Cross-Sectional and Longitudinal Associations Between Romantic Attachment, Health Satisfaction, and Health Goal Importance in Partnered and Single Individuals

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Abstract

Attachment has previously been linked to people's health. However, less is known about how romantic attachment in currently partnered and single people predicts their health. The present study examines the association between romantic attachment and health outcomes at different timescales (i.e., cross-sectional and across 2 years) while considering individuals' relationship status (i.e., partnered and single). The concurrent results based on 516 partnered individuals suggest that more anxious partnered individuals experience lower health satisfaction while more avoidant partnered individuals place less importance to their health. Our results suggest no long-term prediction of partnered individuals' romantic attachment on their health satisfaction and health goal importance. For the results based on a sample of 173 singles, the picture was painted differently regarding the role of romantic attachment in their health: Avoidance was concurrently negatively linked to health satisfaction and health goal importance; yet, longitudinally, it emerged as a positive predictor for health satisfaction and health goal importance.

Keywords Attachment · Health satisfaction · Health goals · Singles · Partnered

Introduction

Being in a satisfying romantic relationship which is often characterized by a secure attachment to the romantic partner is conducive to a healthy life (e.g., Kiecolt-Glaser & Wilson, 2017). Conversely, attachment insecurity—represented by both the avoidance and anxiety dimensions—has been associated with adverse health in previous studies (Brazeau & Chopik, 2020). For instance, research has found that more avoidant individuals tend to report lower health-related quality of life (Maras et al., 2021) and that more anxious individuals tend to report more cardiovascular conditions (McWilliams & Bailey, 2010).

However, much remains unknown about the attachment–health link. The present study aims to address four

specific limitations in the literature. First, little is known about how health-related outcomes that reflect an early warning system for later health-related problems, such as health satisfaction and health goal importance, are related to attachment. Learning more about the generalizability of the effect of attachment on health will contribute to the theoretical understanding of the far-reaching predictive power of attachment for people's health. Second, previous studies have rarely focused on how *romantic* attachment (instead of global attachment) links to health outcomes. Understanding how attachment specific to a romantic partner is related to health outcomes will contribute to a contextualized understanding of the attachment–health link and aid future intervention studies that target changes in romantic attachment. Third, we know little about the longitudinal predictive validity of romantic attachment insecurity for later health outcomes. Most prior research on the attachment–health link was cross-sectional, which gives little indication about whether attachment can *predict* health. In the present study, we examine whether romantic attachment can predict two health outcomes (i.e., self-rated health and health importance) concurrently but also across 2 years. And fourth, given that single individuals also hold romantic

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attachment orientations toward former or desired partners, much remains to be uncovered about how attachment to a current partner in partnered individuals and attachment toward a former or desired partner in singles links to health outcomes. The present study uses health satisfaction and health goal importance as two important health outcomes of romantic attachment insecurity and examines how the romantic attachment in partnered individuals *and* in singles relates to their health satisfaction and health goal importance concurrently *and* across 2 years.

Attachment and Health Outcomes

Attachment theory provides a valuable paradigm when understanding the link between romantic relationships and health (Brazeau & Chopik, 2020). Romantic attachment can be characterized as typical behaviors, thoughts, and emotions in romantic relationships and are often measured along the two dimensions of avoidance and anxiety (Mikulincer & Shaver, 2007). People high in attachment avoidance tend to be uncomfortable with emotional closeness and prefer to be independent of their romantic partners. People high in attachment anxiety tend to have an increased need for closeness and intimacy that is accompanied by intensive worries about one's worth as a partner and the emotional availability of one's partner in times of need (Mikulincer & Shaver, 2007). As attachment guides interpersonal experiences with a partner, it ultimately affects relationship outcomes, such as satisfaction and responsiveness. Previous research shows that attachment insecurity is linked to lower relationship satisfaction and responsiveness (e.g., Bühler et al., 2020; Candel & Turliuc, 2019). These relationship outcomes are theorized to be either directly linked to health outcomes or to be mediated by physiological stress reactions, affect, and health behaviors, which then predict health outcomes (Pietromonaco et al., 2013a, 2013b).

A growing body of research suggests that global insecure attachment—i.e., both attachment avoidance and anxiety more generally (not toward a particular target)—is accompanied by various negative health outcomes. For instance, both attachment avoidance and anxiety have been linked to headaches, back and neck problems, and other forms of chronic pain, pain symptoms, and somatoform pain disorders (McWilliams & Bailey, 2010; McWilliams et al., 2010; Nacak et al., 2017). Avoidance and anxiety have also been linked to a variety of chronic conditions and diseases (e.g., breast cancer, fibromyalgia, and chronic fatigue) and how these conditions are managed (Meredith & Strong, 2019). Further, both avoidant and anxious attachment were also linked to heightened activity of the hypothalamic–pituitary–adrenal axis and thus to an increase in the body's stress response (Pietromonaco et al., 2013a, 2013b).

Regarding attachment avoidance in specific, previous research suggests that attachment avoidance is linked to lower treatment adherence in individuals diagnosed with lupus disease (Bennett et al., 2011) and to higher inflammatory responses to marital conflict signified by a higher inter-leukin-6 production (Gouin et al., 2009). More avoidantly attached individuals were also more likely to report lower health-related quality of life (Maras et al., 2021) and had lower levels of immunity, indicated by lower NK cell cytotoxicity (Picardi et al., 2013).

Regarding attachment anxiety, previous research suggests that anxiety is positively linked to a number of health conditions, such as somatic symptoms, including shortness of breath, dizziness, and digestive upsets (Ciechanowski et al., 2002; Maunder et al., 2011); cardiovascular conditions, including strokes, heart attacks, and high blood pressure (McWilliams & Bailey, 2010); and maladaptive alterations in cortisol levels and cellular immunity (Jaremka et al., 2013).

Health Satisfaction and Health Goal Importance

As mentioned, previous research has linked attachment to various self-reported health symptoms and conditions. Such studies are crucial when identifying risk factors for specific health conditions, such as cardiovascular disease (e.g., McWilliams & Bailey, 2010). However, in addition to this line of research, studies also need to assess attachment's role regarding individuals' general health satisfaction and their motivation to be healthy. Health satisfaction represents a global, subjective, and valid health indicator (e.g., Jylhä, 2009) that is linked to mortality (Idler & Benyamini, 1997) and could thus provide an early warning system for later health problems. Health goal importance, on the other hand, is a motivational health outcome that can be perceived as a crucial starting point to health-promoting and disease-averting behaviors in individuals (Gollwitzer & Oettingen, 1998). Both health indicators are the focus of the present study.

We know of no previous studies that have directly examined attachment in relation to health satisfaction or health goal importance. However, previous research hints at a link between attachment orientations and these two health indicators. Avoidantly and anxiously attached individuals might report lower health satisfaction for various reasons. Past results suggest that avoidantly and anxiously attached individuals show an increased vulnerability to pain-related conditions as well as mental and physical health problems (although more consistently in anxiously attached individuals; Stanton & Campbell, 2014). This elevated health-related vulnerability is likely rooted in maladaptive physiological processes (e.g., increased stress reaction) (Pietromonaco et al., 2013a, 2013b) and adverse relationship experiences (Feeney & Fitzgerald, 2019; Feeney & Karantzas, 2017;

Pepping et al., 2018), which are more prevalent among insecurely compared to securely attached individuals. Further, more anxious individuals tend to be more sensitive to and concerned with their health status (Noyes et al., 2003; Sherry et al., 2014). Together, these factors might contribute to lower health satisfaction among insecurely—and particularly anxiously—attached individuals. Regarding more avoidantly attached people, health satisfaction might be less negatively colored by their attachment because of their deactivating regulation processes (Mikulincer & Shaver, 2007) and avoidant coping style (Maras et al., 2021). Specifically, it was found in previous research that more avoidantly attached individuals close off the experience of negative emotions and emotionally disengage and cognitively distance themselves from threatening events (Mikulincer & Shaver, 2019). Health problems, which imply stress and threat, might thus be downregulated, or simply ignored.

