

# Alexithymia and Adult Attachment: Investigating the Mediating Role of Fear of Intimacy and Negative Mood Regulation Expectancies

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**Abstract**

Literature suggests an association between alexithymia and insecure adult attachment, but the mediation factors involved in this relationship are under-investigated. The study was carried out to test the possible mediation roles of the fear of intimacy and negative mood regulation expectancies in explaining this relationship. A convenience sample of 258 Polish adults (mean age: 30; 45% male), completed self-reporting measures related to adult attachment (RAAS), alexithymia (TAS-20), fear of intimacy (FIS) and negative mood regulation expectancies (NMRE). The results showed that alexithymia directly and indirectly predicts insecure adult attachment. Alexithymia positively predicts the fear of intimacy, which, in turn, positively predicts insecure adult attachment. Finally, alexithymia negatively predicts NMRE which, in turn, predict insecure adult attachment. It emerges from our data that the fear of intimacy and NMRE may be mediating factors in the relationship between alexithymia and adult attachment. Limitations, future directions of research and guidance for intervention are discussed.

**Keywords**

Alexithymia, fear of intimacy, negative mood regulation, adult attachment

**Introduction**

In recent decades, clinicians and researchers have paid increasing attention to the multifaceted personality construct called alexithymia (Keefer et al., 2019). The term alexithymia refers to a cognitive and affective disorder that is characterized by the following four salient aspects: i) problems identifying feelings and distinguishing them from the bodily sensations associated with emotional arousal ii) problems with describing individual's feelings verbally; iii) restricted imaginal processes; and iv) a specific and externally oriented cognitive style (Zackheim, 2007).

High levels of alexithymia may adversely affect the lives of individuals, affecting psychological well-being and quality of relationships with others (Greene et al., 2020; Prino et al., 2019).

***Alexithymia and insecure adult attachment***

It has been proven that there is an association between alexithymia and adult attachment (Lyvers, Edwards, et al., 2017; Lyvers, Mayer, et al., 2019; Taylor et al., 2014, Thorberg et al., 2011a, 2011b; Zakhour et al., 2020; Zdankiewicz-Ścigala & Ścigala, 2018). Adult attachment refers to the tendency to pursue and preserve proximity to and relationship with one or a few co-specifics, who ensure the subjective potential for safety and security on the physical and psychological

level. In accordance with the attachment theorists (Bartholomew, 1990; Mikulincer & Shaver, 2012), children build relational models characterized by the representation of themselves, the other and the relationship between themselves and others, based on their primary experiences with caregivers and the way in which these caregivers respond to children's needs for support and protection.

Representations of childhood attachment may be stabilised by influencing the adult attachment style, and therefore, insecure attachment in childhood may contribute to the maintenance of forms of adult insecure attachment, characterized by the fear of abandonment by a partner or the fear of intimacy (Bartholomew, 1990; Fabris et al., 2018). Various evidence seems to suggest that dysfunctional parenting and insecure attachment in childhood tend to promote alexithymic traits (Lyvers, Mayer, et al., 2019), and it is therefore possible that, given the tendency of attachment patterns to be stable over time, adults with alexithymia are more at risk of reporting an insecure attachment to their partners.

In fact, in this way, studies seem to indicate a negative association between alexithymic traits and secure attachment in adults, thus indicating that individuals characterized by the high levels of alexithymia show a tendency to be more fearful of being unloved and are comfortable with being intimate with a romantic partner (Taylor et al., 2014; Thorberg et al., 2011a, 2011b). It is therefore possible that alexithymic patients may develop relational fears, characterised by fear of abandonment or fear of closeness (van Dijke & Ford, 2015; van Dijke et al., 2018). In this direction, considering the difficulty in emotional regulation, alexithymic subjects may deploy attachment avoidance and deactivation strategies, resulting in a reluctance to rely on significant others for support in times of difficulty. These avoidance and deactivation of attachment strategies can be considered a defensive strategy with respect to the fear of closeness and the discomfort related to the intimate relationship with the partner. However, by resorting to emotion avoidance and suppression strategies, alexithymic individuals accumulate discomfort with intimacy and tend not to share the emotional aspects of their experiences with others, thus impoverishing social relationships, including those with their partners (Gross & John, 2003).

However, despite various evidence supporting an association between alexithymia and insecure attachment, little investigation has taken place of possible mediation factors in the reality between the two constructs. With this contribution, it was the authors' intention to test, in a non-clinical population, the possible role of two theoretically expected mediating factors: the fear of intimacy and negative mood regulation.

### *Fear of intimacy as a possible mediating factor*

It has been suggested in the model of interpersonal process (Reis & Shaver, 1988) that close and intimate relationships develop when two people mutually exchange vulnerable self-disclosures, are responsive to the other's disclosures,

and perceive the other's responses as being responsive. The fear of intimacy, defined as the individual's inhibited ability to share thoughts and emotions of personal significance with other important individuals due to personal anxiety and fear (Descutner & Thelen, 1991), conflicts with the ability to form close and intimate relationships (Doi & Thelen, 1993). Some evidence suggests that high levels of alexithymia tend to positively associate with the fear of intimacy (Lyvers, Edwards, et al., 2017). Taken as a whole, these data reflect the idea that people, who have a deficit in verbally identifying and expressing their emotions, may have difficulties dealing with their partner's emotions and fear forming emotional contact with people. With regard to this, in a small sample of young adults, Lyvers, Edwards, et al. (2017) identified the fear of intimacy's possible mediating role in the relationship between alexithymia and insecure adult attachment. It is therefore possible that alexithymic subjects may establish a form of insecure attachment as a result of their poor ability to enter into emotional contact with their partners and experience emotions in their relationships, or that an insecure attachment, especially avoidance, may somehow protect the alexithymic subjects with respect to the discomfort experienced in relation to intimacy with their partners.

