correlation (item-rest correlations);

† – item removed from index due to low communality weakening the measurement reliability;

(†..) – results after removal of weakening item.

* inversed measures.

Green Areas

In the original instrument, this was a single four-item index. In line with the theoretical assumptions, only one factor was distinguished in the PCA, although it accounted for only 42% total variance. Despite the four-item index's reliability at an acceptable $\alpha = .71$

level, an analysis of covariance and common variance clearly indicated that the problematic GA3 item ("Going to a park means travelling to other parts of the city") be eliminated from the index. This substantially improved the index's consistency and increased its reliability up to $\alpha = .77$. Once GA3 was eliminated, the Green Areas factor accounted for nearly 70% total variance (Table 5).

Table 5

Factorial Structure and Reliability of Green Areas

	Factor λ	h^2	R_{CC}
GA1 There are green areas for relaxing in this neighborhood	.80	.48 (†.57)	.75 (†.51)
GA2 There are enough green areas in this neighborhood	.69	.64 (†.79)	.62 (†.70)
† GA3 Going to a park means travelling to other parts of the city*	< .50	.16	.74
GA4 In this neighborhood, green areas are in good condition	.65	.43 (†.70)	.55 (†.62)
Eigenvalues	1.71 (†2.06)		
Variance explained	42% (†69%)		
Index Cronbach's α	.71 (†.77)		

Note. K-M-O = .63; Bartlett Test of Sphericity $\chi^2(6) = 117.24$, $p < .001$

Extraction Method: PCA

GA – Green Areas

h^2 – communalities (PCA); R_{CC} – corrected item-total correlation (item-rest correlations);

† – item removed from index due to low communality weakening the measurement reliability;

(†..) – results after removal of weakening item.

* inversed measures.

Environmental Health

In the original instrument, this was a single four-item index. In line with the theoretical assumptions, only one factor was distinguished in the PCA, which accounted for 67% total variance. An analysis of covariance and common variance clearly indicated that the weakest item – EH4 ("Residents' health is threatened by pollution in this neighborhood") – be eliminated from the index. Although it did not significantly alter the index's already high reliability, with Cronbach's alpha at $\alpha = .83$, the eliminating the item increased its consistency considerably. Thus the reduced EH factor accounted for as much as 80% total variance (Table 6).

Table 6

Factorial Structure and Reliability of Environmental Health

	Factor λ	h^2	R_{CC}
	EH		
EH1 The air is clean in this neighborhood	.87	.76 (†.89)	.75 (†.70)
EH2 This neighborhood is generally not polluted	.87	.62 (†.87)	.62 (†.65)
EH3 This is a noiseless neighborhood	.78	.75 (†.83)	.74 (†.75)
† EH4 Residents' health is threatened by pollution in this neighborhood*	.73	.53	.55
Eigenvalues	2.67 (†2.26)		
Variance explained	67% (†75%)		
Index Cronbach's α	.83 (†.83)		

Note. K-M-O = .78; Bartlett Test of Sphericity $\chi^2(6) = 170.40$, $p < .001$

Extraction Method: PCA

EH – Environmental Health

h^2 – communalities (PCA); Rcc – corrected item-total correlation (item-rest correlations);

† – item removed from index due to low communality weakening the measurement reliability;

(†..) – results after removal of weakening item.

* inversed measures.

Organization of Accessibility and Roads

Two indexes, each comprising three items, combined to form this scale in the original instrument: (1) Internal Functionality, and (2) External Connections. In line with the theoretical assumptions, two factors were distinguished in the PCA that corresponded with their respective indexes (Table 7). The factors, which accounted for 60% total variance, were not correlated ($r = .03$). Analysing particular items' communalities revealed none of them to have much in common with the remaining hypothetical scale. Thus, the entire Organization of Accessibility and Roads scale would have a relatively low reliability, exactly at $\alpha = .43$. This indicated that, although internally consistent, the two indexes of Internal Functionality and External Connections diagnosed two separate and unrelated phenomena. We hold that in the Polish version these indexes fail to form one consistent scale and ought to be analyzed separately. What is more, it is worth pointing out that both indexes are generally weak: the Internal Functionality index has a low consistency level ($\alpha = .66$), which is similar to its original Italian equivalent; in contrast, the External Connections index (at $\alpha = .66$ in our study) was considerably more consistent in the Italian version ($\alpha = .82$). Eliminating one of the index's items (EC3) improved its consistency to a minimal degree – it produced a slightly more consistent measure ($\alpha = .71$), where the remaining EC1 and EC2 items correlated with the other elements of the scale (that is, with each other) at an acceptable $r = .55$ level.

Table 7

Factorial Structure and Reliability of Organization of Accessibility and Roads

	Factor [a] λ		h^2	R_{CC}
	EC	IF		
EC1 The city center can be easily reached from this neighborhood	.78		.69	.25
EC2 This neighborhood is well connected with important parts of the city	.77		.68	.35
† EC3 This neighborhood is too cut off from the rest of the city*	.76		.48	.10
IP2 There's a good availability of parking spaces		.83	.61	.33
IP1 Parked cars impede walking in this neighborhood*		.81	.60	.28
IP3 It is easy to cycle around in this neighborhood		.66	.60	.21
Eigenvalues by factor	1.91			
Variance explained by factor	31%		Σ 60%	
Index Cronbach's α	.66 (†.71)			
Scale Cronbach's α			.43	

Note. K-M-O = .63; Bartlett Test of Sphericity $\chi^2(15) = 107.43$, $p < .001$

Extraction Method: PCA and Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization. Pattern matrix is reported except loadings in brackets, which are reports of structure matrix whenever respective loadings are above .50

EC – External Connections; IF – Internal Functionality

h^2 – communalities (PCA); R_{CC} – corrected item-total correlation (item-rest correlations);

† – item removed from index due to low communality weakening the measurement reliability;

(†..) – results after removal of weakening item.

* inversed measures.

Also the Iranian authors' questionnaire (Bonaiuto et al., 2015) chose to distinguish two factors, which, however, differed in their structure from both the Italian (Fornara et al., 2010) and Polish versions. Moreover, they demonstrated higher reliability than the factors used in our study. In the Iranian version, Internal Functionality loaded on two items (IP2 and IP3), correlating at $r = .54$, $p < .01$.

Sociorelational Features

Nine items made up this scale in the original instrument, which was divided into three indexes: (1) Security, (2) Discretion, and (3) Sociability. In line with the theoretical assumptions, three factors were distinguished in the PCA that corresponded with the hypothetical indexes and accounted for 71% total variance (Table 8). The factors were poorly correlated, ranging between $r = .00$ and .30. The Discretion index, an internally inconsistent measure, showed no correlation with the remaining two factors. Conversely, the Security and Sociability indexes were correlated, although only moderately ($r = .30$), each being also an internally consistent measure, at $\alpha = .91$ and .74, respectively.

Table 8

Factorial Structure and Reliability of Sociorelational Features 3F

	Factor [a] λ			h^2	R_{CC}
	SE	SO	DI		
SE2 Acts of vandalism happen in this neighborhood*	.93			.83	.61
SE3 Here in the night there is the risk of dangerous encounters*	.88			.85	.70
SE1 You can meet bad people in this neighborhood*	.88			.82	.69
SO2 In this neighborhood, it is easy to get to know people		.82		.65	.39
SO1 In this neighborhood, it is difficult to make friends with people*		.82		.68	.36
SO3 In this neighborhood people tend to be isolated*		.63		.64	.52
DI1 People gossip too much in this neighborhood*			.90	.79	.25
DI2 In this neighborhood you feel watched*			.83	.68	.22
DI3 In this neighborhood people are not intrusive			< .40	.39	.15
Eigenvalues by factor	3.32	1.64	1.40		
Variance explained by factor	40%	18%	15%	Σ 71%	
Index Cronbach's α	.91	.74	.59		
Scale Cronbach's α				.76 (.82[a])	

Note. K-M-O = .73; Bartlett Test of Sphericity $\chi^2(36) = 379.26$, $p < .001$

Extraction Method: PCA and Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization. Pattern matrix is reported except loadings in brackets, which are reports of structure matrix whenever respective loadings are above .50

SE – Security; SO – Sociability; DI – Discretion

h^2 – communalities (PCA); Rcc – corrected item-total correlation (item-rest correlations);

† – item removed from index due to low communality weakening the measurement reliability;

(†..) – results after removal of weakening item.

[a] After removal of items indicated by † the scale was unidimensional.

* inversed measures.

The imperfect indicators of the Discretion index were eliminated, which led to a reasonable solution with a scale now comprising only two factors: (1) Security and (2) Sociability; these accounted for 76% total variance (Table 9). The factors were moderately correlated ($r = .40$) and formed a reliable scale. Interestingly, the common variance of all the scale's items and of the corrected item-total correlation indicator for each item in the scale indicated that – relying solely on statistics – at least two further items could be eliminated from the scale without detriment to its mathematical properties. This solution, however, would not be advised for theoretical reasons, as eliminating the two items whose correlation with the scale was the weakest (SO1 and SO2; Table 9) would effectively leave the scale devoid of a crucial research aspect concerning interpersonal relations.

In conclusion, analysis of the Polish Socio-relational Features scale meant that the Discretion index was eliminated from the Polish questionnaire and further analyses altogether. The two remaining indexes (1) Security and (2) Sociability can be analyzed both separately – as reliable measures of their corresponding constructs, and together – within one Socio-relational Features 2F scale (Table 9).

