

Marta Szpak *
Marta Bialecka-Pikul **

Attachment and alexithymia are related, but mind-mindedness does not mediate this relationship

Abstract: The main aim of the study was to check: (a) attachment-related differences in alexithymia and (b) the mediating role of mind-mindedness in attachment-alexithymia relationship. Method: Attachment (PAM; Berry et al., 2007), alexithymia (TAS-20; Bagby, Taylor, & Parker, 1994) and mind-mindedness ("describe your friend" method; Meins et al, 2008) were measured in the sample of 128 Polish undergraduates. Results: Positive associations were seen between attachment anxiety and overall alexithymia scores and difficulty identifying emotions. Attachment avoidance was positively associated with overall alexithymia score, difficulty describing feelings and externally oriented thinking. Mind-mindedness was not related to neither attachment or alexithymia. Conclusion: There are attachment-related differences in alexithymia, but mind-mindedness seems not to mediate attachment-alexithymia relationship.

Key words: alexithymia, attachment, mind-mindedness, mentalizing

Introduction

The term "alexithymia" refers to a specific disturbance in emotional processing that is manifested by difficulties in identifying and describing feelings, difficulties in distinguishing feelings from bodily sensations of emotional arousal, a constricted fantasy life, and an externally oriented cognitive style (Taylor & Bagby, 2004). Researchers have revealed that alexithymia is broadly associated with various physical and mental health problems (Leweke, Leichsenring, Kruse, & Hermes, 2012). Nevertheless, despite extensive research, the etiology of alexithymia remains unclear (Taylor & Bagby, 2004). The most promising perspective guiding research on the etiology of alexithymia is attachment theory, which provides an account of how patterns of parent-infant interaction become self-regulating features of the child's personality (Kobak, Holland, Rayanne, & Fleming, 1993).

Attachment and alexithymia

The attachment relationship with main caregiver in childhood is considered as playing a fundamental role in the development of emotion regulation (Kobak, Holland, Rayanne, & Fleming, 1993). For example, neurobiological data support the role of attachment in

development of neural structures responsible for emotion regulation (Schore, 2000). Since alexithymia reflects difficulties in affective self-regulation, it is reasonable to claim that alexithymic features are strictly connected with an individual's attachment style. Indeed, links between insecure attachment and alexithymia have been confirmed in many studies with adults (e.g. De Rick & Vanheule, 2006; Hexel, 2003; Montebanocci, Codispoti, Baldaro, & Rossi; 2004; Picardi, Toni, & Caroppo, 2005), and alexithymia was related to perception of parenting both in clinical (De Rick & Vanheule, 2006) and nonclinical samples (Berry, Band, Corcoran, Barrowclough, & Wearden, 2007).

Nevertheless, most research report associations between insecure attachment and only general alexithymia score. That is, few studies examine different factors of alexithymia such as: difficulty in identifying emotions, difficulty in describing emotions and externally oriented thinking (Bagby, Taylor, & Parker, 1994). Recently it has been claimed that associations between attachment and alexithymia based on general measures may be simplified and thus misleading (Meins, Harris-Waller, & Lloyd, 2008). Since attachment characteristic are related to different regulatory strategies (Kobak et al., 1993) and different regulatory strategies may lead to different alexithymic features, it was hypothesized that: (a) attachment anxiety, associated with amplifying emotional experiences, can lead

* Institute of Psychology, Jagiellonian University, ul. Ingardena 6, 30-060 Cracow; marta.szpak@o2.pl

** Institute of Psychology, Jagiellonian University

to difficulty in identifying emotions, while (b) attachment avoidance, associated with minimizing emotions, can lead to an excessive focus on behavior (externally oriented thinking) (Meins, Harris-Waller, & Lloyd, 2008). Although the results of Meins et al. (2008) have confirmed attachment-related differences in alexithymia, Picardi, Toni and Caroppo (2005) reported that both attachment anxiety and avoidance were related to all alexithymia features. Given that the nature of attachment-alexithymia relationship remains unclear, the aim of presented study was to examine links between attachment and different alexithymia factors. Moreover we also intend to check if mind-mindedness mediates the relation between attachment and alexithymia.