However, to our knowledge, this is the exclusive study to have identified a possible mediating role of the fear of intimacy in the relationship between alexithymia and insecure attachment, and no other variables have been included in the model. Nevertheless, the fear of intimacy tends to be associated with a poor perceived ability of subjects to terminate, manage, or relieve negative states of mood (Lyvers et al., 2008; Thorberg & Lyvers, 2010), and an interesting point is the result of placing the two constructs within a theoretical frame that considers attachment as a system of interpersonal emotional regulation.

### *Negative mood regulation expectancies as a possible mediating factor*

Negative mood regulation expectancies (NMRE), represent more specifically meta-cognitive aspects of emotional regulation, i.e. how an individual evaluates and perceives his/her mood-regulatory abilities (Catanzaro & Mearns, 1990, 2016).

Therefore, it is possible that individuals who perceive themselves as having better skills in terms of managing problems and coping with negative emotions tend to resort to more functional and adaptive coping strategies to improve their moods and develop healthy and effective emotional regulation strategies (Catanzaro & Mearns, 2016). Some evidence suggests that alexithymia may be a predictor of NMRE, thus indicating that alexithymic individuals tend to be characterized by a poor negative emotion regulation (Lyvers, Brown, et al., 2019; Lyvers, Kohlsdorf, et al., 2017; Spence & Courbasson, 2012; Thorberg et al., 2019).

Insecure attachment experiences may have undermined the emotional regulation skills in alexithymic subjects, which, in turn, may have developed with

experience metacognitions that support a negative perception of their own emotion management skills. These perceptions may therefore influence the subjects throughout adult life, including their relationships with their partners. According to the hyperarousal model of alexithymia, alexithymic individuals tend to be affected by extended autonomic hyperreactivity, given that alexithymia is connected with raised levels of sympathetic arousal due to emotional stimuli (Thorberg et al., 2019).

Emotional regulation deficits may increase negative mood and distress in those with alexithymia (Lyvers, Brown, et al., 2019; Lyvers, Kohlsdorf, et al., 2017), and this may prompt these individuals to adopt dysfunctional strategies to manage negative moods or avoid situations that solicit emotional stimuli (Lyvers, Brown, et al., 2019; Lyvers, Kohlsdorf, et al., 2017; Spence & Courbasson, 2012). As a consequence, it is possible that the perception of poor negative mood regulation skills strengthen, in subjects with high levels of alexithymia, the development of insecure forms of adult attachment, expressing anxiety and avoidance in relationships with significant others, leading them to resort to dysfunctional and avoidance-based coping strategies.

Insecurely attached adults tend to present less self-confidence in their emotional regulation skills, which makes them more hypervigilant to threat cues. Such individuals may develop a tendency to create more catastrophic interpretations of such threat cues, or may be pushed to distance the self from distressing situations thereby suppressing their emotions (Goldstein et al., 2019). It is therefore possible that, on the basis of their evolutionary experiences, adult alexithymic subjects maintain insecure attachment by associating it with NMRE.

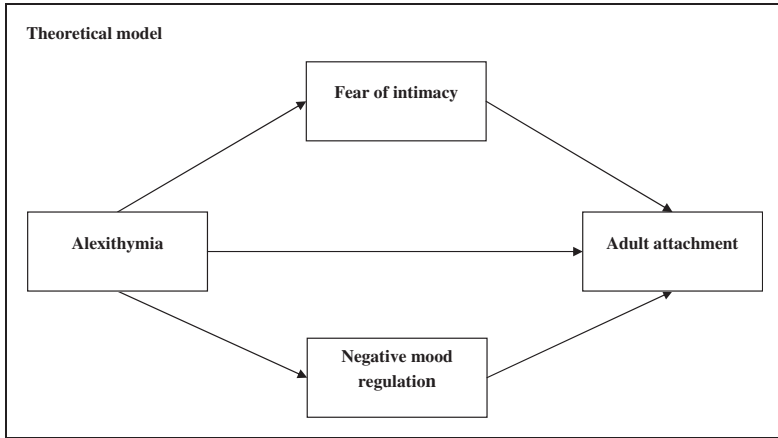
### *The purpose of this study*

Based on the aforementioned theoretical framework, the objective of this article was to analyse the relationship between alexithymia and insecure attachment, mediated by the fear of intimacy and negative mood regulation as shown in Figure 1. The assumption was made in this study that alexithymia predicts insecure attachment both directly and indirectly. In the latter case, a hypothesis was formulated that alexithymia positively predicts the fear of intimacy and negatively predicts NMRE. In addition, it was assumed that both the fear of intimacy and NMRE predict insecure attachment, positively and negatively, respectively.

## **Method**

### *Participants*

Convenient sampling was used to select participants for the research. The sample comprised 258 participants with an average age of 30.29 ( $SD = 7.27$ ,



**Figure 1.** Hypothesized model. Total indirect effect.  $b = .21$ . 95% CI  $[-0.2723; -0.1594]$ .

Min. = 20, Max. = 50). In the sample, 54.7% were females ( $n = 141$ ) and 45.3% were males ( $n = 117$ ).

### Instruments

*Socio-demographic characteristics.* Subjects were asked to provide the socio-demographic information: age and gender.

