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The role of secure-base supervision and dispositional attachment in predicting supervisees' research self-efficacy, curiosity, and satisfaction

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ABSTRACT

The present study explores the effects of secure-base supervision in predicting supervisees' research self-efficacy, curiosity and exploration, and supervision satisfaction.One hundred and eleven research supervisees completed an online survey.

Stepwise multiple regressions revealed that supervisors' ability to provide a secure base predicts supervisees' levels of research self-efficacy and supervision satisfaction and this effect is stronger for anxiously attached supervisees. Research self-efficacy mediates the relationship between secure-base supervision and curiosity and exploration as well as supervision satisfaction. The results provide the first empirical evidence that attachment theory is a relevant framework that can be applied to academic supervisory relationships.

Keywords: adult attachment, secure-base, research degree supervision

The supervisory relationship in the context of postgraduate research supervision has been predominantly conceptualized as an interpersonal relationship by numerous higher education scholars who have developed a number of models (e.g., Gatfield, 2005; Lee, 2008; Mainhard et al., 2009) in an attempt to promote supervisors' awareness and improve the quality of the relationship. Nevertheless, these models have struggled to receive strong empirical support (McCallin & Nayar, 2012) while the student-teacher relationship at university is still considered an under-researched area (Hagenauer & Volet, 2014). Although these models attempt to match supervisors to supervisees based on supervisory styles and interpersonal compatibility (Bastalich, 2017), they fail to acknowledge the importance of dispositional styles of relating as conceptualized by relational theories such as attachment theory, despite the evidence coming from the fields of clinical supervision (e.g., Dickso et al., 2011; McKibben & Webber, 2017) and leadership (Mayseless & Popper, 2019; Wu & Parker, 2017).

The study presented here contributes to filling this gap in the literature by exploring the role of secure-base supervision (SBS) and dispositional attachment (i.e., whether an individual has a secure or insecure attachment style) in predicting supervisees' research self-efficacy, curiosity and exploration, and supervision satisfaction. Employing a quantitative design, the current study showed that SBS predicts supervisees' levels of research self-efficacy and supervision satisfaction with this effect being stronger for anxiously attached supervisees. These findings contribute to the higher education literature by demonstrating that the relational dynamics of the supervisory relationship, as conceptualized by attachment theory, bear important implications for the study and practice of research degree supervision.

The interpersonal aspect of the research supervisory relationship

Undoubtedly, research degree supervision constitutes a distinctive form of pedagogy (McCallin & Nayar, 2012) in the context of which research supervisors are required to fulfill a number of roles ranging from project management and pedagogic support for the research process to developing and maintaining working relationships with students (Bastalich, 2017). Several pedagogical models have been developed (see Andriopoulou & Prowse, 2020 and Orellana, et al., 2016 for reviews) with an aim to match students to supervisors based not only on the project topic but also on interpersonal compatibility (Bastalich, 2017). Even though a

review of these models is beyond the scope of this paper, it is imperative to be mentioned that most of them (e.g., Gatfield, 2005; Mainhard et al., 2009) acknowledge the importance of the interpersonal aspect of the supervisory relationship. More recent studies have also shown that the research supervisory relationship is a major determinant (albeit not the sole one) of supervisees' satisfaction, retention, and thesis completion (David, 2020). Despite the growing recognition of the importance of the relational dimension of the research supervisory relationship, a conceptual model which would promote the understanding of the dynamics of this relationship and would inform supervisors' training is missing from the higher education literature. We propose that attachment theory provides a useful framework in this respect.