Previous research also provides indirect support for the idea that attachment is linked to health goal importance. Evidence suggests that both avoidance and anxiety are associated with more negative health behaviors (e.g., less health promotion, more risky behavior, and fewer visits to healthcare providers) (Ahrens et al., 2012; Feeney & Ryan, 1994; Huntsinger & Luecken, 2004; Kim & Miller, 2020; Sadava et al., 2009; Scharfe & Eldredge, 2001). Such negative health behaviors could be partly explained by the lower self-regard that avoidantly and anxiously attached individuals hold (e.g., Huntsinger & Luecken, 2004; Mickelson et al., 1997). In addition, avoidantly attached individuals are also more likely to report maladaptive coping strategies that include behaviors such as using drugs or alcohol (Maras et al., 2021). We argue that these unfavorable health-related behaviors reflect a lack of importance placed on health by people with higher attachment insecurity.

Romantic Attachment and Health

While most studies have examined *global* attachment in relation to health outcomes, the present study focuses on *romantic* attachment in partnered participants, which has rarely been the focus when examining attachment and health (for an exception, see Weidmann & Chopik, 2022). Nevertheless, people have distinct attachment orientations regarding important relationship partners, such as parents, friends, and romantic partners (Sibley & Overall, 2008), which might have distinct consequences for health. In addition, interventions that aim to improve attachment insecurity (and potentially also health outcomes) could be more straightforwardly implemented when they focus on altering the attachment orientation toward a romantic partner, rather than altering the global attachment orientation of individuals, which is determined by multiple relationship partners and experiences.

A Longitudinal Viewpoint

Even though previous studies have greatly contributed to the understanding of the attachment–health link, most of these studies were cross-sectional (for an exception, see Jaremka et al., 2013; Picardi et al., 2013). To comprehend the predictive validity of attachment for health, however, long-term longitudinal studies are needed. Such studies can build a stronger case for the causal role of attachment in predicting health outcomes (e.g., Maunder & Hunter, 2001; Pietromonaco et al., 2013a, 2013b) and thereby solidify the theoretical importance of insecure attachment as a psychosocial risk factor for adverse health development across time.

Romantic Attachment in Singles

Aside from studying partnered individuals' romantic attachment, singles—a growing demographic in Western countries (e.g., Snell, 2017)—have been largely overlooked in previous attachment research (Pepping et al., 2018). Considering the higher avoidance and anxiety levels in singles compared to partnered persons (Bookwala, 2003; Chopik et al., 2013; Shaver & Brennan, 1992), singles may be particularly vulnerable to adverse health outcomes. Most research suggests that being in a romantic relationship is protective against worse health outcomes (e.g., Umberson & Thomeer, 2020). For example, fair or poor self-rated health was more prevalent in never married, divorced/separated, or widowed individuals in one study compared to happily married individuals (Lawrence et al., 2019). Nevertheless, there is also mixed evidence on whether being in a relationship is advantageous for a person's health (e.g., Averett et al., 2008).

Little is known, however, regarding the link between attachment and health in singles. Some of the past research has asked about general attachment orientations and not reported the participants' relationship status or included singles and partnered individuals in the same sample. Others have studied only romantic attachment but not included singles (for an exception, see Fraley et al., 2015) or not included any health outcomes. One study, however, has studied global attachment orientations in combination with health outcomes separately for singles and partnered individuals and found that attachment was more often associated with health-related risk and promotion behaviors in partnered compared to single individuals (Scharfe & Eldredge, 2001). Furthermore, the authors found that some associations went in a different direction for partnered compared to single individuals. For example, while partnered individuals with a preoccupied insecure attachment style showed a lower sleep quality, the authors found a higher sleep quality among preoccupied singles. This piece of evidence suggests that it is worthwhile to examine the potentially differential attachment–health link in partnered and single individuals.

Further, even though singles are not in a romantic relationship, they might still hold *romantic* attachment orientations. Since adult attachment is relatively stable across the lifespan (e.g., Chopik et al., 2019), the influence of a romantic relationship on a person's attachment style might reverberate long after the relationship has ended. This is in line with the previous results showing that people who changed relationship partner(s) across a period of 8 years did not experience significant changes in their attachment security (Lehnart & Neyer, 2006) and that people transfer their romantic attachment styles of previous partners to potential future romantic partners (Brumbaugh & Fraley, 2006). In addition, people who have not yet been involved in a romantic relationship might rely on attachment representations from other close relationships (e.g., parents and friends) when imagining a desired relationship (e.g., Furman et al., 2002). Furthermore, one study explicitly examined attachment working models toward a future long-term partner and found that its effects on participants' emotional well-being remained even when controlling for global romantic attachment orientations (Mohr et al., 2010). Hence, it might be a fruitful next step to include the romantic attachment of singles to a former or desired partner in the study of the attachment's role in health. The present study, therefore, aims to study specifically romantic attachment insecurity (i.e., avoidance and anxiety) and health outcomes in partnered *and* single individuals to broaden the understanding of how distinct attachment orientations are linked to subjective health outcomes.

Age, Gender, and Relationship Duration

Three demographic variables play an essential role when investigating attachment and health. First, age is important to consider when examining attachment and health. Previous research has shown that attachment changes across the lifespan (Chopik et al., 2019). In addition, one study, for example, has shown that avoidance is highest among middle-aged adults and lower among young and older adults, while anxiety is highest among younger adults and lowest among middle-aged and older adults (Chopik et al., 2013). Age is also a significant predictor of health. Especially in terms of the subjective evaluation of health, self-rated health declines between young adulthood up to older adulthood (Zajacova et al., 2017), and into oldest age (French et al., 2012). Regarding health goal importance, however, age seems to be unrelated to the life stage individuals find themselves in (e.g., Bühler et al., 2019; Carney & Patrick, 2017). Hence, we would expect that age would be related to the levels of avoidant and anxious attachment, as well as to self-rated health, but not necessarily health goal importance.

Second, gender is another important demographic variable to consider. In terms of attachment, mixed evidence

has emerged: Female individuals have been found to report higher avoidance and anxiety levels (Bühler et al., 2020; Chopik et al., 2013), but also lower avoidance and anxiety levels (Bühler et al., 2020; Chopik et al., 2019; Wongpakaran et al., 2012) compared to male individuals. A study across 62 cultural regions, however, found that men usually have higher avoidance (i.e., dismissive) attachment levels compared to women (Schmitt, 2003). In terms of health outcomes, previous research has shown that self-rated health is generally lower in men compared to women (French et al., 2012), suggesting that gender could be a valid predictor of health outcomes.

And third, regarding relationship duration, previous research is also mixed as to whether a longer relationship duration is linked to differences in avoidance and anxiety: Research has found that a longer relationship duration is either not linked to attachment (Kuncewicz et al., 2021) or it is linked to lower avoidance and unrelated to anxiety (Smith & Klases, 2016), or higher levels of avoidance and lower levels of anxiety (Umemura et al., 2018). However, it has been shown to moderate the links between attachment and relationship satisfaction (Hadden et al., 2014). Arguably, the negative effect of avoidance and anxiety on relationship satisfaction might accumulate over time (Hadden et al., 2014). Similarly, relationship duration might influence the attachment–health link, and controlling for relationship duration is therefore crucial. The present study, therefore, takes age, gender, and relationship duration as control variables into account when examining the link between romantic attachment and health outcomes in partnered and single individuals.

