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The Effects of Adult Attachment on Exercise

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Abstract

Previous research has associated insecure adult attachment with lower levels of pain self-efficacy within a laboratory setting. However, the external validity of these results remains unclear. This study focused on the applicability of this theory outside of a laboratory setting, specifically within the lens of exercise habits. If insecure adult attachment is positively associated with low levels of pain self efficacy, then individuals with an insecure attachment style will perceive pain to be more extreme than their peers might. It can be hypothesized, then, that insecure attachment style is a predictor of lower levels of rigorous exercise habits. A volunteer sample of 148 participants (117 females, 31 males) was taken. Participants were given several measures of attachment style, personality, and exercise habits. The findings indicate that individuals with either a fearful or preoccupied attachment style were significantly less likely to exercise across all exercise measures than other individuals. This is the first study to link exercise and attachment style in a university setting. These results suggest that there may be an underlying mechanism that links fearful and preoccupied attachment styles and causes ambivalent attitudes towards exercise within these groups.

Keywords: attachment theory, adult attachment, exercise, pain

The Effects of Adult Attachment on Exercise

Adult attachment theory has been at the forefront of psychological research for some time now. Not only has the psychology community been intrigued by the apparent continuity of Ainsworth's original findings, but new research has begun to expose the vast predictive value of adult attachment theory. Much of the focus on attachment theory has been on personality disorders, particularly anxiety and depression disorders. There is also a great interest in addiction behaviors in relation to insecure attachment. In summary, the focus of adult attachment theory has been psychological disorders—little research has been done on the physiological differences between the four attachment groups.

Literature Review

Attachment Theory

In its original form, attachment theory was developed to assess infant-mother relationships and the effects of stress on the maternal bond (Ainsworth, 1978). Bowlby and Ainsworth (1978) developed an experimental study—the Strange Situation—that explicitly displayed different infant reactions to maternal separation. Ainsworth (1978) further developed the Attachment Theory, accompanied by several observations. The research showed that a) infants are biologically disposed to show alarm in the face of maternal separation, b) the return of the mother, in most children, stops this alarm system and allows the infant to return to normal functioning, and c) infants who are not calmed by the return of their mother react to the reunion in a distinct and patterned way (Ainsworth, 1987). Ainsworth attributed this alarmed response to an *Insecure* attachment to the mother. In contrast, infants who could be comforted by their mother were found to have a *Secure* attachment to the mother. Infants with an *Insecure* attachment, Ainsworth found, behave in one of two ways during reunion with the mother: a) the

infant shows no apparent anxiety, but does not make eye contact in effort to reinforce the bond—Ainsworth called this *Avoidant* behavior; b) the infant cannot be calmed by the return of the mother, and is overly anxious and resistant to return to play—Ainsworth called this *Ambivalent* behavior. This exploration found that about 62% of infants displayed a *Secure* attachment, while 38% displayed an *Insecure* attachment (23% showing *Avoidant* behavior, 15% showing *Ambivalent* behavior.)

Adult Attachment Theory

Hazan and Shaver (1987) were interested in the continuity of Ainsworth's research, and the effects of attachment theory on adult romantic relationships. In their report on the connection between romantic love and attachment processes, Hazan and Shaver suggested that adult romantic relationships may mimic the infant/mother relationships that Ainsworth (1978) studied. The pair used Ainsworth and Bowlby's research on attachment styles to develop a theory about adult attachment in romantic relationships. Hazan and Shaver developed a self-report measure that encapsulated Ainsworth's descriptions of the three attachment styles (*Secure*, *Avoidant*, *Ambivalent*) within the lens of adult romantic relationships. They found that attachment style is similar in adult groups and in infant-mother groups. Adult attachment theory, as developed through the lens of romantic relationships, attempts to address the multidimensionality of love, and the individual differences between romantic attachment styles. This was the *first* study to examine romantic love in parallel with Ainsworth's work on attachment.

Within the last 20 years, there have been various adaptations to Hazan and Shaver's theory on adult romantic attachment, particularly with regard to the measurement and implications. Bartholomew and Horowitz (1991) developed a dynamic self-report measure that, similarly to Hazan and Shaver's model, assessed an individual's adult attachment style. This

scale was developed based on the theory that Adult Attachment is derived from internal working models of self-worth and availability of others to provide a secure base (Bartholomew & Horowitz, 1991). Bartholomew and Horowitz developed a four-item questionnaire based on the following assessment of these internal working models, see Figure 1.