*The Toronto Alexithymia Scale - 20 (TAS-20; Parker et al., 1993).* In order to investigate the level of alexithymia, the Toronto Alexithymia Scale-20 was applied. Except for the general level of alexithymia, the questionnaire enabled to calculate separate scales for such dimensions as: “difficulty in identifying feelings”, “difficulty in describing feelings” and “externally oriented style of thinking.” The survey form included 20 test items, and each of them was assessed according to a five-point Likert scale (1 – strongly disagree; 2 – partially disagree; 3 – undecided; 4 – partially agree; 5 – strongly agree). Examples of questions from TAS scale are: for the DIF scale “*I am often confused about what emotion I am feeling.*”; “*I have physical sensations that even doctors don’t understand.*”; for the DDF scale “*It is difficult for me to find the right words for my feelings.*”; “*I find it hard to describe how I feel about people.*” and for EOT scale “*I prefer to watch “light” entertainment shows rather than psychological dramas.*”; “*Looking for hidden meanings in movies or plays distracts from their enjoyment.*”. The range of the scale is from 20 to 100 points, and it proved to be a reliable and precise tool. As for the Polish version, the Cronbach’s alpha coefficient was .86 for the general score; .75 for the “difficulty in describing feelings” scale; .81 for the “difficulty in identifying feelings” scale; and .64 for the “externally oriented

style of thinking” scale (Ścigała et al., 2020). In the present sample, the Cronbach’s alpha reliability coefficient for total the score amounted to .86.

*The Revised Adult Attachment Scale - Close Relationship Version (RAAS; Collins, 1996; Collins & Read, 1990).* The Revised Adult Attachment Scale constitutes an 18-item tool to measure adult attachment style. It comprises the following three subscales: close, depend, and anxiety. The close subscale serves to measure the level of comfort that a person feels with closeness and intimacy. Examples of questions from this scale are: “*I find it relatively easy to get close to people.*”; “*I don’t worry about people getting too close to me.*” The depend subscale was designed to evaluate whether an individual feels he/she may rely upon others to be available when needed. The questions that relate to this dimension are: “*I am comfortable depending on others.*”; “*I find it difficult to allow myself to depend on others.*” Whereas the anxiety subscale is intended to measure the level of anxiety that a person feels about being rejected or unloved. Examples of question from the anxiety scale are: “*I often worry that other people don’t really love me.*”; “*I want to get close to people, but I worry about being hurt.*”

High values on the subscale of close and depend, and low values on the subscale of anxiety, provide for a secure attachment style. A five-point Likert scale is used to assess each item, with some points being reverse scored. The RAAS has proven to be of appropriate validity and reliability (Collins & Read, 1990). In the present study, the Cronbach’s alphas amounted to .83 for anxiety, .80 for depend, and .81 for close, respectively. It is necessary to mention that the RAAS is not used to assess attachment styles but continuous dimensions of attachment hypothesized to underlie adult attachment (Collins, 1996). Therefore, in the present study, the following formula was used to index the secure attachment:  $(\text{close} + \text{depend})/\text{anxiety}$  (Lyvers, Edwards, et al., 2017).

*The Fear of Intimacy Scale (FIS; Descutner & Thelen, 1991).* The tool was created in order to estimate an individual’s inability to communicate thoughts and feelings in a close relationship or when a person feels the opportunity of a close relationship. It is a 35-item measure where a five-point Likert scale ranging from 1 (not at all characteristic of me) to 5 (extremely characteristic of me) is applied. Examples of questions on described scale are: “*I would find it difficult being open with my Partner about my personal thoughts.*”; “*I would feel comfortable keeping very personal information to myself.*”; “*I would feel at ease to completely be myself around my Partner.*”; “*I would feel at ease telling partner that I care about him/her.*” Higher values on the scale prove a higher level of the fear of intimacy. The construction of items is based on three defining features, i.e. content (the conveyance of personal information), emotional valence (strong feelings about the personal information exchanged), and vulnerability (high regard for the intimate other). In the present sample, the Cronbach’s alpha reliability coefficient reached the value of .87.

*The Negative Mood Regulation (NMR; Catanzaro & Mearns, 1990).* The Negative Mood Regulation Scale is a 30-item tool developed by Catanzaro and Mearns (1990). The purpose of this tool is to measure generalized expectancies aimed to alleviate negative moods. Subjects are asked to specify the extent to which they believe their use of various coping strategies may prevent a negative mood condition. The scores for each item are provided on a five-point Likert scale ranging from “strongly disagree” to “strongly agree”, and responses are intended to complete a statement: “When I’m upset I believe that...”. Example items included the following: “I can do something to feel better”, “planning how I deal with things will help,” and “wallowing in it is all I can do.” It has been shown in the factor analysis that the NMR scale is unidimensional (Catanzaro & Mearns, 1990). A high score indicates a strong belief that an individual is able to relieve his/her negative moods through non-pharmacological means. The NMR scale correlates, in theoretically predicted ways, with instruments for the assessment of anxiety, depression, emotional states, and coping responses, and has presented discriminant validity regarding social desirability, depression, and the locus of control (Catanzaro & Greenwood, 1994; Catanzaro & Mearns, 1990; Mearns, 1991). In the discussed sample, the Cronbach’s alpha reliability coefficient amounted to .88.

### *Procedure*

The study was carried out pursuant to the recommendations by the University of Social Sciences and Humanities Ethics Committee, and based on informed consents in writing, which were obtained from all participants. All procedures adopted in the study, which involved the participation of humans, complied with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration, as amended, or other comparable and equivalent ethical standards. Before moving on to the questionnaire pack, participants were requested for their consent to participate, and they were informed on how to complete the questionnaire, as well as how to withdraw from the study. They were also informed that their participation was voluntary and anonymous.

