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# Polish Journal of Applied Psychology

Editor: Alicja Kuczyńska

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## Social Support and Externalizing Symptoms in Children from Alcoholic Families

### Abstract:

This study examines whether social support perceived from different sources can significantly predict behavioral problems in children from alcoholic families. Participants are composed of 540 children in three age groups. We use the Child and Adolescent Social Support Scale and Youth Self Report/YSR 11-18. Our finding was that children of alcoholics have a greater risk of externalizing symptoms in comparison to children of non-alcoholics. Social support significantly predicts behaviour problems in the different life periods. In alcoholic families it was observed that mother, teacher and peer support negatively correlated with externalizing problems in the different developmental periods. Regression Analysis showed that the important predictors for externalizing such problems are low levels of support from teachers (in middle childhood and late adolescence), peers (in middle childhood) and mothers (in early adolescence). Our concluding remark is that social support perceived by children of alcoholics differs from the support perceived by children from control groups. This is important for prevention and therapy.

### Keywords:

children of alcoholics, behavior problems, social support sources

### Streszczenie:

Celem prezentowanych badań było oszacowanie, czy postrzegane przez dzieci z różnych źródeł wsparcie społeczne jest istotnym predyktorem problemów z zachowaniem u potomstwa alkoholików. W badaniach uczestniczyło 540 dzieci w trzech grupach wiekowych. Do pomiaru zmiennych wykorzystano skalę VII i VIII Kwestionariusza Diagnostycznego Achenbacha oraz Kwestionariusz Wsparcia Społecznego Dzieci i Młodzieży (CASSS). Uzyskane wyniki pokazały, że u dzieci alkoholików istnieje większe ryzyko pojawienia się objawów eksternalizacyjnych w porównaniu do dzieci niealkoholików.

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Okazało się także, że wsparcie społeczne spostrzegane od rodziny, kolegów i nauczycieli jest istotnym predyktorem problemów z zachowaniem u dzieci alkoholików na różnych etapach ich życia. Podsumowując można uznać, że uzyskane wyniki mają znaczenie dla konstruowania programów profilaktycznych i terapeutycznych, które powinny uwzględniać rolę różnych źródeł wsparcia na różnych etapach życia dzieci alkoholików.

**Słowa kluczowe:**

dzieci alkoholików, wsparcie społeczne, problemy z zachowaniem

## **Introduction**

Children of alcoholics have been focused on both by clinicians and scientists for years. This is due, on the one hand, to the high incidence of alcoholism in society and, on the other hand, to the specificity of how families with alcohol-related problems function. According to the Polish State Agency for the Prevention of Alcohol Related Problems, in Poland about 800 thousand people are addicted to alcohol, which provides an estimated number of children of alcoholics at about 1.5 million (PARPA, 2012). Epidemiological evidence shows that parental alcoholism is linked to greater mental and physical health problems in children. There is a wide range of behavior problems in both children and adolescents, ranging from depression and aggression to withdrawal and delinquency (Williams et al., 2009). The majority of problem-behavior researchers distinguish between internalized and externalized dysfunction (Achenbach, 1990; Garnefski et al., 2005). Externalized problems are signified by undercontrolled behaviors like defiance, impulsivity, disruptiveness, drug and alcohol use, antisocial features, and overactivity. Generally, this form of behavior is harmful or disruptive to others, and these manifestations can be described under the headings of aggression and delinquency (Patterson, 2002).

Parental alcoholism is a well-established risk factor for adult alcoholism, and recent data suggest that parental alcoholism also raises the risk for child-based behavioral problems (Chassin, Rogosch, Barrera, 1991; Hawkins, Catalano, Miller, 1992; Chassin et al., 1996; Eiden et al. 2007; Cierpiałkowska, Ziarko, 2006; Grzegorzewska, 2013). This effect can be seen as early as age two (Hussong et al., 2007) and may even extend into adulthood as disinhibited behavior (Sher et al., 1991). Studies of early behavioral outcomes in children aged between three to eight years from alcoholic parents report that the clinical group had significantly greater behavioral problems than children from non-alcoholic families. In a study by Cierpiałkowska, Ziarko (2009), the results indicated a significant correlation between paternal alcohol use disorders and externalizing symptoms in preschool-aged children. Studies of externalizing symptoms in older children and adolescents of alcohol-abusing families have tended to focus on aggressive conduct

disorders and delinquency. In a significant study by Obot and Anthony (2004), statistical analyses showed that children from alcoholic families had significantly higher delinquency and aggressive behavior scores compared to those of control-group children. In another study that examined trajectories of disruptive behavior problems among sons of alcoholics from preschool age to adolescence, it was found that paternal alcoholism was associated with the sons' elevated levels of disruptive behavior problems (Loukas, Zucker, Fitzgerald and Krull 2003).

Multiple mechanisms may account for the increased risk that the children of alcoholics have for externalizing symptoms, with possible explanations ranging from the genetic to the neighborhood levels of analysis. Susceptibility to alcohol abuse and other behavioral problems is affected by hereditary conditions within the population. However, the gene responsible for alcoholism has not yet been discovered, something which would prove to be a spectacular event alcoholism research. The complexity and diversity of the alcoholism phenotype in principle may preclude a single specific gene responsible for the disorder. However, progress in mapping the human genome is increasingly moving us towards understanding the relationship between the structure of chromosomes and the metabolism of alcohol in the body (Higuchi et al., 1992) which has a seemingly significant impact on drinking behavior. Notably, behavioral genetics studies indicate that genetic variance associated with risk for alcohol use disorders is largely non-specific, reflecting a generalized risk for disinhibited behavior (Kendler et al., 2003; King et al., 2009; Krueger et al., 2002; McGue et al., 2006). The second source of vulnerability is due to psychosocial factors; an increased amount of negative life stress plays a role in developing problematic behaviors in the children of alcoholics. From such a perspective, vulnerability may be viewed as specific alcoholic and non-alcoholic interactions of parents with their offspring (Jacob, Johnson, 1997). Alcohol is specifically related to a range of factors, such as: the unconscious identification and modeling, imitating parental drinking habits, growth expectations associated with alcohol consumption and other parent-child relationship aspects (Chassin et al, 1993; Zucker et al, 1995). These factors are particularly important in the development of addiction in the alcoholics' offspring. Risk processes implicated at the level of family interactions and environmental exposure (e.g., maternal sensitivity in early childhood, Eiden et al., 1999, or stress and poor monitoring, Chassin et al., 1996) as well as at the neighborhood level context (e.g., disorganization and availability of substances, see Buu et al., 2009) similarly convey risk for externalizing symptoms more generally.

A specific role in this process could be played by social support. Parental support is fundamental in the emotional atmosphere of the whole family (Barber, 2008). A growing body of research has highlighted the importance of identifying resilience factors against

conduct behavior. Research showed that low levels of family social support and low positive parental involvement are key risk factors that predict greater externalizing levels and conduct problems in adolescents (Loeber & Farrington, 2001). Conversely, parent psychopathology and lower family functions (roles, communication, and behavior control) are risk factors for mental health and developmental adaptation (Savi, 2008). And a current study (Panagioti et al., 2014) has shown that perceived social support moderates the impact of the number and severity of PTSD symptoms on suicidal behavior. For those who perceived themselves as having high social support levels, an increased number and severity of PTSD symptoms were less likely to lead to suicidal behavior. Social support has been shown to have positive benefits that affect parenting (Posada, Longoria, Cocker, & Lu, 2011), which, in turn, increase family resilience, as children are better able to adapt to stressful situations (Abaied & Rudolph, 2010). Social support can help lift the burden of psychological stressors relating to deployments and everyday living challenges surrounding a stressful family lifestyle.

Limited studies have shown that social support, or its perception, has the ability to mediate the stress related to a family with alcoholic parents (Fisher, Lyness, 2005). Researchers have frequently found that a family history of alcoholism is an important element in child and adolescent development about substance-use problems. Mediators of associations between parental substance abuse and adolescent behavior identify warmth and support as one parenting style dimension. When parents abuse substances, their ability to provide appropriate levels of support may be compromised, thereby blocking a mediating pathway to adolescent substance use and abuse (Barnes, Reifman, Farrell, & Dintcheff, 2000). For example, King and Chassin (2004) found that adolescents with lower levels of behavioral undercontrol, benefitted from parental support in buffering or moderating drug use in emerging adulthood. Among adolescents with higher levels of undercontrol, parental support disappeared as a buffer. Other studies confirmed that although parental support is an important main effect of adolescent alcohol use, it is also mediated by other factors such as religiosity, peer alcohol use, and school grades (Mason & Windle, 2001). Further, Wills and Cleary (1996) stated that parental support buffers adolescent substance use by increasing the effects of risk factors and reducing the effects of protective factors. Family support also moderates peer effects on adolescent substance use (Marshall & Chassin, 2000). In their study, Frauenglass et al. (1997) found that parent support protected against peer modeling on tobacco and marijuana use.

In alcoholic families, in which parents are very often emotionally inaccessible, close persons outside the family could model positive coping strategies and health behaviors. Good relationships with peers and teachers are more remote in the causal chain, and therefore require theoretical linkage to behavior. Scientific results indicated that

perceived social support positively impacts mental health; for example, children who cope effectively with alcoholism in their families often rely on support from a nonalcoholic parent, grandparent, teacher, or other caring adult. Support groups, faith communities, and trained professionals also are available to help (Cohen et al., 2000; Emshoff, & Price, 1999; Werner, Johnson, 2004). Environmental factors influence risks as well as protective factors. Stress, nurturance, physical abuse, observed family conflict, and other aspects of social interaction change over time. Social relationships differ in varying age groups. This hypothesis is supported by a significant body of evidence (Masten et al., 2009). For example, an infant's ability to display, as well as regulate, emotion reflects a process of social interaction between the infant and his or her caretakers (Zucker et al. 2000). An alcoholic parent and his wife, for example, are less sensitive and express a greater negative affect toward their children than do nonalcoholic fathers and non-codependent mothers, which, in turn, lowers infant responsivity to the parents (Eiden et al. 2004). Paternal depression, antisocial behavior, and aggression also are associated with lower parental sensitivity. By contrast, the most effective family environments reduce externalizing behavior in children and adolescents (Campbell et al. 2000). In adolescence increase the peer role, along with higher levels of parental support consistently are related to lower levels of adolescent alcohol (Windle et al., 2008). Peer influence plays a major role in adolescent risk behaviors. In fact, the number or percentage of alcohol using friends is the most potent predictor of an adolescent's alcohol use. When a peer group experiments with alcohol or escalates its use, the peer bond of some members is strengthened, whereas other members may choose to drop out of the group. In late adolescence and emerging adulthood, support from parents remains important (Settersten et al., 2005). The perceived support and sense of security parents can provide may make it easier for adolescents to develop and may help launch them toward adult life. Although leaving home means that young people spend less time with their parents, the quality of the relationship typically improves (Aseltine and Gore 1993). Still important remains peer influences. They may be especially important during periods of change and/or adaptation to new environments. Peers influence adolescents' behavioral disorders through several pathways: modeling and/or directly encouraging specific behaviors, seeking out and being selected by peers who have similar values and behaviors, and shifting contexts that alter perceived norms and may minimize the experience of adverse consequences (Brown et al., 2009).

Our purpose in this study is to examine the relationship between the social support perceived from different sources (family, friends, peers and teacher) and the behavioral problems by children of alcoholics, and by their cohorts who are not affected by parental alcoholism (non-COAs).

## Materials and Methods

Our study data was collected by using tools to measure the risk variable (family with alcohol problems), the dependent variables of externalizing problems, and the independent variable of social support, negative life events and activity.

*Risk assessment:* The Children of Alcoholics Screening Test (CAST) is a 30-item screening instrument developed to identify children who are either living with or have lived with alcoholic parents. Screening Test (Jones, 1983) and clinical interviews with parents based on the DSM IV criteria were also used. CAST had acceptably high internal consistency (.88 and .90) and test-retest reliabilities (.88).

*Social support:* The child and adolescent social support scale (CASSS) by Demaray, Malecki, Elliot (2000). CASSS is a 60-item self-report measure that assesses social support in youth. Malecki and colleagues distinguished between four types of social support: Emotional, informational, appraisal, and instrumental. Studies purport that CASSS has good reliability and validity (Malecki & Demaray, 2002). However, as with SSSC, the CASSS was validated in a primarily Caucasian, middle to high class sample and is limited in scope as it only examines social support from the following five sources: Parent, teacher, classmate, close friend, and school (all school personnel outside of teachers).

*Externalizing problems:* The Child Behavior Checklist (CBCL) by Achenbach (1991). Child externalizing symptoms were assessed by mother/teacher/adolescent reports. We used 35 items from the Child Behavior Checklist; aggression and delinquent behavior subscales from *Teachers Report Form* (TRF) for children in middle childhood; and Youth Self-Report (YSR) for the older participants in its Polish adaptation by Wolańczyk (2002). The response scale ranged from 0–2 on a 3-point Likert scale (0=*not at all true*; 1=*somewhat true*; 2= *very true*). The scale have been shown to have good reliability and validity (Wolańczyk, 2002).

## Procedure

In our research a classified person was associated with fulfilled specific criteria relevant from the perspective of the model test. The group concerning children of alcoholics included: 1. an alcoholic father; 2. a full family; 3. parents who did not report any other (non-dependence) symptoms of psychopathology. Control group qualifications consisted of the following criteria: 1. upbringing within a complete family; 2. no psychiatric disorders, including parental alcoholism. The control group was selected from associating students.

**Recruitment:** Parent alcoholism (abuse/dependence) was screened first by CAST and followed up with a more intensive assessment involving a trained clinician using

DSM IV criteria. On the basis of information collected by both instruments, a diagnosis was made about a father’s alcohol abuse/dependence. The participants’ parents could not be in treatment (longer than two weeks) for alcoholism at the time of recruitment. At the same time a diagnosis was made concerning the mother’s absence of alcohol abuse/dependence. The children were invited to participate in the study through schools, clinics for alcoholics, community centers, and the internet.

## Results

Our study aimed to establish a correlation between social support and externalizing problems of alcoholic children at various developmental levels. Results are presented in the following three stages: (a) descriptive statistics of measured variables, (b) correlation analysis and (c) hierarchical multiple regression analyses. Firstly, the results of this study present the descriptive statistics for the variables.

### Preliminary analysis

Prior to verifying the research questions posed in our study, we checked the potential effect of gender on each dependent and independent variables level. The variables were analyzed using the Student’s *t*-test. Gender turned out to have no differentiating effect on any independent or dependent variable ( $0.296 < \alpha < 0.311$ ); therefore data for both males and females were analyzed jointly.

In the next step we analyzed intergroup differences. Means and standard deviations are presented in Table 1.

**Table 1.** The descriptive statistic of variables in compared groups.

	1. Children of alcoholics- middle childhood	2. Control group – middle childhood	3. Children of alcoholics- early adolescents	4. Control group – early adolescents	5. Children of alcoholics- late adolescents	6. Control group – late adolescents	Comparison between groups (eta <sup>2</sup> )
<b>Externalizing symptoms</b>	21,07 (±20,93)	12,22 (±18)	20,97 (±19,09)	15,19 (±16,69)	19,95 (±15,86)	13,74 (±17,22)	F(1,538)=9,212** (0,02)
<b>Support mother</b>	49,022 (±15,95)	57,891 (±14,5)	47,545 (±13,85)	48,978 (±15,02)	49,157 (±15,82)	47,692 (±13,37)	F(1,538)=5,36* (0,01)
<b>Support father</b>	29,922 (±17)	50,609 (±18,33)	35,352 (±17,5)	41,5 (±15,8)	28,596. (±15,96)	39,066. (±15,76)	F(1,538)=74,32*** (0,12)

<b>Support teacher</b>	42,39 (±15,84)	46,74 (±16,01)	38,54 (±12,9)	41,06 (±13,46)	37,64 (±15,01)	36,13 (±12,33)	F(1,538)=13,23*** (0,05)
<b>Support peers</b>	47,11 (±14,99)	50,8 (±18,87)	47,76 (±11,83)	52,63 (±13,53)	51,68 (±12,87)	51,22 (±10,78)	F(1,538)=4,96 n.i.
<b>Support friend</b>	49,1 (±16,86)	51,63 (±21,9)	56,92 (±11,66)	56,65 (±17,1)	57,83 (±13,27)	56,64 (±12,36)	F(1,538)=10,44*** (0,04)
<b>Activity</b>	5,12 (±3,95)	6,87 (±4,44)	5,4 (±3,35)	7,47 (±3,87)	4,8 (±2,76)	6,08 (±3,18)	F(1,538)=29,15***
<b>Negative life events - single</b>	5,1 (±3,34)	3,41 (±2,66)	7,98 (±5,18)	4,9 (±2,89)	6,21 (±3,8)	5,97 (±3,8)	F(1,538)=27,42*** (0,5)

### The results of Linear Correlation

We examined how potential risk factors predicted externalizing problems in middle and early childhood and in late adolescence by means of linear correlation analyses for alcoholic children and control groups (see Table 2).