Mind-mindedness as an explanatory mechanism

Mind-mindedness (MM) is a trait-like measure of individuals' *motivation* or *tendency* to deploy mentalizing ability, that is ability to refer to unobservable mental states such as emotions and beliefs (Meins, Fernyhough, Johnson & Lidstone, 2006; Meins, Harris-Waller & Lloyd, 2008). It was empirically proven that having mentalizing ability does not mean that it is spontaneously used. For example, a child that is able to pass mentalizing task does not necessarily make references to mental states when telling a story (Meins, Fernyhough, Johnson, & Lidstone, 2006). Interestingly, there is evidence that highly alexithymic people perform well in mentalising tasks (Wastell & Taylor, 2002). They also have access to emotional vocabulary, but are not *prone* to spontaneously employ it (Luminet, Rime, Bagby, & Taylor, 2004). Consequently, alexithymia is currently best framed in terms of deficit in *performance* rather than competence. Therefore, MM, as focused on *motivation* instead of the ability itself, might be an explanatory mechanism of relation between attachment and alexithymia (Meins et al., 2008).

Meins, Harris-Waller and Lloyd's study (2008) showed that MM was a mediating factor in the relation between attachment avoidance and externally oriented thinking, but did not mediate any other attachment-alexithymia links. We agree with Meins and co-workers (2008) that externally oriented thinking is one of the three factors of alexithymia that most clearly involves probably a conscious decision (*motivational* aspect) to not explore mental states. Therefore it may be the best expression of individuals' tendency to use their emotional understanding (that is, mind-mindedness).

Nevertheless, we also postulate that the lack of mediating role of MM in attachment anxiety-alexithymia is consistent with characteristics linked to attachment anxiety. Firstly, attachment anxiety is associated with amplifying emotional experiences (Kobak et al., 1993), so people who have high attachment anxiety should actually be more focused on their own internal states. Secondly, because attachment anxiety is related to the fear of being abandoned by important others (Bartholomew & Horowitz, 1991),

people with high attachment anxiety may be excessively preoccupied by other people's mental states (e.g. does he/she really like me? Is she/he think I am a nice person?). For example, the fear of abandonment is the characteristic feature of borderline personality disorder (BPD). Although people suffering from BPD have severe problems with understanding social situations (see Preißler, Dziobek, Ritter, Heekeren, & Roepke, 2010), Fertuck and co-workers (2009) found that those people were better than healthy, control group in standard mentalizing task that requires emotion recognition.

In sum, in our replication study we hypothesized that (a) attachment avoidance would be associated positively with externally oriented thinking, difficulty in describing emotions and the overall alexithymia; (b) attachment anxiety would be associated positively with difficulty in identifying emotions, difficulty in describing emotions and the overall alexithymia; but (c) mind-mindedness would mediate only the relation between attachment avoidance and alexithymia.

Method

Participants

The participants were 128 Polish undergraduate students (36 men), aged 19-30 ($M = 22.22$, $SD = 2.06$). Women ($M = 22.61$, $Mdn = 23$, $SD = 2.33$) and men ($M = 22.07$, $Mdn = 22$, $SD = 1.94$) were in similar age ($U = 1465$, $z = -1.02$, $p = .305$). No incentive was offered for participation.

Measures

Attachment. General attachment was assessed using the Psychosis Attachment Measure (PAM; Berry et al., 2007). The questionnaire is based on the Bartholomew and Horowitz's (1991) model of attachment, and it yields scores on two dimensions: attachment avoidance and attachment anxiety. Attachment anxiety is the experience of dependence, worry, low self-worth, desire to be very close to the attachment figure, and fears of being abandoned, while attachment avoidance comprises negative expectations of relationships and fears of emotional closeness and intimacy (Griffin & Bartholomew, 1994).