Attachment Theory Basic Concepts

Attachment theory posits that human babies are born with an innate biological system, the attachment system, that leads them to create emotional bonds with significant others to ensure their survival (Bowlby, 1969). The attachment system is activated by environmental threats to a person's survival and its primary and natural strategy is seeking proximity to significant, stronger others who will protect the person and provide support and comfort (Mikulincer & Shaver, 2007). Significant others, or attachment figures, when responsive to the infant's needs serve several functions that promote the infant's survival and well-being. When attachment figures fulfil their role in an optimal way, they provide a secure base from which the child explores the world. Securely attached individuals have been found to develop positive mental representations (internal working models: IWMs) of themselves and others (e.g., "I am lovable", "Others are trustworthy"), engage in more effective problem solving, regulate their emotions efficiently, develop flexible stress coping strategies, and enjoy better mental health in both childhood and adulthood (Mikulincer & Shaver, 2007; Schore, 2001). Children whose attachment figures have been unresponsive or insensitive to their needs develop an insecure attachment style and insecure IWMs (e.g., "I am not worthy of support", "Others will reject me") (Bowlby, 1969). Individuals whose attachment figures are completely indifferent towards their needs develop an avoidant attachment style that cause them to avoid intimacy and engage in compulsive self-reliance when dealing with stressors, whereas when attachment figures are inconsistently available, children develop an anxious attachment style associated with clinging behaviour, rumination,

and impaired problem solving (Mikulincer & Shaver, 2007). Bowlby (1969) theorised that the attachment patterns developed in childhood are maintained throughout an individual's life, "from cradle to grave", affecting cognitions, emotions, and ways of relating. Research into adult attachment has grown exponentially over the past 35 years revealing that adult attachment relationships share similar characteristics and functions with childhood attachment relationships (Gillath et al., 2016).

Attachment Theory in the Context of Professional Relationships

Attachment theory and individual differences in the way people relate and interact with others based on their dispositional attachment styles (i.e., whether an individual has a secure or insecure attachment style originating from their early interactions with attachment figures) are relevant not only in the context of close or intimate relationships but also in the context of professional (Wu & Parker, 2017) and supervisory relationships (Riggs & Bretz, 2006). Evidence from the field of management and leadership has revealed that managers' insecure attachment predicts employees' burnout, job dissatisfaction (Ronen & Mikulincer, 2012), poor socioemotional functioning, and poor mental health (Davidovitz et al., 2007). Similarly, professional doctorate or PhD supervisors with an anxious (preoccupied) attachment style have been found to rate their supervisees as less professionally developed when compared to the ratings of supervisors with different attachment styles (Foster et al., 2006). The authors explained this finding in the light of evidence showing that anxiously attached individuals have a negative view of self (Bartholomew & Horowitz, 1991) which leads them to diminish their supervisees' capabilities in an attempt to boost their own self-esteem. Likewise, Riggs and Bretz (2006) have found that supervisees who perceived their clinical supervisors as secure rated the supervisory bond higher as compared to supervisees who rated their supervisors as insecure.

Supervisees' organisation of attachment has also been found to affect supervisory outcomes. More specifically, Foster et al. (2007) have found that supervisees' attachment to their clinical supervisors was congruent with their dispositional attachment patterns. The study also revealed that insecurely attached supervisees scored low on a self-report measure of professional development. More recent studies in the area of clinical supervision have also revealed that supervisees with an insecure attachment style evaluate the supervisory relationship more negatively

(McKibben & Webber, 2017; Wrape et al., 2017), have higher levels of cognitive distortions, and are less receptive to corrective feedback (Rogers et al., 2019) as compared to their secure counterparts. As it becomes evident from the above literature review individual differences in attachment are particularly relevant in the context of supervisory relationships. Consequently, the current study set to explore the relevance of attachment dynamics in the context of research degree supervision.

Characteristics and Functions of a Secure Base

As mentioned above, attachment figures who are available and responsive to the individual's needs promote a sense of safety and security which evokes positive cognitions and emotions, and encourages confident engagement in growth-oriented activities such as curiosity and exploration (Mikulincer & Shaver, 2007). In other words, responsive attachment figures provide a safe haven and a secure base from which the individual explores the world. To put it in Bowlby's (1988) words: "In essence this role is one of being available, ready to respond when called upon, to encourage and perhaps assist, but intervene actively only when clearly necessary" (p. 11).