**Table 2.** The results of linear correlation.

Externalizing symptoms		Children of alcoholics			Control groups		
		Middle childhood	Early adolescence	Late adolescence	Middle childhood	Early adolescence	Late adolescence
Support	Mother	-.434**	-.351**		-.529**	-.324**	-.361**
	Father			-.358**	-.491**		-.320**
	Teacher	-.604**	-.451**		-.474**	-.336**	-.463**
	Peers		-.447	-.512**	-.257*	-.476**	-.348**
	Friend	-.208*	-.408**		-.279**	-.398**	-.273*

The results, given in Table 2, shows the correlation between perceived social support and externalizing symptoms in children from alcoholic families and in control groups.

In alcoholic families we observed that the mother's support was negatively correlated with externalizing problems in middle childhood and early adolescence. The father's support, on the other hand, correlated negatively only in late adolescence. Negative support correlations were observed from teachers of children with alcoholic parents in middle childhood and early adolescence. Additionally, support from peers was negatively correlated with externalizing symptoms in COAS in early and late adolescence, and with support from friends in middle childhood and early adolescence.



More correlations were observed in control groups. Externalizing problems are negatively correlated with support from the mother, peers, teachers and friends in all measured periods. Only support from the father was negatively correlated in middle childhood and late adolescence.

**The results of Regression Analysis**

Stepwise Regression Analysis examined whether the social support that children and adolescents of alcoholic fathers received from their families, peers and teachers was significant in predicting behavior problems. The findings are given in Table 3.

**Table 3.** The result of stepwise regression analysis in children of alcoholics.

Externalizing symptoms			$\beta$	$R^2$
Middle childhood	Support	Teacher	-0.188	0.123
		Peers	0.137	0.019
	R <sup>2</sup> =0.142 F (2)= 15.75 p<0.001			
Early adolescence	Support	Mother	-0.211	0.017
		R <sup>2</sup> =0.017 F(2)=12.97 p<0.001		
Late adolescence	Support	Teacher	-0.241	0.022
R <sup>2</sup> =0.022 F(2)=11.448 p<0.001				

In Table 3, the social support the children received from their families, peers and teachers predicts the behavior problems at a significant level. Accordingly, in middle childhood externalizing problems are predicted negatively by teacher support ( $\beta$ =-0.188;  $R^2$ =0.123) and positively by peers ( $\beta$ =0.137;  $R^2$ =0.019). Accordingly, 14.2 % of the behavior problems in total are explained by social support, while the externalizing problems in early adolescence significantly predicted the low level of externalizing problems in children by family support (from the mother) ( $\beta$ =-0.211;  $R^2$ =0.017). Accordingly, 1.7% of adolescents’ externalizing problems are explained by mother support and negative life experiences.

We observed that externalizing symptoms in late adolescents are significantly predicted only in negatively by teacher support ( $\beta$ =-0.241;  $R^2$ =0.022). Accordingly, 2.2 % of behavior problems are explained by this variable.

In the next step we used Stepwise Regression Analysis to examine whether social support for children from control groups was a significant predictor of behavior problems. The findings are given in Table 4.

**Table 4.** The result of stepwise regression analysis in control groups.

Externalizing symptoms			$\beta$	$R^2$
Middle childhood	Support	Teacher	-0.277	0.021
		Peers	0.225	0.017
	$R^2=0.038$ F (2)= 13.61 p<0.001			
Early adolescence	Support	Father	0.239	0.018
		Teacher	-0.173	0.107
		Friends	-0.264	0.132
	$R^2=0.167$ F(2)= 11.25 p<0.001			
Late adolescence	Support	Teacher	-0.266	0.098
		Friends	-0.197	0.136
$R^2=0.234$ F(2)=7.98 p<0.001				

In Table 4, social support the children received mainly from their peers and teachers predicts the behavior problems at the significant level. Accordingly, in middle childhood externalizing problems are predicted negatively by teacher support ( $\beta=-0.277$ ;  $R^2=0.021$ ) and positively by peers ( $\beta=0.225$ ;  $R^2=0.017$ ). In total 3.8% of the behavior problems are explained by social support.

The externalizing problems in early adolescence in the control group are predicted significantly and positively by the support received from fathers ( $\beta=0.239$ ;  $R^2=0.018$ ); while support from teacher and peers, on the other hand, predict significantly the low level of externalizing problems in children: from teachers ( $\beta=-0.173$ ;  $R^2=0.107$ ) and peers ( $\beta=-0.264$ ;  $R^2=0.132$ ). In total 16.7 % of the externalizing symptoms is explained by social support in this group. It was observed that the behavior problems among late adolescents of the group control are significantly but negatively predicted by teacher support ( $\beta=-0.266$ ;  $R^2=0.022$ ) and peers ( $\beta=-0.197$ ;  $R^2=0.136$ ). Accordingly, 23.4 % of the behavior problems are explained by this variables.

## Discussion

In our study, we tested whether children of alcoholic fathers are more vulnerable to externalizing symptoms and which factors may predict this vulnerability. The strengths of our approach included using integrative data analysis in three age groups. Overall, we found that a greater risk of externalizing symptoms exists in children of alcoholics than non-COAs, especially in middle childhood and early adolescents. In addition, we recognized the role of perceived social support in children of alcoholics.

The research results suggest that behavior problems in the children do not exhibit differences according to gender. This is surprising, because we may typically expect that

mental problems, aggressiveness, destructive behavior and externalized behavior problems in boys are higher than those exhibited in girls (Cakar, 2013). According to previous studies where contradictory findings exist, a higher proportion of aggressive and anti-social behaviors was observed in boys (Bongers, et al., 2003; Stormount, 2002). Furthermore, such studies indicated that behavior problems differ according to sex, that this can be clearly observed in middle childhood, and this differentiation is especially explicitly manifested in the boys' aggressive behavior (Kazdin, 2007). Our results support the hypothesis that in late childhood and adolescence, differences between the sexes become blurred; as in Ellis and Zaratany's studies (2007), where it was found that boys tend to engage more frequently in deviant behavior than girls, but that girls manifest more relational aggression than boys in late childhood and early adolescence.

One of our findings was that children of alcoholics exhibit a greater risk in externalizing symptoms when compared to children of non-alcoholics. Research on the effects of parental psychopathology on externalizing symptoms in children has shown similar findings. The Michigan Longitudinal Studies (MLS) have shown that vulnerable children of alcoholics, as defined by high problem behavior levels during preschool, showed significantly more aggression and delinquency in adolescence in comparison to their peers from non-alcoholic families (Zucker, Wong, Puttler, Fitzgerald, 2003). Other research identified parental alcoholism and antisocial behavior as important predictors of externalizing symptoms (Chassin, Rogosh, Barrera, 1991). Furthermore, recent studies have examined the relationships between problem behaviors and parental psychopathology. For example, Hussong et al. (1998) showed a relationship between parental alcoholism and other problems (like antisocial disorders) and heavy initial alcohol use and an increased level of use in adolescence. Similar results were presented by Chassin and College (1999) who investigated the idea that parental alcoholism significantly predicts a greater risk of alcohol and drug use by their children. Also, this relationship was partially mediated by externalizing problems so that behavior problems (like externalizing symptoms or earlier conduct problems) predicted a greater likelihood that alcohol-related problems would occur in children of alcoholics. Other data support this hypothesis about externalizing pathways to alcohol and drug abuse (Sher, 1991; Zucker, 1994). Our data suggested that there exists a possible interactive mechanism between being the child of an alcoholic and having behavior problems.

Our study analyzed the relationship between the behavior problems of children of alcoholics and perceived social support, the findings of which were discussed according to our study's aim and with a view to the available literature. In children from alcoholic families, perceived social support may decrease those childhood and adolescent behavior problems which can evolve into substance abuse issues during late adolescence and

early adulthood. The research shows that these children are characterized by a specific system of perceived social support. The significance of the social support role is different in different age levels. According to previous research supporting this concept, perceived social family support is negatively related to behavior problems in adolescents, but in alcoholic families the father's role is not important. This is an important suggestion, because it confirms the hypothesis that drinking parents are less sensitive, express greater negative affect toward their children, and aren't able to respond appropriately to a child's needs. Only the mother plays an important role in adaptive development, whose support seems to have a decreasing effect on externalizing behaviors. These results have been supported by a previous study (Grzegorzewska, 2013), a study which is particularly important, since this correlation exists only in alcoholic families. This means that during adolescence -- a specific period in development -- a non-alcoholic parent may be a particularly positive resource. It is typical for an adolescent to be estranged from their families during adolescence. This is an adaptive mechanism that promotes separation from the natal family (Steinberg 1989). During this phase the ability to think abstractly increases, and adolescents become more proficient at arguing and more critical of their parents. These changes may alter the parent-child relationship. In alcoholics families stressful events, undercontrolled behaviors of a drinking parent, marital conflicts and violence within the family change the natural process. The presented results suggest that nonnormative development refers to children in alcoholic families. It means that the nonalcoholic parent can help adolescents to adapt to normative and nonnormative changes.

There is a significant relationship, negatively, between teacher support and behavior problems in middle childhood and late adolescence. As noted by Çakar (2013), the teacher plays an important protective role for the child to make himself/herself aware, to gather gender role identity and to develop competencies. This finding may suggest that in children from high-risk families (for example, among children of parents with mental disorders) that teachers may act as additional caregivers and be a model for the child; thus supplementing the role of his/her mother or father. However, such developmentally supportive positive relationships between teacher and child seem much less documented (O'Connor & McCartney, 2006); externalizing symptoms have been associated rather with conflictual, overly dependent and distant relationships with teachers, both concurrently and prospectively (Henricsson & Rydell, 2004). Taking into account that children in middle childhood spend their first years in school intensively, teachers should be important for forming a child's self-perception; and teachers' positive evaluations of children's competence and behavior would seem to be important for positive self-perception (Çakar, 2013). Also, during late adolescence the quality of the teacher-student relationship, and sometimes that of the coach-pupil, shapes the susceptibility or resistance of

young people in relation to the disorder. It means that for children of alcoholics their role is very important and specific.

The results of our study indicate that during early adolescence, the role and structure of the support network changes. Adolescents ages 12–15 experience dramatic changes in their biological, cognitive, emotional, and social development as well as in their physical and social environments. These include the physiological and psychological changes associated with puberty; further development of the brain; changes in family, peer, and romantic relationships; and exposure to new societal and cultural influences. During this period, many adolescents also begin to criticize adults, especially their parents. Relationships between parents-adolescents still remain the important protecting factor for young people and their behavior problems. Studies by Offer and others (1990) suggested that a low level of perceived support from parents may contribute to externalizing problems in young people. It is important that despite peer support roles in this group, the mother's support still can buffer problem behavior. Nevertheless in adolescence, peer relationships and friendships become increasingly salient and play a more significant role. Evidence indicates that peer relationships become an important resource for social support. A peer group is expected to influence a child's emotional competence because of that group's similarity regarding similar socio-cognitive and moral levels; likewise, such groups share the same role in the eyes of teachers and create peer cultures with their own norms and values (Denham, 200; Çakar, 2013). According to Barry and Wentzel (2006), peers can have both positive and negative influences. For example, good relationships with deviant peers and friends are related to delinquent behaviour (Farrington, 2002) or substance use (Scholte et al., 2001). Peer support has also been shown to promote psychological well-being despite adversity. In a previous study, lack of perceived support from friends could predict problem behavior (e.g., drug and alcohol use, delinquent acts) in a sample of 221 African American adolescents, ranging from school grades 9 to 12 (McCreary et al., 1996). Supportive friend-based relationships have been linked to adjustment correlates and outcomes such as interpersonal competence and self-worth (Rubin et al., 2006). In children from alcoholic families, positive relationships with friends and colleagues appear to compensate for the emotional problems of insufficient relationships with their parents. Therefore, when our results are examined, it can be understood as two dimensions of peer support in adolescents. Firstly, in high-risk families (where there is a greater possibility that behavior problems are connected with the low social support perceived by the family) children tend towards receiving more support from their peers. On the other hand, the fact that alcoholic families do not provide sufficient support should mean that any such peer support is perceived as being greater. This will be consistent with the concept of peer selection and peer socialization (Windle, Davies, 1999). Our result suggests

that it is true only in middle childhood. Specifically, among adolescents an important support role is played by the mother (early adolescence) and teacher (in late adolescence).

Consequently, while children exhibit different characteristics in every period of their development, they need a healthy social environment and sufficient psychological and social support. When parents are emotionally unavailable, social support like trust, safety and accepting relationships with people outside the family could be protective factors. During this process, perceived social support and the quality of the relationships they establish with their family in particular -- and with other adults, peers and teachers -- plays a key role in both their successfully being able to fulfill the developmental tasks of the period they are in and their being able to reach the next period healthily. Similarly, in studies regarding behavior problem prevention, it is emphasized that preventive approaches are mostly effective in children; thus, family intervention and school-based measures are important.

In conclusion, it is worth noting the need to include children in prevention programs specific to children in families with alcohol problems, as well as taking into account the child's developmental stage at that time. These programs should be based on knowledge derived from relationships between social support and externalizing problems. It is also important to note that potential risk and protective factors should be specific for the age of the child in question.

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## Personal resources and daily life fatigue in caregivers of persons with paraplegia

### Abstract:

Taking care of a paraplegic may contribute to the caregiver's fatigue. Sixty family caregivers participated in our study, out of which 30 provided care for paraplegics in hospital, and 30 for paraplegics at home. The Orientation to Life Questionnaire (SOC-29) was used to measure individual sense of coherence, The Life Orientation Test – Revised for dispositional optimism, The Polish Resiliency Assessment Scale for resiliency, and The Daily Life Fatigue Questionnaire for daily life fatigue. In order to collect data about caregivers an individual examination was applied. People with higher personal resource levels such as sense of coherence, optimism and resiliency are characterized by less severe daily life fatigue.

### Keywords:

personal resources, daily life fatigue, caregiver, paraplegia

### Streszczenie:

Sprawowanie opieki nad osobą z paraplegią może przyczyniać się do zmęczenia jej opiekuna. Badaniem objęto 60 opiekunów osób z paraplegią, w tym 30 opiekunów osób przebywających w szpitalu i 30 opiekunów osób przebywających w domu. Do pomiaru indywidualnego poczucia koherencji zastosowano Kwestionariusz Orientacji Życiowej SOC-29, dyspozycyjnego optymizmu – Test Orientacji Życiowej LOT-R, prężności – Skalę Pomiaru Prężności SPP-25 i nasilenia zmęczenia życiem

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codziennym Kwestionariusz Zmęczenia Życiem Codziennym KZZC. W celu zebrania danych o opiekunach zastosowano ankietę osobową. Osoby z wyższym poziomem zasobów osobistych takich jak: poczucie koherencji, optymizm i prężność charakteryzują się mniejszym nasileniem zmęczenia życiem codziennym.

**Słowa kluczowe:**

zasoby osobiste, zmęczenie życiem codziennym, opiekun, paraplegia

## **Introduction**

A growing number of car accidents, the most frequent cause of spinal cord injuries, appears to be one of the major problems we are facing today. As a result, those who sustain a spinal cord injury (SCI) suffer from many neurological complications, with paralysis to the lower extremities, so-called paraplegia, being one of the most common injuries associated with SCI, and very often become dependent on other people.