The Present Study

The present study examines the concurrent and longitudinal associations between romantic attachment and subjective health outcomes in partnered and single individuals. By doing so, the present study provides initial evidence of (1) whether the implications of insecure attachment extend to important subjective health indicators; (2) whether they are valid when examining *romantic* attachment as predictors of health; (3) whether romantic attachment avoidance and anxiety reflect long-term risk factors for health; and (4) whether attachment–health associations generalize across partnered and single individuals. Based on previous evidence, we expect to find group differences in attachment and health between partnered and single individuals. More specifically, we expect higher avoidance and anxiety levels and lower health ratings for singles compared to partnered individuals, based on previous research (e.g., Chopik et al., 2013; Umberson & Thomeer, 2020). In terms of the attachment–health link, we expect that more anxious persons report lower health satisfaction, while more anxious and

avoidant persons, in general, value health goals less. Because there is little evidence regarding singles' attachment and health outcomes, we explore whether these associations are found in partnered and single individuals alike (see Scharfe & Eldredge, 2001). Given that previous research is primarily based on cross-sectional results, we further explore whether the hypothesized links also emerge longitudinally.

Method

Participants

The data for the present study were taken from the Co-Development in Personality study, a large longitudinal research project funded by the Swiss National Science Foundation, which received ethical approval from the Ethics Committee Basel (approval number: 175/09). The overarching goal of the Co-Development in Personality study was to examine personality development in close relationships across three family generations. The participants filled out questionnaires at three measurement points in 2010, 2012, and 2014. Participants' romantic attachment orientations were measured at the second and third measurement waves. Thus, we relied on these two waves for our analyses (referred to as T1 and T2). The data from T1 were used for the main cross-sectional analyses and data from T2 were used to reproduce these cross-sectional analyses. Data from both waves were used for the longitudinal analyses. We grouped participants into the partnered and the singles sample based on a question at T1 about whether they currently have a romantic partner.

Partnered Sample

Participants that were in a relationship at T1, that reported their romantic attachment at T1, and that reported at least one health outcome (i.e., health satisfaction and/or health goal importance)[1] at T1 constituted the partnered sample of 516 individuals (56.6% female). This sample was used for the cross-sectional analyses with T1 data. The sample was between 15 and 89 years old ($M = 47.04$, $SD = 20.40$). The average relationship duration at T1 was 19.68 years ($SD = 17.58$), ranging from 1 month to 60 years. The partnered participants reported different civil statuses: 54.8% were married or in a registered partnership, 36.2% were unmarried, 4.8% were divorced, 2.9% were widowed,

and 1.2% were separated from their legal spouse. Regarding their parental status, 62.4% had children. The participants' main occupation status consisted of working part-time (31.6%), working full-time (24.6%), not active in the job market (23.8%), currently in education (17.8%), reporting another employment status (1.0%), not reporting their employment status (1.0%), and currently unemployed (0.2%). Of those partnered participants, 416 (80.6%) also responded about at least one health outcome in T2 and could therefore be included in the longitudinal analyses.

At T2, the partnered sample for the cross-sectional reproducibility analyses consisted of 502 individuals who reported being partnered at this measurement wave and reported on their attachment orientation and at least one health outcome. Partnered participants were between 17 and 90 years old ($M = 47.10$, $SD = 20.52$). The average relationship duration across partnered participants at T2 was 20.14 years ($SD = 18.10$), ranging from 1 month to 64 years. Regarding the participants' civil status, half of the sample was married (51.8%). The remaining participants reported being unmarried (38.6%), divorced (5.6%), widowed (3.4%), and separated from their spouse (0.6%). Most of the participants had children (59.8%). The participants' main occupation status was diverse, with 31.7% working part-time, 26.7% working full-time, 23.1% not active in the job market, 16.3% currently in education, 1.0% reporting another employment status, and 0.8% currently unemployed. Two participants (0.4%) did not report on their main occupation status.

Single Sample

Participants that were single at T1, that reported their romantic attachment at T1, and that reported at least one health outcome at T1[1] constituted the single sample of 173 individuals (68.2% female). They were between 15 and 93 years old ($M = 35.31$, $SD = 23.27$). Regarding their civil status, 72.8% were unmarried, 12.1% were widowed, 11.6% were divorced, and 3.5% were separated from their spouse. Regarding their parental status, 28.3% had children. Participants' main occupation status was in education (42.2%), working part-time (21.4%), not active on the job market (19.1%), working full-time (12.7%), unemployed (0.6%), and other (4.0%). Of those singles, 137 (79.2%) also responded about at least one health outcome in T2 and hence constituted the longitudinal singles sample.

At T2, the single sample for the cross-sectional reproducibility analyses consisted of 134 individuals who reported to be single at this measurement wave and reported on their attachment orientation and at least one health outcome. The sample was between 17 and 93 years old ($M = 40.13$, $SD = 23.76$). The original sample included 135 participants. However, one person reported being married but not

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[1] Missing data occurred because some participants did not fill out all survey questions. However, to maximize the number of participants that could be included in at least some analyses, we included participants that reported at least one health outcome and, consequently, could be included in at least one set of analyses that predicted a specific health outcome.

currently being in a relationship. We, therefore, excluded that person from the analyses and retained a final T2 single sample of 134 participants. Regarding their civil status, 64.2% were unmarried, 15.7% were widowed, 14.2% were divorced, 5.2% were separated from their spouse, and one person (0.7%) did not report their marital status. The minority (35.8%) had children. Participants' main occupation status was in education (29.1%), working part-time (29.1%), not active on the job market (23.1%), working full-time (17.2%), and other (0.7%). One person (0.7%) did not provide information on their main occupation status.

Attrition Analyses

Partnered Sample

When compared to partnered participants who dropped out from the study ($n = 100$), the retained partnered participants were not different in their attachment avoidance ($t[514] = -0.06$, $p = 0.95$), their attachment anxiety ($t[514] = -1.16$, $p = 0.25$), their health satisfaction ($t[508] = 1.62$, $p = 0.11$), and their gender ($\chi^2[1, N = 516] = 1.31$, $p = 0.22$) at T1. They did, however, differ in their health goal importance ($t[130.31] = 2.16$, $p = 0.03$), with the retained sample of partnered participants reporting higher health goal importance ($M = 3.64$, $SD = 0.37$) compared to the dropout sample ($M = 3.53$, $SD = 0.45$). The retained sample of partnered participants was also older ($M = 48.50$ years, $SD = 19.91$) than the dropout sample ($M = 40.97$, $SD = 21.39$; $t[143.06] = 3.21$, $p = 0.002$).

Single Sample

When compared to single participants who dropped out from the study ($n = 36$), the retained single participants were not different in their attachment avoidance ($t[171] = 0.26$, $p = 0.80$), their attachment anxiety ($t[171] = 1.39$, $p = 0.17$), their health satisfaction ($t[48.01] = 1.69$, $p = 0.10$), their health goal importance ($t[170] = 1.34$, $p = 0.18$), and their age ($t[171] = 0.33$, $p = 0.74$) at T1. However, the retained single participants were more likely to be female (72.26%) compared to the dropout sample (52.78%; $\chi^2[1, N = 173] = 4.13$, $p = 0.04$) at T1.