The Psychosis Attachment Measure (PAM) includes 16 items referring to thoughts, feelings, and behaviors in close interpersonal relationships. Respondents are asked to rate the extent to which each item applied, using a four-point Likert scale ranging from 0 = "not at all" to 3 = "very much". Attachment anxiety and avoidance are calculated separately as the sum of anxiety/avoidance items divided by eight (each scale consists of eight items). Thus the results for each scale vary from 0 to 3. Higher scores indicate greater attachment anxiety and avoidance. The internal consistency of each dimension was acceptable. Cronbach's alphas for the anxiety and avoidance dimensions were 0.76 and 0.78¹.

Alexithymia. Alexithymia was assessed using the

¹ Although PAM was developed as a questionnaire measuring adult attachment style specifically for use with people with psychosis, it was also successfully used with non-clinical student sample (see e.g. Berry, Wearden, Barrowclough, & Liversidge, 2006; Berry, Band, Concoran, Barrowclough, & Wearden, 2007). On the purpose of this study, measures were translated into Polish with the original authors' approval. The questionnaire was also used in different studies, and factor analysis conducted on the sample $n = 494$ revealed two-factor structure, analogous to original questionnaire. Further information can be obtained from the first author.

Polish version of the Toronto Alexithymia Scale-20 (TAS-20; Bagby, Taylor, & Parker, 1994; Cedro, Kokoszka, & Popiel, 2001). The questionnaire consists of 20 items, which participants are asked to rate using a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. The 20 items cover the three dimensions of alexithymia: (a) Difficulty Identifying Feelings (DIF; 7 items), (b) Difficulty Describing Feelings (DDF; 5 items), and (c) Externally Oriented Thinking (EOT; 8 items). The total alexithymia score is the sum of responses to all 20 items (ranging from 20 to 100), while the subscale scores are the sums of the subscale items. Higher TAS-20 total scores indicate greater alexithymia. Factor analysis of the Polish version of the scale identified three factors identical to the factors on the English version, and the reliability of the Polish version is acceptable for research (Cedro, Kokoszka, & Popiel, 2001).

Mind-mindedness. Mind-mindedness was assessed using the "describe your friend" method (Meins, Harris-Waller & Lloyd, 2008). Participants were asked to write description of a close friend. Following the procedure from original study (Meins, Harris-Waller & Lloyd, 2008), the instruction was phrased: "Think of a person you regard as a very close friend. Please use the space below to tell us a little about this person". A space of 14 lines was provided for each description.

The resulting description was divided into single characteristics, each of which was placed into one of the following mutually exclusive and exhaustive categories adapted from Meins et al.'s (2008) coding system: (a) Mind-minded: any references to the friend's mental life, for example, emotions, intellect, or imagination (e.g., "he has a great imagination"); (b) Behavioral: descriptions that could be interpreted on a purely behavioral level (e.g., "he likes jogging"); (c) Physical: comments on physical characteristics (e.g., "he's tall"), including age; (d) Self-referential: comments in which the primary focus was the agent, rather than the friend (e.g., "I can count on him"); (e) Relationship: comments that focused on properties of the relationship rather than either of the individuals involved (e.g., "we met in high school"); and (f) Other: descriptions which did not fit into any of the above categories (e.g., the friend's name), including non-specific value judgments (e.g., "he's great").

The score for mind-mindedness was calculated by dividing the number of mental characteristics by the number of all given characteristics. Proportional expression was used to control for variation in answer length. Higher scores indicated greater mind-mindedness. Participants' descriptions of friends were coded by a trained researcher. A randomly selected subsample of 41 descriptions was coded independently by a second researcher. Inter-rater reliability was 0.93.

Procedure

All participants were handed with booklet including the three inventories described above. The participants provided information on gender, age, university department and signed the agreement statement on a cover sheet.

Results

All statistical analysis were conducted using SPSS 21. Data analysis started with the assessment of the missing data. It occurred that all participants filled out PAM ($n = 128$), nevertheless three participants did not answer one of the question in the questionnaire. In those cases, the missing data were replaced with approximate average score of the rest of the answers in particular scale (e.g. if the average score for 7 questions equals 2.1, the missing value was replaced with 2). Two people (women) did not filled out TAS-20 ($n = 126$ participants included in further analysis). Although three participants did not answer one of the questions, the missing data were replaced with approximate average score of the rest of the answers in particular scale. Finally, 18 participants did not write the description of the friend. Thus 110 descriptions were analyzed. All information about the number of participants that have scores in particular variables are presented in Table 1 (See next page).