Table 9

Factorial Structure and Reliability of Socio-relational Features 2F

	Factor λ		h^2	R_{CC}
	SE	SO		
SE1 You can meet bad people in this neighborhood*	.92		.84	.71
SE2 Acts of vandalism happen in this neighborhood*	.95		.84	.64
SE3 Here in the night there is the risk of dangerous encounters*	.88		.85	.77
SO1 In this neighborhood, it is difficult to make friends with people*		.86	.69	.40
SO2 In this neighborhood, it is easy to get to know people		.88	.74	.46
SO3 In this neighborhood people tend to be isolated*		.62	.63	.61
Eigenvalues	3.27	1.32		
Variance explained	54%	22%	Σ 76%	
Index Cronbach's α	.91	.74		
Scale Cronbach's α			.83	

Note. K-M-O = .79; Bartlett Test of Sphericity $\chi^2(15) = 325.08$, $p < .001$

Extraction Method: PCA and Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.

SE – Security; SO – Sociability

h^2 – communalities (PCA); Rcc – corrected item-total correlation (item-rest correlations)

* inversed measures.

Also in the recent Iranian adaptation (Bonaiuto et al., 2015), the Socio-relational Features scale was employed in a different form from how it was originally designed in the Italian study (Table A2). In the Iranian case, it was a one-factor scale that comprised seven items diagnosing three theoretical traits of the environment – Security, Discretion, and Sociability. By and large, this appears to be one of the most problematic scales in the questionnaire.

Welfare Services

Two indexes, comprising six items, combined to form this scale in the original instrument: (1) School Services and (2) Social Care Services. In line with the theoretical assumptions, two factors were distinguished in the PCA that corresponded with their respective indexes, and accounted for 53% total variance (Table 10). The factors correlated

poorly (r=.20). The weak correlation of items within both indexes (ranging between r=.17 and .30, a result that translated into similarly low reliability levels) rendered it questionable to equip the Polish version not only with the scale itself but also with the two indexes – School Services and Social Care Services – that would hypothetically combine to form that scale. More details on the scale's items are given in Table 10.

Table 10

Factorial Structure Of Welfare Services.

	Factor λ		h^2	R_{CC}
	SS	SC		
SS3 Schools are generally good in this neighborhood	.75		.55	.22
SS1 This neighborhood has good school facilities	.68		.61	.46
SS2 Schools can be easily reached on foot in this neighborhood	.58		.36	.25
SC3 The local health service is inadequate in this neighborhood*		.88	.76	.21
SC1 Social services are inadequate in this neighborhood*		.63	.53	.46
SC2 Elderly care services are lacking in this neighborhood*		.53	.38	.34
Eigenvalues	2.00	1.19		
Variance explained	33%	20%	Σ 53%	
Index Cronbach's *α*	.48	.50		
Scale Cronbach's *α*			.58	

Note. K-M-O = .60; Bartlett Test of Sphericity $\chi^2(15) = 74.38$, $p < .001$

Extraction Method: PCA and Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization. Pattern matrix is reported except loadings in brackets, which are reports of structure matrix whenever respective loadings are above .50

SS – School Services

SC – Social Care Services

h^2 – communalities (PCA); R_{CC} – corrected item-total correlation (item-rest correlations)

* inversed measures.

Unlike the case here in Poland, the indexes had high reliability levels in both the Italian study (Fornara et a., 2010) and the recent Iranian adaptation (Bonaiuto et al., 2015). In that light, we recommend that both indexes be excluded from the Polish version, much less so since they both diagnose phenomena that were virtually absent in the narratives collected in our previous exploratory study (unpublished) aiming to find out what Poles found important in their residential environments.

Recreational Services

Two indexes, comprising a total of six items, combined to form this scale in the original instrument: (1) Sport Services and (2) Social-Cultural Activities. In line with the theoretical assumptions, two factors were distinguished in the PCA that corresponded with their hypothetical indexes and accounted for 67% total variance. The factors moderately correlated (*r*=.41). More details on the items in this scale are given in Table 11. An item-

rest correlation analysis showed that, despite having acceptable reliability, the scale was not entirely consistent. Eliminating the SA2 and SA3 items (low communality, see Table 11) led to the creation of a one-dimensional, consistent Recreational Services 1F scale that replaced the two former Sport Services and Social-Cultural Activities indexes (Table 12). This was additionally motivated by an unacceptably low reliability of the individual Social-Cultural Activities index, also in the Italian original barely exceeding the accepted threshold α = .71

Table 11

Factorial Structure and Reliability of Recreational Services 2F.

	Factor λ		h^2	R_{CC}
	SP	SA		
SP3 There are areas where you can do outdoor sports in this neighborhood	.91		.75	.60
SP1 You can do various sports in this neighborhood	.85		.72	.56
SP2 The neighborhood is well equipped with sports grounds	.78		.68	.62
SA2 In the evening, this neighborhood offers various attractions		.93	.74	.36
SA3 This neighborhood is not well equipped to host cultural events*		.66	.52	.46
SA1 Entertainment activities for residents are lacking in this neighborhood*	(.53)	.65(.76)	.64	.58
Eigenvalues	2.91	1.14		
Variance explained	48%	19%	Σ 67%	
Index Cronbach's α	.80	.67		
Scale Cronbach's α			.78	

Note. K-M-O = .76; Bartlett Test of Sphericity $\chi^2(15) = 193.85$, $p < .001$

Extraction Method: PCA and Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization. Pattern matrix is reported except loadings in brackets, which are reports of structure matrix whenever respective loadings are above .50

SP – Sport Services; SA – Social-Cultural Activities

h^2 – communalities (PCA); Rcc - corrected item-total correlation (item-rest correlations)

* inversed measures.

Eliminating SA2 and SA3 allowed for the creation of a reasonable one-dimensional solution that accounted for 62% total variance. The common variance of all the scale's items and of the corrected item-total correlation indicator for each item in the scale indicated that the scale was far from perfect, its consistency slightly reduced by the SA1 item related to residents' entertainment activities. As we decided to keep this item for its capacity to diagnose recreational aspects related to broadly defined entertainment, while simultaneously wanting to acquire a consistent measure, we chose to reduce the scale's aspect concerning sport-related recreation. This is why we eliminated the weakest "sport" items – SP3, thus creating a more consistent Recreational Services 1F scale.

Table 12

Factorial Structure and Reliability of Recreational Services 1F

	Factor λ	h2	R_{CC}
	RE		
SP1 You can do various sports in this neighborhood	.83	.70	.60
SP2 The neighborhood is well equipped with sports grounds	.82	.67	.57
SA1 Entertainment activities for residents are lacking in this neighborhood*	.77	.60	.51
Eigenvalues	1.97		
Variance explained	65%		
Index Cronbach's α	.74		

Note. K-M-O = .68; Bartlett Test of Sphericity $\chi^2(3) = 71.78$, $p < .001$

Extraction Method: PCA

RE – Recreational Services

h^2 – communalities (PCA); R_{CC} – corrected item-total correlation (item-rest correlations);

* inversed measures.

The Iranian adaptation's authors (Bonaiuto et al., 2015) chose otherwise and distinguished two factors: Sport Services and Socio-Cultural Activities, which, however, differed in their structure from the Italian original (Fornara et al., 2010). What is more, the adaptation had the Sport Services factor reach the reliability level $\alpha > .90$ (Table A2), which may indicated item redundancy. In addition, the Socio-Cultural Activities factor comprises two items correlated at $r = .36$, $p < .01$, which, in turn, proves that it is not a reliable measure.

Pace of Life

Two indexes, comprising six items, combined to form this scale in the original instrument: (1) Relaxing versus Distressing and (2) Stimulating versus Boring. In line with the theoretical assumptions, two factors were distinguished in the PCA that corresponded with their hypothetical indexes and accounted for 73% total variance (Table 13). The factors were not correlated (r = .05). However, item-total correlations (item-rest correlations) analysis for individual items of the potential Pace of Life scale indicated these items to be very weakly correlated with the scale (r = .26 to .51). In this light, even though it could reach an acceptable α = .67 reliability , we held that this scale ought not to be analyzed as a whole. The step to reject the aggregated scale is also warranted by the Kaiser-Meyer-Olkin measure, which demonstrated that the total data from the six items merely averaged for factor analysis. In contrast, the items to be potentially included in the hy-

pothetical Pace of Life scale exhibited high internal consistency and reliability levels, whereas aggregating them as one scale would inevitably reduce the reliability of the entire measure. More details on this scale and its indexes are given in Table 13.

Table 13

Factorial Structure and Reliability of Pace of Life

	Factor λ		h^2	R_{CC}
	RD	SB		
RD3 Living in this neighborhood is quite distressing*	.87		.76	.49
RD1 There is a calm atmosphere in this neighborhood	.86		.74	.31
RD2 This neighborhood is still livable if compared with the chaos of other areas	.82		.70	.51
SB2 Every day there is something interesting in this neighborhood		.88	.77	.38
SB1 This neighborhood is full of activity		.87	.76	.26
SB1 This neighborhood is full of activity		.74	.61	.45
Eigenvalues	2.32	2.03		
Variance explained	39%	34%	Σ 73%	
Index Cronbach's α	.81	.76		
Scale Cronbach's α			.67	

Note. K-M-O = .67; Bartlett Test of Sphericity $\chi^2(15) = 227.06$, $p < .001$

Extraction Method: PCA and Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.