Caring for people with paraplegia can lead to increased daily life fatigue in caregivers. Research findings show that socio-demographic factors and personal resources that a person uses in coping with day-to-day problems are among key predictors of daily life fatigue (Sęk & Pasikowski, 2001; Hobfoll, 2006). Personal resources include, among others, a sense of coherence, dispositional optimism, and resiliency. Therefore, to investigate the relationship between personal resources and daily life fatigue in a group of caregivers appears to be warranted.

### **Daily life fatigue characteristics**

Since so many people in our modern society are becoming overwhelmingly tired, fatigue has come to be viewed as one of the most important sociological problems in the 21<sup>st</sup> century. Researchers have provided different perspectives and theoretical frameworks for fatigue (Jason et al., 2005; Carruthers et al., 2003). Chronic fatigue syndrome has been the most frequently described affliction in the scientific literature (Niloofar, & Buchwald, 2003). It is estimated that 5% of the world's population suffer from chronic fatigue syndrome. Major CFS symptoms include persistent fatigue lasting at least six months, sleep disorders, malaise, reluctance to undertake any activity and limited daily activity, plus a feeling of fatigue not relieved by rest or sleep. Other symptoms that characterize CFS may include dispersed pain and reduced intellectual ability (Schwid et al., 2002).

A Polish researcher, Urbańska, has suggested a new perspective on fatigue, with a view to more closely analyzing the psychological consequences involved in modern social life participation. She introduced the term daily life fatigue as a psychological phenomenon defined as an individual's subjective overall fatigue. Daily life fatigue

manifests itself in reluctance to undertake any daily activity (no matter what its type) and results from incongruity in life's day-to-day demands and a person's psycho-social abilities (Urbańska, 2010).

Daily life fatigue can occur due to exposure to a difficult situation experienced by an individual, viewed, in this case, as traumatic and exceeding the a system's capacity to adapt. An example can be a family member's spinal cord injury, a condition debilitating not only for the person suffering from paraplegia, but also for close relatives.

### **Caring for a chronically ill person**

A complete thoracic spinal cord injury results in totally losing sensory and motor functions of lower extremities, known as paraplegia (Kirshblum et al., 2011). Paraplegics preserve nerve sensation and functions in all their upper extremities. A T1 level paraplegia, so-called high paraplegia, is characterized by an impaired balance in a sitting position and frequent breathing problems. People with thoracic cord injury (T2-T5) have a better torso control, which enables better stability and preserves sensory functions of diaphragm muscles. Persons with a T6-T12 injury can use torso muscles for breathing and therefore are able to stand with the help of braces (Hagner, Kasprzak, & Sosnowski, 2002; Kirshblum et al., 2011). Individuals with paraplegia preserve nerve sensation and functions in all their upper extremities. Long rehabilitation and regaining functional independence after an injury along with unfavorable prognosis for completely recovering motor and sensory functions, make paraplegia a chronic condition.

Providing care to a chronically ill person can lead to a situation in which the caregiver is overburdened with work in trying to meet the dependent person's needs, and the balance is lost between the tasks undertaken and the caregiver's capacity to fulfill those obligations (Donelan et al., 2002). Consequently, these overlapping tasks may in the long run contribute to daily life fatigue (Urbańska, 2010). Differences regarding the capacity to adapt to an ensuing situation depend on an individual's worldview. Preserving minimum hope and optimism when faced with seemingly insurmountable life circumstances, preconditions successful adaptation and coping. According to Folkman and Moskowitz (2000), evaluating circumstances positively, focusing on constructive aspects and constructive fantasizing along with a strong sense of control over a difficult situation can enhance coping with stress, while negative orientation towards solving problems may lead to health impairments in caregivers (Elliott, Shewchuk, & Richards, 2001).

### **Personal resources and their significance in coping with daily life demands**

Factors contributing to better coping with difficult events can on the one hand facilitate control over life's adversity, counteract any negative health and psychological consequences resulting from it, and, on the other hand, increase the person's resistance to experiencing such events as harmful or negative. These factors are most often referred to

as personal resources. Anything can become a personal resource (object, energy, information), as long as it is used by an individual to satisfy their immediate need or realize their long-term objectives (Hobfoll, 2006).

Recently, there has been a tendency to view an individual's beliefs and expectations as particularly important. Many research studies have shown that such constructs as sense of coherence, optimism in life, and resiliency are crucial (Hart, Wilson, & Hittner, 2006).

Sense of coherence, according to the definition put forward by Antonovsky (1987), is a person's global dispositional orientation. It expresses their pervasive, enduring, though dynamic sense of confidence that (1) the stimuli coming from their internal and external environments are structured, predictable and explicable; (2) the resources are available to them to meet the demands posed by these stimuli; and (3) these demands are challenges, worthy of investment and engagement. There are three basic elements that constitute sense of coherence, namely: comprehensibility, manageability, and meaningfulness (Antonovsky, 1987). Since sense of coherence is a relatively stable and enduring disposition to perceive life as comprehensible, meaningful and manageable, it correlates with somatic and physical health and a higher resistance to stress and acceptance of unavoidable difficulty (Lundman, & Norberg, 1993; Basińska, & Andruszkiewicz, 2008). Therefore, it may be assumed that this positive influence also refers to adaptation in caring for paraplegics.

Dispositional optimism, viewed as a relatively stable personality trait, functions as a moderating mechanism, influencing the choice of goals and goal-oriented actions. It expresses positive expectations towards future events, and a conviction and belief that negative outcomes will be rather scarce or will not happen (Carver, & Scheier 1990, 1998; Scheier, & Carver 1992). Dispositional optimism helps to preserve persistence in action even when confronted with failure or a difficult and very slow change in life (Carver, & Scheier 1990, 1998; Scheier, & Carver 1992).

Resiliency consists in a set of personality characteristics and skills that help an individual to cope with difficult situations that are also significantly stressful. The ability to break away from negative experiences and evoke positive emotions is crucial here (Smith, Tooley, Christopher, & Kay, 2010).

Two research objectives were formulated based on the literature in the field. Firstly, we attempted to define the differences in the daily life fatigue levels in paraplegic caregivers in a rehabilitation ward in hospital and those caregivers who cared for paraplegics at home. Secondly, we examined whether there was any interaction between the personal resources, coherence and resiliency, and the daily life fatigue levels in these paraplegic caregivers. Hypothetically, we assumed that:



1. due to hospital-stay related stress, the daily life fatigue level is higher among caregivers when paraplegics remain in hospitals than when caregivers care for paraplegics at home, and that
2. paraplegic caregivers with high personal resource levels, such as sense of coherence, optimism and resiliency, experience less daily life fatigue compared to paraplegic caregivers with lower personal resource levels.

## Materials and Methods

### Participants

To test these hypotheses 60 study participants were examined, including 25 women and five men who cared for paraplegics in a rehabilitation ward in hospital and 25 women and five men who cared for paraplegics at home.

The average caregiver's age in hospital (N=30) was 45.07 years  $\pm$  12.35, the youngest person being 21 while the oldest was 64. In the sample of caregivers at home (N=30) the average age was 50.30  $\pm$  15.74, the youngest aged 24 and the oldest 78.

In terms of education, the majority of caregivers had higher education while those who declared vocational secondary education were in the minority.

### Measures

The following measures were used in the research study:

1. The Orientation to Life Questionnaire SOC-29 by Antonovsky, is used to define sense of coherence (SOC) in adults. The Cronbach coefficient alpha value for the Polish version was .87 (Sęk, & Pasikowski, 2001).
2. The Polish Resiliency Assessment Scale (SPP-25) is used to examine the resiliency levels in adults. The Cronbach's alpha reliability coefficient was .89 (Juczyński, & Ogińska-Bulik, 2008a).
3. The Life Orientation Test – Revised (LOT-R) is used to measure dispositional optimism in adults. Reliability of the Polish version is close to the original test and is .87 Cronbach's alpha (Juczyński, 2001).
4. The Daily Life Fatigue Questionnaire consists of 24 statements grouped in eight subscales: physical fatigue scale (PFS), mental fatigue scale (MFS), and social fatigue scale (SFS). Each scale consists of eight statements. Study participants answer *Yes* if the statement applies to them or *No* if it does not. Total score for the daily life fatigues is the sum of all three subscale scores and ranges within 0-24 points. A high score means a high level of daily life fatigue, while a low score indicates a low level. In its original form, the Cronbach alpha value was calculated as .89 for the entire scale while in the present study the Cronbach alpha value is .88.

The psychometric properties indicate that the Daily Life Fatigue Questionnaire is a reliable instrument, and individual scale scores correlate highly with the total score (Urbańska, 2010).

5. A personal questionnaire was used in order to collect socio-demographic data.

### **Statistical Analyses**

In order to answer the research question posed in our study, firstly, basic statistics were calculated for the entire sampled caregivers, preserving the distinction between care settings: hospital and home. Next, statistically significant differences in the average severity of daily life fatigue among the caregivers were computed. Interaction between daily life fatigue and personal resources as well as caregiving settings was also examined. The analyses were conducted with Statistica 10.0.

### **Results**

In both groups of caregivers (N=60), the majority declared low or average daily life fatigue severity. Concerning sense of coherence among caregivers in hospital, the majority showed low and average sense of coherence levels. Concerning optimism levels in the entire sample, the majority of subjects displayed optimism, and the fewest number showed pessimism. At the resiliency level, the majority showed high resiliency, the fewest number showed low.

#### **A comparative analysis of caregivers**

Since The Daily Fatigue Questionnaire variable lacked normal distribution, the non-parametric U Mann-Whitney testing procedure was used to estimate statistically important differences in the daily fatigue levels among paraplegic caregivers staying in hospital and those staying at home ( $z=-0.185$ ;  $p=0.853$ ). The answer to the first research question was negative; the place where care is provided was not a variable differentiating daily life fatigue severity.

#### **The analysis of daily life fatigue severity interacting with paraplegic caregivers' personal resources**

In order to verify the research hypothesis about interaction between daily life fatigue levels of personal resources, namely sense of coherence, optimism and resiliency, a two-factor analysis of variance was implemented with the first degree interaction, which showed a significant relationship between coherence, optimism, and resiliency levels, and the severity of a daily life fatigue. Significant interaction was found between coherence level and place where care was provided (Table 1).

**Table 1.** The significance of interaction between daily life fatigue, personal resources and care settings.

Resources	PR		PI		PRS	
	F	p	F	P	F	P
SOC	14.739	< <b>0.0001</b>	3.791	<b>0.029</b>	0.126	0.724
Optimism	13.649	< <b>0.0001</b>	0.117	0.890	0.113	0.738
Resiliency	7.626	<b>0.001</b>	1.051	0.357	0.099	0.754

PR= The probability of a relationship between a given personal resource included in the variance analysis model and the level of daily life fatigue

PI = The probability of an interaction of a given personal resource included in the model and caregiving settings

PRS = The probability of a relationship between caregiving settings (the second variable included in the variance analysis model) and daily life fatigue

F= F (variance analysis) score

The Duncan test (Table 2) uncovered a statistically significant difference in daily fatigue severity in individual levels of every factor. The study showed that individuals with low sense of coherence levels are significantly different from individuals with average and high levels, and persons with average levels differ significantly from persons with high sense of coherence. Therefore we observed a general tendency towards a decrease in daily life fatigue in paraplegic caregivers who demonstrated an increased level of coherence (Table 2).

**Table 2.** A statistically significant difference between the level of daily life fatigue and the examined personal resource levels across the entire caregiver group ( $p \leq 0.01$ ).

Level of SOC			Level of optimism			Level of resiliency		
	M	SD		M	SD		M	SD
Low	<b>11.00</b>	5.55	Low	<b>12.58</b>	5.03	Low	<b>11.50</b>	5.29
Mean	<b>6.57</b>	4.43	Mean	<b>7.59</b>	4.95	Mean	<b>6.63</b>	5.00
High	<b>3.85</b>	3.91	High	<b>4.23</b>	3.81	High	<b>5.22</b>	4.60

It can also be concluded from the test that there is a tendency towards decreased levels of daily life fatigue with an increase in optimism. The study showed that individuals disposed toward pessimism differ significantly from individuals with an average level of optimism, and persons with an average level of optimism differ significantly from optimists (Table 2).

The test also shows that a relation emerges between decreased daily life fatigue severity and increased resiliency levels in caregivers. Therefore it can be observed that caregivers with a low level of resiliency are significantly different from caregivers with

average resiliency levels and caregivers with high levels (Table 2). Thus these findings allowed us to positively answer the second research question.

## **Discussion**

The analyses of factors that determine the severity of daily life fatigue showed that these personal resources are important: sense of coherence, optimism, and resiliency of paraplegic caregivers. This means that high personal resource levels lessen daily life fatigue levels. Such a result is completely understandable when viewed by the conservation of resources theory (Hobfoll, 2006). According to this theory, a person with more personal resources is able to better cope with adversity in life and continuously strives to manage their resources so that they can apply them to survive, ensure their well-being, avoid illness and maintain social interaction on an optimal level.

The above relationship confirms the salutogenic theory propounded by Antonovsky, according to which sense of coherence is one of the key personal resource in coping with stress and difficult events in life (Antonovsky, 1995). A high level of optimism enables individuals to look into the future optimistically and without fear or anxiety (Seligman, 2005). Consequently, they are more likely to positively assess their chance for successful performance. This in turn increases their motivation so necessary in lessening the consequences of paraplegia (Juczyński, & Ogińska-Bulik, 2008b). Resiliency, on the other hand, facilitates the flexible adaptation to life's demands in the form of increased social competences, fulfilled developmental tasks and without any emotional or behavioral disorders (Smith et al., 2010).

According to previous research on caregivers of persons with spinal cord injuries, elevated levels of physical stress, emotional stress, burnout, fatigue, anger and resentment, and depression have been reported (Boschen, Tonack, & Gargaro, 2005; Lucke, Coccia, Goode, & Lucke, 2004; Elliott, Shewchuk, & Richards, 2001). Since daily life fatigue is a relatively new concept in the literature, and no research has been conducted as yet into daily life fatigue in paraplegic caregivers, the findings in our study will refer to similar research samples. Until now research has shown similarly that a high level daily life fatigue and a low level resiliency allow one to predict that mothers of children with ADHD will develop chronic fatigue (Basińska, Kielnik, & Grzankowska, 2014). A statistically significant negative relationship has been found between daily life fatigue and satisfaction with life in an entire group of parents and mothers who have children with cerebral palsy. Such a correlation has not been identified in a group of fathers under study (Basińska, & Wędzińska, 2014). The literature provides substantial evidence that attending to the chronically ill seriously burdens family caregivers and may be understood in

terms of costs and negative consequences in providing care by family caregivers (Grad, & Sainsbury, 1966), or tension that has built up in trying to cope with persistent problems associated with caregiving demands (Pearlin, & Schooler, 1978). The experienced burden has a negative influence on caregivers' health, finances and social life, causing mental deterioration and tiredness.

Research on the burden experienced by family caregivers of the chronically ill has found that among its most significant predictors are: sense of coherence, health status, time spent on caregiving, emotional status and social support (Pearlin, & Schooler, 1978). The experienced burden has a negative influence on caregivers' health, finances and social life, causing mental deterioration and tiredness.

Research on the burden experienced by family caregivers of the chronically ill has found that its most significant predictors are: sense of coherence, health status, time spent on caregiving, emotional status and social support (Grabowska-Fudala, Jaracz, & Górna, 2009).

Research findings obtained in the present study proved to be comparable with the findings related to factors determining the burden level in family caregivers of chronically ill persons.

Our findings show that factors conditioning daily life fatigue levels of paraplegic caregivers are diverse. The importance of sense of coherence, optimism and resiliency in explaining the caregivers' functioning, enables them to understand and explain the essence of their need to live their own lives despite the close one's adversity. High level personal resources contribute to reevaluating their own experiences, having a positive view on life, and consequently accepting and learning to live with their condition; lower fatigue intensity caregivers in spite of all adversities learn to appreciate and notice life's positive aspects. These findings further suggest that personal resources buffer caregivers against difficult events in their own lives.

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## Influence of memory on experienced pain during Virtual Reality analgesia

### Abstract:

Virtual Reality (VR) technology can be applied during pain treatment, acting as an effective distractor from pain stimuli. In our paper we investigate how memory influences experienced intensity of thermal pain stimuli. An experiment (within subject design) was conducted on 35 students from various Wrocław universities. A cold pressor test was used for pain stimulation. Participants were immersed in customized virtual environments, created for this particular study. The environments differed at the level of memory engagement while playing a game. Pain measures were determined by the length of time participants kept their hands in cold water (pain tolerance), and their pain rating intensity was measured on the VAS scale (pain intensity). Participants were asked to put their hand in a container with cold water and keep it there until the pain became difficult to bear.