Due to the type of research, only people who have been in a romantic relationship for at least six months participated in the procedure. Participants were encouraged to answer the questions as truthfully as possible and were guaranteed anonymity when filling out the questionnaires. Respondents completed the same questionnaire pack individually. Furthermore, the participants did not receive credit for its completion.

### *Data analysis*

IBM SPSS Statistics Version 26 software was applied for all data analyses in this study. Initially, descriptive statistics were computed on sociodemographic



**Table 1.** Means, standard deviations and bivariate correlations of variables under study.

	<i>M</i>	<i>SD</i>	<i>Skew</i>	<i>Kur</i>	1	2	3	4
1. Age	30.29	7.27	0.85	-0.17	-			
2. Alexithymia	46.14	13.02	0.17	-0.86	-.06	-		
3. Adult Attachment formula	2.93	1.49	.94	0.37	.03	-.47***	-	
4. Fear of intimacy	74.63	23.23	0.63	-0.24	.03	.42***	-.50**	-
5. Negative mood regulation	98.29	16.60	-0.31	-0.31	.12	-.43***	.42***	-.44***

Note: *M*: Mean, *SD*: Standard Deviation, *Skew* = Skewness, *Kur*= Kurtosis.

Adult Attachment formula is (close+depend)/anxiety (Lyvers et al., 2017).

\*\*\* $p < .001$ .

information and study variables. The calculation of skewness and kurtosis values was carried out in order to check the normality of the data. Due to the fact that they fell between +1 and -1 (see Table 1), the data were considered to have a normal distribution (Tabachnick & Fidell, 2013). Further, Pearson correlation coefficient tests were carried out to examine the relationships between the research variables.

Ultimately, a test was performed on a parallel multiple mediation model. Two variables (i.e., the fear of intimacy and negative mood regulation) were proposed as mediators of the relationships between the independent variable, i.e. alexithymia, and a dependent variable, i.e. adult attachment. The latter was determined as a result of the formula (close + depend)/anxiety According to what is definitive from RAAS scores, secure attachment in fact refers to high scores on closeness and dependence and low scores on anxiety (Lyvers, Edwards, et al., 2017). The parallel multiple mediation model was conducted with the use of SPSS PROCESS macro (Hayes, 2018). PROCESS enables to assess direct effects, indirect effects, standard errors, as well as confidence intervals based on the distribution obtained with the bias corrected and accelerated bootstrapping method. The mentioned method of bias-corrected bootstrapping does not assume the normality or symmetry of the sampling distribution of the indirect effect, and has been shown to be among the best methods (e.g., it is better than those generated using the simpler percentile method) for making inferences about an indirect effect (e.g., detecting averaged effects) while balancing validity and power consideration when an indirect effect exists (Hayes & Scharkow, 2013; Mackinnon et al., 2004; Preacher, 2015). Although in small to moderate sample sizes ( $N < 500$ ) it may slightly inflate the probability of a type I error (i.e., it may result in type 1 error rates slightly above the nominal 0.05 level) when either path a or b is moderate to large (e.g., .39 to .49) and the other path is zero (Fritz et al., 2012; Hayes & Scharkow, 2013; Valente et al., 2016).

In our study, both parameters  $a$  and  $b$  were different from zero, so the accelerated, bias-corrected bootstrapping method was chosen to test the significance of the averaged effect and create accurate confidence intervals for the averaged effect. A statistically significant indirect effect proves that the effect of the independent variable on the result is mediated by other variables. As per Hayes' (2018), the statistical significance of the indirect mediating effects of variables upon the bootstrap method is assessed depending on whether the point estimate of the mediating variable is zero within a 95% bias-corrected and accelerated confidence interval (BCa CI). Thus, an indirect effect was deemed statistically significant if the specific 95% bias-corrected bootstrap confidence interval did not contain "0". Hayes (2018) recommended that 10,000 bootstrap samples should be used for mediation analyses in the test from parallel multiple mediation. Therefore, data obtained from 10,000 bootstrap samples were used in the present study. Bootstrapping is a procedure of re-sampling where numerous sub-samples of the same size as the original sample are drawn randomly with replacement. Ultimately, various pairwise comparisons between specific indirect effects were carried out to assess whether one indirect effect was statistically different from another.

## Results

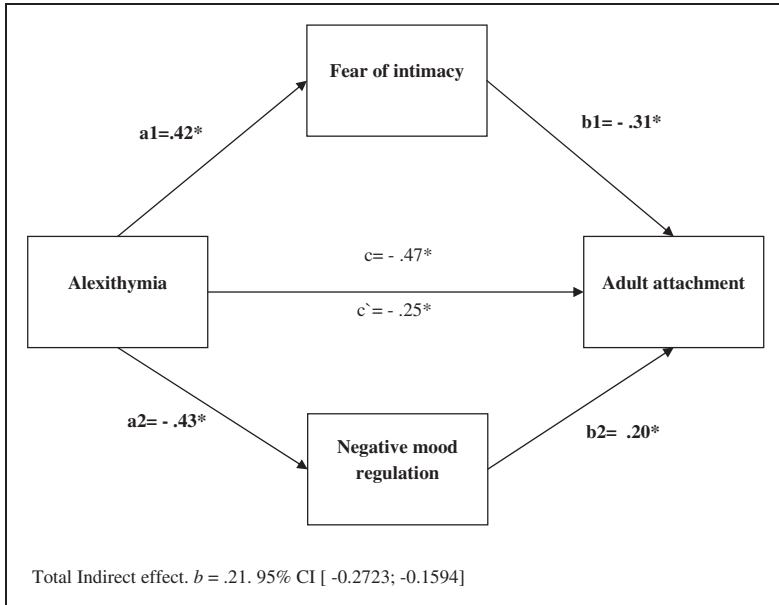
### *Descriptive and correlations*

Table 1 presents correlations, means, and standard deviations of variables under study. Correlations coefficients were established to determine the relationships among the variables. As expected, alexithymia correlated negatively with the adult attachment formula and negative mood regulation, and positively with the fear of intimacy. In addition, negative mood regulation correlated positively with the adult attachment formula, and the fear of intimacy correlated negatively with the adult attachment formula, as well (see Table 1).