Each of these categories is again derived from Ainsworth's (1978) assessment of maternal bonds and an infant's use of the mother as a secure base. In this model, "preoccupied" is equivalent to Ainsworth's *Ambivalent* category. The *Avoidant* category is divided into "dismissive" and "fearful." Here, a "fearful" individual has high dependence and a high avoidance to others, and might therefore avoid contact so as to shelter themselves from rejection. "dismissive" individuals have a low dependence and a high avoidance to others, and these individuals are not likely to need relational contact.

The high dependence axis of the model has often been associated with higher levels of anxiety and neuroticism. In this respect, preoccupied and fearful individuals frequently score similarly on tests that measure these traits.

Adult Attachment and Pain

In the current research, adult attachment and its implications are of particular interest and importance to researchers—specifically insecure attachment. Researchers have been focused on exposing the link between maternal neglect (which is at the root of the development of insecure attachment), adult attachment, and social and psychological correlations with insecure attachment. These connections, rooted in early childhood development, put a great amount of weight or emphasis on the importance of healthy childhood development and maternal and familial support.

One of the intriguing physiologically-based concepts within this exploration is the association between pain and insecure attachment. Meredith, Strong and Feeney (2006) were the first to associate pain with adult attachment in a chronic-pain-free group. The research found that preoccupied attachment was strongly negatively correlated with pain threshold and tolerance. Further, as pain intensity increased, preoccupied attachment became a strong predictor of catastrophization of pain (Meredith et al., 2006). These results suggest that attachment style in some way moderates assessed pain intensity. However, the study was conducted in an experimental laboratory setting and external validity of the theory remains to be examined.

It is widely known that exercise, particularly moderate to rigorous exercise, is associated with some amount of pain; most individuals who engage in these activities would admit that rigorous exercise is accompanied by some amount of struggle. From Meredith et al.'s research, it can be concluded that individuals may subjectively assess pain differently—one event may subjectively feel particularly more or less painful to an individual. The current study was designed to investigate the correlation between pain and adult attachment style in a particular environment, like exercise. Due to the pain associated with moderate to rigorous exercise levels, we would expect that individuals who are insecurely attached—particularly preoccupied—are less likely to report engaging in these activities.

Methods

Participants

The study consisted of 148 participants (117 Female, 31 Male) ranging in age from 17-57 with a mean age of 20 years (see table 1). The participants were all Oregon State University students who were enrolled in a psychology course through the university.

Procedure

All participants were volunteers and self-elected to participate in the study through an online database called SONA. Each participant was guaranteed to receive 1 credit-hour of extra credit for participating in the study. The study was described as an assessment of attitudes towards relationships and was to be completed online through any internet connection. The link to the study was provided on the SONA website, and each participant was led directly to the opening page of the study. All participants were treated according to the APA guidelines.

Materials

The study was a within-subjects study designed and administered through Qualtrics, a survey-design program employed by Oregon State University. The survey was estimated to take 20-50 minutes to complete, and included several measures of daily exercise, relationship status and quality, and several other personality measures. As the measure of exercise, a series of sliding-scale questions were used. For example, participants were asked, “In the past 5 months, how many weeks have you worked out (e.g., cycling, jogging, dancing, kick boxing, Stair Master, etc.) *at least 3 or more times during the week?*” Participants were able to choose from 6 options, each representative of an increasing number of weeks (0, 1-4, 5-8 etc.) The three research questions are referred to as Q19, Q20 and Q21 in this report, and appeared in the study as follows:

Q19: “In the past 5 months, how many weeks have you worked out (e.g., cycling, jogging, dancing, kick boxing, Stair Master, etc.) *at least 3 or more times during the week?*”

Q20: In the past 5 months, indicate the number of weeks you have worked out at least 3 or more times in those weeks where *each session lasted 60 minutes or longer?*

Q21: In the past 5 months, indicate the number of weeks you have worked out for *more than seven hours in those weeks?*

For attachment style measurement, the Bartholomew Scale of Adult Attachment was provided (Bartholomew & Horowitz, 1990). This scale presented participants with four short paragraphs describing different attitudes towards romantic relationships. The paragraphs were not labeled with attachment styles, and each participant was asked to choose only one option that best fit their own attitudes towards romantic relationships. Only the Bartholomew scale and 3 exercise measures will be discussed in this report because they are the only measures directly related to the hypothesis.

Results

Statistics

Analyses were performed on participant data using Microsoft Excel 14.2.0 and SPSS 22.0. As a preliminary assessment of the data, descriptive statistics were run for demographic information including age, gender and attachment style (see Tables 1 and 2). In accordance with previous research, the spread of participants between the attachment styles should be roughly 60% secure, 20% avoidant and the rest split fairly evenly between preoccupied and fearful categories (Hazan & Shaver, 1987). Results of the current study show similar findings, with an increased percent of fearfully attached individuals.