Feeney & Thrush (2010) determined the characteristics and functions of a secure base and developed the Secure Base Characteristics Scale. According to their model, the first characteristic of a secure base is availability in times of need. There is evidence coming from different age groups showing that responsive attachment figures foster a sense of security (Ainsworth et al., 1978; Bowlby, 1988) and raise kids who feel confident in exploring novel environments because they know that support will be available when they need it (Waters & Cummings, 2000). More interestingly, even activating experimentally the secure base schema in adults has produced similar results facilitating exploration (Green & Campbell, 2000) and creative problem solving (Mikulincer et al., 2011). The second characteristic is non-interference as according to attachment theory interference communicates a number of negative messages related to the person's intelligence, competency, and their capability to engage in independent exploration (Feeney & Thrush, 2010). Conversely, a non-interfering attachment figure conveys a message of trust to the person's abilities promoting thus a sense of self-efficacy (Feeney, 2004). The final characteristic, encouragement and acceptance of exploration, refers to the degree to which the attachment figure supports the individual's growth by encouraging them to take up challenges and pursue personal goals (Feeney

& Thrush, 2010). The second aim of the present study was to explore whether research supervisors could operate as a secure base for their supervisees improving a number of outcomes such as research self-efficacy and supervision satisfaction.

Attachment, Secure Base Support, and Self-efficacy

Self-efficacy has been defined as "an individual's belief in his or her own ability to organize and implement action to produce the desired achievements and results" (Bandura, 1997, p. 3). Several studies have examined the relationship between dispositional attachment and self-efficacy (e.g., Mallincrodt & Wei, 2005; Julal Cnossen et al., 2019) and the results have revealed that attachment security is associated with higher scores in perceived self-efficacy in both social and non-social domains whereas attachment anxiety is related to low self-efficacy in all life domains. Avoidant individuals, contrastingly, perceive their self-efficacy differentially depending on the life domain studied exhibiting high self-efficacy for non-social domains and low self-efficacy in social domains (see Mikulincer & Shaver 2007 for a review). In the social domain, insecure individuals report lower satisfaction with their romantic partners and the relationship between attachment insecurity and relationship satisfaction is mediated by self-efficacy beliefs (Julal Cnossen et al., 2019).

The impact of secure-base support has been investigated in the area of leadership (Davidovitz et al., 2007; Wu & Parker, 2017). Leaders have been conceptualized as attachment figures who provide a secure base for their followers or employees and recent studies have revealed that leaders who provide a secure-base support facilitate role breadth self-efficacy and autonomous motivation with the effect being stronger for those employees with high scores on attachment anxiety (Wu & Parker, 2017) as they are the ones who have consistently been found to hold negative self-evaluations and therefore depend more on others' approval (Srivastava & Beer, 2005). The relevance of attachment theory and the positive influence of SBS have been established in the fields of clinical supervision and leadership (Andriopoulou & Prowse, 2020). We wanted to investigate the potential value of the theory for research supervisors.

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The present study

To the best of our knowledge, no study has examined the research supervisory relationship through the lens of attachment and secure-base

support. Indirect evidence for the beneficial effects of a secure base on research self-efficacy (students' confidence that they can perform research tasks in a successful way) comes from a study by Overall et al. (2011) showing that the stronger predictor of students' research self-efficacy was the degree to which their supervisor encouraged autonomous thinking and acting (autonomous support). In addition, those students whose supervisors offered high levels of autonomy and academic support (as measured by supervisors' availability to provide feedback, advice, and practical assistance, and their ability to generate clear goals and expectations) exhibited the highest research self-efficacy. In the same study, it was found that greater supervisor availability predicted greater student satisfaction.

Therefore, the aim of the present study is twofold: firstly, to explore the relevance and usefulness of attachment theory in the context of research degree supervision; secondly, to investigate the effects of SBS on research self-efficacy, epistemic curiosity and exploration, and supervision satisfaction. Based on the literature reviewed above the following hypotheses have been advanced:

a) Dispositional attachment and SBS will predict research self-efficacy, curiosity and exploration, and supervision satisfaction.

b) The beneficial effects of SBS will be more evident for supervisees with high levels of attachment anxiety

c) Research self-efficacy will mediate the relationship between SBS and curiosity and exploration, and this mediating effect will be stronger for supervisees with high attachment anxiety scores

d) Research self-efficacy will mediate the relationship between SBS and supervision satisfaction, and this mediating effect will be stronger for supervisees with high attachment anxiety scores

No hypotheses were advanced for attachment avoidance as previous studies' findings have been inconclusive (e.g., Wu & Parker, 2017).