Further analysis of data, based on outlier labeling rule with recommended $k = 2.2$ (Hoaglin, & Iglewicz, 1987), did not reveal any outliers².

Descriptive statistics and preliminary analyses

Descriptive statistics for alexithymia, attachment and mind-mindedness are shown in Table 1. A total of 110 descriptions of the friend were returned (86%), and 40 participants (36% from 110) failed to include any mind-minded descriptions. The lack of mind-minded descriptions was the most frequent value, and the median value was 0.22. Consequently, following Meins et al. (2008) we dichotomize MM variable (mind-minded present versus mind-minded absent).

There were no gender differences in MM (present vs absent; $\chi^2(1) = 2.74, p = 0.098, \phi = .16$) and in alexithymia ($M_f = 49.01, M_m = 48.94, t(124) = 0.03, p = 0.974, d < 0.01$), but there were sex differences in attachment characteristics. Women had higher score in attachment anxiety ($M_f = 1.20, M_m = 1.00, t(126) = 1.87, p = 0.063, d = 0.35$), while men scored higher on attachment avoidance ($M_f = 1.27, M_m = 1.50, t(126) = -1.98, p = 0.049, d = -0.40$).

² When the $k = 1.5$ was used (Hoaglin, Iglewicz, & Tukey, 1986) or when data were being screened for observations that were above/below three standard deviations from the mean (Osborne & Overbay, 2004), only one outlier were found in anxiety attachment variable distribution. Exclusion of this observation did not change the effects reported in the paper. In case of variables that were not normally distributed, nonparametric correlation analysis was used, thus the ranking of data eliminated possible problem with outliers.

Table 1. Descriptive statistics

	<i>N</i>	<i>Range</i> (possible range)	<i>M</i>	<i>Mdn</i>	<i>SD</i>	<i>Shapiro-Wilk's test</i> (<i>p</i>)
TAS-20	126	22 – 72 (20 – 100)	48.99	49.00	10.23	.986 (.201)
DIF	126	7 – 27 (7 – 35)	17.50	17.00	5.01	.971 (.008)
DDF	126	5 – 24 (5 – 25)	13.75	14.00	4.58	.975 (.019)
EOT	126	8 – 30 (8 – 40)	17.74	17.00	4.54	.965 (.003)
Anxiety	128	0.00 – 3.00 (0.00 – 3.00)	1.14	1.13	.56	.983 (.121)
Avoidance	128	0.13 – 2.88 (0.00 – 3.00)	1.33	1.25	.58	.986 (.224)
Mind-mindedness	110	0 – 1 (0 – 1)	.27	.22	.27	.872 (< .001)

Table 2. Associations between attachment and alexithymia (*N* = 126)

	Avoidance		Anxiety	
	<i>Pearson's r</i>	95% CIs	<i>Pearson's r</i>	95% CIs
TAS-20	0.38**	[0.23 – 0.50]	0.24*	[0.08 – 0.40]
	<i>Spearman's rho</i>		<i>Spearman's rho</i>	
DIF	0.07	[-0.11 – 0.23]	0.41**	[0.26 – 0.55]
DDF	0.44**	[0.28 – 0.58]	0.13	[-0.03 – 0.29]
EOT	0.29**	[0.12 – 0.45]	0.04	[-0.15 – 0.21]

Note: The type of analysis of correlations was chosen on the basis of variable distribution (see Descriptive Statistics in Table 1); one-tailed tests; * $p < 0.005$, ** $p < 0.001$; the 95% bootstrapped confidence interval are based on 1000 replications.

Attachment, alexithymia, and mind-mindedness

Associations between alexithymia and attachment characteristics are shown in Table 2. Both attachment anxiety and attachment avoidance were associated positively with overall alexithymia score. Anxiety was also correlated positively with DIF, and avoidance was positively related to DDF and EOT. All effects sizes were ranging from moderate to large.