A one-way, four level, between-subjects ANOVA was performed to compare the effect of attachment style on exercise level within each of the three exercise measures (see Table 3). For Q19, there was a significant effect of attachment style on the number of weeks a participant exercised ($F(3, 144) = 4.075, p = .008$). For Q20, there was a significant effect of attachment style on the number of weeks where a participant had exercised for 60 minutes 3 or more times

per week ($F(3, 144) = 4.890, p = .003$). For Q21, there was a significant effect of attachment style on the number of weeks a participant had exercised for more than 7 hours each week ($F(3, 144) = 4.079, p = .008$). These results suggest that, overall, an individual's attachment style has a significant effect on the amount of exercise performed within a 5 month period.

Discussion

The results of this study suggest that attachment styles play a role in levels of exercise within a university population. The findings for all three relevant exercise questions were significant; this means that the amount of exercise between the attachment styles is significantly different. From responses to each question, we can speculate about the a) frequency of exercise for each individual (Q19) b) the number of longer-duration exercise sessions for each individual (Q20) and c) the frequency of these longer-duration exercise sessions for each individual. In accordance with our hypothesis, insecurely attached individuals were less likely to participate in rigorous exercise activities (for the purpose of our study, we can qualify rigorous exercise activity as anything with a duration of over 60 minutes).

In comparing the means of the four attachment groups (within each question), we find that securely attached individuals are more likely to a) exercise more frequently within a 5-month period ($M = 3.71$) than insecurely attached individuals ($M = 3.32$), b) exercise for longer than 60 minutes more frequently ($M = 3.48$) than insecurely attached individuals ($M = 2.91$) and c) more frequently exercise for more than 7 hours each week ($M = 2.63$) than insecurely attached individuals ($M = 2.15$). These findings support our hypothesis that securely attached individuals are more likely to partake in "painful" activities like rigorous amounts of exercise.

Previous research has shown that preoccupied individuals have a lower tolerance of pain and thus a lower pain threshold. The hypothesis extends this theory to exercise, speculating that

preoccupied individuals will exercise less frequently, particularly at rigorous levels. This hypothesis is explored in Figure 2—in which each cluster corresponds to an item on the exercise measure. From the data, it is clear that there is a connection between both preoccupied and fearful attachment styles in frequency of exercise. Previous research has shown that individuals with low self-efficacy and increased anxiety—which are both positively correlated with fearful and preoccupied attachment styles—also show lower levels of pain-self efficacy, (Meredith, Strong & Feeney, 2006). This common factor of increased anxiety in connection with low pain-self efficacy may point to an underlying connection between these two attachment styles, specifically in pain assessment.

One proposed mechanism for this connection is the Hypothalamic–Pituitary–Adrenal (HPA) axis, a part of the neuroendocrine system that regulates stress, emotions and other brain-body interactions. The function and development of the HPA axis has been studied in humans with particular interest to victims of child-abuse. Individuals with major early-life stressors like these often form hyper-active HPA axes with abnormally sensitive responses to stressors. It is also well-known that early childhood adversities (sexual, physical and emotional abuse and neglect) contribute to the formation of an insecure attachment (Waldinger, Schulz, Barsky & Ahern, 2006). It is then very possible that these individuals, in addition to an insecure attachment, also form a hyper-sensitive HPA axis. If this is true, these individuals would be overly sensitive to the otherwise-normal pain of daily exercise. A more in-depth exploration of the relationship between insecure attachment style and hyper-sensitive HPA axis formation will provide more information about this hypothesized mechanism. If the hypothesized mechanism stands, individuals with a hyper-sensitive HPA axis—and, by extension, some insecurely attached individuals—would have more sensitive stress response mechanisms, and may interpret

daily life stressors to a far more intense degree than their securely attached peers. These daily stressors could include being late for work, failing a test, interacting with peers, and, conclusively, exercise.

In addition to further research, the current study would show an increase in internal validity through several changes in the methods. In accordance with an online administration of the survey, environmental effects for each individual were not controlled for. It may be more beneficial to require participants to take the survey in a controlled setting to minimize distractions. The results of the exercise questions (in addition to the Bartholomew scale) are a quintessential part of the research. It is thus crucial to ensure the accuracy and validity of each item of the measure. In particular, it may be beneficial to ask participants specifically about the amount of “rigorous” exercise they participate in, to remove the assumption that a particular amount of exercise quantifies as “rigorous.” With this research design, we make the assumption that 60 minutes of exercise quantifies as rigorous—however, some individuals, like endurance athletes, may see 60 minutes as a normal amount of exercise. Subjective assessment of rigor is a difficult barrier for this study; wording of items should be carefully considered for the exercise measures.