RD – Relaxing Versus Distressing; SB – Stimulating Versus Boring

h^2 – communalities (PCA); Rcc – corrected item-total correlation (item-rest correlations)

* inversed measures.

Transport Services

In the original instrument, this was a single four-item index. In line with the theoretical assumptions, only one factor was distinguished in the PCA, which accounted for 67% total variance (Table 14). An analysis of covariance and common variance clearly indicated that the weakest item – TS3 ("Buses are too uncomfortable in this neighborhood") – be eliminated from the index. Eliminating the item increased the index's reliability up to $\alpha = .87$, and improved its consistency. This was hardly surprising: the question refers to the bus quality as such, whereas the remaining items in this index ask about the quality of the neighborhood's public transport services in general. Eliminating the TS3 item, the TS factor then accounted for 79% total variance (Table 14).

Table 14

Factorial Structure and Reliability of Transport Services

	Factor λ	h^2	R_{CC}
	TS		
TS1 In this neighborhood, public transport provides good connections with the rest of the city	.90	.81 (†.83)	.79 (†.79)
TS2 In this neighborhood, the frequency of public transport is adequate for residents' needs	.86	.68 (†.86)	.67 (†.70)
† TS3 Buses are too uncomfortable in this neighborhood*	.83	.44	.49
TS4 Bus stops are well distributed in this neighborhood	.67	.75 (†.89)	.73 (†.76)
Eigenvalues	2.70 (†2.37)		
Variance explained	67% (†79%)		
Index Cronbach's α	.83 (†.87)		

Note. K-M-O = .78; Bartlett Test of Sphericity $\chi^2(6) = 187.42$, $p < .001$

Extraction Method: PCA

TS – Transport Services

h^2 – communalities (PCA); Rcc – corrected item-total correlation (item-rest correlations);

† – item removed from index due to low communality weakening the measurement reliability;

(†..) – results after removal of weakening item.

* inversed measures.

Upkeep

In the original instrument, this was a single four-item index. In line with the theoretical assumptions, only one factor was distinguished in the PCA, which accounted for 50% total variance. It was a weak measure with low internal consistency and debatable reliability. Eliminating its weakest item – UP3 ("Residents show care for their neighborhood") – only minimally reduced the index's reliability, down to $\alpha = .65$, while at the same time making it account for greater total variance – at 60% (Table 15). The elimination also appears to lend itself to logical justification – this question requires participants to assess the behavior of other residents inhabiting the neighborhood (specific people and their specific actions), whereas the remaining items in this index ask them to evaluate actions of indeterminate institutions responsible for street maintenance. For this reason – bearing in mind Cronbach's alpha measure limitations, such as the tendency to decrease with further item reduction, notwithstanding the actual level of the measure's consistency – we decided to reduce the index down to three relatively consistent items before including it in the Polish version. At the same time, we believe it is advisable that the index be used with full awareness that it has shortcomings.

Table 15

Factorial Structure and Reliability of Upkeep

	Factor λ	h^2	R_{CC}
	UP		
UP1 Streets are regularly cleaned in this neighborhood	.78	.61 (†.52)	.55 (†.43)
UP2 Road signs are well kept in this neighborhood	.71	.51 (†.58)	.47 (†.46)
† UP3 Residents show care for their neighborhood	.70	.40	.36
UP4 There are too many holes in the neighborhood's streets*	.64	.48 (†.66)	.42 (†.52)
Eigenvalues	2.02 (†1.77)		
Variance explained	50% (†60%)		
Index Cronbach's α	.66 (†.65)		

Note. K-M-O = .59; Bartlett Test of Sphericity $\chi^2(6) = 76.36$, $p < .001$

Extraction Method: PCA

UP – Upkeep

h^2 – communalities (PCA); Rcc – corrected item-total correlation (item-rest correlations);

† – item removed from index due to low communality weakening the measurement reliability;

(†..) – results after removal of weakening item

* inversed measures.

The Upkeep and Care index proved different in the Iranian adaptation (Bonaiuto et al., 2015) and was treated otherwise: the UP3 item appeared highly correlated with the scale, and the UP4 item was chosen for elimination (Table A2). However, while the index's reliability, at α = .93, indicates very high consistency, one should bear in mind that reliability indicators over α = .90 could arouse suspicion that the scale comprises redundant items and that it measures only a portion of the entire construct.

Factorial validity of Neighborhood Attachment

In the original instrument, this scale was treated on par with the other environment quality dimensions. Going against this assumption, we held that Neighborhood Attachment (NA) does not logically belong with the remaining residential quality dimensions, for which there are three reasons. First, NA is a purely mental construct, one that is built theoretically and based on introspection. Second, contrary to the remaining environmental quality dimensions, NA is not directly related to specific objects and states of the residential environment's physical reality; as such, it also does not constitute their material assessment. Third, which we feel is most important, being a mental state, NA appears to result from the perceived quality (among others) rather than from its constituted quality. For these reasons, we chose to treat and analyze this construct independently.

In the original instrument, NA was diagnosed with a single four-item index. In line with the theoretical assumptions, one factor was distinguished in the PCA, which accounted for 67% total variance. An analysis of covariance and common variance clearly indicated that the weakest item – NA4 ("I do not feel integrated in this neighborhood") – be eliminated from the index. Although it did not alter the index's already high reliability, with Cronbach's alpha at $\alpha = .83$, the elimination of the item increased its consistency considerably. Thus the reduced NA factor accounted for as much as 76% total variance (Table 16).

Table 16

Factorial Structure and Reliability of Neighbourhood Attachment

	Factor λ	h^2	R_{CC}
	NA		
NA1 This neighborhood is part of me	.85	.73 (†.67)	.55 (†.62)
NA2 It would be very hard for me to leave this neighborhood	.85	.72 (†.79)	.47 (†.72)
NA3 This is the ideal neighborhood for me	.85	.72 (†.82)	.36 (†.77)
† NA4 I do not feel integrated in this neighborhood*	.73	.53	.42
Eigenvalues	2.70 (†2.28)		
Variance explained	67% (†76%)		
Index Cronbach's α	.84 (†.84)		

Note. K-M-O = .70; Bartlett Test of Sphericity $\chi^2(6) = 200.85$, $p < .001$

Extraction Method: PCA

NA – Neighbourhood Attachment

h^2 – communalities (PCA); Rcc – corrected item-total correlation (item-rest correlations);

† – item removed from index due to low communality weakening the measurement reliability;

(†..) – after removal of weakening item

* inversed measures.

Conclusions from the factorial validity of the indexes and thematic scales

The above analyses of the basic dimensions concerning residential quality showed that significant differences exist between the results obtained in the Polish and Italian studies. The 12 Italian scales were replaced by 14 structurally changed and more precise measures (Tables 17 and 18). Furthermore, of the 12 originally developed scales, only five received positive verification in the Polish study, and this was after they had undergone some modification. Likewise, of the original multifactorial scales, only one – Socio-Relational Features – was positively verified, although this scale also differs structurally from its Italian equivalent. Moreover, we recommend that in the Polish version the scale's (reliable) Security and Sociability indexes be treated as individual measures that diagnose two distinct residential environment aspects.

Table 17

Final dimensions and related indexes in Polish version of questionnaire (PL-APREQ & NA)

Macroevaluative dimension (theoretical, negatively verified)	Index (basic dimension, positively verified)	Items	α
Architectural & Urban Planning Features	1. Architectural & Urban Planning Space 1F	BD2 There is enough space between houses in this neighborhood	.82
		BD3 There is little space between buildings in this neighborhood*	
		BV1 The dimension of buildings is oppressive in this neighborhood*	
		BA2 It is pleasant to see this neighborhood	
	2. External Connections	EC1 The city center can be easily reached from this neighborhood	.71
		EC2 This neighborhood is well connected with important parts of the city	
	3. Green Areas	GA1 There are green areas for relaxing in this neighborhood	
		GA2 There are enough green areas in this neighborhood	
		GA4 In this neighborhood, green areas are in good condition	
	4. Internal Functionality	IP2 There's a good availability of parking spaces	.66
		IP1 Parked cars impede walking in this neighborhood*	
		IP3 It is easy to cycle around in this neighborhood	
Sociorelational Features	1. Security	SE1 You can meet bad people in this neighborhood*	.91
		SE2 Acts of vandalism happen in this neighborhood*	
		SE3 Here in the night there is the risk of dangerous encounters*	
	2. Socialability	SO1 In this neighborhood, it is difficult to make friends with people*	.74
		SO2 In this neighborhood, it is easy to get to know people	
		SO3 In this neighborhood people tend to be isolated*	
Functional Features	1. Commercial Services	CS1 There are all kinds of stores in this neighborhood	.86
		CS2 Anything can be found in the neighborhood's stores	
		CS3 This neighborhood is well served with stores	
	2. Recreational Services 1F	SP1 You can do various sports in this neighborhood	.74
		SP2 The neighborhood is well equipped with sports grounds	
		SA1 Entertainment activities for residents are lacking in this neighborhood*	