Method

Participants and Procedure

To calculate sample size Green's (1991) formula ($N \geq 50+8m$, where m = the number of predictors), for detecting a medium effect with 80% power in multiple regressions, was employed. Given the initial number of predictors (8) of this study, the sample size was calculated to be

114 participants. The final sample consisted of 111 participants (84 females, 25 males, 1 non-binary, and 1 participant who preferred not to reveal their gender), with a mean age of 35.27 (SD = 9.16). All participants were enrolled for a postgraduate research degree at PhD or Doctoral level. As for the areas of study, 38.7% of participants came from social science, 22.5% from science, 11.7% from education, 5.4% from arts, 5.4% from business, and 16.2% from other fields.

The study was administered online via the Qualtrics platform. Participation was completely anonymous and voluntary as no incentives for participation were given. Ethical approval for the study was obtained from the University's Research Ethics and Governance Committee.

Material – Measures

Secure-base supervision: An adapted form of the *Secure Base Characteristics Scale* (SBCS; Feeney & Thrush, 2010) was administered to participants. The *Availability* subscale assesses the extent to which supervisors generally make themselves available to supervisees if needed during exploratory activities. The *Interference* subscale assesses the extent to which supervisors generally intrude in the explorations and goal pursuits of supervisees. The *Encouragement* subscale assesses the extent to which supervisors generally encourage supervisees' goal strivings, personal growth, and exploration. The scale consists of 15 items (5 items for each subscale) and participants need to rate the extent to which they agree with each statement on a 6-point Likert scale. The scale has been found to have good psychometric properties (Feeney & Thrush, 2010). Cronbach's alphas for this study were calculated to be .89, .66, and .88 for availability, interference, and encouragement respectively.

Adult Attachment: The *Experiences in Close Relationships Scale-Revised* (ECR-R; Fraley et al., 2000) is a 36-item scale which assesses two orthogonal constructs, namely attachment anxiety and avoidance. Each subscale consists of 18 items and respondents need to rate the extent to which they agree with each statement on a 7-point Likert-type scale ranging from 1 (disagree strongly) to 7 (agree strongly). The anxiety subscale assesses the respondents' fears of abandonment, whereas the avoidance subscale assesses the respondents' fears of intimacy and emotional closeness. Low scores on both dimensions indicate attachment security whereas high scores on both dimensions is an indication of fearful attachment. The measure has been designed to assess general/dispositional attachment. Therefore, participants are instructed to complete the scale in

terms of how they experience intimate relationships in general rather than how they experience their current romantic relationship. The ECR-R was developed from a factor analysis of over 300 items drawn from different measures of adult attachment and is the most widely used, and for many the most valid, measure of adult attachment as it has good psychometric properties (Fraley et al., 2000). Cronbach's alphas for the current study were .94 and .95 for attachment anxiety and avoidance respectively.

Research Self-efficacy: It was assessed through the *Self-Efficacy in Research Measure* (Phillips & Russell, 1994) which is a self-report scale of 33 items. The scale consists of 4 subscales assessing Research Design Skills, Practical Research Skills, Quantitative and Computer Skills, and Writing Skills. Participants are asked to rate in a 9-point Likert scale (1= no confidence, 9 = total confidence) the degree to which they feel confident in their ability to successfully perform various research tasks. The overall score was used for the present study (Cronbach's α = .95).

Epistemic Curiosity: The *Interest Type and Deprivation Type Scales* (I/D Scale; Litman & Spielberger, 2003) were employed to measure epistemic curiosity. This questionnaire consists of two 5-item subscales that assess Interest-Type epistemic curiosity and Deprivation-Type epistemic curiosity. Example items include *"I enjoy exploring new ideas" and "I enjoy learning about subjects that are unfamiliar to me"* for the Interest type, and *"Difficult conceptual problems can keep me awake all night thinking about solutions"* and *"I can spend hours on a single problem because I just can't rest without knowing the answer"* for the Deprivation type. Respondents have to select an appropriate response on a Likert scale with a highest point of 4 (almost always) and a lowest point of 1 (almost never). Cronbach's alpha for the epistemic curiosity scale was .80.