In both VR conditions participants kept their hands in the cold water significantly longer than in a non-VR (control) condition. Results of pain intensity measures were inconclusive. We did not find any significant differences in effectiveness in the virtual environments that were used.

### Keywords:

virtual reality, pain, attention distraction, cold pressor test, video games, memory

### Streszczenie:

Rzeczywistość wirtualna może być zastosowana jako efektywne narzędzie odwracania uwagi od bodźców bólowych. W przeprowadzonym badaniu testowano wpływ zaangażowania pamięci na poziom odczuwania bólu. Termiczna stymulacja zimnem została zastosowana jako bodziec bólowy. W eksperymencie wzięło udział 35 studentów Uniwersytetu Wrocławskiego. Osoby badane dwukrotnie (model grup zależnych) zostały zanurzone w wirtualne środowiska, które różniły się poziomem wykorzystywania procesów pamięciowych. Przeprowadzono również pomiar kontrolny, czyli miarę tolerancji bólu osób badanych bez zanurzenia w wirtualne środowisko. Poziom odczuwanego bólu mierzono na dwa sposoby: czas zanurzenia ręki w zimnej wodzie oraz ocena intensywności bólu na

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skali VAS. W obu warunkach eksperymentalnych osoby badane trzymały rękę w zimnej wodzie istotnie dłużej niż podczas pomiaru kontrolnego. Pomędzy zastosowanymi środowiskami wirtualnymi nie wystąpiły jednak różnice w poziomie mierzonych wskaźników bólu, czyli poziom zaangażowania procesów pamięciowych nie wpłynął na efekt analgetyczny.

**Słowa kluczowe:**

wirtualna rzeczywistość, ból, dystrakcja uwagi, stymulacja termiczna, gry komputerowe, procesy pamięciowe

## **Introduction**

Virtual Reality technology, and its possible applications, in the domain of psychology is a widely researched and growing field of study. Several published studies indicate that Virtual Reality technology can be effectively used in alleviating pain. (Czub & Piskorz, 2012; for review also see: Botella *et al.*, 2008; Wiederhold & Wiederhold, 2007; Malloy & Milling, 2010). While being immersed in VR, patients actively participate in a three-dimensional computer generated environment, which responds consistently to their actions. Usually, immersion is achieved through the use of head mounted displays (HMD), which allow for a more engaging experience. Effectiveness of VR in alleviating pain was tested both in clinical populations and in laboratory studies, where experimentally induced pain stimuli were used. Gershon *et al.* (2004) demonstrated the possible use of Virtual Reality to reduce pain and stress associated with therapy in cancer patients. Hoffman and colleagues (2001) have shown it can be an effective tool during dental treatments. VR can also be used effectively in the treatment of pain in children (Das *et al.*, 2005).

It is widely assumed that VR pain alleviating effects act through attentional mechanisms by dragging patient's attention away from painful stimuli. (Gold *et al.*, 2007; Botella *et al.*, 2008). Active engagement in VR activity, and the medium's immersive nature, involves the patient's attention more intensively (compared with other methods) – and thus can be a significantly more effective tool in pain alleviation.

Systematically comparing the effectiveness of VR distraction with other distractions (like watching a movie) has shown VR's greater effectiveness (Van Twillert *et al.*, 2007).

Known factors that influence the analgesic effect are: the subjective strengths in a virtual world, graphics and sound quality, and the degree of possible interactions with the virtual world (Hoffman *et al.*, 2004).

Active participation in the virtual environment was found more effective in alleviating pain, than passive observation in someone else's game play. (Dahlquist *et al.*, 2007). Point of view taken within the game (first person vs. third person view) did not influence

the alleviating effect (Dahlquist *et al.*, 2010). However, only a few published studies investigate how the virtual environment relates to the pain experience.

The majority of research using VR as a distractor is based on the assumption that the main factors decreasing pain are the following: the sense of “being there”, and cognitive engagement and motor activity. Virtual environments used in previous studies stimulated mainly visual-motor coordination. To the best of our knowledge, no research has verified whether memory while being immersed in VE improves pain distraction.

However, results of several studies not related to VR analgesia suggest a relation between memory level processes and intensity of experienced pain (Buhle & Wager, 2010; Yamasaki *et al.*, 2000). Memory engaging tasks were effective in dragging participant’s attention away from painful stimuli.

On the other hand, according to the load theory of attention, increasing the cognitive load should result in diminished ability to ignore distractors (Lavie, 2010). We interpret the VR game as a distraction from pain, but it’s also possible to assume a different perspective – and perceive the pain as a distraction from playing the game. Load theory of attention has strong predictions regarding distractors under a cognitive load, but the theory has not yet been tested using painful stimuli as distractors.

In the following experiment we attempt to verify the influence of memory engagement on experienced pain. We test the hypothesis that memory engagement changes the intensity of experienced pain during VR immersion.

## **Methods**

### **Participants**

Thirty-five volunteers (students from various Wroclaw universities) participated in the study. This group included 19 females (age: average 22.21; SD 3.03; min 19, max 33) and 16 males (age: average 22.56; SD 2.94; min 19; max 29). The experimental procedure was approved by the local ethics committee. Participants gave their informed consent before the experimental session began.

### **Apparatus**

*Virtual reality equipment.* The participants engaged in the virtual environment via a virtual reality headset (HMD) - E-magin Z-800.

HMD goggles had SVGA resolution – 800x600 pixels per display (1.44 megapixels), view angle - 40 deg diagonal FOV (which equals seeing a 2.7 m diagonal movie screen from 3.7 m distance). The display set weighed 227g. Participants heard stereo sound from HMD’s audio output.

The participants used Microsoft Kinect controller. They navigated the avatar-sphere in three dimensions with their dominant hand. Hand movements in 3D space were translated to avatar sphere movements in virtual 3D space.

*Video game.* The participants played games designed by us. During the game they navigated a 3D sphere-avatar in a space filled with coloured spheres. In the first VR environment (memory VR condition) the participants' task was to memorize group elements that made the same sounds upon hitting them with an avatar sphere. The game's rules were similar to the ones in the popular "Memory" game. In the VR game used in the current study the player navigated an avatar-sphere and pointed to multiple white spheres which then produced different sounds. At the same time the player had to avoid three red spheres in order not to lose points.

In the second VR environment (no-memory VR condition) the gamer's task was to hit white spheres with an avatar-sphere. Additionally, red spheres were interfering with completing the task. Upon creating the two environments the researchers' aim was to make these two as similar as possible, with the only difference being to employ memory processes in one of them.

*The pain stimuli apparatus.* The study used thermal (cold) stimulation. The apparatus consisted of a container (25x35cm) filled with cold water (temperature 4.5 – 5.5°C). The container had two chambers connected to each other: one of them was filled with ice in order to maintain the proper water temperature and in the other one the participants were immersing their hands. A water circulator was mounted within the container in order to maintain constant temperature in both chambers. The water temperature was monitored with an electronic thermometer. Similar equipment had been used in previously published studies (Dahlquist, 2007; Forys, Dahlquist, 2007).

## **Measures**

*Visual Analogue Scale (VAS)* – measure of pain intensity. The scale is a horizontal continuous line, 100mm in length. Participants marked the strength of experienced pain, expressed on the scale in millimeters, where 0 stands for slight pain, and 100 for extreme pain. Each participant marked the scale three times: once without VR - to assess the pain threshold, and twice after exposure to the pain stimulus during immersion in high and low interaction VE.

*Pain tolerance* – the period of time during which participants kept their hand in cold water.

*Igroup Presence Questionnaire (IPQ).* A scale created by Schubert, Friedmann & Regenbrecht for measuring sense of presence experienced in the virtual environment. The scale consists of four subscales: Spatial presence – the sense of being present in VE; Involvement – the engagement level in VE; Realism – how real VE seemed; General –

an additional item measuring the general “sense of being there”. IPQ’s reliability (Cronbach’s Alpha) is between 0.63 and 0.78 (Schubert, 2003). There is no Polish IPQ adaptation, we therefore translated the items.

### **Design and Procedure**

A within-subject design was used in the experiment. Participants experienced two experimental conditions (memory task *vs.* high interaction). In addition, the participants’ pain threshold established during non-VR constituted the baseline measurement.

The experiment was conducted in a room belonging to Wroclaw University Institute of Psychology. Participants were told that the experiment purpose was to investigate experiences of one’s own body in virtual reality. Participants were also informed that they could withdraw from participation at any moment and without any particular reason. The equipment and procedure was then presented to them. They immersed their hands in cold water for a few seconds in order to feel its temperature. They were also given thorough instructions on how to play the game in each virtual environment, and practiced playing in order to learn how to navigate the game and how to use the interface. The participants, while wearing the HMD headset and using hand movements recorded by Kinect, practised hitting white spheres with an avatar-sphere. The training phase ended after they were able to hit five white spheres in a row.

After training, participants were asked to fill in a short personal data survey, and upon its completion were exposed to three experimental conditions. The presentation of conditions was counterbalanced (Latin square).

During all experimental conditions participants wore HMD headsets and their heads were covered with a black scarf to better isolate them from peripheral stimuli. They were instructed to put their hand in the container with cold water, and keep it there until the pain became difficult to bear (they were also asked to verbally communicate the moment when they removed their hand from the water). They were requested not to withstand overwhelming or unbearable pain. The experiment was terminated after four minutes if the participant did not remove their hand earlier.

After one minute playing the game, the participants’ non-dominant hand was immersed in the cold water while they continued playing. After finishing the trial (that is after participants removed their hand from the cold water) they assessed their experienced pain on the VAS scale, and filled in the *Igroup Presence Questionnaire*.

Both VR procedures were identical.

### **Non VR condition**

During the non-VR condition, participants were seated in such a way that enabled them to put their dominant hand into the cold water container. Identical to VR conditions, participants wore an HMD headset and had their heads covered with a black scarf.

However, no images were displayed, and participants saw a blank screen. After one minute their dominant hand was immersed in the cold water. Similarly to VR conditions, they were instructed to inform us verbally and take their hand out of the container when the pain became difficult to bear. The trial was stopped after four minutes if the participant had not removed the hand earlier. Upon ending the trial, participants assessed their level of experienced pain on the VAS scale.

Between each experimental condition participants were given a 15 minute break during which they could warm their hands. They were provided with a container filled with room temperature water, and could put their hands in it.

### **Statistics**

Non-parametric statistics were used for analysis (i.e. Friedman's ANOVA, Spearman's Rank Correlation Coefficient, Median Test, Wilcoxon's Signed Rank Test, and Mann-Whitney U-test). Non-parametric statistics were dictated by a lack of normal distribution (data distribution was bimodal) as well as homogeneous the results. Using the formula for non-parametric test of significance for dependent ( $r = Z/\sqrt{N}$ , where N is the number of observations) and independent samples ( $r = Z/\sqrt{N}$ , where N is the number of participants), the authors calculated the effect sizes. According to Cohen's assumptions (1988, 1992) the effect was considered small when  $r = 0.10$ ; medium when  $r = 0.25$ ; and big when  $r = 0.50$ .

## **Results**

### **Preliminary analyses**

The first step in statistical analysis focused on verifying whether the sequence of conditions influenced tolerance to pain.

The analysis tested pain tolerance and pain intensity as a function of succeeding measurements. The succession of measures influenced neither tolerance to pain results (median test, Chi square = 0.71;  $df = 2$ ;  $p = 0.70$ ) nor pain intensity ratings (median test, Chi square = 0.94;  $df = 2$ ;  $p = 0.62$ ).

### **Main analyses**

*Pain tolerance.* The results confirmed that VR is effective as a distractor. Its main effect: major differences were found in tolerance to pain between the three examined conditions (Friedman's ANOVA ( $df = 2$ ) = 14.13;  $p < 0.001$ ). Further analyses carried out with Wilcoxon's Signed Rank Test revealed that both no-memory VR ( $T = 57.0$ ;  $Z = 3.61$ ,  $p < 0.001$ , effect size:  $r = 0.47$ ), and memory VR ( $T = 51.5$ ;  $Z = 3.72$ ;  $p < 0.001$ , effect size:  $r = 0.48$ ) increased the participants' pain tolerance in comparison with the non-VR condition. In both cases participants managed to keep their hands in cold water for a substantially longer period of time (see Table 1).

**Table 1.** Descriptive statistics of pain tolerance measures in non VR and VR conditions.

	Time of immersion of hand in the cold water – pain tolerance			
	Average of ranks	Sum of ranks	M	SD
Non VR	1.52	48.50	63.50	74.00
No-memory VR	2.13	68.00	112.63	95.81
Memory VR	2.36	75.50	115.13	90.19

The next step in analysis examined the influence of immersion in virtual reality on pain intensity ratings. The main effect between the three examined environments did not occur (Friedman’s ANOVA ( $df = 2$ ) = 2.90;  $p = 0.24$ ) (see Table 2).

With the sample size we used ( $N=35$ ), we had 80% chance for detecting the effect size Cohen  $d = 0.44$ , assuming that the effect exists. Therefore, our sample size was sufficient to detect medium effect sizes.

**Table 2.** Descriptive statistics of pain intensity measures in non VR and VR conditions.

	VAS scale – pain intensity			
	Average of ranks	Sum of ranks	M	SD
Non VR	2.23	71.50	6.21	1.77
No-memory VR	1.83	58.50	5.46	1.87
Memory VR	1.94	62.00	5.63	2.05

*Pain vs. virtual reality type.* The results did not confirm our initial assumptions: the type of virtual environment was not a differentiating factor with respect to the participants’ tolerance to pain. Participants kept their hands in cold water for a similar time period both in no-memory VR and in memory VR (Wilcoxon’s Signed Rank test;  $T = 124$ ;  $Z = 0.74$ ,  $p = 0.46$ ).

Participants who kept their hand in cold water for four min (upper limit) were four in no-VR condition, nine in no-memory VR and ten in memory VR condition. No data was excluded from the analysis.

A similar outcome was obtained from a comparison with subjectively assessed pain intensity (VAS scale). In both VR conditions participants reported similar pain intensity (Wilcoxon’s Signed Rank test;  $T = 206$ ;  $Z = 0.54$ ,  $p = 0.59$ ).

*Other results.* Finally, correlations between the following variables were examined: pain tolerance and pain intensity measures, and all dimensions of immersion in virtual reality from IPQ. Reliability (Cronbach’s Alpha) results in our study were 0.82.

Statistically significant differences were discovered while correlating the memory VR results with IPQ scales: spatial presence positively correlated with pain intensity indicators ( $r = 0.37$ ,  $p < 0.05$ ); involvement positively correlated with virtual games experiment ( $r = 0.35$ ,  $p < 0.05$ ), even though this correlation was not a major one. The IPQ questionnaire results were compared with the database (Schubert *et al.*, Viaud-Delmon, website), and confirmed their similarity to those achieved by other researchers.

*Pain sensitive and pain tolerant.* Participants were divided into pain sensitive and pain tolerant groups: those who achieved results below 100 seconds in the non-VR were classified as pain sensitive, whereas those with results higher than 100 seconds were classified as pain tolerant. Participant results classified as pain sensitive were clustered around 30 seconds mean; there were no scores in the 60-100 seconds range, and all participants who scored above 100 seconds were classified as pain tolerant. The first group comprised 28 participants, and the second one only seven.

First it was examined whether statistical differences in pain tolerance and pain intensity measures existed between the pain sensitive and pain tolerant groups. This was performed in order to test if the pain tolerant/pain sensitive division is valid across all conditions. It revealed that both groups differ significantly in terms of pain tolerance measures. Pain sensitive group members could bear to keep their hands in cold water for a significantly shorter time than the pain tolerant group members (no-memory VR:  $U = 25$ ,  $Z = -2.94$ ,  $p < 0.01$ , effect size:  $r = -0.50$ ; memory VR:  $U = 43.5$ ,  $Z = -2.07$ ,  $p < 0.01$ , effect size:  $r = -0.36$ ). The comparison of pain intensity measures, however, did not disclose any major differences. In both experiment conditions, both groups assessed the level of experienced pain similarly (no- memory VR:  $U = 84$ ,  $Z = -0.43$ ,  $p = 0.67$ ; memory VR:  $U = 81.5$ ,  $Z = -0.40$ ,  $p = 0.69$ ) (see Table3).