	3. Transport Services	TS1 In this neighborhood, public transport provides good connections with the rest of the city	.87
		TS2 In this neighborhood, the frequency of public transport is adequate for residents' needs	
		TS4 Bus stops are well distributed in this neighborhood	
Context Features	1. Environmental Health	EH1 The air is clean in this neighborhood	.83
		EH2 This neighborhood is generally not polluted	
		EH3 This is a noiseless neighborhood	
	2. Relaxing vs. Distressing	RD1 There is a calm atmosphere in this neighborhood	.81
		RD2 This neighborhood is still livable if compared with the chaos of other areas	
		RD3 Living in this neighborhood is quite distressing*	
	3. Stimulating vs. Boring	SB1 This neighborhood is full of activity	.76
		SB2 Every day there is something interesting in this neighborhood	
		SB3 Nothing happens in this neighborhood*	
	4. Upkeep	UP1 Streets are regularly cleaned in this neighborhood	.65
		UP2 Road signs are well kept in this neighborhood	
		UP4 There are too many holes in the neighborhood's streets*	
Neighbourhood Attachment		NA1 This neighborhood is part of me	.84
		NA2 It would be very hard for me to leave this neighborhood	
		NA3 This is the ideal neighborhood for me	

Note. * inversed measures.
α = Cronbach's α

All that being said, the Polish versiont did diagnose a solid majority of the residential quality aspects that were also measured by the original APREQ & NA questionnaire. This is because the main differences between the two versions pertain to the structure's 12 scales, rather than to their constituent indexes (of the 20 original indexes, as many as 16 received positive verification in our study, and following the final modifications aimed to increase the measures' consistency, we recommend that 14 be used in the Polish version; see Tables 17 and 18).

Table 18

Statistical characteristics of indexes in Polish version of the questionnaire (PL-APREQ & NA)

	Index (basic dimension, positively verified)	№	*Min*	*Max*	*M*	*SD*	*Sk*	*Ku*	*K-S*	*p*	*α*
1	Architectural& Urban Planning Space 1F	4	.75	6.00	3.53	1.22	−.11	−.51	.65	.79	.82
2	Commercial Services*	3	.00	6.00	3.41	1.47	−.32	−.89	1.44	.03	.86
3	Environmental Health*	3	.33	6.00	3.44	1.37	−.49	−.66	1.74	.00	.83
4	External Connections	2	.00	6.00	4.35	1.24	−.88	.80	1.44	.03	.71
5	Green Areas*	3	1.00	6.00	4.09	1.19	−.60	−.23	1.57	.01	.77
6	Internal Functionality	3	.33	6.00	3.45	1.26	−.19	−.38	.99	.28	.66
7	Recreational Services 1F	3	.67	6.00	2.98	1.22	.08	−.61	.95	.32	.74
8	Relaxing vs. Distressing*	3	1.00	6.00	3.96	1.15	−.68	.05	1.78	.00	.81
9	Security*	3	.00	6.00	3.39	1.45	−.46	−.41	1.41	.04	.91
10	Socialability	3	.33	6.00	3.32	1.06	.04	.09	1.30	.07	.74
11	Stimulating vs. Boring	3	.00	5.67	2.47	1.06	.29	.21	1.12	.16	.76
12	Transport Services	3	.00	6.00	3.94	1.42	−.83	.20	1.35	.05	.87
13	Upkeep	3	.67	6.00	3.56	1.09	−.52	.22	1.36	.05	.65
	Neighbourhood Attachment	3	.00	6.00	3.10	1.45	−.28	−.62	1.04	.23	.84

Note. * non-normal distributed data.

№ = number of items

Min = minimum, Max = maximum, M = mean, Sk = skewness, Ku = kurtosis, K-S = Kolmogorov-Simirnov Z, p = H0 states that the distribution is normal

α = Cronbach's α

To ensure that the terminology remains consistent in the this paper's following sections, the measures called "scales" in the Italian study will hereafter be referred to as "basic dimensions". A scale is a complex variables measurement that is created "by assigning scores to patterns of responses" while also "recognizing that some items reflect a relatively weak degree of the variable while others reflect something stronger" (Babbie, 2006, p. 154). The logic behind scale construction a assumes, therefore, that they "take

into consideration the intensity with which different items reflect the variable being measured" (Babbie, 2006, p. 155). The logic underlying the APREQ & NA Indicators does not takes into account such intensity: the indicators – called "scales" in the original study, and "basic dimensions" here – are created through simple arithmetic that averages the degree to which subjects agree or disagree with certain statements about their residential environment. Hence, these indicators are not in fact scales.

Factorial validity: verification of the macroevaluative dimensions

As mentioned in the section discussing the method and its theoretical assumptions, the measurements obtained by using the original Italian APREQ & NA questionnaire (Fornara et al., 2010) showed the 12 basic assessments of residential environment (11 PREQ + 1 NA) to form five general macroevaluative dimensions: (1) Architectural & Urban Planning Features, (2) Sociorelational Features, (3) Functional Features, (4) Context Features, and (5) Neighborhood Attachment.

Following the verification of the 12 basic dimensions in the Polish version, we proceeded to verify the five original macroevaluative dimensions (a term proposed by Fornara et al., 2010). This was motivated by the considerable discrepancies between the Italian and Polish versions, which have already been discussed in the section devoted to the model's verification measurements. These discrepancies were the reason why we chose to subject the 13 Polish basic dimensions (Neighborhood Attachment was excluded for reasons given above) to exploratory factor analysis rather than confirmatory analysis, which would simply verify the original theoretical model. This allowed us to conduct a thorough investigation into whether the Polish data actually supported the distinction into five macroevaluative dimensions, rather than to presuppose a certain theoretical structure that could eventually prove inadequate to the new, altered conditions that have been shaped by the modified basic indexes and different basic dimensions incorporated into the Polish version.

First and foremost, we wanted to find out whether it was reasonable to perform a factor analysis involving the 13 basic dimensions revealed in the Polish version. At the first examination of the correlation matrix, each basic dimension showed to be correlated with at least one another at the minimum level $r = .40$ – Field (2009) calls for the elimination, performed prior to commencing factor analysis, of the variables which do not correlate with at least one another at the minimum level $r = .30$. Table 19 provides the correlation of the Polish basic dimensions. High adequacy for further analyses was also demonstrated by other measures: the Kaiser-Meyer-Olkin index, at .82, and Bartlett's sphericity test: $\chi^2(78) = 659.47$, $p < .001$.

Table 19

Correlations of the Polish basic dimensions

	AU	EC	IF	GA	SE	SO	RE	CO	TR	RD	ST	EH	UP
AU / Architectural & Urban Planning Space 1F			.50	.51	.41					.59		.57	
EC / External Connections								.46	.54				
IF / Internal Functionality	.50			.46	.44							.47	
GA / Green Areas	.51		.46		.44		.47			.66		.62	
SE / Security	.41		.44	.44		.42				.69		.61	
SO / Socialability					.42								
RE / Recreational Services 1F				.47						.43	.54		
CO / Commercial Services		.46					.40		.54		.54		
TR / Transport Services		.54						.54					
RD / Relaxing vs. Distressing	.59			.66	.69		.43					.77	.52
ST / Stimulating vs. Boring							.54	.54					
EH / Environmental Health	.57		.47	.62	.61					.77			.45
UP / Upkeep										.52		.45	

Note. N = 110. Intercorrelations of indexes (Spearman's Rho's) are presented below the diagonal.
Absolute correlations below $r = .30$ were removed from table to improve readability.
In all of the presented correlations $p \leq .001$

Provided that the Polish version included four macroevaluative dimensions (five original dimensions minus NA), the PCA should produce four factors that corresponded thematically to the dimensions of Architectural & Urban Planning Features, Sociorelational Features, Functional Features, and Context Features. Meanwhile, the Polish data yielded a three-factor solution, which accounted for 66% total variance (Table 20). An analysis with a promax rotation of the main axes showed the following dimensions could be statistically justified: (1) General Evaluation – a factor loading uniquely seven basic dimensions; (2) Communication & Commerce – loading three basic dimensions; and (3) Activity Capability – also loading three basic dimensions. Neighborhood evaluation was weakly correlated with its activity capability ($r = .34$), as was the activity with communication and commerce ($r = .31$). Similarly, there was no correlation between the neighborhood's evaluation and communication and commerce ($r = -.07$). This result is given further elaboration in the section which concludes by verifying the Polish version of the questionnaire.

Table 20

Factorial Structure of hypothetical macroevaluative dimensions

	Factor [a] λ			h^2
	GE	CC	AC	
Environmental Health	.93			.80
Relaxing vs. Distressing	.89			.79
Green Areas	.80			.64
Architectural & Urban Planning Space 1F	.69			.55
Security	.67			.66
Internal Functionality	.61			.43
Upkeep	.60			.49
Transport Services		.87		.71
External Connections		.76		.57
Commercial Services		.73		.72
Stimulating vs. Boring			.80	.77
Socialability			.75	.67
Recreational Services 1F			.64	.69
Eigenvalues by factor	4.56	2.68	1.24	
Variance explained by factor	35%	21%	10%	Σ 66%

Note. K-M-O = .82; Bartlett Test of Sphericity $\chi^2(78) = 659.47$, $p < .001$

Extraction Method: PCA and Principal Axis Factoring.

Rotation Method: Promax with Kaiser Normalization.

GE – General Evaluation; CC – Communication & Commerce; AP – Activity Capability

h^2 – communalities (PCA);

Convergent validity

PL-APREQ & NA's convergent validity was determined by comparing the instrument's scores with the scores obtained for a part of the WHOQOL-BREF questionnaire (Power, Bullinger, & Harper, 1999; World Health Organization, 1998) – a well-established tool

for measuring self-assessed life quality, including in relation to subjectively evaluating physical environment quality. The questionnaire includes a subscale concerning the "Environmental Domain of Quality of Life", which comprises eight questions about perceived environmental quality. Subjects provide their answers on 5-point Likert-type scales that, depending on the question, cover the ranges between "not at all" and "completely", "very poor" and "very well", "very dissatisfied" and "very satisfied", and so forth. We used this dimension to verify the PL-APREQ's validity.

The total score for the 13 basic PL-APREQ dimensions correlated with the assessment of the WHOQOL's Environmental Domain at $r = .58$, $p < .001$, which means, depending on how the correlation coefficient is interpreted (Dancey & Reidy, 2011), an average to moderately strong convergent validity of the tool. The PL-APREQ dimensions which revealed highest convergence with the WHOQOL's Environmental Domain included: Relaxing versus Distressing ($r = .58$, $p < .001$), Security ($p = .52$, $p < .001$), and Green Areas ($r = .51$, $p < .001$). Weak or no correlation with the Environmental Domain was found in the case of Commercial Services ($r = .10$, *ns*), Transport Services ($r = .05$, ns), and External Connections ($r = -.02$, *ns*).

Convergent validity was additionally tested by a question, answered after the questionnaire had been completed, asking about participants' attitude to their neighborhood: "Generally, how satisfied are you with the neighborhood where you currently live?" (response scale 1−10). The total score for the 13 basic PL-APREQ dimensions correlated with this general attitude to one's neighborhood at $r_s = .70$, which shows a high level of convergence of both declaration. The correlation with the general attitude to the neighborhood was highest for the Relaxing versus Distressing dimension ($r_s = .67$, $p < .001$) and lowest for External Connections ($r_s = .12$, *ns*). This result is also consistent with the above-mentioned comparison of scores for PL-APREQ and WHOQOL-BREF's Environmental Domain.

Some PL-APREQ's basic dimensions were also found to correlate with the self-assessed general life quality, as well as self-assessment of WHOQOL-BREF's Physical Health and Psychological Health domains (Table 21). Self-assessed general quality of life covaried with PL-APREQ's four basic dimensions and the total score for all 13 dimensions. Self-assessment of Physical Health covaried with five basic dimensions of the PL-APREQ and the total score for all 13 dimensions. Self-assessed Physiological Health covaried significantly with three PL-APREQ basic dimensions. Interestingly, three PL-APREQ dimensions showed no correlation with any dimension of the WHOQOL-BREF: External Connections, Transport Services, but most crucially, Commercial Services, a dimension representing theoretically a key facilities typein a well-designed modern neighborhood.

Table 21

Correlations between PL-APREQ and WHOQOL-BREF

	AU	EC	IF	GA	SE	SO	RE	CO	TR	RD	ST	EH	UP	Σ13D
General QOL$^{\tau}$	.18*				.24**		.21**			.20**				.16*
Physical Health^{s}				.19*	.34**		.35**			.29**	.29**			.30**
Psychological Health^{s}				.25**	.24*					.23*				
Environmental Domain^{s}	.40**		.37**	.45**	.45**	.31**	.31**			.50**		.42**	.20*	.58**

Note. N = 110. Intercorrelations of indexes are presented below the diagonal.

^{s} = Spearman Rho's

$^{\tau}$ = Kendall Tau's

AU = Architectural & Urban Planning Space 1F, EC = External Connections, IF = Internal Functionality, GA = Green Areas, SE = Security, SO = Socialability, RE = Recreational Services 1F, CO = Commercial Services, TR = Transport Services, RD = Relaxing vs. Distressing, ST = Stimulating vs. Boring, EH = Environmental Health, UP = Upkeep, Σ13D = Summative 13. basic dimensions of PL-APREQ

** $p \leq .01$, * $p \leq .05$, otherwise: non-significant

For the reason that we intended to test PL-APREQ validity by using the tool designed by the World Health Organization, our participants were also asked about their declared state of health. Crucially, the assessing the neighborhood based on PL-APREQ & NA proved insensitive to participant health. In the 110-strong sample, 68 participants declared feeling healthy on the day of the study, while 42 people stated they were "a bit", "moderately", "very", or chronically ill. Variance analysis showed no effect of actual physical illness on any of the PL-APREQ & NA dimensions.

It is also worth pointing out that neighborhood assessment results based on PL-APREQ covaried with its being inhabited by participants' friends or family. This has a strong theoretical justification: people are likely to assess higher the neighborhood which offers them social support, as compared with one inhabited by no significant others. Hence, it came as no surprise that the highest correlation with the presence of relatives and friends was found for the the neighborhood's Sociability dimension, with $F(1, 109) = 13.42$, $p < .001$, $\eta^2 = .12$. Interestingly enough, a high correlation in this respect was also found for the assessment of Architectural and Urban Planning Space: $F(1, 109) = 6.77$, $p < .01$, $\eta^2 = .06$; Recreational Services: $F(1, 109) = 6.77$, $p < .01$, $\eta^2 = .06$; as well as the total score for the 13 basic PL-APREQ dimensions: $F(1, 109) = 7.78$, $p < .001$, $\eta^2 = .07$. In contrast, a surprisingly low (although still significant) correlation

with this aspect was observed for the NA dimension, with $F(1, 109) = 4.18$, $p < .05$, $\eta^2 = .04$. We had expected that the close presence of significant others would have a considerably stronger effect on participants' attachment to their neighborhoods.

Discriminant validity

Also the instrument's discriminant validity was determined by comparing its scores with the WHOQOL questionnaire scores. Apart from questions related to the Environmental Domain, the questionnaire includes those asking about respondents' Physical, Psychological, and Social domains. People's residential environment assessment is theoretically related to a host of aspects connected with their functioning, including their general quality of life and behavior, which has been extensively demonstrated in the literature on the subject (see, e.g., Dębek & Janda-Dębek, 2013; van Kamp et al., 2003). Hence, it would be difficult to find a sphere of human life with which tools such as PREQ would have no theoretical relation. This is why we opted to observe the relationships between how different domains of life are perceived in the well-established WHOQOL questionnaire. As a consequence, we chose to base the PL-APREQ's discriminant validity determination on WHOQOL's Social Domain, one that displayed the weakest correlation with the Environmental Domain.

The total score for the 13 PL-APREQ basic dimensions demonstrated no correlation with WHOQOL's Social Domain ($r = .07$, *ns*). Although this was to be expected, it must be noted that some of PL-APREQ's basic dimensions did correlate significantly with the Social Domain. These were the spheres theoretically connected with people's social functioning, that is, with Security ($r = .30$, $p < .001$) and Sociability ($r = .24$, $p < .001$).

Criterion validity

PL-APREQ and criterion-like declarations

In theory, assessing one's neighborhood should be correlated with a range of variables, such as willingness to move out or stay put, one's attachment to the neighborhood, and readiness to recommend the neighborhood as a good place to live to one's friends (e.g. Dębek, 2014; Dębek & Janda-Dębek, 2013; van Kamp et al., 2003).

To verify these relationships, we asked the participants of our study to respond, after they had filled out the PL-APREQ questionnaire, to several questions concerning the matters mentioned above (on 7-point Likert-type scales). Our study also included the place attachment criterion (the already-described NA dimension integrated with the questionnaire). Results are given in Table 22.

Table 22

Correlations between PL-APREQ and criterion-like declarations

Criterion	Σ13D	HI	LO
"I don't like to move from this neighbourhood in the nearest future"	.34**	Transport Services, .36**	Internal Functionality, .02
"I recommend this neighbourhood to my friends and relatives"	.63**	Relaxing vs. Distressing, .63**	External Connections, .12
Neighbourhood Attachment	.68**	Relaxing vs. Distressing, .61**	External Connections, .16

Note. N=110. Spearman Rho's and Kendall Tau's are presented.

Σ13D = summative 13. basic dimensions of PL-APREQ

HI = the particular basic dimension highest correlated with the criterion

LO = the particular basic dimension lowest correlated with the criterion

** $p \leq .01$, * $p \leq .05$, otherwise: non-significant

PL-APREQ and real estate prices in the assessed neighborhoods

It is our opinion that the most important, and relatively objective, external criterion for verifying the practical functionality of PREQ-type questionnaires – which is urban environment characterization and profiling – is the correlation between the results obtained by using such tools and real estate prices in the assessed areas. This is based on the assumption that in free market economies, to which the Polish economy belongs, real estate prices in a given neighborhood (city, district, or housing estate) are largely influenced by demand – that is, by how attractive given goods are: in this case, a property in a particular neighborhood (Visser, van Dam, & Hooimeijer, 2008). Property attractiveness depends, among other things, on the distance between its location and the city center, and the characteristics of the area's inhabitants (Archer, Gatzlaff, & Ling, 1996). The third most important criterion influencing real estate prices, apart from functionality and location, is the quality of the surrounding area (Simlai, 2014, Visser et al., 2008, 2008). One key neighborhood dimension as measured by PL-APREQ & NA that translates directly into real estate prices is its security – the lower the neighborhood's security, the lower its real estate prices, a relationship proven recently by Buonanno, Montolio and Raya-Vílchez (2013). Other such dimensions include accessibility to green areas and water, the inhabitants' socioeconomic status, connections of the neighborhood with other city parts, trade availability and all sorts of services, as well as proximity to the workplace (Rysak-Czajkowska, 2014; Visser et al., 2008). Therefore, the results produced by PL-APREQ & NA-type questionnaires should correlate with real estate prices in the neighborhoods where the questionnaires are being to make the assessments. In theory, then, neighborhoods scoring highest on PREQ should also be those with the highest apartment prices.