Curiosity and Exploration: The *Curiosity and Exploration Inventory* (CEI; Kashdan, et al., 2004) is a 7-item scale that assesses Exploration (pursuing novelty; e.g., *"I would describe myself as someone who actively seeks as much information as I can in a new situation"*) and Absorption (being absorbed in activities; e.g., *"When I am participating in an activity, I tend to get so involved that I lose track of time"*). Participants respond on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Cronbach's alpha was calculated for the total score and was found to be .69.

Supervision Satisfaction: The *Postgraduate Research Experience Questionnaire* (PREQ; Ainley, 2001) which was developed by the

Australian Council for Educational Research was employed to assess students' satisfaction with research supervision. The measure consists of 28 statements relating to the experience of being a postgraduate research student. Those statements are divided into six subscales; Supervision, Intellectual climate, Skills development, Infrastructure, Thesis examination process, and Clarity of Goals and Expectations. Respondents need to rate how much they agree with each statement on a five-point Likert scale which ranges from "strongly agree" to "strongly disagree". There is also a "does not apply" option for those who think that a specific statement is not relevant to them. Only 25 items were used in the present study as 3 items concerned the experience of viva (item 2: "the thesis examination process was fair", item 15: "I was satisfied with the thesis examination process", and item 25: "the examination of my thesis was completed in a reasonable time") were not relevant for the current participants as the main inclusion criterion was that participants should be currently studying at a PhD or Professional Doctorate level. The psychometric properties of the questionnaire have been tested by the Australian Council for Educational Research (ACER, 1999). Cronbach's alpha for the overall score in the present study was found to be .92.

Results

Table 1 presents zero-order correlations among variables, and descriptive statistics. Higher order constructs were calculated for SBS, and for curiosity and exploration. The first variable was calculated by averaging the scores for availability, non-interference and encouragement (Cronbach's $\alpha = .91$). The second one was calculated by combining the average scores for curiosity and exploration and epistemic curiosity resulting in a variable that was labelled general curiosity (Cronbach's $\alpha = .83$).

Table 1.
Zero Order Correlations and Descriptive Statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Mean	SD
1. Age	1.00															35.27	9.16
2. Gender	-.01	1.00														--	--
3. Supervision length	.18	-.05	1.00													31.38	29.41
4. Full-time/ part-time	.57**	-.19	.19	1.00												--	--
5. Availability	.08	-.10	-.17	.11	1.00											4.02	1.43
6. Intrusiveness	-.17	.08	.06	-.35**	-.43**	1.00										2.44	.99
7. Encouragement	.07	-.10	-.14	.23*	.71**	-.60**	1.00									4.67	1.25
8. Secure base supervision	.12	-.11	-.16	.25**	.88**	-.75**	.91**	1.00								4.41	1.04
9. Research Self-efficacy	-.21*	-.04	.10	-.13	.18	-.05	.25*	.20*	1.00							218.17	48.82
10. Attachment Anxiety	-.16	.19*	.20*	-.17	-.11	.17	-.15	-.16	-.11	1.00						3.02	1.29
11. Attachment Avoidance	-.06	.09	.22*	.10	-.08	.10	-.07	-.09	-.03	.63**	1.00					2.76	1.19

12. Curiosity & Exploration	.06	.00	.08	.04	.01	-.06	.00	.02	.26**	.07	.06	1.00			30.92	5.47
13. Epistemic Curiosity	-.14	.03	-.04	-.08	.05	.05	.07	.04	.38**	.10	.03	.59**	1.00		28.91	4.88
14. General curiosity	-.04	.01	.03	-.02	.03	-.01	.04	.04	.36**	.09	.05	.91**	.88**	1.00	29.91	4.61
15. Supervision Satisfaction	.04	-.04	-.12	.13	.69**	-.43**	.68**	.72**	.52**	-.14	-.11	.18	.16	.19*	1.00	93.77	17.69

Note: **Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

A number of stepwise multiple regressions were conducted for each of the dependent variables, namely research self-efficacy, general curiosity and supervision satisfaction. Age, duration of supervision, and part-time versus full-time status were included in the first step of every regression and were considered control variables. Secure base supervision was added in the second step of each multiple regression. In Step 3 attachment anxiety and attachment avoidance were added, and in the final step the interaction between secure base supervision and attachment anxiety and avoidance were included.

Neither attachment avoidance nor its interaction with secure base supervision made any significant contribution (all *t*s < 1) to the regression models and were dropped from final analyses to avoid multicollinearity as attachment avoidance and attachment anxiety were highly correlated ($r = .63$, $p < .01$). Secure base supervision and attachment avoidance and anxiety were mean-centered before their production term was calculated. All estimates were bootstrapped with 2000 replications. The coefficients presented in table 2 are all bootstrapped coefficients.

As shown in table 2 secure base supervision predicted both research self-efficacy (B = 11.76, $p < .05$) and supervision satisfaction (B = 12.29, $p < .01$), but contrary to hypothesis a, it did not predict general curiosity ($\beta = .28$, $p > .05$). The main effect of attachment anxiety on research self-efficacy and the interaction between attachment anxiety and secure base were marginally non-significant (B = -6.74, $p = .07$ and B = 6.21, $p = .07$ respectively; see figure 1). Neither the main effect of attachment anxiety (B = .33, $p > .05$) on general curiosity nor the interaction between secure base and attachment anxiety (B = -.112, $p > .05$) were significant. There were no significant findings for the main effect of attachment anxiety (B = -.46, $p > .05$) or the interaction between attachment anxiety and secure base supervision (B = 1.30, $p > .05$) for supervision satisfaction.

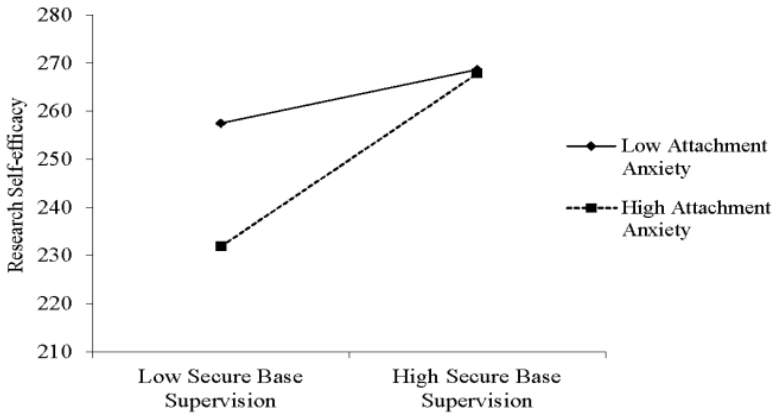
Table 2.
Results of Regression Analyses (n = 111, B = 2000 Bootstap samples)

	Research Self-efficacy *B*/S.E.		**General Curiosity *B*/S.E.**		**Supervision Satisfaction *B*/S.E**	
	Step 3	Step 4	Step 3	Step 4	Step 3	Step 4
Intercept	251.64/16.88	256.08/17.45	30.53/2.19	30.45/2.21	95.68/5.14	96.62/5.34
Age	-1.22/.49*	-1.35/.512*	-.02/.065	-.02/.06	-.05/.15	-.08/.16
Supervision length	.41/.16**	.46/.19*	.004/.02	.003/.02	.01/.04	.02/.04
Full-time/part-time	-16.99/11.81	-15.84/11.66	.04/1.46	.02/1.46	-2.04/3.75	-1.80/3.85
Secure-base Supervision (SBS)	12.88/5.08*	11.76/4.81*	.26/.44	.28/.45	12.53/1.28**	12.29/1.24**
Attachment Anxiety	-6.74/3.74	-6.57/3.46	.33/.34	.33/.34	-.50/.96	-.46/.95
SBS x Attachment Anxiety		6.21/4.48		-.112/.35		1.30/.99

*$p < .05$ **$p < .01$

In order to test hypothesis 3 the PROCESS procedure developed by Hayes (Model 7: moderated mediation, Hayes, 2017) was employed bootstrapped with 2000 replications. Age, duration of supervision, and part-time versus full-time status were included in the analyses as covariates to control for their influence. Research self-efficacy had a significant mediation effect between secure base supervision and general curiosity when attachment anxiety was medium (conditional mediation effect = .42; C.I. = .08 to .86) or high (conditional mediation effect = .71; C.I. = .11 to 1.43) but a non-significant one when attachment anxiety was low (conditional mediation effect = .13; C.I. = -.39 to .68). In addition, research self-efficacy had a significant mediation effect between secure base supervision and supervision satisfaction when attachment anxiety was medium (conditional mediation effect = 1.76; C.I. = .35 to 3.58) or high (conditional mediation effect = 2.97; C.I. = .39 to 5.71) but a non-significant one when attachment anxiety was low (conditional mediation effect = .54; C.I. = -1.54 to 2.43).

Figure 1. Interaction of attachment anxiety and secure-base supervision in predicting research self-efficacy



Discussion of findings

The present study set out to investigate the role of secure-base supervision (SBS) and dispositional attachment in research self-efficacy, curiosity and exploration, and

supervision satisfaction. The findings indicate that attachment theory provides a useful theoretical framework when exploring the dynamics of the research degree supervisory relationship. In addition, the findings revealed that supervisors who serve as a secure base, by being available, encouraging and non-interfering, tend to have supervisees who report higher levels of research self-efficacy and supervision satisfaction. Most importantly, this effect was stronger for anxiously attached supervisees, who were benefited the most from SBS. These findings are in line with those of previous studies from the field of leadership. For example, Wu & Parker (2017) found that anxiously attached employees benefited more from secure base leadership in terms of experiencing higher levels of role breadth self-efficacy and proactive behaviour.

Contrary to the first hypothesis advanced in the introduction, dispositional attachment did not predict any of the outcome variables. One possible explanation could be the low mean levels of attachment anxiety (M = 3.02) and avoidance (M = 2.76) reported by the current sample. It is therefore possible that participants' attachment insecurities were not strong enough to have an effect on the outcome variables. In addition, previous studies have suggested that supervision-specific attachment has a stronger predictive power when it comes to the evaluation of the supervisory relationship as compared to general/dispositional attachment (Bennett et al., 2008; Marmarosh et al., 2013). Contemporary adult attachment scholars (Collins & Read, 1994; Mikulincer & Shaver, 2007) posit that adult representations of attachment are best conceptualised as a hierarchical network of interrelated mental models. Accordingly, at the top of the hierarchy there are general representations of attachment whereas further down in the hierarchy there are context-specific representations (Collins & Read, 1994; Overall et al., 2003). In line with the hierarchical model but also the most recent connectionist

approach to adult attachment (Fraley, 2007), context-specific representations might be more salient in the context of specific relationships and therefore more influential. Future research on supervisees' attachment to supervisors could employ scales that directly assess attachment bonds between supervisors and supervisees like the Experiences in Supervision Scale developed by Gunn & Pistole (2012) or the Experiences in Close Relationships – Relationship Structures Questionnaire (Fraley et al., 2011). It is likely that the scale utilised in this study (ECR-R) was not effective in capturing the attachment representations activated in the context of supervision.

In line with our third and fourth hypotheses, this study found that the relationship between SBS and curiosity and supervision satisfaction is mediated by research self-efficacy. These findings suggest that SBS from supervisors can promote supervisees' research self-efficacy by encouraging them to believe in their competence to achieve their research goals (Bandura, 1997), which in turn has a positive impact on curiosity and supervision satisfaction. This boost in self-efficacy is particularly important for anxiously attached individuals who hold negative IWMs of their selves (Bowlby, 1969) and score low on coping self-efficacy (Wright et al., 2017).

The lack of findings regarding attachment avoidance could be explained in several ways. First, the avoidance levels of the participants of the specific study might have been particularly low to predict any of the outcome variables. It is also possible that avoidant individuals' compulsive self-reliance (Mikulincer et al., 2003), which causes them to deny attachment needs and inhibit proximity seeking and interdependence, makes the provision and availability of a secure base irrelevant, or even threatening, as receiving supervisors' support would mean to reduce their emotional distance. Doing so would impair the effectiveness of their defensive strategies whose

main goal is to keep the attachment system deactivated or down-regulated (Mikulincer & Shaver, 2007). Finally, as mentioned above the attachment scale utilised might not have been sensitive enough to capture the dynamics of the supervisory relationship-specific IWMs.