References

- Ainsworth, M. (1978). Classification of Infants in Terms of Their Strange Situation Behavior. In *Patterns of attachment: A psychological study of the strange situation* (pp. 55-60). Hillsdale, N.J.: Erlbaum. doi: 10.4324/9781315802428
- Bartholomew, K., & Horowitz, L. (1991). Attachment Styles Among Young Adults: A Test Of A Four-category Model. *Journal of Personality and Social Psychology*, 61(2), 226-244. doi: 10.1037/0022-3514.61.2.226
- Davies, K.A., Macfarlane, G.J., McBeth, J., Morriss, R., & Dickens, C. (2009). Insecure attachment style is associated with chronic widespread pain. *Pain*, 143, 200-205. doi: 10.1016/j.pain.2009.02.013
- Hazan, C., & Shaver, P. (1987). Romantic Love Conceptualized as an Attachment Process. *Journal of Personality and Social Psychology*, 52 (3), 511-524. doi: 10.1037/0022-3514.52.3.511
- Meredith, P., Strong, J., & Feeney, J.A. (2006a) Adult attachment, anxiety, and pain self-efficacy as predictors of pain intensity and disability. *Pain*, 123, 146-154. doi: 10.1016/j.pain.2006.02.025
- Meredith, P., Strong, J., & Feeney, J.A (2006b). The relationship of adult attachment to emotion, catastrophizing, control, threshold and tolerance, in experimentally-induced pain. *Pain*, 120(1-2), 44-52. doi: 10.1016/j.pain.2005.10.008
- Ravitz, P., Maunder, R., Hunter, J., Sthankiya, B., & Lancee, W. (2010). Adult Attachment Measures: A 25-year Review. *Journal of Psychosomatic Research*, 69(4), 419-432. doi: 10.1016/j.jpsychores.2009.08.006

Waldinger, R.J, Schulz, M.S., Barsky, A.J., & Ahern, D.K. (2006). Mapping the Road From Childhood Trauma to Adult Somatization: The Role of Attachment. *Psychosomatic Medicine*, 68, 129-135. doi: 10.1097/01.psy.0000195834.37094.a4

Table 1

Demographic Information of Population by Count

Demographic	Count	Population %
Gender		
<i>Male</i>	31	20.9%
<i>Female</i>	117	79.1%
Attachment Style		
<i>Secure</i>	73	49.3%
<i>Avoidant</i>	26	17.6%
<i>Preoccupied</i>	19	12.8%
<i>Fearful</i>	30	20.3%

Table 2

Mean Demographic Information of Population

Demographic	Mean	Standard Deviation
Age	20.04	3.58

Table 3:

One-way ANOVA of Exercise Measures

Exercise Measure	<i>df</i>	<i>F</i>	<i>p</i>
Q19	3, 144	4.075	0.008**
Q20	3, 144	4.890	0.003**
Q21	3, 144	4.079	0.008**

**These findings approach statistical significance at the $p < 0.05$. All of these findings are significant.

Figure Captions

Figure 1. This model of Adult Attachment uses Models of Self and Models of others to categorize individuals into four Adult Attachment styles. Models of Self are assessed by dependency on others, and Models of Others are assessed by avoidance to others.

Figure 2. This figure represents the moderation of attachment style on levels of exercise as measured by the three exercise measures in the study. Q19: “In the past 5 months, how many weeks have you worked out (e.g., cycling, jogging, dancing, kick boxing, Stair Master, etc.) *at least 3 or more times during the week?*” Q20: “In the past 5 months, indicate the number of weeks you have worked out at least 3 or more times in those weeks where *each session lasted 60 minutes or longer?*” Q21: “In the past 5 months, indicate the number of weeks you have worked out for *more than seven hours in those weeks?*”

Figure 1:

		MODEL OF SELF (Dependence)	
		Positive (Low)	Negative (High)
MODEL OF OTHER (Avoidance)	Positive (Low)	SECURE Comfortable with intimacy and autonomy	PREOCCUPIED Preoccupied with relationships
	Negative (High)	DISMISSING Dismissing of intimacy Counter-dependent	FEARFUL Fearful of intimacy Socially avoidant

Figure 2: