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Individual and dyadic associations among relational self-expansion potential, affect, and perceived health

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Abstract

A growing body of literature suggests that specific markers of relationship quality are meaningfully linked to health outcomes. We tested whether relational self-expansion potential might be one of these markers in cross-sectional samples of individuals and romantic couples. Study 1 found that greater self-expansion potential was linked to better perceived physical health via both higher positive affect (PA) and lower negative affect (NA). Study 2 replicated these findings for PA (but not NA) and revealed both actor and partner effects of self-expansion potential. Results remained robust when statistically accounting for gender, age, body mass index, agreeableness, neuroticism, and perceived partner responsiveness. These findings identify a new relationship-level "active ingredient" associated with health and have implications for future physical health studies.

KEYWORDS
actor–partner interdependence model, affect, health, relationships, self-expansion

1 | INTRODUCTION

The quality of individuals' relationships is an important predictor of short- and long-term health outcomes (Holt-Lunstad, Smith, & Layton, 2010; Kiecolt-Glaser & Newton, 2001; Robles, Slatcher, Trombello, & McGinn, 2014). Theoretical models of relationships and health propose that specific elements of relationship quality should be linked to health outcomes via mediating biological, behavioral, or psychological processes (e.g., Kiecolt-Glaser & Newton, 2001; Slatcher & Selcuk, 2017). Nevertheless, the specific markers of high relationship quality that most strongly predict health outcomes have only recently begun to be established. For example, perceived partner responsiveness (PPR; the extent to which partners understand and appreciate one another) is robustly linked to diurnal cortisol profiles (Slatcher, Selcuk, & Ong, 2015), sleep quality (Selcuk, Stanton, Slatcher, & Ong, 2017), and mortality (Stanton, Selcuk, Farrell, Slatcher, & Ong, 2019). PPR is thus argued to be a relationship-level "active ingredient" within the health domain (Farrell & Stanton, 2019). However, PPR is one of many markers of high relationship quality that may be linked to health. The purpose of the present research was to investigate if *relational self-expansion potential* (i.e., partners' beliefs that their relationship will offer them opportunities to grow in the future) may serve as an additional facet of relationship quality that plays a role within the health domain via its links to affect. Specifically, we sought to demonstrate initial evidence for the links between self-expansion potential, positive and negative affect (PA and NA), and perceived physical health in a cross-sectional study of romantically involved individuals and a second cross-sectional study of romantic couples.

1.1 | Self-expansion theory

Self-expansion theory proposes that individuals are intrinsically motivated to broaden their self-efficacy, which can occur by trying new things, gaining more knowledge, or learning new skills (Aron & Aron, 1986, 1996). Importantly, self-expansion theory posits that our romantic partners and relationships are key vehicles through which self-expansion is achieved. Within the romantic domain, partners can expand their sense of self by facilitating each other's attainment of new perspectives, identities, and resources, as well as through pursuing shared novel and exciting experiences (Aron, Lewandowski, Mashek, & Aron, 2013). Indeed, studies have shown that engaging in novel, interesting, or challenging activities with a romantic partner increases relationship quality (e.g., Aron, Norman, Aron, McKenna, & Heyman, 2000). Relational self-expansion also is associated with greater sexual desire (Muise et al., 2019) and higher PA (Gordon & Baucom, 2009; Waugh & Fredrickson, 2006).

Recent studies have begun to explore how self-expansion processes extend into other domains, including preliminary evidence suggesting that self-expansion processes may be linked to health-relevant behaviors. For example, research has shown that individual-level self-expansion (i.e., encountering and engaging in novel and interesting activities by oneself) is linked to better adherence and obesity treatment outcomes in adults (Xu et al., 2016), as well as to smoking abstinence of former and current smokers (Xu, Floyd, Westmaas, & Aron, 2010). These initial studies suggest that individual self-expansion may aid people in making better health choices. However, since a tenet of self-expansion theory is that the primary way of expanding the self is via one's romantic relationship and partner (Aron et al., 2013), research that examines how relational self-expansion in particular may be linked to global health

perceptions and physical symptoms would advance our understanding of the downstream associations relationships have with health outcomes.