Measures

Romantic Attachment

The German version of the Experiences in Close Relationships-Relationship Structures questionnaire was used (ECR-RS; Fraley et al., 2011) to assess romantic attachment at T1 and T2. The items were preceded by the instruction to "Please answer the following questions with reference to your partner. If you are currently not in a relationship, answer the questions with reference to a former or desired relationship." Previous research has also asked participants about their attachment to their former partner when studying single participants (e.g., Lehnart & Neyer, 2006). Additionally in our study, we asked single participants about their attachment to a desired partner, because otherwise, only singles who have been in a romantic relationship could answer the question, while we would have excluded singles with no romantic relationship experiences. Six items referred to attachment avoidance, including the item "I prefer not to show my partner how I feel deep down." Three items referred to attachment anxiety, including the item "I often worry that my partner doesn't really care for me." These items were rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The reliabilities of avoidance for the cross-sectional sample at T1 ($\alpha = 0.77$ for partnered participants, $\alpha = 0.79$ for singles), for the cross-sectional sample at T2 ($\alpha = 0.78$ for partnered participants, $\alpha = 0.78$ for singles), and for the longitudinal sample at T1 ($\alpha = 0.77$ for partnered participants, $\alpha = 0.78$ for singles) were satisfactory. Likewise, the reliability of anxiety for the cross-sectional sample at T1 ($\alpha = 0.71$ for partnered participants, $\alpha = 0.79$ for singles), for the cross-sectional sample at T2 ($\alpha = 0.81$ for partnered participants, $\alpha = 0.81$ for singles), and for the longitudinal sample at T1 ($\alpha = 0.72$ for partnered participants, $\alpha = 0.79$ for singles) were satisfactory.

Health Satisfaction

Health satisfaction was assessed at T1 and T2 with one item based on the German Socioeconomic Panel and the Swiss Household Panel (Voorpostel et al., 2010; Wagner et al., 2007). The participants were asked to report how satisfied they were with their health on a scale ranging from 0 (*completely unsatisfied*) through 5 (*neutral*) to 10 (*completely satisfied*).

Health Goal Importance

Health goal importance was assessed at T1 and T2 with an adapted German version of the Aspirations Index (Deci & Ryan, 1997; Klusmann et al., 2005). Participants rated the importance of four statements such as "being physically healthy" on a scale from 1 (*very unimportant*) to 4 (*very important*). The reliabilities of health goal importance for the cross-sectional sample at T1 ($\alpha = 0.72$ for partnered participants, $\alpha = 0.67$ for singles), the cross-sectional sample at T2 ($\alpha = 0.69$ for partnered, $\alpha = 0.66$ for single participants), and for the longitudinal sample at T2

($\alpha = 0.69$ for partnered participants, $\alpha = 0.74$ for singles) were satisfactory.

Data Analysis Plan

Before conducting the main analyses, we will describe the data in terms of means, standard deviations, and inter-correlations between the key variables. We will also report group differences between partnered and single individuals in avoidance, anxiety, self-rated health, and health goal importance. We employed multilevel models to consider the interdependent nature of the data due to the family study design. We computed cross-sectional and longitudinal models (i.e., across 2 years) to examine the concurrent and longitudinal link between attachment and health outcomes in partnered and single individuals. Because attachment was reported at T1 and T2, we aimed to reproduce the cross-sectional analyses by repeating the cross-sectional models of T1 with data from T2. Models were computed separately for health satisfaction and health goal importance. Consequently, for each sample (i.e., partnered and singles), four cross-sectional models (two with data at T1 and two with data at T2), and two longitudinal models were computed with avoidance and anxiety as simultaneous predictors of either health satisfaction or health goal importance.

Previous research suggests age differences in attachment across the lifespan (e.g., Chopik et al., 2013), and gender differences in Switzerland and other Western European countries (Schmitt et al., 2003). Furthermore, age is an important predictor of self-rated health (e.g., Hill et al., 2013; McCullough & Laurenceau, 2005), while there is slight variation in how female and male individuals rate their health across the adult lifespan (Zajacova et al., 2017). Thus, the models were controlled for age and gender (coded as -1 = female, 1 = male). Because age and relationship duration were highly correlated ($r = 0.81$) among partnered individuals, we did not include relationship duration as a simultaneous control variable with age. However, as post hoc analyses, we also tested whether the attachment–health associations in partnered individuals are different if we control for relationship duration rather than for age. We grand-mean centered the predictors (except for gender). In the longitudinal models, we additionally controlled for the stability of health outcomes by adding the respective health outcome at T1 as predictor to control for their unique influence. In other words, in the longitudinal models, we predict residual change in health outcomes because we control for their respective stability. As a control variable, age in years was divided by 10 to reach a similar variance compared to the other variables. Missing data were handled with listwise deletion. Analyses were conducted with the lme4 package (Bates et al., 2015) in R, version 3.5.1 (R Core Team, 2021).

Handling Missing Data

In the present study, two types of missing data were present. First, participants *skipped* a scale in the survey and thus had missing values on one but not all key variables at a time point. And second, participants dropped out of the study and did not provide values at T2. The first type of missing data affected less than 5% of the data, which makes it unlikely that the missingness of the data influenced the results. The second type of missing data, however, affected a larger proportion of the data (approximately 20%). Therefore, we used multiple imputation with 10 imputed data sets to handle missing data due to attrition. Data for health satisfaction and health goal importance were imputed using the predictive mean matching method. For these analyses, we used the *mice* package (van Buuren & Groothuis-Oudshoorn, 2011), the *miceadds* package (Robitzsch & Grund, 2023), and the *merTools* package (Knowles et al., 2023). We report the pooled estimates and standard errors of the analyses based on multiple imputation alongside the results based on the observed data.

Power Analysis

At the time the present study was conceptualized, data collection had already been completed. Therefore, a post hoc power analysis with G*Power (Faul et al., 2007) for multiple regression was conducted. The effect sizes of previous research varied from very small to large, however, most studies found small effects (Ahrens et al., 2012; Ciechanowski et al., 2002; Kim & Miller, 2020; McWilliams & Bailey, 2010; Sadava et al., 2009). We, therefore, used f^2 effect sizes of 0.15 (medium) and 0.02 (small) to estimate the power of finding an effect of romantic attachment. Twelve power analyses were conducted with the smallest sample sizes for partnered ($N_{\text{cross-sectionalT1}} = 510$, $N_{\text{cross-sectionalT2}} = 496$, $N_{\text{longitudinal}} = 405$) and single individuals ($N_{\text{cross-sectionalT1}} = 171$, $N_{\text{cross-sectionalT2}} = 132$, $N_{\text{longitudinal}} = 134$) and the two different effect size estimates (i.e., small and medium). The number of predictors was four for cross-sectional models (attachment avoidance, attachment anxiety, age, and gender) and five for longitudinal models (attachment avoidance, attachment anxiety, age, gender, and health outcome at T1). Our study was well-powered to find medium effects for partnered individuals (> 0.99 for the cross-sectional models at T1 and T2, and = 0.99 for the longitudinal models) and for single individuals (= 0.99 for the cross-sectional models at T1, 0.96 for the cross-sectional models at T2, and 0.95 for the longitudinal models). To find a small effect, the power for partnered individuals was 0.94 for the cross-sectional models at T1, 0.94 for the cross-sectional models at T2, and 0.88 for the longitudinal models. To detect small effects among single individuals, the power for the

Table 1 Measurement invariance for romantic attachment across partnered and single participants

	χ^2 (df)	CFI	RMSEA [90% CI]	Comparison	ΔCFI	ΔRMSEA	p
Avoidance							
Configural	119.52 (18)	.942	.128 (.107, .150)				
Partial metric	127.26 (21)	.939	.121 (.101, .142)	Configural	.003	.007	.052
Metric	149.32 (23)	.928	.126 (.107, .146)	Configural	.014	.002	< .001
Scalar	171.95 (28)	.917	.122 (.105, .140)	Metric	.011	.004	< .001
Anxiety							
Configural	0.00 (0)	1.000	.000 (.000, .000)				
Metric	1.10 (2)	1.000	.000 (.000, .090)	Configural	.000	.000	.578
Scalar	6.05 (4)	.996	.039 (.000, .097)	Metric	.004	.039	.084

p = *p* values based on the chi-square difference test. Partial metric test included freely estimating the third and the sixth items but constraining all other items to be equal across groups

cross-sectional models at T1 was 0.58, 0.49 for the cross-sectional models at T2, and 0.49 for the longitudinal models.