### *Parallel mediation model explaining the adult attachment formula*

Figure 2 shows the findings of the tested model related to the parallel mediating roles of the fear of intimacy and negative mood regulation in the relationship between alexithymia and the adult attachment formula.

As it was shown in Figure 2, the total effect of alexithymia on adult attachment was statistically significant ( $c = -.47$ ,  $SE = .01$ ,  $t = 8.45$ ,  $p < .0001$ ) (step 1), confirming our Hypothesis that alexithymia predicts adult attachment. As expected, the alexithymia had a positive and direct effect on the fear of intimacy ( $b = .42$ ,  $SE = .06$ ,  $t = 7.40$ ,  $p < .0001$ ) and a negative and direct effect on the negative mood regulation ( $b = -.43$ ,  $SE = .06$ ,  $t = 7.67$ ,  $p < .0001$ ), both direct effects were statistically significant (step 2). Moreover, the fear of intimacy had a



**Figure 2.** Parallel-multiple mediation of fear of intimacy and negative mood regulation between alexithymia and adult attachment formula.

negative and direct effect on adult attachment ( $b = -.31$ ,  $SE = .01$ ,  $t = 5.28$ ,  $p < .0001$ ) and the negative mood regulation had a positive and direct effect on adult attachment ( $b = .20$ ,  $SE = .01$ ,  $t = 3.33$ ,  $p < .050$ ), both direct effects were statistically significant (step 3), as expected. Finally, when alexithymia and the mediating variable were simultaneously entered into the model (step 4), the direct effect of alexithymia on adult attachment fell down, however, the significance level did not change ( $b = -.25$ ,  $SE = .01$ ,  $t = 4.36$ ,  $p < .0001$ ). To explain further, the direct effect remained significant, indicating partial rather than full mediation, confirming our Hypothesis. That is, the mediation analysis indicated that the fear of intimacy and negative mood regulation partially mediated the relation between alexithymia and adult attachment. The tested model turned out to be statistically significant  $F_{(3, 254)} = 47.52$ ;  $p < .0001$ . The presented model explains 36% ( $R^2 = .36$ ) of the adult attachment formula scores' variability.

The bootstrap results for the mediating role of fear of intimacy and negative mood regulation in the link between alexithymia and adult attachment proved that both indirect paths for fear of intimacy ( $b = .13$ , 95% CI [-.18; -.09]) and negative mood regulation ( $b = .08$ , 95% CI [-.13; -.04]) were statistically significant, thus fully confirming our hypothesis. The total indirect effect, (i.e. the difference between the total and indirect effects/ $c-c'$ ), of alexithymia on adult

**Table 2.** The comparison of indirect effects of alexithymia on adult attachment formula through the fear of intimacy and negative mood regulation and its specific indirect effects.

Effects	Point estimate	SE	Product of coefficients		Boostrapping 95% CI	
			Z	p	Lower	Upper
Total indirect effects	.2142	.0287			-.2723	-.1594
Fear of intimacy	.1296	.0235	4.2750	<.0001	-.1784	-.0862
Negative mood regulation	.0846	.0246	3.0305	<.050	-.1332	-.0369

attachment through the fear of intimacy and negative mood regulation was statistically significant (point estimate  $b = .21$ , 95% CI  $[-.27, -.16]$ ) (see Table 2). The difference between the indirect effect of the fear of intimacy and negative mood regulation was not statistically significant (point estimate  $b = .05$ , 95% CI  $[-.12, .03]$ ).

## Discussion

The purpose of the study was to examine the association between alexithymia and insecure attachment in light of two possible mediators, i.e. the fear of intimacy and negative mood regulation expectancies (NMRE). Substantial evidence demonstrates that alexithymia knows its matrix in developmental pathways characterized by adverse evolutionary experiences and insecure attachment to parents, which contribute to undermining emotional regulation abilities in subjects with alexithymic traits (Lyvers, Brown, et al., 2019). Considering that attachment patterns tend to demonstrate a certain stability from childhood to adulthood (Bartholomew, 1990; Fabris et al., 2018), it is possible that individuals with high levels of alexithymia tend to report more insecure attachment to their partners in adulthood.

In accordance with previous literature (Lyvers, Brown, et al., 2019; Lyvers, Kohlsdorf, et al., 2017; Taylor et al., 2014; Thorberg et al., 2011a, 2011b; Zdankiewicz-Ścigała & Ścigała, 2018), our study identified an association between alexithymia and insecure attachment in adults. It is therefore possible that alexithymic adults tend to be less comfortable with being intimate with a romantic partner and more fearful about being unloved (Taylor et al., 2014; Thorberg et al., 2011a, 2011b).