**Table 3.** Descriptive statistics of pain tolerance and pain intensity measures in the pain sensitive and pain tolerant groups.

	pain sensitive group	pain tolerant group
	Sum of ranks	Sum of ranks
Time - No-memory VR	403*	192*
VAS - No-memory VR	462	133
Time - Memory VR	394.5**	166.5**
VAS - Memory VR	432.5	128.5

\* $p < 0.01$ ; \*\* $p < 0.05$



Subsequently, both groups were compared regarding the IPQ results. It was determined that the groups substantially differed only in one measure and only in one experiment condition – the one requiring high interaction: participants belonging to the pain tolerant group showed a higher general immersion factor score than those belonging to the pain sensitive group (high interaction:  $U = 40$ ,  $Z = -2.37$ ,  $p < 0.05$ , effect size:  $r = -0.40$ ). Other measures did not differentiate those two groups.

## **Discussion**

Previously published research on cognitive tasks influencing pain experience suggests that the involvement of memory processes can decrease experienced pain intensity (Buhle & Wager, 2010; Yamasaki *et al.*, 2000). Contrary to the above, our results suggest that increased memory load could lead to greater difficulty in ignoring distractors (Lavie, 2010). However, results presented in this paper show that interacting memory with the virtual environment does not increase or decrease the analgesic effect of VR distraction. Lacking an increase in the analgesic effect could be explained by the fact that distraction effects may not add up when different cognitive and perceptual processes are involved. On the other hand, lack of a decrease in the analgesic effect could indicate that noxious stimuli are not processed in the same way as other kinds of distractors. Load theory has not yet been tested in this context; so its predictions may not extend to processing of noxious distractors. It is also possible that the task we used was not demanding enough, and thus did not engage memory functions sufficiently. Bantick and colleagues (2001) have shown that the degree of cognitive challenge may be related to the pain experience.

The results of pain intensity measures were not in accordance with the results of pain tolerance measures. Though great differences emerged in pain tolerance measures between non-VR and VR conditions, differences in pain intensity measures were not discovered. In most studies (*e.g.* Muhlberger *et al.*, 2007; Dahlquist *et al.*, 2010) concerning the relation between VR distraction and pain, researchers used only one method to measure pain: pain intensity, or pain tolerance. However, our results suggest that these two measures represent two different variables and thus are not directly comparable.

It was hypothesized that the sense of presence in VE is related to an analgesic effect (Hofmann 2004). However, results presented by Dahlquist and colleagues (2010) does not support this hypothesis. Similarly, our results do not confirm a direct relation between virtual reality and tolerance to pain. In accordance with Dahlquist and colleagues (2010), we suggest that engaged cognitive and motor processes, as well as a high paced game, are more significant in distraction from pain than the “sense of being there.”

The participants that qualified based on non-VR results as pain tolerant displayed a definitely higher pain tolerance in both VR conditions than participants qualified as pain sensitive. Our result supports a stable division for pain sensitive and pain tolerant people in the cold-pressor task paradigm.

## Limitations

Our paper may suggest that engaging memory processes is not related to an analgesic effect. However, we did not directly measure memory performance, and more studies are needed to fully confirm the lack of relationship between memory and VR analgesia. In addition to memory, other potential differentiating factors, like personality variables, motor engagement and different interfaces still remain to be examined with regard to their influence on pain experience.

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## Use of Internet and its Addictive risk among Polish students – comparative analysis over a seven-year period

### **Abstract:**

Our study reveals the psychosocial changes occurring in Polish students on the Internet in the last seven years. The study comprised two stages (2005 and 2012). The analyses indicated that while the Internet's intense use has lowered, the factors facilitating Internet risk addiction have become more pronounced. Such risk factors are: the manner of using the Internet (entertainment, pornography); relationships in the cyber community; and time spent online (the more time spent, the greater the risk of addiction). The lower the self-esteem the higher the risk of addiction. However, the percentage of people with Internet addiction symptoms has remained static.

### **Keywords:**

internet addiction, use of Internet, satisfaction with life, polish students, prospective studies

### **Streszczenie:**

W artykule zostaną zrelacjonowane badania, które dają obraz zmian w funkcjonowaniu psychospołecznym studentów polskich w Internecie na przestrzeni ostatnich siedmiu lat (2005 roku oraz 2012). Analizy wskazują, że zmieniła się intensywność użytkowania Sieci, zwiększyła się rola czynników ryzyka uzależnienia od Internetu takich jak: sposób korzystania z Sieci (rozrywka, pornografia); więzi w cyberspołeczeństwie, czas spędzany w Internecie (im więcej czasu tym większa podatność na uzależnienie). Nie zmienił się natomiast odsetek osób z objawami uzależnienia od Internetu na przestrzeni siedmiu lat.

### **Słowa kluczowe:**

uzależnienie od Internetu, użytkowanie Internetu, satysfakcja z życia, polscy studenci, badania propektywne

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## Introduction

Our article analyses behaviours related to Internet usage by Polish students and compare these behaviours over a seven-year period (between 2005 and 2012). The first analogue Internet connection in Poland was established on 26 September 1990 (Malik, 2012). In 1994, the Polish government launched its own website. In that same year the Internet became available to all Polish citizens. The first Internet portal developed by Poles – Wirtualna Polska (“*Virtual Poland*”) – was established in 1995. In April 1996, Telekomunikacja Polska offered anonymous access to the Internet via modems. In the 1990s the Internet was not widely available to the public (Rafa, 1995) and despite the Internet’s huge development in the last 15 years, the quality of Internet connections in Poland and Slovakia remains very low, which limits access to this medium (Poznański P., 2010). A study conducted in 2012 by Centrum Badań Opinii Społecznej (*Public Opinion Research Center*) on a sample of 1,017 randomly chosen Poles revealed that 56% of Polish adults regularly (i.e. at least once a week) use the Internet. This figure is identical to one revealed in a similar study the year before. However, it represents a huge growth compared to 2002 when only 17% of adult Poles claimed to use the Internet regularly, and to 2006 when this figure amounted to 37%. It is expected that the number of Internet users will now grow more gradually and less spectacularly than over the last 10 years. The strongest predictors of Internet usage are age and educational background. However, the youngest generations acquire digital competencies regardless of other aspects conditioning their place in the social structure. Therefore, most of them are active Internet users. The older the subjects, the lower the number of Internet users. Almost all adult subjects with higher education use the Internet, as well as over two-thirds of respondents with secondary education. The lowest number of Internet users can be found among those subjects with only a basic education (CBOS, 2012).

Among studies concerning the influence of the Internet on human behaviour, one can identify three broad areas (Augustynek, 2001) which are closely related to the Internet’s multi-functionality phenomenon:

1. Psychological determinants of Internet usage.
2. Psychological bonding aspects between the individual and the cyber community.
3. Descriptions of the predispositions towards Internet addiction (dysfunctional Internet use).

## Psychological determinants in using the Internet

Internet services offered to users differ in technical requirements, number of users, and mostly in the style of communication and the goal towards which they are used. Studies

which analyse actions performed on the Internet arrive at consistent conclusions. People usually browse websites, play online, communicate with each other, look for cybersex, shop online, and download software, films and music files (Augustynek, 2010).

Internet usage style depends on several factors. A detailed analysis of this phenomenon was presented by J. Czapiński and T. Panek (2007). They found that the Internet is used more often by men than by women, and is most popular among people below 25, with at least secondary education, living in big cities, and professionally active or still learning/studying.

Psychological bonding aspects between the individual and the cyber community

The Internet has changed everyday life and blurred boundaries between the local and the global. Even more importantly, it has created new communication and interaction channels (Giddens, 2004).

J. Suler (1998) analysed the differences between virtual and real communication, which led to selecting nine differentiating factors:

- limited physical stimuli – no physical contact;
- fluidity of identity and anonymity – the ability to hide some aspects of one's identity and to create a new identity for the sake of online relations;
- equal statuses – everyone is allowed to speak their mind on the Internet, regardless of social status;
- crossing spatial boundaries – contact is possible regardless of the distance separating the interlocutors;
- stretching and concentrating time – virtual space creates a unique time space characterized by the stretching of passing time;
- availability of many contacts – no limitations regarding the number of interlocutors along with a simultaneous possibility for selecting them according to one's preferences;
- permanent recording – entire Internet conversations may be archived and saved as files;
- different states of consciousness – when sitting at a computer one may feel the control reality and may experience different states of consciousness;
- rapid conclusion of conversation – users may leave the conversation any time.

R. Kubey i M. Csikszentmihalyi (2002) said that: "For growing numbers of people, the life they lead online may often seem more important, more immediate and more intense than the life they lead face-to-face. Maintaining control over one's media habits is more of a challenge today than it has ever been" (p. 70).

## Internet addiction

The debate over Internet addiction has been taking place since the mid-1990s. The official discussion regarding this subject was started unintentionally by I. Goldberg (1996), who formulated “as a joke” a set of diagnostic criteria for an imaginary, in his opinion, phenomenon called *Internet Addiction Disorder* (IAD). Paradoxically, what began as a joke soon became the current diagnostic canon. IAD syndrome is a complex and diverse phenomenon which “is characterised by an internal compulsion to stay on the Internet.” The author says: “Pathological Computer/Internet Use Disorder is the suggested name for a disorder in which people overuse computers to the extent that such a use causes them distress. Such a use has a detrimental effect on their physical, psychological, interpersonal, marital, economic, or social functioning. A parallel unofficial disorder would be ‘workaholism’ and the parallel official DSM-IV diagnosis would be “Pathological Gambling (DSM-IV).”

Symptoms that indicate Internet addiction include:

- spending more and more time at the computer at the cost of other hobbies;
- neglecting family or professional (or school) duties because of the computer;
- family conflicts arising due to the computer;
- lying to significant others regarding the amount of time spent at the computer;
- trying to control the amount of time spent at the computer;
- spending more and more money for computer hardware, software, accessories as well as computer books and magazines;
- reacting with irritation or even aggression, when it is hard or impossible to use a computer (Woronowicz, 2001).

IAD can be found as a disorder in Diagnostic and Statistical Manual V (DSM-V) as well in (Holden, 2010). IAD as a behavioral addiction still needs further research for effective diagnostic criteria.

Internet addiction and internet use are described in the literature as Problematic Use of Internet (PIU) (Dell’Osso, Altamura, Allen, Marazziti, Hollander, 2006). Young Internet Addiction Test (IAT), which was a base for measurement in this study, is qualified as one of the methods for PIU as well (Moreno, Jelenchick, Cox, Young, Christakis, 2011). Some authors underline the compulsive nature of Internet use (Greenfield, 1999; Meerkerk, Eijnden, Franken, Garretsen, 2010) by comparing Compulsive Internet Use (CIU) to Internet use and behavior. Such diversified approaches can be found to the nature of Internet Addiction and internet use as: *Excessive Internet Use* (Hansen, 2002), *Internet Addiction Syndrome* (IAS) (Jakubik, Popławska, 2003) or *netaholism, netaddiction* (Woronowicz, 2001).

The factors facilitating IAD may be inherent in the Internet itself or in the addicted person. In order to be able to exhaustively answer the question why the Internet



has addictive potential, we have to return to the issue of its many-sidedness and individually examine its various functions (the most important are its informative, communicative, economic, entertaining and technical functions). Because of these functions Internet addiction is not a uniform phenomenon. Each function constitutes a separate addictive factor; therefore at least five types of Internet addiction can be described: compulsive searching for information, downloading files; addiction to online interpersonal contact; compulsive buying, bidding in online auctions; compulsive virtual games playing, taking part in quizzes, online gambling, and so on including an addiction to cybersex and pornography as a unique type of “online addiction”; and addiction to computers themselves and the technical side of the Internet (e.g. compulsive hacking).

Several studies indicate that cyberspace is not addictive per se. However, its multifunctionality may be its addiction. This is because the Internet allows us to perform various activities and to comprehensively satisfy many human needs, such as: “information hunger”, communication with other people, acceptance, and belonging to a group, freedom from restrictive behaviour norms (Suler, 1996). K. Young (1998) discovered in her studies, and other authors confirm it (Auoil, Siedlaczek, 2011; Casale, Fioravanti, 2011; Kormas, Critselis, Janikian, Kafetzis, Tsitsika, 2011; Kittinger, Correia, Irons, 2012; Fioravanti, Dettore, Casale, 2012; Durkee, Kaess, Carli, Parzer et al., 2012; Smahel, Brown, Blinka, 2012), that addicted persons are much more likely than other people to make use of services allowing interaction with other Internet users (chat rooms, online games, discussion groups, electronic mail). Therefore, interactivity seems to be one of the most crucial Internet features. The aforementioned study results suggest that higher susceptibility to Internet addiction is characteristic of persons looking online for sexual, erotic or pornographic materials (Young, 1998; Casale, Fioravanti, 2011; Kormas, Critselis, Janikian et al., 2011).

Among subjective factors that facilitate Internet addiction are – apart from a sense of internal control – coexistence of other addictions (Ko, Yen, Yen et al., 2012), mood disorder (Tsitsikai, Critselis, Louizou, et al., 2011; Christakis, Moreno, Jelenchick et al., 2011; Muller, Ammerschlanger, Freisleder et al., 2012; Ko, Yen, Yen et al., 2012), loneliness and social anxiety (Fioravanti, Dettore, Casale, 2012; Yen, en, Chen et al., 2012; Ko, Yen, Yen et al. 2012), self-destructive behaviours (Tsitsikai, Critselis, Louizou et al., 2011), positive conditioning experiences (Aouil, Siedlaczek, 2011) and a subjective happiness (Cao, Sun, Wan et al., 2011; Akin, 2012).

The studies also indicate that addicted user’s personality traits are very important. The analyses suggest that low self-esteem is also significant (Stiegr, Burger, 2010; Wartberg, Sack, Petersen, Thomasius, 2011). A personality dimension from Costa, McCrae’s Five Factor Model that is most strongly correlated with dysfunctional Internet use levels is extraversion/introversion, which is manifested in the sphere of interpersonal contacts in

a manner completely different from the real world. Kraut (see also: Aouil, Siedlaczek 2011) proved that the extraversion level is a kind of “bridge” – indicating the relation between one’s emotions and the way they use the Internet. People with a higher extraversion score derived more satisfaction from their online presence and demonstrated a lower sense of loneliness and higher self-esteem. On the contrary, introverts felt more lonely on the Internet, and their self-esteem was lowered (Aouil, Siedlaczek, 2011). Emotionality of Internet users in the context of susceptibility to IAD is represented by neuroticism (Andreassen, Torsheim, Brunborg, Pallesen, 2012).

Research indicates that approximately 6%-14% of Internet users met IAD criteria (Greenfield, 1996; DeAngelis, 2000). Polish research in this area is rare and based on non representative samples that are too small or on surveys conducted merely online (Kaliszewska, 2010). The number of Polish Internet users who meet IAD criteria is 12% (Poprawa, 2007).

## **Materials and methods**

Because of the Internet’s growing significance in all everyday aspects and because the Internet developed dynamically in Poland after 2000, the following aims for this study were selected:

1. Diagnosing style changes in Internet use by Polish students over a seven-year time period.
2. Diagnosing symptoms of dysfunctional Internet use (IAD symptoms).
3. Establishing a relationship between IAD symptoms and self-esteem and satisfaction with life.

Our studies were conducted in two stages. The first was carried out in 2005 and included 220 Polish students taking full-time courses in economics (Tab. 1).

In this part of the study an original tool was used – the Internet Perception Scale (Dembińska, 2005). The questions suggested by Young (1996) were used to diagnose IAD and were included in the scale. The study’s second stage was conducted in 2012, and included a similar group of Polish students (232) taking courses in economics, again analysed using the Internet Perception Scale. During the second stage two additional tools were used: the Self-Esteem Scale SES (Łaguna, Lachowicz- Tabaczek, Dzwonkowska, 2007) and the Satisfaction with Life Scale SWLS (Juczyński, 2001).