Data Sharing Agreement

Because we controlled for age, gender, and the participants' family connections, we cannot share the data of the current study for reasons of identifiability. We share the R-scripts, the output files, and the measures used on the Open Science Framework: https://osf.io/8jrfc/.

Results

Measurement Invariance Across Partnered and Single Individuals

To examine whether the attachment measures reflected the same construct across partnered and single individuals, we tested for configural, metric, and scalar measurement invariance. To that end, we conducted a series of confirmatory factor analyses for attachment avoidance and anxiety at T1: (a) by freely estimating the factor loadings (configural invariance), (b) by setting the factor loadings equal across partnered and single participants (metric invariance), and (c) by additionally setting the intercepts of the indicators (i.e., items) equal across partnered and single participants. Measurement invariance was decided based on a ΔCFI equal or smaller than 0.01 (Chen, 2007; Cheung & Rensvold, 2002), a ΔRMSEA equal or smaller than 0.015 (Chen, 2007), and a non-significant chi-square difference test between models.

The model fit indices and model comparisons can be found in Table 1. In addition, Table 2 shows the freely estimated factor loadings on avoidance and anxiety for partnered and single individuals. The analyses suggest that the measurement of attachment avoidance was not comparable across groups, neither in how the items loaded onto the avoidance factor nor in terms of their intercepts. When we tested partial metric invariance aiming at freely estimating as few loadings between groups as possible, we found that freely estimating the third and the sixth items led to measurement invariance between the two groups (ΔCFI = 0.003, ΔRMSEA = 0.007, *p* = 0.052). For the measurement of attachment anxiety, we could establish metric but not scalar invariance between partnered and single participants. That is, groups were similar in how the items loaded on the anxiety factor but dissimilar in the items' intercepts (based on ΔCFI larger than 0.01 and ΔRMSEA larger than 0.015). From these invariance tests, we conclude that the latent anxiety construct is more comparable between partnered and single participants compared to the latent avoidance construct. In sum, we note that a direct comparison of the effects of attachment avoidance on health in partnered and single participants might not be given, while a comparison of the effects of attachment anxiety is warranted.

Descriptive Statistics

Zero-order correlations, means, and standard deviations for partnered and single individuals can be found in Table 1. The correlations, means, and standard deviations for the partnered and single individuals in the cross-sectional reproducibility analyses at T2 can be found in Table 2.

Regarding group differences, we found that in line with the previous studies (e.g., Bookwala, 2003; Chopik et al., 2013; Shaver & Brennan, 1992), singles reported significantly higher ratings of avoidance ($t[687] = 3.36$, $p = 0.001$) and anxiety ($t[687] = 8.01$, $p < 0.001$) at T1 compared to partnered individuals. Singles did not significantly differ from partnered individuals in their health satisfaction at T1 ($t[679] = 0.49$, $p = 0.63$) and T2 ($t[543] = 0.66$, $p = 0.51$) and their health goal importance at T1 ($t[683] = 0.56$, $p = 0.57$) and T2 ($t[552] = -1.03$, $p = 0.30$). Singles were, however, substantially younger ($t[687] = -6.32$, $p < 0.001$), more likely to be female ($\chi^2[1, N = 689] = 6.78$, $p = 0.007$) and to be

Table 2 Item loadings for romantic attachment avoidance and anxiety across partnered and single participants in the model with freely estimated factor loadings

	Partnered (n = 516)			Single (n = 173)		
	β	b (95% CI)	p	β	b (95% CI)	p
Avoidance Items						
1. It helps to turn to my partner in times of need. (r)	.89	0.84 (0.76, 0.92)	< .001	.87	1.15 (0.99, 1.31)	< .001
2. I usually discuss my problems and concerns with my partner. (r)	.86	0.96 (0.88, 1.04)	< .001	.93	1.17 (1.02, 1.32)	< .001
3. I talk things over with my partner. (r)	.86	1.02 (0.94, 1.11)	< .001	.76	0.95 (0.78, 1.11)	< .001
4. I find it easy to depend on my partner. (r)	.64	0.69 (0.60, 0.78)	< .001	.70	1.03 (0.83, 1.23)	< .001
5. I don't feel comfortable opening up to my partner	.26	0.53 (0.35, 0.71)	< .001	.18	0.33 (0.04, 0.61)	.024
6. I prefer not to show my partner how I feel deep down	.50	0.82 (0.68, 0.96)	< .001	.45	0.70 (0.47, 0.94)	< .001
Anxiety Items						
1. I often worry that my partner doesn't really care for me	.54	0.83 (0.69, 0.98)	< .001	.72	1.15 (0.91, 1.38)	< .001
2. I'm afraid my partner may abandon me	.61	0.91 (0.76, 1.05)	< .001	.69	1.25 (0.98, 1.51)	< .001
3. I worry that my partner won't care about me as much as I care about him/her	.90	1.38 (1.21, 1.55)	< .001	.85	1.61 (1.34, 1.89)	< .001

(r) = items have been recoded

childless (χ^2[1, N = 689] = 59.18, p < 0.001), less likely to work full-time (χ^2[1, N = 689] = 10.13, p = 0.001), and more likely to be in education (χ^2[1, N = 689] = 46.78, p < 0.001). The same pattern of group differences also emerged in the reproducibility sample at T2: compared to partnered individuals, singles reported significantly higher ratings of attachment avoidance (t[634] = 3.90, p < 0.001) and attachment anxiety (t[169.47] = 6.90, p < 0.001) at T2. Regarding health, singles did not significantly differ from partnered persons in their health satisfaction (t[191.16] = -0.35, p = 0.73) as well as their health goal importance (t[633] = 0.58, p = 0.56) at T2. Singles were, however, substantially younger (t[189.25] = -3.10, p = 0.002), more likely to be female (χ^2[1, N = 636] = 12.12, p < 0.001) and to be childless (χ^2[1, N = 636] = 23.51, p < 0.001), less likely to work full-time (χ^2[1, N = 636] = 4.67, p = 0.03), and more likely to be in education (χ^2[1, N = 636] = 19.49, p < 0.001) (Tables 3 and 4).

Is Romantic Attachment Linked to Health Outcomes in Partnered Individuals?

The results of the cross-sectional models for partnered individuals can be found in Table 5 (see the left section for T1 and the right section for T2). We found that gender was not significantly linked to health satisfaction and only at T1 it was linked to health goal importance. Specifically, women showed a higher health goal importance than men at T1. Age was negatively linked to health satisfaction but was not linked to health goal importance. Regarding attachment, we found that avoidance was not linked to health satisfaction in partnered individuals but was

negatively linked to health goal importance. On the other hand, anxiety was negatively linked to health satisfaction but was not linked to health goal importance. These results of attachment and health outcomes were reproduced with data from T2.