All 110 participants who filled out the PL-APREQ also disclosed their place of residence, approximated to the nearest street intersection. However, before we could proceed to analyze the relationship between the neighborhoods' real estate prices and their assessment in the PL-APREQ, it was necessary to determine the size of the area that should be taken into consideration for the intended price analysis. To that end, we had to designate an area with a specific radius around the intersection declared by participants; yet it proved rather difficult to determine the actual "neighborhood" size that each individual participant could have in mind.

Determining the average sized area defined as "the neighborhood"

Therefore, we first set to find out what size area participants thought of when they referred to "the neighborhood". For this reason, we conducted another study on a sample made up from people living in Wrocław.

Participants

Thirty-six students participated – 18 women and 18 men aged between 19 and 85 (*Mdn* = 45). As was the case with the main study, this was a convenience sample composed of part-time students from the Higher School of Banking in Wrocław, Department of Finance and Management (N = 20), and part-time students from the University of the Third Age (at the University of Wrocław, N = 16). They received no financial compensation for their involvement in the study.

Method

Participants were presented with a questionnaire comprising three questions that introduced spatial issues; they involved general neighborhood , unwillingness to move out, and potential in recommending the neighborhood as a good place to live to one's friends. Participants responded on a zero to six scale to the "How satisfied are you with the neighborhood where you currently live?" question, and on seven-point Likert-type scales – to the remaining two questions.

Next, participants were asked to think about the areal space they considered to be "the neighborhood" they had just assessed. As a visual aid, they received a piece of paper showing a square-shaped black and white drawing of a generic urban structure enclosed within four streets; they were then to fill in the street names that enclosed what they identified as their own "residence". The procedure took around five minutes to complete.

Results

The 34 valid observations revealed that participants differed markedly in spatial views on what they considered to be their neighborhoods. The smallest such-delineated area covered a mere 20,000 m^2 (approx. 24,000 yd^2), while the largest – 900,000 m^2 (slightly over one million yd^2). On average, participants declared an area covering 130,000 m^2

(approx. 155,000 yd^2; *mdn*), a size we initially chose to define as "the average area" surrounding participants' residences so that we could examine apartment prices in the neighborhoods assessed in PL-APREQ.

Establishing apartment prices in the assessed areas

To establish apartment prices in the assessed areas we used an online search service made available on the Home Broker company's website (www.homebroker.pl). This service is a quick and efficient tool used to find the average offer and real estate prices in Wrocław, which are based on advertisements and sales transactions handled by this company. A preliminary analysis obtained using this service showed it necessary to expand the initially-accepted area of 130,000 m^2 (which equals ca. a 200-meter-radius circle) to about 2.5 km^2 (equal to ca. a 900-meter-radius circle). Only by analyzing areas with such dimensions was it possible to establish the mean price per square meter of apartment space based on at least three offer and three transaction prices.

The price analysis was carried out in December 2014 – half a year after the main PL-APREQ & NA study was completed. The analysis included nearly 3,000 real estate prices in Wrocław (Home Broker, 2014), including 1,848 price offers (on average 20, min. 3 and max. 62 prices per square meter of apartment space for each individual assessment in PL-APREQ) and 1,101 transaction prices (on average 14, min. 3 and max. 32 prices). The price per square meter of apartment space in each "neighborhood" was calculated as the mean offer and transaction price recorded for that individual area. In this way, we were able to "price" 78 neighborhoods (the remaining 32 of the 110 questionnaires were invalid due to their incorrectly identified street intersections located closest to participants' place of residence).

The assessed areas' mean offer prices, transaction prices, and prices per square meter of apartment space, as at December 2014, are given in Table B1.

PL-APREQ and Wrocław apartment prices in the assessed areas

The PL-APREQ results were significantly correlated with apartment prices in the assessed areas (Table 23). The prices covaried with the dimensions of Security, Recreational Services 1F, Relaxing vs. Distressing, Environmental Health, Upkeep, and the total score for PL-APREQ's 13 basic dimensions. The dimensions that did not correlate (a near-zero correlation) with apartment prices were External Connections, Sociability, and Transport Services. The correlation between the total score for the 13 basic dimensions and the mean price per square meter of apartment space in the assessed areas was found at $r_S = .24$, $p < .01$. This suggests a modest – although still significant – correlation between participants' subjective neighborhood assessments he and objective neighborhood attractiveness indicators : in this case, the apartment prices.

Table 23

Correlations between PL-APREQ and the criterion: real estate prices in the assessed neighborhoods

Criterion	Σ13D	HI	LO
Cena ofertowa	.23*	Upkeep .35**	Socialability .02
Cena transakcyjna	.25*	Relaxing vs. Distressing .30**	Socialability −.01
Cena średnia	.24*	Security .30**	Socialability .01

Note. 78 measured residential environments (areas within the 500 meter radius from the particular crossings nearest to the respondents' homes). Spearman Rho's are presented.
Σ13D = Summative 13. basic dimensions of PL-APREQ
HI = the particular basic dimension highest correlated with the criterion
LO = the particular basic dimension lowest correlated with the criterion
** $p \leq .01$, * $p \leq .05$, otherwise: non-significant

Furthermore, it is worth noting that apartment prices also covaried, at $r_\tau = .29$, $p < .01$, with participants' general neighborhood assessment, formulated as the answer to the question: "Generally, how satisfied are you with the neighborhood where you currently live?"

At the same time, we observed no correlation between neighborhood apartment prices and WHOQOL-BREF's Environmental Domain, which indicates that PL-APREQ diagnoses different environmental reality aspects than the WHOQOL-BREF questionnaire does, even though both instruments largely covary in their environmental assessment results ($r = .58$, $p < .001$).

Measurement stability over time

We tested measurement stability over time and residential environmental immunity to external disturbances by examining the same participants twice, in early and late June 2014.

Participants

Participants in this stage were 30 people – 10 men and 20 women aged between 19 and 34 ($Mdn = 21$). They were full-time students at the University of Wrocław, Department of Psychology (N = 18), and full-time students at Wrocław University of Technology, Faculty of Architecture (N = 12). Participants received no financial compensation for their involvement in the study.

Method, tools, and procedure

As was the case in the study conducted to verify the measurement model, participants filled out the PL-APREQ & NA questionnaire that comprised 66 statements concerning 11 dimensions of perceived residential environment quality and neighborhood attach-

ment. They were to respond to these statements on a seven-point Likert-type scale. In addition, participants were asked to answer (on a 0−6 response scale) an additional question concerning how they generally assessed their neighborhood: "Generally, how satisfied are you with the neighborhood where you currently live?", and to declare whether they would recommend the neighborhood as a good place to live to their friends (on a 7-point Likert-type scale). Finally, participants completed a short demographic form. They were also given printed coupons bearing a seal and a unique number, with the instruction to bring the coupons to the study's second stage. This made it possible to identify the participants at the two stages conducted within a one-month period, while also ensuring their anonymity. The study took between 10 and 12 minutes to complete.

Results

The measurements, taken across a one-month period, were highly correlated (see Table 24) and showed almost identical distributions for the majority of dimensions. Three dimensions demonstrated considerable differences in mean values obtained in both studies, although still showing high intrasubjective correlations; they were Green Areas (systematically higher results obtained in the first study), Recreational Services, and Environmental Health (in both these cases, systematically lower results in the first study). The mean differences recorded for the two studies were insubstantial, while the three dimensions were found to show lower standard deviation levels in the study conducted later. A lower dispersion of results was observed in the retest, which showed lower standard deviation levels for 11 of the 13 tested dimensions and the NA assessment – for the remaining two dimensions, the retest's SD measure was either comparable to or lower than in the first study (as was the case of Internal Functionality). The dimensions that proved most stable were External Connections (virtually no mean difference between the test and retest), Security, and Sociability. The total score for the 13 basic dimensions of the PL-APREQ did not differ between the test and retest: $F(1, 28) = 3.37$, *ns*.

Table 24

Differences and correlations between test and retest in PL-APREQ & NA

	K-S	K-S p	Min	Max	ΔM	t	F	η^2	p	r_s
Architectural & Urban Planning Space 1F	.80[1] .77[2]	>.05[1] >.05[2]	1.25	5.75	.07	.66	.44	*ns*	.51	.90
External Connections	.99[1] .86[2]	>.05[1] >.05[2]	.50	6.00	.00	.00	.00	*ns*	1.00	.84
Internal Functionality	.61[1] .77[2]	>.05[1] >.05[2]	.33	6.00	.25	−1.30	1.68	*ns*	.20	.64
Green Areas	.64[1] .74[2]	>.05[1] >.05[2]	1.00	6.00	.36	−2.96	8.76	.23	.01	.85
Security	1.26[1] .56[2]	>.05[1] >.05[2]	.33	5.00	.02	.15	.02	*ns*	.88	.83

Socialability	1.06[1] .95[2]	>.05[1] >.05[2]	.33	5.33	.02	−.18	.03	*ns*	.86	.74
Recreational Services 1F	.79[1] .71[2]	>.05[1] >.05[2]	1.00	6.00	.31	2.33	5.42	.16	.03	.81
Commercial Services	.49[1] .83[2]	>.05[1] >.05[2]	1.00	6.00	.15	.91	.81	*ns*	.37	.76
Transport Services	.86[1] .50[2]	>.05[1] >.05[2]	1.00	6.00	.05	.49	.23	*ns*	.63	.90
Relaxing vs. Distressing	.87[1] .65[2]	>.05[1] >.05[2]	2.00	6.00	.06	.68	.46	*ns*	.50	.90
Stimulating vs. Boring	.53[1] .60[2]	>.05[1] >.05[2]	.67	4.67	.29	1.85	3.43	*ns*	.07	.62
Environmental Health	.57[1] .72[2]	>.05[1] >.05[2]	.67	5.67	.31	2.33	5.42	.16	.03	.84
Upkeep	.87[1] .95[2]	>.05[1] >.05[2]	2.00	6.00	.10	1.14	1.29	*ns*	.26	.83
Neighbourhood Attachment	.76[1] .64[2]	>.05[1] >.05[2]	.67	6.00	.04	.36	.13	*ns*	.72	.86

Note. N = 30.

K-S = Kolmogorov-Smirnoff test: normality of distribution; [1] = test, [2] = retest

Min / Max = minimum and maximum both in test and retest, ΔM = absolute difference between test and retest means, t = t test for dependent measures: differences in test and retest, F = repeated measures ANOVA test, η^2 = partial eta squared: size of the one-month interval effect, r_s = Spearman's Rho between test and retest.

In all of the presented correlations $p \leq .001$

Measurement stability over time was also found for the answers to the two questions: "Generally, how satisfied are you with the neighborhood where you currently live?" (Wilcoxon Signed-Rank Tests indicated that post-test scores were statistically the same as in the pre-test, $Z=-1.00$, $p>.05$ and $r_\tau=.77$, $p<.001$); and "Would you recommend the neighborhood as a good place to live to your friends?" (Wilcoxon Signed-Rank Tests: $Z=-1.06$, $p>.05$; $r_\tau=.81$, $p<.001$).

Verification of the PREQ & NA's Polish adaptation – Conclusions

PL-APREQ & NA in light of the original Italian tool and its Iranian adaptation

The Polish questionnaire version, the PL-APREQ & NA, is a tool that appears well-designed for assessing perceived multidimensional residential environment quality. The instrument differs in its dimensional structure and the reliability of some indicators from both the original version (Fornara et al., 2010) and from its recent Iranian adaptation (Bonaiuto et al., 2015). As can be inferred from the Iranian study (Bonaiuto et al., 2015), where the instrument also differed from the Italian original in both structure and measurement reliability, the authors appear to have accepted the existing intercultural differences. Admittedly, the structural changes and minor item modifications introduced to the

adapted versions did not in essence alter their measurement – all the significant residential environmental dimensions diagnosed by the Italian original have also found their way to the Iranian and Polish adaptations. The only exception is Welfare Services (School Services and Social Care Services), which was eliminated from the Polish version due to its less than acceptable statistical properties.

PL-APREQ & NA and macroevaluative dimensions

The results of our Polish study did not justify accepting the five originally-proposed macroevaluative dimensions: (1) Architecture & Urban Planning, (2) Sociorelations, (3) Functions, (4) Contexts, and (5) Neighborhood Attachments. Principal component analysis and principal axis factoring clearly indicated that the relationships between the Polish basic dimensions differ substantially from those of the original instrument. A potential solution would be to base further analyses on the three macroevaluative dimensions statistically justified in the Polish version: General Evaluation, Communication & Commerce, and Activity Capability. This, however, appears overly reductionist given the potential practical application of the PL-APREQ & NA, as one key use that this tool is intended for is to multi-dimensionally compare of how people perceive the multiple aspects of their environments, leading, for instance, to building useful residential environment profiles. Such comparisons and profiling should be based on measures detailed enough to allow for distinguishing between environments with a higher and lower value according to social needs. What is more, these measures should also be precise enough to diagnose the areas where urban environments fail in fulfilling their residents' needs. Such diagnoses can be performed by comparing multiple environments on the 13 basic dimensions of the PL-APREQ & NA, which could be conducive to developing potential action plans aiming at increasing the environments' quality. Ultimately, the goal of such comparisons is to improve residential environments, leading in consequence to a higher life quality for people inhabiting urban areas (Dębek & Janda-Dębek, 2013).

In light of the above-presented results and in the aims that the PL-APREQ & NA questionnaire can be used to achieve, we recommend using the combined13 basic dimensions and NA, rather than the 3 macroevaluative dimensions and NA.

Validity of the instrument

PL-APREQ & NA is a well-suited instrument for assessing residential environment quality and neighborhood attachment. Assessing residential environment quality by PL-APREQ & NA proved highly, although not excessively, correlated with the assessment made by using the well-known questionnaire WHOQOL-BREF. PL-APREQ & NA yields measurements that are stable over time and appear immune to potential external disturbances, such as the participant's physical and mental state.

Furthermore, the perceived quality of the 13 PL-APREQ neighborhood dimensions is significantly and positively correlated with neighborhood attachment (NA), respondents' readiness to recommend the neighborhood to their friends, and their unwillingness to move out. Most importantly, however, the PL-APREQ & NA-based neighborhood assessment is significantly and positively correlated with the assessed neighborhoods' apartment prices. This indicates the tool's theoretical as well as ecological validity.

Our study also demonstrated that the assessed residential environmental quality in Poland is indeed positively correlated with general of quality of life and physical health. This has long been hypothesized, while also numerous attempts have been made to examine these relationships in several other countries (Dębek & Janda-Dębek, 2013; van Kamp et al., 2003).

Of the 13 PL-APREQ's basic dimensions, the one related to neighborhood relaxation (stress) potential, appears to have the greatest diagnostic significance. This dimension demonstrated the highest correlation with both the assessed neighborhoods' transaction prices per one meter of apartment space, participants' readiness to recommend the neighborhood to their friends, and neighborhood attachment, but also with the generally assessed environmental quality measured by the WHO questionnaire, and by that measured by one test item. What is more, this is also one of two dimensions (the other being neighborhood security) that correlated with both general life quality and participants' self-assessed physical and psychological health.

Conclusions

So far, no tool has been available in Poland that would allow people to measure reliably their subjective perceptions of their residential environments. We believe the PREQ & NA questionnaire may fill this gap and prove a useful instrument that can be effectively utilized in environmental psychology. The results of our analyses justify the conclusion that PREQ & NA is a fairly universal, reliable tool that should also lend itself to an adaptation to Polish conditions. As has been demonstrated above, the questionnaire is not excessively sensitive to cultural differences. In light of the subtle differences that likely exist between the populations inhabiting different countries, it may prove necessary to introduce a several minor modifications to the tool. These would involve, for example, eliminating several original questionnaire indexes and items, a recommendation that has been elaborated on in greater detail above. Provided that the analysis is subjected to a range of the necessary corrections, the Polish version PL-APREQ & NA, which has been presented in this article, can be successfully employed for use in Poland.

That being said, the above adaptation is not entirely free from limitations. First and foremost, even though we chose a demographically diversified group of study participants, they did not constitute a random sample, which means the group does not represent the Polish population. Furthermore, the analyzed environments were not systematically diversified: the study was conducted in Wrocław and a several other cities/towns in Lower Silesia Province, with the study participants being selected without accounting for the type of residential environment they inhabited (e.g., single family housing, downtown-type development, block housing estate, etc.). Further research aimed at verifying PL-APREQ & NA should involve random stratified sampling, with the stratification variable including participants' places of residence in particular environmental types. Such a research approach could perhaps be conducive to normalizing the instrument and, as a result, lead to developing Polish subjective residential environmental quality norms for a variety of urban environment types.

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APPENDIX A

Table A1

Polish translations of the APREQ & NA items (only items present in the final version of PL-APREQ & NA are shown).