The study was conducted referring to the following inclusion factor:

- First year economics majors(the main aim was not to include students majoring in Informatics);
- Full-time students.

**Table 1.** Characteristics of the subject group.

No.	Year of conducting the study	N	Women [%]	Men [%]	Mean age [years]
1.	2005	220	62.3	37.7	20.23
2.	2012	232	61.6	38.4	20.38

The study was design to maintain participant anonymity and confidentiality. To gain a representative sample, the study was conducted in class, using the traditional method: paper and pencil. Using this method enabled us to interpret results for the Polish student population.

The model used in our study- based on Augustynek’s theory (2001) and exploring psychological determinants of Internet behaviour over a seven-year period, included the following variables (Fig.1.):

- a) Internet usage modes - include small talk, entertainment, discussion groups, pornography, e-mail, online shopping, looking for information, and aimless surfing.
- b) Addiction symptoms – according to Young’s previously quoted criteria.
- c) Self-esteem – generalised positive or negative attitude towards oneself, which includes a component related to beliefs and opinions concerning oneself, as well as an emotional component related to accepting and liking oneself (Łaguna, Lachowicz- Tabaczek, Dzwonkowska, 2007; Łaguna, 2010).
- d) Satisfaction with life – general assessment of one’s quality of life in relation to the criteria set by oneself (Juczyński, 2001).

**Figure 1.** Prospective research model based on Augustynek theory (2001) exploring psychological determinants of Internet behaviour over a seven-year period.

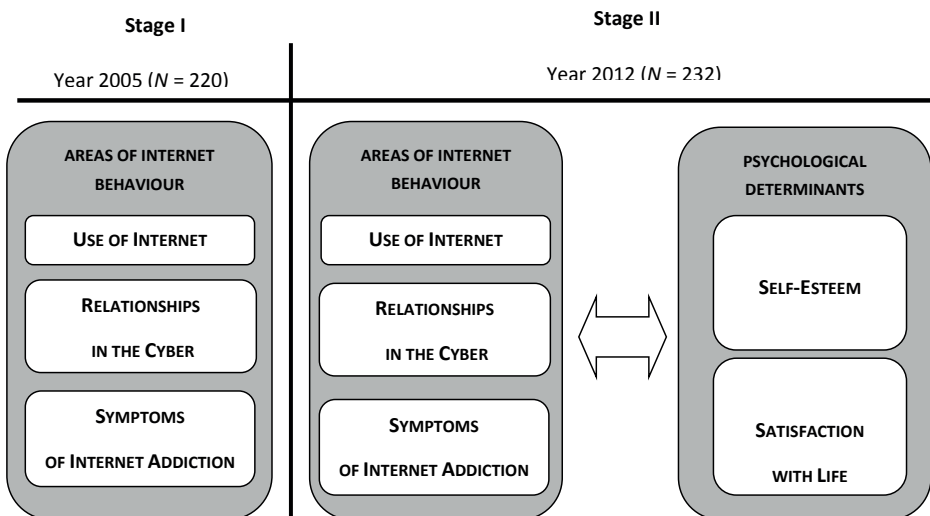


Figure 1. Prospective research model based on Augustynek theory (2001) exploring psychological determinants of Internet behaviour over a seven-year period.

## Results

Our study, conducted over a seven-year period, included a comparative analysis of psychosocial aspects in using the Internet's psychological behaviour determinants among Polish students. The first aspect which reveals significant differences is the time spent online – subjects questioned in 2012 spent more time on the Internet than those questioned in 2005,  $\chi^2(1, N = 452) = 98.33, p < .001$ .

Analysis of Internet usage modes by students from both stages (Tab. 2 and Tab. 3) indicates that now and seven years ago the dominant function was information, with communication coming second.

Differences in Internet usage over time were analysed with the Kruskal-Wallis test. No statistically significant differences in Internet usage for entertainment were found,  $p > .05$ . However, in using other online services, statistically significant differences were revealed. At present students use the Internet less often for small talk,  $\chi^2(1, N = 452) = 10.35, p = .001$ , but use it more often for participating in discussion groups,  $\chi^2(1, N = 452) = 10.49, p = .001$ , looking for pornography,  $\chi^2(1, N = 452) = 7.27, p = .017$ , e-mailing,  $\chi^2(1, N = 452) = 19.07, p < .001$ , online shopping,  $\chi^2(1, N = 452) = 119.92, p < .001$ , looking for information,  $\chi^2(1, N = 452) = 9.57, p = .002$ , and “aimless” surfing,  $\chi^2(1, N = 452) = 19.52, p < .001$ .

**Table 2.** Internet usage in 2005 – stage I of the study.

No.	Use of Internet	“never” / “rarely”		“sometimes”		“often” / “always”	
		Number of answers N	[%]	Number of answers N	[%]	Number of answers N	[%]
1.	Small talk	40	18.18	50	22.73	130	59.09
2.	Entertainment	48	21.81	83	37.73	89	40.46
3.	Discussion groups	145	65.90	60	27.28	15	6.82
4.	Pornography / cybersex	196	89.10	16	7.27	8	3.63
5.	E-mail	27	12.28	79	35.90	114	51.82
6.	Online shopping	100	45.46	103	46.82	17	7.72
7.	Looking for information	5	2.27	69	31.36	146	66.37
8.	Aimless surfing	20	9.10	97	44.10	103	46.80

**Table 3.** Internet usage in 2012 – stage II of the study.

No.	Use of Internet	“never” / “rarely”		“sometimes”		“often” / “always”	
		Number of answers N	[%]	Number of answers N	[%]	Number of answers N	[%]

1.	Small talk	49	21.1	88	37.9	95	40.9
2.	Entertainment	37	15.9	101	43.5	94	40.5
3.	Discussion groups	121	52.2	85	36.6	26	11.2
4.	Pornography / cybersex	185	79.7	33	14.2	14	6.0
5.	E-mail	8	3.4	61	26.3	163	70.3
6.	Online shopping	57	24.6	142	61.2	33	14.2
7.	Looking for information	0	0	24	27.0	65	73.0
8.	Aimless surfing	66	28.4	122	52.6	44	19.0

As mentioned before, in 2005 and again in 2012, one of the most important Internet functions is the communicative one. The subjects' relationships with the cyber community established solely through the Internet and by means of other media has not changed,  $p > 0.05$ , over seven years.

One of the Internet's greatest dangers is its addictive potential. Addiction symptoms were analysed during both stages. The study showed that the number of persons endangered with addiction according to K. Young's criteria has not changed significantly,  $p > .05$ . Internet users who met IAD criteria was approximately 12% in 2005 and 9% in 2012.

However, analysing individual symptoms revealed (Tab. 4) that the following symptoms now have a significantly higher occurrence rate: "problems with controlling time", "escaping from problems", and "undertaking unsuccessful attempts at limiting the time spent online." On the other hand, "lengthening the time spent online" is now lower. Still, "thinking about the Internet", "risk of losing relationships", "devoting an exaggerated amount of time" and "lying to significant others" is not significantly different.

**Table 4.** Internet addiction symptoms in the subject groups from both stages of the study.

No.	Symptoms of Internet addiction	Stage I 2005	Stage II 2012
1.	Controlling time**	87.3 [%]	95.7 [%]
2.	Thinking about the Internet	11.4 [%]	14.2 [%]
3.	Escaping from problems*	23.6 [%]	32.8 [%]
4.	Lengthening the time**	31.4 [%]	20.7 [%]
5.	Attempts at limiting*	19.1 [%]	27.6 [%]
6.	Risk of losing relationships	11.8 [%]	9.1 [%]
7.	Spending exaggerated amount of time	33.2 [%]	28.4 [%]
8.	Lying to significant others	8.6 [%]	11.6 [%]

\* $p < 0.05$ , \*\* $p < 0.01$

A very important factor facilitating addiction is the amount of time spent online. Comparative analyses reveal that at present subjects spend significantly **more time on the Internet**.

The risk of **Internet addiction correlates** with:

- low **self-esteem**,  $r_s = -.25, p < .001$ ;
- contacts **limited to** the Internet,  $r_s = .29, p < .001$ , and contacts in the Internet and beyond it,  $r_s = .19, p = .003$ ;
- the amount of time spent online every week,  $r_s = .19, p = .004$ ;
- Internet usage rate in looking for **pornography**,  $r_s = .20, p = .003$ ; and **entertainment**,  $r_s = 0.18, p = .007$ .

The proposed model of regression turned out to be significant,  $F_{4,227} = 13.49, p < .001$ , and explains the dependent variable in 18%,  $R^2 = .18$ . The predictors of Internet addiction are:

- self-esteem,  $\beta = -.21, t = -4.03, p = .001$ ;
- contacts limited to the internet,  $\beta = .25, t = 4.03, p < .001$ ;
- time spend online every week,  $\beta = .20, t = 3.21, p = .002$ ;
- Internet usage rate in looking for pornography,  $\beta = .16, t = 2.60, p = .010$ .

“Satisfaction with life” does not correlate directly with “Internet addiction”, but analyses indicate that the lower the satisfaction with life, the higher:

- the time spent on online entertainment,  $r_s = -.16, p = .012$ ;
- the time spent on aimless Internet surfing,  $r_s = -.14, p = .031$ ;
- the time spent on online pornography  $r_s = .15, p = .021$ .

## Conclusions

The Internet is an area currently experiencing dynamic development. In this context, Poland is experiencing major changes because of recent technological developments that ensured public access to the Web. The Internet is an important area of action for many people. Our studies regarding Internet usage by Polish students in the years 2005 and 2012, indicated the following:

- the intensity of Internet usage has changed (the subjects spend more time online, they spend less time on small talk, but more on discussion groups, pornography, e-mailing, shopping, looking for information and aimless surfing);
- now and seven years ago, the dominant function was informative, with the communicative function coming second;
- the factors facilitating Internet risk addiction have become more pronounced;
- the percentage of people with Internet addiction symptoms has remained static.

One reason behind increased Internet use is its growing availability society.

Our analyses revealed risk factors which positively correlate with the number of Internet addiction symptoms. Such **risk factors** are: **Internet usage** modes (entertainment, pornography); **relationships in the cyber community** (the number of contacts limited to the Web); low **self-esteem** and **time** spent online (the higher the time, the greater the risk). Regression analyses revealed the predictors of Internet addiction:

- higher number of contacts limited to the Internet,
- lower self-esteem,
- larger intensity of time spent online every week,
- larger usage rate in looking for pornography.

Though looking for entertainment is positively related to Internet addiction, it is not significant as its predictor.

The number of contacts limited to the Web significantly reflects interpersonal relations deprivation in the real world. Internet users can satisfy the basic human need for interpersonal contact in a virtual world. We assume that the stronger an unsatisfied need is for connection in the real world, the stronger the bond will be within the cyber community. The possibility of “personal” on-line interaction makes the Internet a much more attractive space for satisfying psychological needs than reality. Hence, contacts limited to the cyber community create the greatest Internet addictive risk in this research.

Contrary to assumptions, satisfaction with life is not directly related to Internet addiction. Satisfaction with life refers to one’s global assessment; therefore it refers to previous experiences in various areas of life that can be more meaningful and richer when compared with Internet addiction consequences. On the other hand Internet addiction reveals only the intensity of Internet addiction symptoms. Therefore it is possible to clearly state whether one is addicted or not. Internet users with high symptoms scores might be on a different Internet addiction level and for that reason may not experience the psychological addictive consequences that could be connected with life satisfaction.

Our study reveals the changes occurring in the psychosocial functioning of Polish students on the Internet from 2005 to 2012. The risk-factor correlations identified here have become important clues for professionals developing preventive programs related to Internet risks (particularly Internet addiction). Practitioners of Internet addiction therapy should pay special attention to:

1. strengthening self-esteem, and
2. establishing relationships and contacts outside the Internet.

The level of satisfaction with life may not be directly connected with addiction symptoms; however, it is connected with the manner in which the Internet is used, and should be taken into account during therapeutic psychosocial Internet work.

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## Which literary theory tools can a psychologist use for interpreting language communication?

### Abstract:

The theory of literature provides tools for interpreting language communication. A psychologist, when interpreting a communication – which is often a latent one – has no other alternative but to employ these tools (with the exception of non-verbal communication). Often, however, this stage of work is defined as “intuitive”, which significantly limits the repeatability of the procedure and thus gives rise to reservations as to its scientific value. Review of certain literary theory devices, along with their possible applications, allows for naming these tools, selecting, and ordering the consecutive stages of communication analysis. In our opinion, such reviewing opens up the possibility for filling this gap in qualitative research analysis with specific tools and specific ways of using these tools in place of intuitiveness.

### Keywords:

narrative analysis; interpretation of personal narratives; qualitative research; interdisciplinary approach; literary theory devices

### Streszczenie:

Teoria literatury dostarcza narzędzi do interpretacji komunikatu językowego. Psycholog, dokonując interpretacji – często niejawnego komunikatu, nie ma innej możliwości niż posługiwanie się tymi narzędziami (wyluczając komunikację niewerbalną). Zwykle jednak ten etap pracy określany jest jako intuicyjny, co znacznie ogranicza powtarzalność procedury a tym samym budzi zastrzeżenia co do jej naukowości. Przegląd poszczególnych narzędzi teorii literatury oraz możliwości ich zastosowania pozwolił na nazwanie narzędzi, selekcję i uporządkowanie kolejnych etapów analizy wypowiedzi. Co, jak sądzimy, daje możliwość wypełnienia owej luki w analizach badań jakościowych konkretnymi narzędziami i sposobem ich użycia, zamiast intuicyjnością.

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**Słowa kluczowe:**

analiza narracji; interpretacja osobistych narracji; badania jakościowe; podejście interdyscyplinarne; teoria literatury

## **Introduction**

“How is it possible that you don’t have my tools and yet see the same things as I do?” This question was asked almost at the same time by a psychologist and a specialist in Polish studies, who were sitting together and trying to work through transcripts of monologues on upbringing – and this very question provided a starting point for this article. The answer to this question was pretty obvious. Neither of us saw nor heard the authors of the analysed narrations. The only option open for us was to make use of what a narrator actually said, and in what way he did it (including only the linguistic aspect of the narration, without non-verbal communication). What we had to do was to identify the shared elements of the process, find their sources, verify their legitimacy by means of devices taken from the theory of literature and adequately define their successive stages. As we were proceeding with our analysis, new questions arose, concerning underlying assumptions, and many times we were surprised at the relevance of some observations and reservations. Here are the results of our efforts.

Utilising methods of literary interpretation analysis for auto-narration might at first raise doubts (because of the specificity of the latter), yet it is entirely justifiable. This is in agreement with Culler’s (2000) belief, which states that from the methodological point of view there is not much difference between the novels by Virginia Woolf and the cases described by Freud, and that literature and non-literary texts can be analysed concurrently and in a similar way due to the fact that literature is derivative of language<sup>3</sup>. A similar opinion is expressed by Okopień-Sławińska (1987), who says that a narration provides information about the addresser in the same way as any other piece of work does about its manufacturer. A narration presents the addresser through its content, and also (sometimes even more so) through its characteristic semantic organisation.

However, considering the distinctive nature of auto-narration in the psychological context, it is important to make a few comments/reservations:

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<sup>3</sup> Culler’s statement is the consequence of learning the context and rules of language use socially. It concerns the methodology of analysis and not final conclusions, which obviously will be different for auto-narration and for literary narration. It is noteworthy that the term ‘auto-narration’ is narrower in psychology than in the theory of literature. In psychology this term is limited exclusively to communications referring to personal life.