The lack or presence of MM description did not differentiate neither attachment anxiety ($M_{MM} = 1.17$, $M_{non-MM} = 1.15$, $t(108) = .15$, $p = .88$, $d = .04$), attachment avoidance ($M_{MM} = 1.35$, $M_{non-MM} = 1.25$, $t(108) = .93$, $p = .357$, $d = .20$), general alexithymia ($M_{MM} = 48.47$, $M_{non-MM} = 49.34$, $t(106) = -0.43$, $p = 0.668$, $d = -0.08$) nor externally oriented thinking ($M_{MM} = 17.23$, $M_{non-MM} = 18.63$, $t(106) = -1.55$, $p = 0.125$, $d = -0.30$). Given these results, no further analysis examining mediating role of MM in attachment-alexithymia relationship was conducted.

Discussion

The main aim of the present research was to examine relation between attachment and alexithymia and also to test if mind-mindedness is a mediating factor in this relation. As we hypothesized, attachment characteristics were associated with alexithymia. The higher attachment anxiety and/or avoidance, the higher alexithymia. Furthermore, attachment anxiety was positively correlated with difficulty in identifying emotions, whereas attachment avoidance was positively correlated with difficulty in describing emotions and externally oriented thinking.

Our results demonstrate a significant association between attachment characteristics (anxiety and avoidance) and alexithymia (total score), and thus support findings from previous studies (e.g. De Rick & Vanheule, 2006; Hexel, 2003; Montebanocci, Codispoti, Baldaro, & Rossi, 2004; Picardi, Toni, & Caroppo, 2005). Moreover, our findings support Meins, Harris-Waller and Lloyd's (2008) original thesis that there are important attachment-related differences

in the three factors of alexithymia, and that the associations between attachment variables and alexithymia factors should be measured separately. The reported results may be of special interest for developmental psychopathologists. More specifically, as Meins and colleagues (2008) proposed, different attachment characteristics may lead to difficulties in emotion regulation, and thus may contribute differently to general alexithymia. Longitudinal research projects are thus needed to explain further developmental relations between attachment and alexithymia.

Regarding the role of mind-mindedness (MM) in attachment-alexithymia relationship, results showed that there were no associations found between MM and neither attachment nor alexithymia. Consequently, the present results are unable to confirm that MM is an explanatory mechanism. Nevertheless, it should be stressed that – similarly to Meins et al.'s study (2008) – there were many responses with no mind-minded statements and little variance in the overall frequency of mind-minded descriptions, thus the assessment of MM was equated with only the presence or absence of any references to the friend's mental life. It is possible that the instruction: "Think of a person you regard as a very close friend. Please use the space below to tell us a little about this person" could make a participant concentrate on the nature or quality of friendship rather than the specific person who is participant's best friend.

This proposition seems justified if we bear in mind that in original Meins et al.'s (1998) study, when mothers had to describe their children, there were five categories of these characteristics: mind-minded, behavioral, physical, general, and other. And in the study of MM in peer relationships (Meins, Harris-Waller, & Lloyd, 2006), two new categories were introduced: interpersonal and self-related characteristics. This suggests that many participants may not have thought about friend's characteristics but more about the general concept of friendship (e.g., "we are like sisters"), or about personal features that make somebody their friend (e.g., "he makes me smile"). Possibly, it may have been the instruction that was responsible for the paucity of mind-minded references and would thus be to use the alternative version of it. For example, future studies could ask the participant of the name of his/her friend and write it into instruction (e.g. "tell us a little about Mathew").

What is more, it should be also considered that the "describe your friend" method could measure only general ability to make description in neutral context. Currently it is postulated that mentalizing ability should be measured in the context of attachment system activation (see e.g. Fonagy, 2006). Thus it would be worth studying if descriptions of the friends differ depending on instruction: a general description and emotional situation with a friend (emotional, interpersonal context, e.g. argument, separation)³.