This study makes a significant contribution to the research degree supervision literature. To the best of our knowledge, this is the first study to examine the research supervisory relationship through the lens of attachment theory. The results provide empirical evidence that attachment theory is a relevant framework that can be applied to academic supervisory relationships. The findings of this and future studies could inform the training of research supervisors who could learn to be vigilant towards signs of attachment anxiety or avoidance and employ suitable strategies which will allow them to meet the supervisees' needs, by being available, encouraging, and non-interfering, with an aim to enhance their sense of security. Based on the findings of the current study, it becomes obvious that anxiously attached supervisees would particularly benefit from SBS. Even though, the current study failed to demonstrate an interaction between attachment avoidance and SBS, it has to be noted that the benefits of this type of supervision were evident for all participants irrespective of their attachment style. Avoidant supervisees' attachment behaviours in particular have been reported to be challenging for supervisors (Wrape et al., 2017) as their compulsive overreliance leads them to avoid interpersonal interaction, disclosure, and even feedback. Supervisors should therefore be vigilant for the covert signs of avoidance behaviours and intervene before valuable supervisory time is lost. In addition, training for supervisors should also aim at enhancing their self-awareness regarding their own patterns of relating and their impact on the supervisory process as it has been shown, for example, that insecure supervisors tend to rate their supervisees as less

professionally developed (Foster et al., 2006) and engage in abusive supervision (Robertson et al., 2018). Moreover, evidence suggests that the supervisors' ability to form secure supervisory relationships is predictive of both supervisors' and supervisees' perceptions of the supervisory working alliance, while the supervisees' ability to form attachment relationships is not (Dickson et al., 2011; White & Queener, 2003), signifying the importance of the ability to provide a secure base in supervision. It is therefore imperative for supervisors to be encouraged and supported to provide supervisees with SBS tailored to their individual attachment orientations (Watkins Jr & Riggs, 2012). Recent evidence coming from attachment-based parenting (Huber et al., 2015b; Huber et al., 2015a) and couples' interventions (Wiebe & Johnson, 2016) indicate that attachment security can indeed be increased with positive outcomes.

Limitations and future research

The current study is not without limitations. The first limitation concerns the correlational nature of the data, which does not allow for any causal inferences. Future research could employ longitudinal or experimental designs to explore the effects of secure base supervision and supervision-specific attachment on a number of variables such as student satisfaction and retention, and timely completion of theses. Another shortcoming pertains to the sample size. Even though sample size calculations that were performed prior to recruitment indicate that the sample size is adequate for the analyses performed, future studies could replicate these findings with larger sample sizes for additional power. In addition, the sample is gender-biased as it consisted mostly of females (75.7%). However, previous studies have found no gender differences in adult attachment orientations (Kafetsios et al., 2014; Van IJzendoorn & Bakermans-Kranenburg,

1996). In addition, this study focused on a sample of doctoral and PhD students. Future studies could explore the attachment dynamics between supervisors and masters' students.

It is worth noting that the evaluation of SBS was based on students' perceptions of their supervisors' ability to provide a secure base. Even though, many studies have employed a similar design exploring the receivers' experience of supervision (e.g., Bennett et al., 2008; Halbert, 2015; Lindsay, 2015), which does not necessarily reflect the supervisors' actual ability to provide SBS, future research could recruit supervisory dyads to explore both the perspectives of the supervisors and the interaction of supervisors' and supervisees' attachment orientations. Moreover, although there is evidence that the attachment dynamics are activated within supervisory relationships (Rogers et al. 2019), we need to be cautious as supervisory relationships cannot be considered 'full-blown attachments' (Watkins and Riggs 2012). Even though, based on our findings, the interpersonal aspect of the relationship may play an important role in the learning process, this should not undermine the significance of other factors that bear important weight such as research expertise, project management, knowledge of university policies and procedures etc.

Conclusion

The findings of the present study demonstrated that attachment theory is a relevant conceptual framework in the context of research degree supervision and that secure base supervision enhances supervisees' research curiosity and supervision satisfaction. This evidence indicates that the interpersonal nature of the supervisory relationship and the relational individual differences should be taken into consideration in the development of university policies for

supervision and the design of training curriculums for research degree supervisors.

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