However, despite an increasing amount of work proving an association between alexithymia and attachment measures, little has been investigated about the possible mediation factors involved in this association. According to our data, the fear of intimacy and negative mood regulation expectancies

were found to be two possible factors that mediate the relationship between alexithymia and insecure attachment. It was found out in the previous study by Lyvers, Kohlsdorf, et al. (2017) that the fear of intimacy is a mediating factor between alexithymia and insecure attachment. Our data replicate the results of the previous study for a wider sample and in a different cultural context. Overall, these data seem to suggest that alexithymic subjects, probably due to their deficits in terms of emotional regulation processes, may fear entering into emotional contact with their partners, developing the fear of intimacy, which, in turn, may encourage anxiety in relationships and maintain patterns of insecure attachment in adulthood. Compared to the previous study, our model considered an additional mediation factor: NMRE. In accordance with previous evidence (Lyvers et al., 2008; Thorberg & Lyvers, 2010), our data confirm the existence of a correlation between the fear of intimacy and NMRE measures. NMRE have been studied in the context of social learning theory, thus indicating that these meta-cognitive aspects of emotional regulation develop as a result of learning in the context of interpersonal relationships (Catanzaro & Mearns, 1990, 2016).

It is therefore possible that the fear of intimacy strengthens if the subjects have low levels of NMRE, and that, in turn, low levels of NMRE are associated with higher levels of the fear of intimacy, thereby infusing each other. Based on our data, NMRE may play a mediating role between alexithymic traits and insecure attachment. According to some previous evidence (Lyvers, Brown, et al., 2019; Lyvers, Kohlsdorf, et al., 2017; Spence & Courbasson, 2012; Thorberg et al., 2019), alexithymic subjects tend to report lower levels of NMRE, suggesting poor negative mood regulation. Emotional stimuli may result in high distress and negative emotions in people with high levels of alexithymia (Thorberg et al., 2019). The emotional regulating deficits typical of alexithymic subjects may therefore, through the experience of emotional stress, increase the structure of negative meta-cognitions related to the ability to manage negative emotional states.

Consequently, on the basis of NMRE, the subject may apply dysfunctional coping and emotional avoidance strategies in order to reduce distress from emotional stimuli and, in this regard, NMRE could therefore contribute to the maintenance of insecure models of adult attachment.

In conclusion, subjects with high levels of alexithymia tend to experience anxiety in relationships and insecure attachment. Emotional regulation deficits in alexithymic subjects may increase the fear of intimacy and NMRE which, in turn, may increase the maintenance of insecure attachment forms.

From this perspective, insecure attachment may be the subject's an attempt to seek the proximity of a co-specific and reduce the distress resulting from emotional stimuli, especially in interpersonal relationships.

For certain reasons, interpretations of our data must take into account the limitations of this study. In fact, the cross-sectional approach limits us in

inferring the causality of the relationship between the measured variables, and therefore, longitudinal studies are necessary. In addition, self-report measures may be influenced by aspects of memory, social desirability, and text comprehension. Therefore, different instruments and observers should be involved in future studies.

In addition, the RAAS is an indicator of the insecurity of the attachment bond and, in itself, does not measure the style of attachment. Therefore, future studies will be able to adopt specific tools, such as the adult attachment interview, and study the relationship between constructs taking into account the different types of attachment links identified by theorists.

Finally, one should take into account the low probability of detecting alexithymic participants in a sample selected from the general population, as alexithymia rates in the general population range from 9 to 17% for men and 5 to 10% for women (e.g., Franz et al., 2008; Mattila et al., 2007). However, while the diagnosis of alexithymia can be extremely useful in clinical practice, in scientific analyses classifying participants into alexithymic and non-alexithymic groups can limit statistical analyses and, therefore, a more dimensional approach to analysing the level of alexithymia may be more useful (Bagby et al., 2020; Ścigala et al., 2020). Thus, the TAS-20 was used as a measure of alexithymia and a total TAS-20 score was calculated. The total TAS-20 score, based on empirical evidence accumulated over more than 25 years, accurately reflects and measures the construct of alexithymia, thus, measuring individual differences in alexithymia. It can be noted that it is recommended that researchers analyse TAS-20 scores as a continuous variable rather than classifying participants into alexithymic and non-alexithymic groups (Bagby et al., 2020). Our data may have implications for the assessment and treatment of individuals with alexithymia.

The evaluation of subjects with alexithymia should include the adult attachment bond, and further, some mediation factors such as the fear of intimacy and NMRE. In addition, these mediation factors may be considered as the target of possible psychotherapeutic strategies. In particular, established techniques in cognitive-behavioural therapies seem to achieve positive results compared to both the fear of intimacy (Wetterneck & Hart, 2012) and NMRE (Catanzaro & Mearns, 2016).

## **Compliance with ethical standards**

The study was carried out pursuant to the recommendations by the University of Social Sciences and Humanities Ethics Committee. All procedures adopted in the study, which involved the participation of humans, complied with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration, as amended, or other comparable and equivalent ethical standards.

### Informed consent

Informed consent was obtained from all subjects participating in the study.