It is also worth discussing the interesting gender effects on attachment self-reports, that is women reported higher attachment anxiety and men higher attachment avoidance. These results are consistent with other studies on attachment which show that men are more likely than

women to endorse dismissing attachment style and less likely than women to endorse fearful attachment style (e.g. Bartholomew & Horowitz, 1991). This gender effect is also in accordance with studies which show that men are much less likely than women to express emotions associated with affiliation (Brody & Hall, 2000), and less likely to seek emotional support during the time of stress (Tamres, Janicki, & Helgeson, 2002). The question whether these differences stem from intrinsic stable features or are the results of socialization remains open. Nevertheless, it is clear that future attachment research should include gender as an important factor in attachment studies as well as utilize different measures than self-reporting measures.

Indeed, a general limitation of our study was that only self-report measures of attachment and alexithymia were used. One could argue that people with high alexithymia cannot adequately answer questions about their emotional experiences in close relationships because alexithymia is defined as a problem with reflecting and describing emotional experiences. Therefore, as Meins et al. (2008) suggested, it would be of interest to investigate the relation between attachment and alexithymia using interviews, such as the Adult Attachment Interview (George, Kaplan, & Main, 1985), and the Toronto Structured Interview for Alexithymia (Bagby, Taylor, Parker, & Dickens, 2006).

Apart from limitations of the study, the results reported here confirm that there are attachment-related differences in alexithymia, thus measuring only general alexithymia may mask important differences in associations between attachment features and different socio-cognitive aspects of functioning. Moreover, based on our results, it cannot be claimed that mind-mindedness explains relations between attachment and alexithymia. Further studies are needed to reject or support this idea. In future research it would be important to use non-self-reporting measures of alexithymia and attachment, and control for accuracy in the narration about close friends while measuring mind-mindedness. What is more, longitudinal studies examining developmental pathways of alexithymia features will be of great importance, as they may lead to better understanding of development of psychopathology.

References

- Bagby, R., Taylor, G., & Parker, J. (1994). The twenty-item Toronto Alexithymia Scale – II. Convergent, discriminant, and concurrent validity. *Journal of Psychosomatic Research*, 38, 33–40.
- Bagby, R., Taylor, G., Parker, J., & Dickens, S. E. (2006). The development of the Toronto Structured Interview for Alexithymia: Item selection, factor structure, reliability, and concurrent validity. *Psychotherapy and Psychosomatics*, 75, 25–39.
- Bartholomew, K. & Horowitz, L.M. (1991). Attachment Style Among Young Adults: A Test of a Four-Category Model. *Journal of Personality and Social Psychology*, 61, 226–244.
- Berry, K., Band, R., Corcoran, R., Barrowclough, Ch., & Wearden, A. (2007). Attachment styles, earlier interpersonal relationships and schizotypy in a non-clinical sample. *Psychology and Psychotherapy: Theory, Research and Practice*, 80, 563–576.
- Brody, L. R., & Hall, J. A. (2000). Gender, emotion, and expression. In M. Lewis & J. M. Haviland (Eds.), *Handbook of emotions* (2nd ed., pp.

³ We are grateful to one of the reviewers for this comment.