The results of the longitudinal models for partnered individuals can be found in the left section of Table 6. We found that health satisfaction and health goal importance were stable over time. Furthermore, gender was not predictive of residual changes in health satisfaction and health goal importance. Age predicted lower health satisfaction across two years, while it was unrelated to residual changes in health goal importance. No significant longitudinal effects were found for romantic attachment avoidance and anxiety on health outcomes in partnered individuals. The results based on multiple imputation are comparable in size to the results based on the analyses with observed longitudinal data.

Do Avoidance and Anxiety Predict Health Outcomes in Singles?

The results of the cross-sectional models for singles can be found in Table 5. Gender was unrelated to health satisfaction and health goal importance in singles. Age was linked to lower health satisfaction at T1 and T2 but was not associated with health goal importance. Regarding attachment, we found that avoidance was negatively linked to health satisfaction in single participants at T1 (but not T2) and negatively associated with health goal importance at T1 (but not T2). No significant effect was found for anxiety on health satisfaction and on health goal importance.

Table 3 Zero-order correlations between target variables, means, and standard deviations for partnered and single individuals

Variable	1	2	3	4	5	6	7	8	9	M (SD) Partnered	M (SD) Singles	|d|
1. Avoidance T1		**.45**	−.18	−.03	−.12	−.17	**.15**	−.08	.09	2.16 (0.95)	2.44 (1.03)	**0.29**
2. Anxiety T1	**.34**		−.24	−.09	−.04	−.07	−.07	.06	−.11	2.17 (1.22)	3.08 (1.50)	**0.67**
3. Health satisfaction T1	−.23	−.08		**.55**	.14	.18	−.09	−.04	−.08	7.43 (2.26)	7.53 (2.40)	0.04
4. Health satisfaction T2	−.02	−.17	**.60**		.14	.13	−.15	.01	−.15	7.10 (2.37)	7.26 (2.39)	0.07
5. Health goal importance T1	−.31	−.16	.15	.21		**.63**	.03	**.12**	.03	3.62 (0.39)	3.64 (0.42)	0.05
6. Health goal importance T2	.03	.04	.08	.08	**.38**		−.05	.05	−.09	3.60 (0.39)	3.56 (0.46)	0.10
7. Age	−.08	−.30	−.18	−.08	.12	.05		−.16	**.81**	47.04 (20.40)	35.31 (23.27)	**0.54**
8. Gender	−.08	−.02	−.04	.09	.10	.16	.07		−.07	56.59%	68.21%	–
9. Relationship duration	–	–	–	–	–	–	–	–		19.68 (17.58)	–	–

Correlations of partnered individuals are above the diagonal; correlations of singles are below the diagonal. Gender was coded female = 1, male = −1. M = mean and SD = standard deviation. Coefficients in bold are significant ($p < .05$). \|d\| denotes the absolute mean difference between partnered and single participants. Chi-square test regarding differences in the distribution of gender in the partnered and single sample was significant ($\chi^2[1, N = 689] = 6.78$, $p = .007$). Percentage of gender refers to the proportion of females. Relationship duration is only reported for partnered participants. Correlations between variables measured at T1 were computed with the cross-sectional samples at T1, while the longitudinal correlations between variables measured at T1 and T2 were computed with the longitudinal samples

Table 4 Zero-order correlations between target variables, means, and standard deviations for partnered and singles at T2 (reproducibility sample)

Variable	1	2	3	4	5	6	7	M (SD) Partnered	M (SD) Singles	|d|
1. Avoidance T2		**.45**	−.06	−.15	**.15**	−.09	**.12**	2.08 (0.95)	2.44 (1.01)	**.37**
2. Anxiety T2	**.25**		−.13	−.10	−.07	.04	−.07	1.99 (1.11)	2.99 (1.57)	**.73**
3. Health satisfaction T2	−.12	−.03		**.15**	−.14	.02	−.15	7.17 (2.28)	7.08 (2.54)	.04
4. Health goal importance T2	−.09	−.02	.05		.00	.07	−.01	3.60 (0.40)	3.62 (0.41)	.06
5. Age	.03	−.20	−.24	.08		−.16	**.82**	47.10 (20.52)	40.13 (23.76)	**.31**
6. Gender	−.03	−.08	.03	.14	.13		−.07	58.2%	74.6%	–
7. Relationship duration	–	–	–	–	–	–		20.14 (15.50)	–	–

Correlations of partnered individuals are above the diagonal; correlations of singles are below the diagonal. Gender was coded female = 1, male = −1. M = Mean and SD = Standard deviation. Percentage of gender refers to the proportion of females. Coefficients in bold are significant ($p < .05$). \|d\| denotes the absolute mean difference between partnered and single participants

The right section of Table 6 shows the longitudinal results of the link between romantic attachment and health outcomes for singles. We found that in singles, health satisfaction and health goal importance were stable over time. Furthermore, gender was not predictive of residual changes in health satisfaction, but it predicted later health goal importance. In other words, for women, we found higher health goal importance at T2. Age did not predict later health satisfaction and health goal importance changes. Regarding attachment, we found that avoidance in singles was positively linked to residual changes in health satisfaction and health goal importance. In contrast, anxiety was negatively linked to later health satisfaction but unrelated to later health goal importance. The results based on multiple imputation are comparable to the results based on the observed data (except for the effect of gender, which changed their effect sign).

Post Hoc Analyses

Are the Results Consistent When Controlling for Relationship Duration in Partnered Individuals?

We conducted additional analyses with partnered individuals, in which we controlled for relationship duration and gender instead of age and gender. The findings are summarized in Tables 7 and 8. Relationship duration, similar to age, was linked to lower health satisfaction concurrently and longitudinally but was unrelated to health goal importance. The results regarding attachment were identical in terms of the direction, strength, and significance of the effects in comparison to those found when controlling for gender and age.

Table 5 Results of cross-sectional multilevel models predicting health satisfaction and health goal importance from attachment insecurity in partnered and single individuals

	T1								T2							
	Partnered				Single				Partnered				Single			
	Est	SE	p	n	Est	SE	p	n	Est	SE	p	n	Est	SE	p	n
Health satisfaction T1				510				171				496				132
Intercept	**7.45**	0.11	<.001		**7.60**	0.19	<.001		**7.16**	0.10	<.001		7.04	0.26	<.001	
Gender	−0.12	0.10	.220		−0.12	0.19	.545		0.01	0.10	.911		0.13	0.24	.596	
Age	**−0.12**	0.05	.021		**−0.23**	0.08	.004		**−0.17**	0.05	<.001		**−0.27**	0.09	.005	
Avoidance	−0.17	0.12	.158		**−0.51**	0.18	.005		0.08	0.12	.488		−0.21	0.22	.348	
Anxiety	**−0.38**	0.09	<.001		−0.12	0.13	.366		**−0.32**	0.10	.002		−0.09	0.14	.539	
Health goal importance T1				513				172				502				133
Intercept	**3.61**	0.02	<.001		**3.63**	0.03	<.001		**3.59**	0.02	<.001		3.59	0.04	<.001	
Gender	**0.04**	0.02	.010		0.04	0.03	.268		0.02	0.02	.203		0.06	0.04	.120	
Age	0.01	0.01	.208		0.01	0.01	.285		0.01	0.01	.560		0.02	0.02	.325	
Avoidance	**−0.05**	0.02	.014		**−0.12**	0.03	<.001		**−0.04**	0.02	.035		−0.04	0.04	.241	
Anxiety	0.01	0.02	.741		−0.01	0.02	.542		−0.02	0.02	.337		0.01	0.02	.590	

Est.=unstandardized estimates, SE=standard error, p=p value, n=number of observations available for this model. Gender was coded female=1, male=−1. Coefficients in bold are significant ($p < .05$)

Discussion

The present study extended previous research on attachment and health (1) by examining the attachment–health link including subjective–evaluative and motivational health outcomes, (2) by examining *romantic* rather than *general* attachment, (3) by examining these associations concurrently and longitudinally, and (4) by testing these associations in partnered and single participants. Along with the study of Scharfe and Eldredge (2001), the present study provides further impetus to study romantic attachment and health separately in partnered and single individuals. In the following, we will discuss the present findings and provide an outlook for future studies based on the present study's limitations.