Indexes (basic dimensions)	Items in English	Items in Polish
1. Architectural & Urban Planning Space 1F	BD2 There is enough space between houses in this neighborhood	W tej okolicy jest wystarczająco dużo przestrzeni między budynkami.
	BD3 There is little space between buildings in this neighborhood*	W tej okolicy jest mało przestrzeni pomiędzy budynkami.
	BV1 The dimension of buildings is oppressive in this neighborhood*	W tej okolicy rozmiary budynków są przytłaczające.
	BA2 It is pleasant to see this neighborhood	Miło się patrzy na tę okolicę.
2. External Connections	EC1 The city center can be easily reached from this neighborhood	Łatwo się dostać do centrum z tej okolicy.
	EC2 This neighborhood is well connected with important parts of the city	Ta okolica jest dobrze połączona z ważnymi częściami miasta.
3. Green Areas	GA1 There are green areas for relaxing in this neighborhood	W tej okolicy są tereny zielone, gdzie można odpocząć.
	GA2 There are enough green areas in this neighborhood	W tej okolicy jest wystarczająco dużo zieleni.
	GA4 In this neighborhood, green areas are in good condition	W tej okolicy zieleń jest dobrze utrzymana.
4. Internal Functionality	IP2 There's a good availability of parking spaces	W tej okolicy miejsca parkingowe są łatwo dostępne
	IP1 Parked cars impede walking in this neighborhood*	W tej okolicy zaparkowane samochody utrudniają ruch pieszym.
	IP3 It is easy to cycle around in this neighborhood	W tej okolicy można łatwo poruszać się rowerem.
5. Security	SE1 You can meet bad people in this neighborhood*	W tej okolicy kręcą się podejrzane osoby.
	SE2 Acts of vandalism happen in this neighborhood*	W tej okolicy często dochodzi do aktów wandalizmu.
	SE3 Here in the night there is the risk of dangerous encounters*	W tej okolicy spacer późnym wieczorem może być niebezpieczny.
6. Socialability	SO1 In this neighborhood, it is difficult to make friends with people*	W tej okolicy trudno się z kimś zaprzyjaźnić.
	SO2 In this neighborhood, it is easy to get to know people	W tej okolicy łatwo nawiązać znajomość z innymi ludźmi.
	SO3 In this neighborhood people tend to be isolated*	Mieszkańcy tej okolicy unikają innych ludzi.
7. Commercial Services	CS1 There are all kinds of stores in this neighborhood	W tej okolicy można znaleźć wszystkie rodzaje sklepów.
	CS2 Anything can be found in the neighborhood's stores	W okolicznych sklepach mogę znaleźć wszystko.
	CS3 This neighborhood is well served with stores	W tej okolicy jest wystarczająco dużo sklepów.

8. Recreational Services 1F	SP1 You can do various sports in this neighborhood	W tej okolicy można uprawiać różne sporty.
	SP2 The neighborhood is well equipped with sports grounds	Ta okolica jest dobrze wyposażona w obiekty sportowe
	SA1 Entertainment activities for residents are lacking in this neighborhood*	W tej okolicy brakuje rozrywek dla mieszkańców.
9. Transport Services	TS1 In this neighborhood, public transport provides good connections with the rest of the city	Komunikacja publiczna zapewnia dobre połączenie tej okolicy z resztą miasta.
	TS2 In this neighborhood, the frequency of public transport is adequate for residents' needs	Częstotliwość kursowania komunikacji publicznej w tej okolicy jest dopasowana do potrzeb mieszkańców.
	TS4 Bus stops are well distributed in this neighborhood	Przystanki komunikacji publicznej są dobrze rozmieszczone w tej okolicy.
10. Environmental Health	EH1 The air is clean in this neighborhood	W tej okolicy jest czyste powietrze.
	EH2 This neighborhood is generally not polluted	Ta okolica jest ogólnie czysta (mowa o wszelkich zanieczyszczeniach)
	EH3 This is a noiseless neighborhood	Ta okolica jest cicha.
11. Relaxing vs. Distressing	RD1 There is a calm atmosphere in this neighborhood	To jest spokojna okolica.
	RD2 This neighborhood is still livable if compared with the chaos of other areas	W porównaniu z innymi obszarami w tej okolicy mieszka się dobrze.
	RD3 Living in this neighborhood is quite distressing*	Życie w tej okolicy jest stresujące.
12. Stimulating vs. Boring	SB1 This neighborhood is full of activity	W tej okolicy wiele się dzieje.
	SB2 Every day there is something interesting in this neighborhood	W tej okolicy każdego dnia dzieje się coś ciekawego.
	SB3 Nothing happens in this neighborhood*	W tej okolicy brakuje aktywności (*tzn. nigdy „nic się nie dzieje"*).
13. Upkeep	UP1 Streets are regularly cleaned in this neighborhood	W tej okolicy ulice są regularnie sprzątane.
	UP2 Road signs are well kept in this neighborhood	Oznakowanie ulic w tej okolicy jest dobrze utrzymane (w dobrym stanie).
	UP4 There are too many holes in the neighborhood's streets*	Ulice w tej okolicy są dziurawe.
Neighbourhood Attachment	NA1 This neighborhood is part of me	Ta okolica jest częścią mnie.
	NA2 It would be very hard for me to leave this neighborhood	Byłoby mi trudno wyprowadzić się z tej okolicy.
	NA3 This is the ideal neighborhood for me	To idealna okolica dla mnie.

Table A2

Comparison between Polish and Iranian adaptation of APREQ & NA with the Italian original

Scales (basic dimensions)	Factors (indexes)	Poland		Iran		Italy	
		№	α	№	α	№	α
Architectural and Urban Planning Space	1. Building Aesthetics					3	.72
	2. Building Density					3	.85
	3. Building Volume					3	.83
Architectural and Urban Planning Space	1. Building Aesthetics & Density			3	.73		
	2. Building Volume			3	.80		
Architectural and Urban Planning Space 1F	(unidimensional)	4	.82				
Commercial Services	Commercial Services	3	.86	4	.87	4	.88
Green Areas	Green Areas	3	.77	4	.88	4	.87
Environmental Health	Environmental Health	3	.83	4	.89	4	.86
Organization of Accessibility and Roads	1. Internal Practicability	3	.66	2	.54*	3	.67
	2. External Connections	2	.71	3	.80	3	.82
Sociorelational Features	1. Security					3	.78
	2. Sociability					3	.73
	3. Discretion					3	.79
Sociorelational Features	(unidimensional)			7	.87		
Sociorelational Features	1. Security	3	.91				
	2. Sociability	3	.74				
Welfare Services	1. School services	–	–	3	.86	3	.79
	2. Social care services	–	–	3	.78	3	.62
Recreational Services	1. Sport services			3	.91	3	.82
	2. Social-cultural activities			2	.36*	3	.71
Recreational Services 1F	(unidimensional)	3	.74				
Pace of Life	1. Relaxing versus Distressing	3	.81	3	.84	3	.71
	2. Stimulating versus Boring	3	.76	3	.77	3	.67
Transport Services	Transport Services	3	.87	4	.75	4	.81
Upkeep	Upkeep	3	.65	3	.93	4	.70
Neighbourhood Attachment	Neighbourhood Attachment	4	.84	4	.93	4	.82
	Σ of items	43		58		66	

Note. α = Cronbach's α, № = number of items, * = Pearson correlations instead of α

– removed from the questionnaire due to low reliability

APPENDIX B

Table B1

*Average real estate prices per square meter of the apartment in investigated neighborhood (Wroclaw, Poland)**

	M	Mdn	HI	LO
Offer price	5.85 (1.39)	5.62 (1.34)	9.17 (2.18)	4.70 (1.12)
Actual transaction price	5.48 (1.30)	5.42 (1.29)	7.26 (1.73)	4.23 (1.01)
Average price	5.68 (1.35)	5.55 (1.32)	8.20 (1.95)	4.60 (1.10)

Note. 78 measured residential environments (areas within the 500 meter radius from the particular crossings nearest to the respondents' homes)

M = mean of prices' means; Mdn = median of prices' means

HI = highest of prices' means; LO = lowest of prices' means

All prices reported in thousands PLN. Approximate equivalents in thousands EUR reported in brackets.

* based on 2949 observations at www.homebroker.pl in December 2014

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Papers submitted to the *Polish Journal of Applied Psychology* are to be in English only with the exception of the abstract which should be prepared in both English and Polish. Send an e-mail copy of your submission to Marta Kochan-Wójcik PhD: m.kochan-wojcik@psychologia.uni.wroc.pl.

Maximum article length is to be 20 typed pages (including references, footnotes, figures and figures captions, and tables as well as their caption). References should not exceed six typed pages. Typescripts should be Times New Roman and standard font size 12, double-spaced throughout, with 1.5-4 cm margins left and right. The e-mailed copy should be 1800 ASCII characters per computer page.

Papers should include an abstract (maximum 115 words) in both English and Polish, along with key words, typed text, references, footnotes, figures and tables (on separate pages in that order). Indicate in a separate footnote the address to which requests for re-prints should be sent. Tables are to be treated as self-contained: that is, do not repeat in the text data presented in the tables. Keep the number of tables and figures to a minimum. [(Please use quotation marks – not commas – in presenting the data there) – this statement is not understood]. Indicate the placement of these tables in the text.

Folowing the APA standards we propose using ”Podstwowe standardy edytorskie naukowych tekstów psychologicznych w języku polskim na podstawie reguł APA [Basic editorial standards of scientific psychological publications in Polish language according to APA' rules] (www.liberilibri.pl).

For example: for referencing, the most commonly used types of citations are given here:

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Smith, P.B., & Bond, M.H. (1998). Social psychology across culture. Hemel Hemstead, UK: Prentice-Hall.

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Mączyński, J. (2001). The cultural impact on the leadership style of Polish managers. *Polish Journal of Applied Psychology*, (1), 107-132.

Chapter (or article) in a book:

Sashkin, M. (1998). The visionary leader. In J. A. Conger & R. A. Kamungo (Eds.).

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Titles of publications in languages other than English should be given in English in square brackets after the title of the original:
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Numbers one, two, three and through nine should be written out in longhand. Numbers 10, 11, 12, and through infinity should be written as digits.

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"Of" phrases, proper in Polish but unfortunately not a good carry-over into English style, should not be overused. In their place use gerunds, verbs, or prepositional phrases other than ones beginning with of.
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