### Declaration of Conflicting Interests

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### References

- Bagby, R. M., Parker, J. D., & Taylor, G. J. (2020). Twenty-five years with the 20-item Toronto alexithymia scale. *Journal of Psychosomatic Research, 131*, 109940. <https://doi.org/10.1016/j.jpsychores.2020.109940>
- Bartholomew, K. (1990). Avoidance of intimacy: An attachment perspective. *Journal of Social and Personal Relationships, 7*(2), 147–178. <https://doi.org/10.1177/0265407590072001>
- Catanzaro, S. J., & Greenwood, G. (1994). Expectancies for negative mood regulation, coping, and dysphoria among college students. *Journal of Counseling Psychology, 41*(1), 34–44.
- Catanzaro, S. J., & Mearns, J. (1990). Measuring generalized expectancies for negative mood regulation: Initial scale development and implications. *Journal of Personality Assessment, 54*(3–4), 546–563. <https://doi.org/10.1080/00223891.1990.9674019>
- Catanzaro, S. J., & Mearns, J. (2016). Generalized expectancies for negative mood regulation: Development, assessment, and implications of a construct. In S. Trusz & P. Babel (Eds.), *Interpersonal and intrapersonal expectancies* (pp. 52–61). Routledge.
- Collins, N. L. (1996). Working models of attachment: Implications for explanation, emotion, and behavior. *Journal of Personality and Social Psychology, 71*(4), 810–832. <https://doi.org/10.1037/0022-3514.71.4.810>
- Collins, N. L., & Read, S. J. (1990). Adult attachment, working models, and relationship quality in dating couples. *Journal of Personality and Social Psychology, 58*(4), 644–663. <https://doi.org/10.1037/0022-3514.58.4.644>
- Descutner, C. J., & Thelen, M. H. (1991). Development and validation of a fear-of-intimacy scale. *Psychological Assessment, 3*(2), 218–225. <https://doi.org/10.1037/1040-3590.3.2.218>
- Doi, S. C., & Thelen, M. H. (1993). The fear-of-intimacy scale: Replication and extension. *Psychological Assessment, 5*(3), 377–383. <https://doi.org/10.1037/1040-3590.5.3.377>

- Fabris, M. A., Longobardi, C., Prino, L. E., & Settanni, M. (2018). Attachment style and risk of muscle dysmorphia in a sample of male bodybuilders. *Psychology of Men & Masculinity, 19*(2), 273–281. <https://doi.org/10.1037/men0000096>
- Franz, M., Popp, K., Schaefer, R., Sitte, W., Schneider, C., Hardt, J., Decker, O., & Braehler, E. (2008). Alexithymia in the German general population. *Social Psychiatry and Psychiatric Epidemiology, 43*(1), 54–62. <https://doi.org/10.1007/s00127-007-0265-1>
- Fritz, M. S., Taylor, A. B., & MacKinnon, D. P. (2012). Explanation of two anomalous results in statistical mediation analysis. *Multivariate Behavioral Research, 47*(1), 61–87. <https://doi.org/10.1080/00273171.2012.640596>.
- Goldstein, A. L., Haller, S., Mackinnon, S. P., & Stewart, S. H. (2019). Attachment anxiety and avoidance, emotion dysregulation, interpersonal difficulties and alcohol problems in emerging adulthood. *Addiction Research & Theory, 27*(2), 130–138. <https://doi.org/10.1080/16066359.2018.1464151>
- Greene, D., Boyes, M., & Hasking, P. (2020). The associations between alexithymia and both non-suicidal self-injury and risky drinking: A systematic review and meta-analysis. *Journal of Affective Disorders, 260*, 140–166. <https://doi.org/10.1016/j.jad.2019.08.088>
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348–362.
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Publications.
- Hayes, A. F., & Scharkow, M. (2013). The relative trustworthiness of inferential tests of the indirect effect in statistical mediation analysis: Does method really matter? *Psychological Science, 24*(10), 1918–1927. <https://doi.org/10.1177/0956797613480187>
- Keefer, K. V., Taylor, G. J., Parker, J. D., & Bagby, R. M. (2019). Taxometric analysis of the Toronto structured interview for alexithymia: Further evidence that alexithymia is a dimensional construct. *Assessment, 26*(3), 364–374. <https://doi.org/10.1177/1073191117698220>
- Lyvers, M., Brown, T., & Thorberg, F. A. (2019). Is it the taste or the buzz? Alexithymia, caffeine, and emotional eating. *Substance Use & Misuse, 54*(4), 572–582. <https://doi.org/10.1080/10826084.2018.1524490>
- Lyvers, M., Edwards, M., & Thorberg, F. (2017). Alexithymia, attachment and fear of intimacy in young adults. *IAFOR Journal of Psychology & the Behavioral Sciences, 3*(2), 1–11. <https://doi.org/10.22492/ijpbs.3.2.01>
- Lyvers, M., Kohlsdorf, S. M., Edwards, M. S., & Thorberg, F. A. (2017). Alexithymia and mood: Recognition of emotion in self and others. *The American Journal of Psychology, 130*(1), 83–92. <https://doi.org/10.5406/amerjpsyc.130.1.0083>
- Lyvers, M., Mayer, K., Needham, K., & Thorberg, F. A. (2019). Parental bonding, adult attachment, and theory of mind: A developmental model of alexithymia and alcohol-related risk. *Journal of Clinical Psychology, 75*(7), 1288–1304. <https://doi.org/10.1002/jclp.22772>
- Lyvers, M., Thorberg, F. A., Dobie, A., Huang, J., & Reginald, P. (2008). Mood and interpersonal functioning in heavy smokers. *Journal of Substance Use, 13*(5), 308–318. <https://doi.org/10.1080/14659890802040807>



- MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research, 39*(1), 99–128. [https://doi.org/10.1207/s15327906mbr3901\\_4](https://doi.org/10.1207/s15327906mbr3901_4)
- Mattila, A. K., Ahola, K., Honkonen, T., Salminen, J. K., Huhtala, H., & Joukamaa, M. (2007). Alexithymia and occupational burnout are strongly associated in working population. *Journal of Psychosomatic Research, 62*(6), 657–665. <https://doi.org/10.1016/j.jpsychores.2007.01.002>
- Mearns, J. (1991). Coping with a breakup: Negative mood regulation expectancies and depression following the end of a romantic relationship. *Journal of Personality and Social Psychology, 60*(2), 327–334.
- Mikulincer, M., & Shaver, P. R. (2012). An attachment perspective on psychopathology. *World Psychiatry: Official Journal of the World Psychiatric Association (WPA), 11*(1), 11–15. <https://doi.org/10.1016/j.wpsyc.2012.01.003>
- Parker, J. D., Michael Bagby, R., Taylor, G. J., Endler, N. S., & Schmitz, P. (1993). Factorial validity of the 20-item Toronto alexithymia scale. *European Journal of Personality, 7*(4), 221–232. <https://doi.org/10.1002/per.2410070403>
- Preacher, K. J. (2015). Advances in mediation analysis: A survey and synthesis of new developments. *Annual Review of Psychology, 66*, 825–852. <https://doi.org/10.1146/annurev-psych-010814-015258>
- Prino, L. E., Longobardi, C., Fabris, M. A., Parada, R. H., & Settanni, M. (2019). Effects of bullying victimization on internalizing and externalizing symptoms: The mediating role of alexithymia. *Journal of Child and Family Studies, 28*(9), 2586–2593. <https://doi.org/10.1007/s10826-019-01484-8>
- Reis, H. T., & Shaver, P. (1988). Intimacy as an interpersonal process. In S. W. Duck, D. F. Hay, S. E. Hobfoll, W. Ickes, & B. M. Montgomery (Eds.), *Handbook of personal relationships: Theory, research and interventions* (pp. 367–389). John Wiley & Sons.
- Ścigała, D. K., Zdankiewicz-Ścigała, E., Bedyńska, S., & Kokoszka, A. (2020). Psychometric properties and configural invariance of the polish-language version of the 20-item Toronto alexithymia scale in non-clinical and alcohol addict persons. *Frontiers in Psychology, 11*, 1241. <https://doi.org/10.3389/fpsyg.2020.01241>
- Spence, S., & Courbasson, C. (2012). The role of emotional dysregulation in concurrent eating disorders and substance use disorders. *Eating Behaviors, 13*(4), 382–385. <https://doi.org/10.1016/j.eatbeh.2012.05.006>
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics*. Pearson.
- Taylor, G. J., Bagby, R. M., Kushner, S. C., Benoit, D., & Atkinson, L. (2014). Alexithymia and adult attachment representations: Associations with the five-factor model of personality and perceived relationship adjustment. *Comprehensive Psychiatry, 55*(5), 1258–1268. <https://doi.org/10.1016/j.comppsy.2014.03.015>
- Thorberg, F. A., & Lyvers, M. (2010). Attachment in relation to affect regulation and interpersonal functioning among substance use disorder in patients. *Addiction Research & Theory, 18*(4), 464–478. <https://doi.org/10.3109/16066350903254783>
- Thorberg, F. A., Young, R. M., Hasking, P., Lyvers, M., Connor, J. P., London, E. D., Huang, Y.-L., & Feeney, G. F. X. (2019). Alexithymia and alcohol dependence: The roles of negative mood and alcohol craving. *Substance Use & Misuse, 54*(14), 2380–2386. <https://doi.org/10.1080/10826084.2019.1650773>

- Thorberg, F. A., Young, R. M., Sullivan, K. A., Lyvers, M., Connor, J. P., & Feeney, G. F. (2011). Alexithymia, craving and attachment in a heavy drinking population. *Addictive Behaviors, 36*(4), 427–430. <https://doi.org/10.1016/j.addbeh.2010.12.016>
- Thorberg, F. A., Young, R. M., Sullivan, K. A., Lyvers, M., Hurst, C., Connor, J., & Feeney, G. (2011). Attachment security and alexithymia in a heavy drinking sample. *Addiction Research & Theory, 19*(6), 566–570. <https://doi.org/10.3109/16066359.2011.580065>
- Valente, M. J., Gonzalez, O., Miočević, M., & MacKinnon, D. P. (2016). A note on testing mediated effects in structural equation models: Reconciling past and current research on the performance of the test of joint significance. *Educational and Psychological Measurement, 76*(6), 889–911. <https://doi.org/10.1177/0013164415618992>
- van Dijke, A., & Ford, J. D. (2015). Adult attachment and emotion dysregulation in borderline personality and somatoform disorders. *Borderline Personality Disorder and Emotion Dysregulation, 2*(1), 1–9. <https://doi.org/10.1186/s40479-015-0026>
- van Dijke, A., Hopman, J. A., & Ford, J. D. (2018). Affect dysregulation, psychoform dissociation, and adult relational fears mediate the relationship between childhood trauma and complex posttraumatic stress disorder independent of the symptoms of borderline personality disorder. *European Journal of Psychotraumatology, 9*(1), 1400878. <https://doi.org/10.1080/20008198.2017.1400878>
- Wetterneck, C. T., & Hart, J. M. (2012). Intimacy is a transdiagnostic problem for cognitive behavior therapy: Functional analytical psychotherapy is a solution. *International Journal of Behavioral Consultation and Therapy, 7*(2–3), 167–176. <https://doi.org/10.1037/h0100956>
- Zackheim, L. (2007). Alexithymia: The expanding realm of research. *Journal of Psychosomatic Research, 63*(4), 345–347. <https://doi.org/10.1016/j.jpsychores.2007.08.011>
- Zakhour, M., Haddad, C., Salameh, P., Akel, M., Fares, K., Sacre, H., Hallit, S., & Obeid, S. (2020). Impact of the interaction between alexithymia and the adult attachment styles in participants with alcohol use disorder. *Alcohol (Fayetteville, N.Y.), 83*, 1–8. <https://doi.org/10.1016/j.alcohol.2019.08.007>
- Zdankiewicz-Ścigala, E., & Ścigala, D. K. (2018). Relationship between attachment style in adulthood, alexithymia, and dissociation in alcohol use disorder inpatients. Mediation model. *Frontiers in Psychology, 9*, 2039. <https://doi.org/10.3389/fpsyg.2018.02039>

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