Group Differences Between Partnered and Single People

We expected group differences in attachment and health between partnered and single individuals in that singles would report higher avoidance and anxiety levels, and lower health outcomes. In line with previous research, we did observe more insecure attachment ratings for both avoidance and anxiety in singles compared to partnered individuals (Bookwala, 2003; Chopik et al., 2013; Shaver & Brennan, 1992). In terms of health, however, we found that singles reported comparable health satisfaction and health goal importance, which is in contrast to previous research that suggests lower health in singles (e.g., Umberson & Thomeer, 2020). On the one hand, it could be that we found no

group difference because the singles sample was comparably younger and therefore may be healthier than the partnered sample. On the other hand, it is also very plausible that singles generally do not have lower health satisfaction and lower health goal importance compared to partnered individuals. This is in line with the previous research that shows comparable health in married, widowed, and never-married individuals, but lower self-rated health in divorced, separated, and cohabiting individuals, suggesting that it is not only the relationship status but also the past experience of low relationship quality that drives poorer health outcomes in singles (Lawrence et al., 2019; Ren, 1997).

Age, Gender, and Relationship Duration as Predictors of Health Outcomes

Similar to previous research, we found that age was a significant predictor of health satisfaction—concurrently and longitudinally (French et al., 2012; Zajacova et al., 2017) and that age seems to be unrelated to health goal importance (Bühler et al., 2019; Carney & Patrick, 2017). While age-related health changes might be reflected in the decline of people's health satisfaction, health seems to be a worthy pursuit throughout the adult lifespan. We found that age and relationship duration were highly correlated and thus, the effects found for age also replicated for relationship duration. In addition, we found consistent null effects of gender on health outcomes, which contradicts previous research on self-rated health (e.g., French et al., 2012). However, given that some health conditions are more likely in female individuals while others are more likely in males (e.g., Crimmins

Table 6 Results of longitudinal multilevel models predicting health satisfaction and health goal importance from attachment insecurity in partnered and single individuals

	Partnered						Single					
	Imputed Est	Imputed SE	Est	SE	p	n	Imputed Est	Imputed SE	Est	SE	p	n
Health satisfaction T2						516/405						173/134
Intercept	7.05	0.14	**7.08**	0.10	<.001		7.27	0.19	**7.04**	0.19	<.001	
Health satisfaction T1	0.57	0.04	**0.57**	0.05	<.001		0.64	0.07	**0.65**	0.07	<.001	
Gender	0.02	0.19	−0.01	0.10	.960		−0.59	0.39	0.21	0.17	.224	
Age	−0.11	0.05	**−0.11**	0.05	.035		−0.02	0.07	0.03	0.08	.709	
Avoidance	0.21	0.11	0.21	0.12	.086		0.42	0.16	**0.38**	0.18	.033	
Anxiety	−0.07	0.08	−0.10	0.09	.269		−0.23	0.11	−0.23	0.11	.050	
Health goal importance T2						516/415						173/137
Intercept	3.59	0.02	**3.59**	0.02	<.001		3.60	0.04	**3.51**	0.04	<.001	
Health goal importance T1	0.64	0.04	**0.64**	0.04	<.001		0.50	0.08	**0.48**	0.09	<.001	
Gender	−0.01	0.03	−0.01	0.02	.647		−0.19	0.07	**0.09**	0.04	.033	
Age	−0.01	0.01	−0.01	0.01	.471		0.01	0.01	0.01	0.02	.632	
Avoidance	−0.04	0.02	−0.04	0.02	.053		0.09	0.03	**0.08**	0.04	.044	
Anxiety	0.00	0.01	0.00	0.01	.916		0.02	0.02	0.03	0.03	.282	

Imputed = pooled estimates and standard errors of multiple imputation models. Est. = unstandardized estimates, SE = standard error, p = p value, n = number of observations with multiple imputation/number of observations available for this model. Gender: female = 1, male = −1. Coefficients in bold are significant ($p < .05$)

Table 7 Results of cross-sectional multilevel models predicting health satisfaction and health goal importance from attachment insecurity in partnered individuals

	T1				T2			
	Est	SE	p	n	Est	SE	p	n
Health satisfaction T1				486				488
Intercept	**7.43**	0.11	**<.001**		7.15	0.10	**<.001**	
Gender	−0.06	0.10	.530		0.04	0.10	.671	
Relationship duration	**−0.01**	0.01	**.030**		**−0.02**	0.01	**<.001**	
Avoidance	−0.21	0.12	.076		0.08	0.12	.524	
Anxiety	**−0.42**	0.09	**<.001**		**−0.31**	0.10	**.003**	
Health goal importance T1				489				494
Intercept	**3.61**	0.02	**<.001**		**3.59**	0.02	**<.001**	
Gender	**0.04**	0.02	**.023**		**0.02**	0.02	.215	
Relationship duration	0.00	0.00	.353		**0.00**	0.00	.987	
Avoidance	**−0.06**	0.02	**.007**		**−0.04**	0.02	**.050**	
Anxiety	0.01	0.02	.542		−0.02	0.02	.359	

Est. = unstandardized estimates, *SE* = standard error, *p* = *p* value, *n* = number of observations available for this model. Gender: female = 1, male = −1. Coefficients in bold are significant ($p < .05$)

Table 8 Results of Longitudinal Multilevel Models Predicting Health Satisfaction and Health Goal Importance from Attachment Insecurity in Partnered Individuals

	Imputed Est	Imputed SE	Est	SE	p	n
Health satisfaction T2						492/384
Intercept	7.07	0.14	**7.07**	0.10	**<.001**	
Health satisfaction T1	0.57	0.04	**0.58**	0.05	**<.001**	
Gender	0.02	0.19	0.01	0.01	.951	
Relationship duration	−0.01	0.01	**−0.01**	0.01	**.020**	
Avoidance	0.24	0.11	0.23	0.12	.068	
Anxiety	−0.09	0.09	−0.11	0.10	.240	
Health goal importance T2						492/393
Intercept	3.58	0.02	**3.59**	0.02	**<.001**	
Health goal importance T1	0.64	0.04	**0.64**	0.04	**<.001**	
Gender	−0.01	0.03	0.00	0.02	.750	
Relationship duration	0.00	0.00	0.00	0.00	.067	
Avoidance	−0.04	0.02	−0.04	0.02	.051	
Anxiety	0.00	0.01	0.00	0.01	.792	

Imputed = pooled estimates and standard errors of multiple imputation models. Est. = unstandardized estimates, *SE* = standard error, *p* = *p* value, *n* = number of observations with multiple imputation/number of observations available for this model. Gender: female = 1, male = −1. Coefficients in bold are significant ($p < .05$)

et al., 2011), the obtained null effects for gender in self-rated health could be contextualized in that regard.