- a) Neither the narrator nor the addresser/sender of a communication is identical with the author in a ratio of 1 to 1; they are only part of the author. It seems that this part corresponds to just one of many polyphonic selves of the author (Oleś & Puchalska-Wasył, 2005). And the narrator/sender are identical with the author only in this part/role. The world presented in auto-narration is narrower than the author's real world. Thus, the analysis and interpretation of auto-narration can concern only and exclusively this part of the author's reality which is included in his communication.
- b) The question as to what degree the narrator is identical with the author has been widely debated in the literature of the subject for a long time, yet no clear consensus exists (see Jasińska, 1987). However, denying the possibility of shared parts of the narrator and the author would be difficult because:
- Even an outstanding author is a human being: if he creates the world, he must draw heavily on his personal experiences and other people's as well. Even when he "borrows" something from other people's observations and experiences, he must filter it through himself/internalise it to some degree. The author's way of thinking, his notional apparatus, his experience and emotions – all these elements must leave a trace on everything that is "filtered" through them. These traces alone reveal – even if it is just in part – the author.
  - The author who does not write belles-lettres finds it more difficult to hide himself, even if he tries hard [high-level control requires many corrections, even in the case of experienced writers (Boy-Żeleński, 1924, p.27; Szumilak, 2008)].
- c) The author of a communication does not have the final word in its interpretation. Wimsatt and Beardsley (1954) claim that a dispute over the interpretation of a literary work cannot be resolved just by referring to the author. Culler (2000, p.66) states that: *the meaning of a work is not what the writer had in mind at some moment during composition of the work, or what the writer thinks the work means after it is finished, but, rather, what he or she succeeded in embodying in the work.*
- d) Language can be perceived as the echo of living/staying in a specific environment/ or environments which is/are relatively stable and long-lasting, even if there are more than one (such environments); individual rules of using the language are established primarily in the family environment (which is predominant when we acquire the language, and remains so for another several years). We learn the language, the rules of using it unconsciously at home and freely at school – but as in the case of the accent or the melody of a language – what is acquired at home is un-eliminable.

Quantitative methods, which strive for the precision of science, usually derive from analysis. Qualitative analysis is different. Following Sawicki's statement (1987), interpretative description (the "intuitive", synthetic stage of communication) is usually a starting point for analysis (not only its aim). Detailed observations and the analysis of specific elements require a wider perspective (Kmita, 1987; Berube, 2002). Once we have identified what is essential and meaningful in the text, we can verify the legitimacy of our perception by analysing the communication. While many scholars consider this "intuitive" starting point indispensable, others have their doubts, as it might allow latitude in interpreting the text (Eco, 1992a, 1992b, 1992c). At the same time it is highly problematic for the researcher to adopt a neutral position (Culler, 1995). In the light of this undoubtedly complex problem, Culler (1992) – in his dispute with Eco – distinguishes between: *understanding* (i.e. posing questions and looking for answers which arise from the text itself) and *overstanding* (formulating questions which are not addressed in the text but which open up possibilities for interpretation, as it is not always the most important what a text tells us but what it wants to conceal). Hermeneutics, which is sometimes viewed by scholars with suspicion (on account of its limited possibility of repetitiveness) cannot be overestimated. Following Sawicki (1987), we can conclude that analysis which is restricted to a statistical registration of motives, plots, metaphors and genres appearing in the text seem to be mere pedantry and its usefulness is questionable, as it does not reveal the guiding idea/concept behind a communication. Although the theory of literature draws on linguistics, it cannot adopt its model of communication. From the perspective of linguistics a communication can be divided into two structures: surface and deep ones. However, a language structure which is deep in the case of literary theory is often the mere superficiality of a communication (Balcerzan, 1998, p.5-6).

In contemporary scholarship, which favours hermeneutics over poetics, literary works are studied because they are believed to have something important to say. They are not studied simply because people are interested in the mechanism of literary functioning. It might be the case that contemporary psychology deals with an individual not merely with the aim of helping him/her understand the mechanisms of his/her functioning. First and foremost, the aim is to hear what his/her world is like and what meaning it carries for him/her, and to what degree it is meaningful. This provides important information not only about the subject, a person the psychologist is working with, but also about the psychologist himself. Patients' stories often say something important about their therapists (Yalom, 2002).



## **Stages of communication analysis**

We isolated consecutive stages empirically. First we described consecutive stages in the process of deciphering the meaning of communication, next we named these stages/activities trying to find the most adequate concepts or categories in the literary theory. Thus, the procedure for narration analysis involved three main stages:

- a) Searching for the “hidden story” through identification of narratively out of key communication.

This stage is based on the assumption of a story within a story, that is, a multiplied, enveloping structure in which the first stage of the presentation provides a compositional frame for the story which takes place at the second stage. The narration is organised in a multistage way, independent compositional units are arranged in hierarchical order. Each unit is confined in the unit one step higher (Sławiński, 2010, p. 255). According to the story-within-a-story assumption, what might be uncovered from under the main current of a communication is also a story which further reveals the meaning. From a psychological perspective this stage reflects the belief that the speaker in his auto-narration wants to reveal only part of the presented area/events. Yet, as it is impossible for him to control all the aspects of communication, he reveals a much greater part of this area than he would wish to. What he would like to omit in his auto-narration, although it is covered with what he actually says, sometimes gets disclosed for a moment, or somehow emerges from under the main current of the narration. Some other time the covering layer is not thick enough and betrays the shape of what the narrator is trying to conceal. This hidden part can be isolated and interpreted by recognising what is different/strange/unsuitable/unusual in the context of the whole narration (see Ulatowska, 2013).

- b) Looking for the answer to the question in one of the following layers:

- thematised and implied information,
- un-stylised/free-flowing and deliberate style of individual language,
- type of narration and changes it undergoes,

Following these, we examine the

- time-level and manner in which it is defined,
- events and their locations (real/mythical),
- place where this narratively distinguishable differentiation of monologues is located.

We also try to find the hidden story on the basis of narratively out of synch communication.

If we analyse monologues of two people who are closely related, there is another stage possible – the fourth stage. Namely, if these monologues concern their relationship, we can compare the worlds presented in two separate hidden stories and answer the

question of whether the worlds described are the same and alike. Theoretically they should be, as any close relationship demands that the characters are present in the same place and time, and that there is interaction between them. We have presented the results of this analysis, conducted on persons in monologue pairs (parents and their adult children) in another article (Kuncewicz, Sokołowska, Sobkowicz, 2014)<sup>4</sup>.

### **Characterisation of individual stages**

The first stage can be defined as intuitive, as it requires a special kind of alertness and sensitivity, including the linguistic one. Everything that “doesn’t fit”, “doesn’t sound”, is “strange”, “attracts attention”, and so on is singled out. These elements can be either isolated cases and therefore unique in the context of the narration, or, by contrast, there are many of them, they are characteristic of the whole communication. In order to isolate these elements it is necessary to read a transcript several times.

At this stage it is not a problem to wrongly classify something as “different” when it is not different at all, but rather to disregard certain “differences”/differentiations. The method of “partly competent” judges (they are told what they are to identify but do not get any detailed explanation or instruction – they are to be guided merely by their own linguistic sensitivity) might be useful at this stage. The judges need not be in agreement – their role is not to eliminate anything but rather to make sure that nothing is eliminated.

At the second stage an attempt is made to name this differentiation, to define what this differentiation actually is. This differentiation is interpreted/explained according to the literature theory in such a way that the other judges, who are now competent (because now properly instructed) can discern and acknowledge the correctness of classifying a given element as “different”, which further verifies differentiated elements.

Differentiated elements can belong to different layers, which have been described below.

### **Thematised and implied information**

The information included in the text about the narrators can be of two kinds: thematised in other words determined by the meaning of words and sentences, and implied in other words defined by the rules of speech. The latter’s scope, which is coded in the communication structure, is more specialised. Thematised information – which pertains to a specific character – can come from his own narration or other characters’. Implied information about a character can only be found in his monologue. Each communication contains some information about its addresser/sender. In psychology the differences and

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<sup>4</sup> The presented type of analysis was also employed in other studies concerning, among other things, relationships based on partnership, life changes and motivation to help. In our estimation, psychological analysis which uses literary theory devices is possible and legitimate only when in a study a psychologist can ask a subject a question relating to his/her private life. At the moment we are working on the second part of this article, which is to illustrate the proposed method of analysis ‘step by step’.

references between thematised and implied information, although not identical, seem to be comparable in certain aspects to those which take place between communication content and meta-communication, verbal and non-verbal, open and latent communication.

Thematised and implied information differ in terms of its origin and scope, as well as the way they are disclosed in the text. The former is imparted directly, the latter indirectly, which does not mean that the former is provided straight out and as a whole, and that it is not subject to interpretative operations; it only means that it derives from formulated meanings (see Barry, 2002).

Implied information about the narrator means a steady flow of information running along in the inner current of openly thematised meanings (Okopień-Sławińska, 1987). In psychology a similar relation can take place for example between open and latent – e.g. continual conflicts between a husband and wife; and a strange (considering the cause of the conflict) inability to solve them would be the equivalent of thematised information. The equivalent of implied information in this particular situation would be the fact that this couple actually keep quarrelling about something different – and more serious than it would appear from what is open. They do not speak straight about this hidden conflict, they just wage it in the confines of what is open.

A significant difference between implied and thematised information is that in the latter we can learn something about the narrator only when he refers directly to himself. On the other hand, implied information allows one to reconstruct the narrator's personality on the basis of a communication in which he does not say a word about himself. Here it must be stressed – however obvious it is – that implied information cannot report on behaviours which are not reflected in the narrator's way of speaking (e.g. simple narrative situations).

A full addresser/sender's picture is not a sum of fragmentary pieces of information. The narration's communicative structure creates a complex system of signals which correct and valorise individual information items. This system is based on the difference in the degree of authoritativeness for thematised and implied information as well as information which comes from different transmitting levels of communication. Okopień-Sławińska (1987) outlines the basic rules concerning how this system functions:

- a) If implied and thematised information items are in conflict, it is the implied one that is stronger and consequently plays a decisive role in interpreting thematised information. Obviously, the situation gets more complicated when high-level thematised information is contradicted by low-level implied information;
- b) If there is a conflict between two thematised information items which come from different levels of the text, the high-level information is stronger; the low-level in-

formation is always subject to interpretation or re-interpretation by the high-level thematised information;

- c) Coherent information items – agreement between consecutive levels of communication – lends credence to low-level information;
- d) Implied information can confirm or undermine thematised information. A conflict between these two types arises when personality traits which the narrator attributes to himself, or his opinion are questioned by his way of speaking. It is analogous to the relation between verbal and non-verbal communication, where the latter can refute the former.

### **Un-stylised/free-flowing and deliberate style of individual language**

Individualised speech consists in linguistic innovativeness and creating new rules or transforming the existing ones. The unique character of individual language is based on the language which functions in a given community. Ultimately, it is just a small fraction of common language (shared by the whole community). Individual language comprises a system of words, inflection types, word-formation types, syntactic patterns and conventions which are stored in individual consciousness and constitute a reservoir of possible communication items which are used by an individual when speaking (Klemensiewicz, 1987). Individual language has two sources: its own pool and the outside one. The former is accumulated unconsciously through contacts with an individual's family, friends and other people in his/her immediate environment. The latter is acquired freely in many different ways – is consciously searched for in dictionaries, specialist publications and also borrowed from surrounding people. Both sources play a constructive role/make a contribution in stylisation in other words they shape the content of communication in such a way that it fulfils its intended function: communicative or expressive and authoritative. The extent of this contribution might be different for each source. In deliberate stylisation, which draws only on an individual's own resources, a set of selection criteria are adopted to produce intended reactions.

Stylisation strongly emphasises everything characterizing an individual: what is relatively stable (their way of thinking, knowledge, education, emotions) and what is momentary or situational (subject, motive, intended function). Style (a system of stylisation tendencies, an individual's characteristics) with regard to conditions and aims of stylisation can be:

- un-stylised/ free-flowing – which derives from individual traits of the speaker, who does not consciously evaluate his own communication,
- deliberate – which comes from the speaker's individual traits and his conscious effort to produce, while speaking, an intended and desired mental reaction in the listener-recipient.

In psychological interpretation, deliberate style in auto-narration can be a form/symptom of reaction formation, where, in an attempt to suppress and deny emotions, the speaker presents a completely different façade. Similarly, deliberate stylisation can be used to create something that actually does not exist. If we track this illusion (created by deliberate style), we can start speculating on what lack/what uncertainty this stylisation is striving to hide. Free-flowing style defines the speaker directly, whereas a deliberate one indirectly – through the purpose it serves, the reaction the speaker wants to produce, and through implying what is hidden.

### **Type of narrator and changes it undergoes**

Narrator types are related to communication levels: there are a number of such levels in a monologue or a literary text (Schmid, 2010; Goetsch, 2004).

**Table 1.** The Level of Communication.

	Level of communication - sender- recipient
The lowest level	Intra-contextual – speaking character-character
	Intra-contextual – chief narrator-addressee of the narration
	Extra-contextual – addresser/sender-recipient (originator of creative activity)-(ideal recipient of this activity)
The highest level	Extra-contextual – author-specific addressee

A characteristic feature of communication within the same level is the possibility for dialogue, in other words swapping roles between the sender and recipient. On the other hand, a hierarchical relation between consecutive levels manifests itself in unidirectional and asymmetrical subordination between the character-sender and the recipient. The lower level knows nothing about the higher one. The character does not know that he is being “talked” about, he cannot become the sender of a communication about the narrator or about the addressee of the narration, he cannot address his communication to them or swap roles with them.

The lowest transmitting level is created by the speaking character. The addressee of his communication is/can be another character. The most common contact between them is dialogue. At a higher level the chief narrator tells about characters in a given story but he is part of this story, too. The addressee of the narration is this part of the listener which is delegated to become a hidden part of the story. The existence of the listener is implied in the text by the chief narrator himself, who- after all- must address his communication to somebody. Each next level of communication is created by the sender and recipient of a communication, who are already outside the story. The sender of a communication is the decision-maker who determines what and in what way will be told and what will be

concealed. The recipient of a communication is also outside the text, therefore they both can establish relations with the author of a communication, and make an attempt to work out the criteria which have been used to select what to say and why. At this level the sender and recipient of a communication can enter into dialogue in a real/tangible way or in an intra-psychic, internalised one (Okopień-Sławińska, 1987).

The sender, although not being placed at the highest level of the narration, has a casting vote/plays a decisive role in the dialogue. The highest communication level – here both the author and the recipient are equipped with all their roles and a wealth of experience, and as such they are present in a communicative situation but silent. They are not persons in their overall dimensions; so full dialogue between them is impossible. In this sense they are both silent.

The sender's role of the sender is special, not only because of his non-reducibility and his presence in each communicative situation and at each level of communication, but also because he has a decisive influence on the relations between the other roles: of the recipient and the character. The change of the addresser results in new personal subordination. From a psychological perspective, it seems even more important in auto-narration, as the author, the narrator and the main character are all parts of the same person. Of course, narrators from different communication levels are not identical. The narrator is always a narrower individual than the author but relations between the outside sender and the one who exists inside a communication or a text are complicated. The narrator does not have the final word in a communication – it is outside his competence to reinterpret the meaning of his own words and subsequently restructure the meaning of the whole text. Thus, within the text there is a set of rules which are outside the narrator's control, which he does not address. In the text there appears implied information which refers to a subject who possesses consciousness superior to the narrator's. The subject is not presented as a character, no thematised information refers to him, and not a single communication item within the text is addressed by him. He is the subject of the whole text. The sender of a communication, when making a decision (more or less consciously) as to what and how to narrate, reveals – in varying degrees – both his experience and the meaning which he attributes to it. The smaller the distance to the world presented (characters experiences, events), the larger the distance to the sender, and vice versa (see Płachecki, 1982). Psychological interpretation requires not only defining the narrator's distance to the sender of a communication. Changes in the distance also matter. In what context do they occur? What brings them about? It is remarkable that the distance of the narrator as well as the changes in this distance define the distance which the recipient is supposed to take on, as he cannot stay for example inside the world presented when the narrator is speaking from an outside perspective.

### Time and the manner in which it is defined

Time in the narration can be specifically defined for example in terms of a particular year, or some concrete events which – although not defined in time – are specified precisely enough to refer to a definite moment in the past/a memory trace (Bartoszyński, 1987; Schmid, 2010). Indeterminacy is a narration in which it is not said what exactly is going on, or where, or when. The narrator can also create a story which on the surface seems to be definite in character for example by accumulating non-defining pronouns like *once*, *somewhere*, or *somebody*; presenting information in an unclear ambiguous manner for example *the world is changing* (What world? What is this change?), *parents taught me (...) all the traditions which they maintained and tried to instil in me so that I would not forget them in the future* (What traditions did they teach? What traditions did they maintain? They tried to instil but were they successful? Does the narrator really remember these traditions?)