- 338–349). New York: Guilford Press.
- Cedro, A., Kokoszka, A., Popiel, A., & Narkiewicz-Jodko, W. (2001). Alexithymia in Schizophrenia: an Exploratory Study. *Psychological Reports, 89*, 95–98.
- De Rick, A. & Vanheule, S. (2006). The relationship between perceived parenting, adult attachment style and alexithymia in alcoholic inpatients. *Addictive Behaviors, 31*, 1265–1270.
- Fertuck, E., Jekal, A., Song, I., Wyman, B. Morris, M., Wilson, S. Brodsky, B., & Stanley, B. (2009). Enhanced 'Reading the Mind in the Eyes' in borderline personality disorder compared to healthy controls. *Psychological Medicine, 39*, 1979–1988.
- Fonagy (2006). The Mentalization-Focused Approach to Social Development. In J.G. Allen & P. Fonagy (Eds.), *Handbook of Mentalization-Based Treatment* (pp.53-99). London: John Wiley & Sons.
- George, C., Kaplan, N., & Main, M. (1985). *The adult attachment interview*. Unpublished manuscript, Department of Psychology, University of California at Berkeley.
- Griffin, D. & Bartholomew, K. (1994). Models of the Self and Other: Fundamental Dimensions Underlying Measures of Adult Attachment. *Journal of Personality and Social Psychology, 67*(3), 43–445.
- Hexel, M. (2003). Alexithymia and attachment style in relation to locus of control. *Personality and Individual Differences, 35*, 1261–1270.
- Hoaglin, D. C. & Iglewicz, B. (1987). Fine tuning some resistant rules for outlier labeling, *Journal of American Statistical Association, 82*, 1147–1149.
- Hoaglin, D. C., Iglewicz, B., & Tukey, J. W. (1986). Performance of Some Resistant Rules for Outlier Labeling. *Journal of the American Statistical Association, 81*, 991–999.
- Kobak, R., Holland, E., Rayanne, F., & Fleming, W. (1993). Attachment and Emotion Regulation during Mother-Teen Problem Solving: A Control Theory Analysis. *Child Development, 64*, 231–245.
- Leweke F, Leichsenring F, Kruse J, Hermes S. Is Alexithymia Associated with Specific Mental Disorders. *Psychopathology, 45*, 22–28.
- Luminet, O., Rime, B., Bagby, R., & Taylor, G. (2004). A multimodal investigation of emotional responding in alexithymia. *Cognition and Emotion, 18*, 741–766.
- Meins, E., Fernyhough, Ch., Russell, J., & Clark-Carter, D. (1998). Security of Attachment as a Predictor Symbolic and Mentalising Abilities: A Longitudinal Study. *Social Development, 7*(1), 1–24.
- Meins, E., Fernyhough, Ch., Johnson, F., & Lidstone, J. (2006). Mind-mindedness in children: Individual differences in internal-state talk in middle childhood. *British Journal of Developmental Psychology, 24*, 181–196.
- Meins, E., Harris-Waller, J., & Lloyd, A. (2008). Understanding alexithymia: Associations with peer attachment style and mind-mindedness. *Personality and Individual Differences, 45*, 146–152.
- Montebarocci, O., Codispoti, M., Baldaro, B., & Rossi, N. (2004). Adult attachment style and alexithymia. *Personality and Individual Differences, 36*, 499–507.
- Osborne, J.W. & Overbay, A. (2004). The power of outliers (and why researchers should always check for them). *Practical Assessment, Research & Evaluation, 9*(6).
- Picardi, A., Toni, A., & Caroppo, E. (2005). Stability of Alexithymia and Its Relationships with the 'Big Five' Factors, Temperament, Character, and Attachment Style. *Psychotherapy and Psychosomatics, 74*, 371–378.
- Preißler, S., Dziobek, I., Ritter, K., Heekeren, H.R., & Roepke, S. (2010). Social Cognition in Borderline Personality Disorder: Evidence for Disturbed Recognition of the Emotions, Thoughts, and Intentions of others. *Frontiers in Behavioral Neuroscience, 4*, 182.
- Schore, A.N. (2000). Attachment and the regulation of the right brain. *Attachment & Human Development, 2*(1), 23–47.
- Tamres, L., Janicki, D., & Helgeson, V. S. (2002). Sex differences in coping behavior: A meta-analytic review. *Personality and Social Psychology Review, 6*, 2–30.
- Taylor, G.J. & Bagby, R.M. (2004). New Trends in Alexithymia Research. *Psychotherapy and Psychosomatics, 73*(2), 68–73.
- Wastell, C.A. & Taylor, A.J. (2002). Alexithymic mentalising: Theory of mind and social adaptation. *Social Behavior and Personality, 30*(2), 141–148.

Acknowledgments

We are most grateful to prof. Kokoszka for providing us with TAS-20, and to Sandra Bosacki and dr Grzegorz Iniewicz for valuable comments on first draft of the paper. We are also most grateful for anonymous reviews which helped to improve the final version of the paper.