Romantic Attachment and Health Satisfaction in Partnered and Single Individuals

In the present study, associations between avoidance and health satisfaction were limited to singles. Concurrently, we found that more avoidantly attached singles were less satisfied with their health. This is in line with the previous studies linking avoidance to various health symptoms (e.g., McWilliams & Bailey, 2010). The present results, however, contradict the assumption that due to their downregulating behavior, people's avoidance might not be related to their health satisfaction. It could be conceived that despite their downregulating strategies, avoidant individuals still experience more stress (Simpson & Rholes, 2017) which could lead to worse health (O'Connor et al., 2021) and more negative health evaluations. Additionally, avoidantly attached individuals might tend to focus on their health more to substitute for a focus on their emotions (Meredith et al., 2016). However, we were not able to reproduce this short-term effect in singles with the cross-sectional data of T2. We suspect that the reduced sample size was one reason for the missing effects at T2 and therefore do not further interpret the results.

On a longitudinal scale, however, the picture of avoidance was painted differently for singles' health satisfaction: Avoidance was positively linked to singles' later health satisfaction. In other words, singles with more avoidant representations of either a former or a desired relationship reported higher health satisfaction two years later. This finding was unexpected. Potentially, for people high in avoidance, being single could indicate less pressure for emotional intimacy, meaning less distress and, consequently, higher health satisfaction in the long term. For partnered individuals, the association was non-significant but also positive. Based on the negative correlational pattern between avoidance and later health satisfaction, especially in singles, however, we infer that these effects could also be due to a suppressor effect.

Regarding anxiety, more anxiously attached individuals reported lower health satisfaction: either concurrently, as in the case of partnered individuals, or longitudinally, as observed for singles. This result is in keeping with the previous studies showing that anxious attachment is linked to worse physical health (Stanton & Campbell, 2014), which could be explained through disruptive relationship processes and adverse physiological responses (e.g., Feeney & Karantzas, 2017; Pietromonaco & Collins, 2017), as well as more anxious individuals' heightened sensitivity and concern with their health status (Noyes et al., 2003; Sherry et al., 2014). For singles, the maladaptive potential of anxiety rather unfolded in the long term. Based on research suggesting that more anxious individuals hold a greater fear of being single (Spielmann et al., 2013) and want more intimacy and closeness (e.g., Hudson & Fraley, 2017), their current single status might reflect a source of distress, that cumulates into long-term detriments in health satisfaction. In contrast, partnered individuals might display a concurrent link between anxiety and health satisfaction due to their ongoing maladaptive relationship processes (Pietromonaco et al., 2013a, 2013b) and health status concerns (Noyes et al., 2003; Sherry et al., 2014). However, these are only possible speculations on why these effects emerged for partnered individuals cross-sectionally and for single individuals longitudinally.

Romantic Attachment and Health Goal Importance in Partnered and Single Individuals

According to the present findings, associations with health goal importance were limited to the avoidance dimension. Concurrently, we found that more avoidantly attached partnered and single individuals showed less health goal importance. Different factors might explain the lower self-care of avoidantly attached persons and in our case, explain a part of why health goals seemed less critical to avoidantly attached participants: Attachment insecurity is closely linked to lower

self-esteem (e.g., Huntsinger & Luecken, 2004), which might be manifested in lower concerns for one's health. Further, evidence shows that avoidantly attached persons have more maladaptive emotion regulation strategies (e.g., Winterheld, 2016), which are linked to less health-promoting behaviors (Bekaroglu & Bozo, 2017). Mikulincer and Shaver (2007) described additional reasons for the unfavorable dynamics between avoidance and health care as follows: "Avoidant people's reluctance to explore novel situations, seek help, and engage in difficult problem solving, as well as their tendency to suppress distressing thoughts and emotions rather than cope effectively with their causes, may interfere with effective health care" (p. 241). These tendencies could shed some light on why avoidant participants tended to place less importance on their health.

On a longitudinal scale, however, single individuals' avoidance was positively linked to health goal importance 2 years later. It could be that more avoidant singles evaded a dissatisfying relationship, which catalyzed more avoidance in the first place. Given that they were no longer exposed to unhealthy relationship experiences, their health-related self-care might have improved over time (e.g., Shrout et al., 2019). In addition, more avoidant singles might focus their time on things such as self-care and exercise as a sign of their self-reliance. This, in turn, could be positively linked to their higher health goal importance. Even though this assumption contradicts past literature that shows a link between insecure attachment and lower self-regard (e.g., Mickelson et al., 1997), there might exist other underlying mechanisms for placing importance on health goals in singles, such as thriving for autonomy and competence in the domain of physical fitness (Wilson et al., 2003) or increasing one's chances for short-term relationships (Schmitt, 2005). We note, however, that because of the observed correlational pattern between avoidance and health goal importance (which was close to zero), the obtained positive link between avoidance and health goal importance in singles could also be due to a suppressor effect.

Limitations and Implications for Future Studies

Several limitations must be kept in mind when interpreting the present findings: First, we relied on self-reported measures. Whereas for attachment, self-reports reflect the norm (Graham & Unterschute, 2015), for health outcomes, a multi-method approach would increase the validity of the present findings. Future studies might consider including objective measures, such as assessing cortisol levels or adding multiple subjective reports from romantic partners (i.e., for partnered individuals) and of family and friends (i.e., for partnered and single individuals) to increase the validity of their health measure. Relatedly, both health measures were captured with either only one (i.e., health

satisfaction) or four items (i.e., health goal importance), which might have limited their reliability and the variance of these measures. Second, the singles sample was not well-powered for the detection of small effects. Thus, it would be crucial for future studies to examine the attachment–health links in single individuals using larger samples. Third, our approach of asking singles to report their romantic attachment to a former or desired partner is novel but limits the comparability with the attachment measure of partnered individuals who were asked to report about their current partner, as indicated by the measurement invariance analyses. In addition, we were not able to differentiate whether the attachment effects in singles apply to a former *or* a desired relationship. These differences between the attachment measures for both groups might also have contributed to the fluctuations in the reported alpha reliabilities. Regarding the singles attachment measure, the question about a former or desired partner bears the limitation that there is no control over which type of partner they are referring to. Future studies might differentiate between former and desired partners, given that previous relationship experiences might not be comparable to desired relationship experiences. Moreover, a direct comparison of the attachment–health link between partnered and single participants (i.e., by including the partnered and single sample into one sample to use relationship status as moderator) was impossible because our study focused on and assessed attachment toward a partner that was currently present (i.e., in the case of partnered participants) and a partner that was not (i.e., in the case of single participants). Relatedly, the partnered and single samples differed in their sociodemographic background and attachment levels. Future research might recruit single and partnered individuals from similar backgrounds or apply matching techniques to account for existing differences. Fourth, partnered individuals were in various phases of their romantic lives. The current results can therefore not inform about how attachment and health are differently associated in newly formed versus long-term couple members. We did, however, control for relationship duration in post hoc analyses, which did not alter the results. Nevertheless, it would be an interesting future endeavor to see how the attachment–health link plays out across various relationship phases and transitions (cf. Fraley et al., 2021 for relationship events and attachment changes). Relatedly, we could not examine whether relationship satisfaction and singlehood satisfaction moderated our findings. And, finally, even though our analyses were longitudinal and controlled for the stability of the health outcomes, it is not possible to infer causality. It is similarly possible that attachment and health co-develop across time or share a bidirectional association.

Conclusion

The present study used cross-sectional and longitudinal data to examine cognitive–evaluative and motivational health outcomes as additional important health outcomes of attachment while assessing romantic attachment in partnered and single individuals. More research is needed to determine whether attachment–health processes differ as a function of relationship status, and whether these processes differ depending on what the health outcome in focus is.

Declarations

Conflict of interest The authors have no financial or non-financial interests to declare.

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