The conditional form does away with time; it expresses that something must happen before something else can happen. However, nobody knows if and when a condition will be fulfilled; or if it is fulfilled, something else will happen [e.g. *If I had the means, I would take a long holiday and have a good rest*; however, if he does have the means, it is not so obvious that he will go after all (because he won't be able to make it or he won't feel like it, etc.) and even if he does go away, it is not certain if he will really find rest].

The imperative (mood) does not necessitate defining in time. It goes without saying that it must be done right now. The mood above all implies intention – pressure is what matters.

Another form of indeterminacy is unrealised potentiality, unverified conjectures – in other words the future which is not based on past experience for example *there are no such subjects I couldn't talk about* (which means that in actual fact he has not talked or there is no telling if he ever will).

An interesting narrative method employed by the sender of a communication is to apply so-called quantifiers of lie in other words universal pronouns such as *all*, *everybody*, *always*, or *everywhere*; and negative ones like *nobody*, *nothing*, *nowhere*, or *none*, which refer to some social/ collective experience. Such experience might be true as long as it is considered in very general terms (e.g. *everybody has some unpleasant memories of their family home* or *nobody can say that they are always happy*). At a more detailed (individual) level such a truth could not be established because of a variety of experiences, ages, resources, relationships possessed by individual persons. In the light of the relations between the sender and recipient this apparent over-determinacy used by the author of a communication “engages” the recipient and makes him feel obliged to find this kind of experience in himself. The sender delegates responsibility to the recipient,

who is to “guess” what other meanings a transmitted picture contains. Besides, so-called quantifiers of lie seem to serve another function in a communication, depending on the place where they are used. If it happens at the beginning of a narration (or at the beginning of its part), they put the listener in a situation where it is simply inappropriate to ask questions or demand further clarification, as everything is obvious – or the recipient “should” know it. Questioning the sense of referring to the collective experience undermines the credibility of the whole communication. However, when such a quantifier is placed at the end of a narration – sometimes even preceded by the word *but* – *we all have such an experience, everybody is in this situation*, and so on – it seems to diminish the importance or uniqueness of the experience which has only just been related. This suggests that since there is nothing peculiar/unique about this experience, there is no point in attaching importance to it or taking an interest in/asking questions about it. It is also an attempt to reach agreement (under the pressure of language) that it is not only the sender and recipient who should not talk about it but that other people should not either. Such quantifiers allow the narrator to avoid saying too much or in great detail and at the same time reduce the emotional charge which lies behind a related story.

On the other hand, expressions like *suddenly* and *all of a sudden* do not define so much time as the pace of action.

### **Places of events (real/mythical)**

A description of a place of events might serve to make a communication more real. By using a large number of unnecessary details, the author wants to create the illusion of life – he pretends that he is simply relating what he “sees” or what he recollects. In this way not only does he disguise his real memories or the need to create pictures different from real ones, but also masks the very act of creating something (Weintraub, 1987; Brodzka, 1987). In order to describe scenes/events, the author of a communication might use recollections not so much from his own life as from the films, commercials he has seen or other people’s stories. To make a narration more real, detailed descriptions are given to the recipient (Mullan, 2006) but, as it is a carbon copy of something that has been seen by the sender, not a specific individual recollection, the recipient does not get any characteristic detail. He does not get anything that could be a memory trace allowing him to reconstruct the remaining elements of narration.

### **Events**

An excessive number of events might serve to fill up the space of a communication. The sender speaks in such a way as not to say something else and prevent the recipient from guessing the information which must remain hidden, or even from realising the very fact of something being hidden. Another method is to speak about something that does not exist or that has not taken place, and so on and avoid talking about what does



exist and what has happened. A communication can be filled with various minor events, characters, stories, and so on. What is interesting and important about this communication is not what the sender is actually talking about, as it is merely a cover-up for what is unsaid (Genette, 1982; 1990). The essence of a communication is just what the sender does not say.

Narration is not a simple task of enumerating/mentioning facts and events. It is “happening” in time. To illustrate this point, the following statement is quoted: “An individual is always an event-teller, he lives surrounded with his events and other people’s events, everything that happens to him, he sees through them; and he tries to live his life as if he was telling it” (Sartre, 2007, p. 56).

By mere listing events we act “against” a story. Lack of a personal composition of events/selection and a failure to invest it with meaning results in a communication which cannot be analysed by means of literary theory tools. The course of events is determined by the intensions of the speaker/character/participants, and so on. Here should be stressed once again how important it is to adopt a narrative perspective (i.e. from whose point of view specific events are told): the speaker’s own perspective – present or past, or if it is somebody else’s, whose perspective is it? Narration makes it possible to express/combine events and time. This aspect has been dealt with by a number of authors, among others Genette (1981, p. 60) who suggests that “the narration reconstructs – in the sequence of a discourse – the chronological sequence of events”, and Bruner (1987, p. 12) who assures us that “there is no way of describing the past time other than doing it in the narrative form”. We refer to the past or the future by inquiring how far it is, whether it is a question of days, months or years. We build up a story on the time axis from events which are more and more specific/more detailed or more general/not very detailed. The analysis might also involve typicality/peculiarity of events which are reported, or the degree of their complexity/difficulty/saturation with negativeness/stress/traumas or with happiness/positiveness, and so on. All this creates the emotional climate of events, the way they are perceived when looked back upon and possible changes in this perception (*now I think about it as... then I used to think that...*). The analysis of “action”/events can cover physical aspects (stroking), metaphysical (enlightenment) and mental ones (a feeling of loneliness).

The third stage, in other words an attempt to work out ‘the hidden story’ from narratively out-of-key elements, requires defining which analysed elements should be identified as its components. These are:

- implied information; thematised information but only those items which are at a higher level of literary communication,
- information related in free-flowing language,

- information in which the distance to the narrator is at its least, and information which can be attributed to the addresser,
- thematised information defined in time/real was rejected, leaving only this thematised information which was not defined or was superficially defined.

All these pieces of information correct one another/are mutually corrective and organized into a coherent whole, which allows for reconstructing the hidden narration. The criteria of coherence make it possible to eliminate what is “different” but only when this “difference” (distinctness) has a random character (see Balcerzan, 1987). This randomness might be interpreted as distinctness which is not an element of any story, or which is an element of a completely different story which, however, cannot be reconstructed because there is a shortage/lack of elements. While communication at the thematised level can be incoherent, a reconstructed hidden story should fulfil the criteria of coherence (see Mayenowa, 1971). Sometimes, it is a story which still has not been reached, which has yet to be discovered.

The fourth stage allows us to compare two narrations in order to analyse how the two worlds presented in isolated hidden stories are related. The paralleled comparison of the worlds will answer the question: “Are the worlds described the same and alike?”

The main component of each narration is the world presented – defined as one of the main components of the communicative content, with all the elements taken as a whole (states, processes, experiences, human activity). The presented world’s building blocks are thematic material, which is subject to selection, interpretation and construction according to the author’s conception. The world, whose elements – or their make-up – are in agreement with socially confirmed cognitive stereotypes, has a realistic character; the opposite world has all the hallmarks of fantasy (Sławiński, 2010, p. 565-566). Possible worlds – a kind of the world presented where described facts and events are not considered in terms of reality. Their existence is not acknowledged or unquestionable. They exist in the realm of potentiality: they might have happened but just as well they might not, they might have taken a certain course but just as well they might have taken a completely different one. On average they are related in a conditional form (Głowiński, 2010, p. 566).

Criteria of assigning to specific groups

**The world the same and alike:**

- main characters are present in both narrations, attributed roles are the same in both narrations, both narrators adopt two perspectives,
- human activity, processes, states, experiences, times and places described in both narrations correspond,
- the visible world is realistic, it is compatible with the hidden one,

- narrators use the same language code.

**The world the same but not alike:**

- the main characters are present in both narrations, attributed roles are characterised by uncertainty and lack of definite character,
- narrators are in agreement on only one element of the worlds presented: human activity, processes, states, experiences, times and places which are attributed to the characters (if one agrees, the others don't),
- the visible world is not compatible with the hidden one,
- language codes are different.

**The world not the same but alike:**

- narrators hold the same negative opinion of the hidden world, they both experience the same negative emotions and agree that what is perceived as negative should not be revealed,
- the visible world is possible or utopian,
- the utopian world is created in a similar way; narrators use the hidden world as a basis from which they pick out what is important – something like reaction formation,
- the visible world refers to social schemas or archetypes (e.g. rituals) – without details, using buzz words, well-known pictures which are broad/general enough to suit everybody, thus they remain non-verifiable,
- smooth schematic stereotypical language – it does not catch attention, it is just to fill space; it might be also another form of expression without anything distinctly different,
- in one tone, a line without amplitude (e.g. chaos),
- language codes have been agreed upon, their aim is to keep up fiction.

**The world not the same and not alike:**

- the narration includes the perspective of only one of the characters (sometimes the other is not present at all, he/she is just “a figure”, an episode, with no significant influence on the events presented in the narration),
- none of the aspects of the worlds presented correspond: processes, states, experiences, times or places; and if the main characters are present, human activity or attributed roles don't either,
- the worlds presented in both narrations are realistic, they are not possible ones,
- language codes used by the narrators are different.

Summary and discussion

To analyse a text/communication, we have used tools from the following areas:

- phonetics and syntax (Labov, 1966; Trudgill, 1986),

- parts of speech and lexis (here: frequency analysis of pronouns, the analysis of motivation patterns/verb forms which appear in the text and investigation into predicate categories) (see Brown & Gilman, 1960; Cutting, 2011),
- semantics (the lexical meaning of words, here: semantic field analysis, the Concept Dictionary of English by Laffal, which allows one to code words using synonymy, similarity and connection; as well as the meaning of discourse; semantic content analysis; concept meaning) (see Malmkjær, 2002; Norrick, 2008; Widdowson, 1995),
- text (its structure, word frequency/the strategy of word counting; using grammatical forms, leading themes, cohesion and coherence, and so on; here: *Linguistic Inquiry Word Count; General Inquiry*) (see Carter & Malmkjær, 2002; Cassidy, Sherman & Jones, 2012),
- language style (Agha, 2003; Halliday, 1978; Shuy, 2008),
- genre (typical content, composition, language) (see Bakhtin, 2007),
- discursive strategies/discursive practise (here: the method of the sentence analysis of discourse, *analyse propositionnelle du discours* APD) (see Cots, 2006; Fairclough, 1992; 2003),
- narration (here: narrative episodes/events, their sequence; themes/a set of motives) (see Harré, 2008; Hymes, 1996; Labov, Waletzky, 1967; Narrative Inquiry, 2006),
- phenomenology, which allows us to work out senses/meanings which can be interpreted [reconstructing subjective structures of the meaning which are not always realised], reconstructing mental phenomena/describing the essence of expression (see Dale, Soderhamn & Soderhamn, 2012; Smith, Flowers & Larkin, 2012),
- patterns of interaction and experience (see Drew, 2001; Liddicoat, 2007; Rapley; 2007; Schegloff, 1972; 1992; Stubbs, 2008),
- social actions/social rank/social rules of expression, patterns of culture (see Vicari, 2010; Yule, 1996).

Quantitative analysis of the text, for example counting individual words (*word count strategies*), sentences or episodes (frequency analysis) enables one to support reached conclusions by numerical data, and draws attention to the meaning of words, which is extremely important and valuable in the work of a psychologist. It could also be important in psychological education, as it is often words, on which our work is based. Hence, proper regard for this element is essential. Its limitation, however, is that it does not reveal the concept or meaning of a communication. Besides, using the aforementioned quantitative strategies raises doubts for example in narrations obtained in an in-

terview technique, where the participant is forced to say more words about some areas than he would like to, which in turn might result in using a greater number of specific verbs, people's names, and so on.

Summing up, none of the aforementioned fields has tools for interpreting a communication/text. We mean the interpretation based on the assumption that real meaning is concealed and cannot be grasped in the process of direct empirical observation (Sławiński, 2010, p. 217-218; Markiewicz, 1984), the interpretation whose final effect assumes the form of a reconstructed story. We propose that such tools should be borrowed from the theory of literature, as it is this area of study that for a long time has been involved in interpreting the meaning of what is expressed in words and between words, deciphering and reconstructing a story. An individual can deal with anything (misfortune, loss, the unimaginable) as long as he/she puts it into a story. Therefore, tracking down a story is the aim of narrative therapy (Csikszentmihalyi, 1996; Tokarska, 2002; Pennenbaker, 2001). A story lacking in words that would tell it "tells a person". It becomes his torment, compulsion, incomprehension (Grosz, 2014). The results of quantitative analysis of a narration do not have narrative structure; they are the complete opposite and thus are useless in psychological practice.

Utilising the aforementioned tools, however demanding it can be, seems useful, as it can be used both in scientific research and in individual work with a patient.

Searching for the hidden story (admitting that it might exist) is, in our opinion, a matter of extreme importance, and yet it is usually skipped over by researchers. On the other hand, it is emphasised in different ways when working with a patient (e.g. remarking that it is not so very important what has been said as what has been concealed) (see Opoczyńska, 2008). As Kaźmierska states (2014), people tend to say more than they would like, and more than they think they have said. A psychologist often depends in his/her work on the unsaid he/she has "heard". In most cases, however, he/she is unable to explain how he/she has managed to hear it and by means of what tools. It is because terming language tools and defining their function lies outside the domain of psychology.

Using literary theory devices not only allows for reconstructing the hidden story but also emphasizes the significance of the speaking situation itself – auto-narration, which is brought about by the authors who adopt the interactive and communicative approach (Metcalf, 2013; Ponterotto, 2002; Holstein i Gubrium, 2003; Stemplewska-Żakowicz, 2008).

The question of who tells whom also matters. We cannot avoid situations in which participants attempt to influence the way they want to be perceived by other people by selecting specific events from their lives or presenting them in a specific way. This auto-

presentation results from two basic difficulties. First, participants find it difficult to open up to the researcher, to establish a meaningful relation of trust. Of course, there are people who are capable of reaching a high level of intimacy in a research situation, but we are inclined to think that there are few such people. The fact that participation in the study is voluntary does not make any difference in this respect. It would be naive to think that it is possible to find a research group that, after one or two sessions with a researcher, would be able to reveal themselves to a considerable degree. Such a group would be possible only if it consisted of people who are on familiar terms with the researcher. Then the relation of trust could take place thanks to their prior acquaintance/familiarity; at the same time it could lead to even more intensive efforts on the part of the participant to build up their self-image, making use of what the researcher already knows.

Thus, what we can do is to analyse a communication using methods that will allow us to reconstruct the meaning in such a way as to gain inside into an individual person's experience, to see what is hidden, to hear what is left unsaid... and say it in the form of a story.

*Translated by Małgorzata Bieleń*

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## GUIDELINES FOR CONTRIBUTORS

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](mailto: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 reprints 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.

Following the APA standards we propose using "Podstawowe 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](http://www.liberilibri.pl)).

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

Book: one, two, or more authors:

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

Article in a scholarly journal:

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.).

Charismatic leadership:

The exclusive factor in organizational effectiveness. San Francisco: Josey Bass, 122-160.

Titles of publications in languages other than English should be given in English in square brackets after the title of the original:

Wojciszke, B. (2002). Człowiek wśród ludzi. [A man among men]. Warszawa: Wydawnictwo Naukowe „Scholar”.

Taken from the internet: “When writing in APA Style, you can use the first person point of view when discussing your research steps (‘I studied...’) and when referring to yourself and your co-authors (‘We examined the literature...’). Use first person to discuss research steps rather than anthropomorphising the work. For example, a study cannot ‘control’ or ‘interpret’; you and your co-authors, however, can.”

“APA Style encourages using the active voice (‘We interpreted the results...’). The active voice is particularly important in experimental reports, where the subject performing the action should be clearly identified (e.g. ‘We interviewed...’ vs. ‘The participants responded...’).”

“Clarity and conciseness in writing are important when conveying research in APA Style. You don’t want to misrepresent the details of a study or confuse your readers with wordiness or unnecessarily complex sentences.”

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.

Abbreviations like etc., e.g. are used only in parentheses ( ) or brackets [ ]. In the running text, that is, outside parentheses or brackets, these abbreviations should be written out: and so on, for example, such as.

“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.

Example:

**before:** “Further analysis of the test results referred to the assessment of the dependency of...”

**after:** “Further test results assessed the dependency of...”

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