Not only do individuals frequently expand their sense of self via their romantic partners and relationships, but they also hold beliefs about the *potential* for their partners and relationships to offer future opportunities for growth and new experiences. Although the self-expansion model has focused primarily on enacted self-expanding experiences in relationships, scholars have argued that individuals' perceptions of how much their relationships will be able to facilitate self-expansion in the future are equally important (Aron et al., 2013; Lewandowski and Ackerman, 2006). If a relationship is perceived as likely to provide opportunities for future self-expansion, the relationship itself then becomes a facilitator of personal growth, which should increase positive feelings and enhance partner and relationship perceptions in the same way that enacted self-expansion does. Perceptions of relational self-expansion potential also tie fundamentally into the self-expansion process more broadly, as partners consider whether they will be able to grow with each other, learn new things together, and so forth. Thus, the optimism inherent in viewing a current partner and relationship as having strong potential for self-expansion in the future should increase individuals' happiness and active engagement with their environment.

1.2 | Relational self-expansion potential, affect, and health

We propose that relational self-expansion potential should be associated with better perceived physical health, and that affect should underlie this association. Affective processes have been found to be robust mediating pathways that explain how relationships are linked to health (Farrell, Imami, Stanton, & Slatcher, 2018; Sbarra & Coan, 2018). PA encompasses alert feelings that reflect pleasurable engagement with the environment, whereas NA encompasses distressed feelings that reflect unpleasurable engagement with the environment (Watson, Clark, & Tellegen, 1988). Higher PA and lower NA are associated with a range of physical health outcomes, including salubrious inflammatory, cardiovascular, and neuroendocrine activity (Dockray & Steptoe, 2010) and a lower risk of morbidity and mortality (Farrell et al., 2018; Haase, Holley, Bloch, Verstaen, & Levenson, 2016; Pressman & Cohen, 2005). PA and NA therefore influence not only how people perceive their bodily health, but also how people's bodies respond physiologically to environmental stimuli.

Of particular relevance to the present research, affect is known to mediate the associations between relational self-expansion and other relationship processes (e.g., Graham & Harf, 2015). This is likely because a primary function of self-expansion processes is to upregulate positive feelings, which result from enthusiastic engagement in new and challenging experiences as well as optimistic perceptions of how self-expanding a relationship is currently and how self-expanding it may be in the future (Aron et al., 2013). Theoretically, self-expansion processes may also serve to downregulate negative feelings, similar to other constructive markers of high relationship quality (e.g., PPR). To the best of our knowledge, however, almost no empirical studies that have tested the NA-reducing function of self-expansion processes systematically. Given that general levels of affect have physiological consequences that lead to physical health outcomes, self-expansion processes—including perceptions of self-expansion potential—may be a relationship-level antecedent of affect and, in turn, health.

In sum, several prior lines of research have demonstrated the separate links between (a) relational self-expansion and affect and (b) affect and perceived health. We believe a logical

extension of this work would be to test these pathways simultaneously in a mediation model. In other words, if perceiving one's partner and relationship to offer opportunities for future growth makes people happier (Aron et al., 2013; Gordon & Baucom, 2009; Graham & Harf, 2015), it seems feasible that higher general PA (and possibly lower general NA) could link relational self-expansion potential to better self-reported physical health.

1.3 | Present research overview and hypotheses

Although prior research suggests there are promising associations between self-expansion and specific health behaviors (e.g., treatment adherence; Xu et al., 2016), to the best of our knowledge no studies have investigated the links between relational self-expansion potential and perceived physical health more broadly. Additionally, studies have not yet systematically investigated whether greater PA (and potentially lower NA) mediates the link between relational self-expansion potential and perceived physical health. Understanding whether and how self-expansion potential predicts health outcomes would advance the budding literature identifying the specific markers of relationship quality that are most robustly tied to health. Moreover, given that previous research has alluded to each of these connections separately, exploring affect as a mechanism explaining associations between relational self-expansion and perceived physical health could unveil a novel and theoretically consistent pathway between a relationship process and health outcomes (c.f. Farrell et al., 2018; Sbarra & Coan, 2018). The purpose of the present research, therefore, was to examine the cross-sectional associations among relational self-expansion potential, PA and NA, and perceived physical health in a sample of romantically involved individuals (Study 1) and a sample of romantic couples (Study 2).

First, given that previous research has linked self-expansion to higher PA (e.g., Aron et al., 2013; Gordon & Baucom, 2009), we anticipated replicating this effect in the current studies. When people engage in self-expansion or believe their relationships to offer opportunities for self-expansion in the future, this should energize them and make them feel happier in general (Aron et al., 2013). Although it would be theoretically consistent for self-expansion to be negatively correlated with NA, studies linking self-expansion to NA are somewhat lacking, and thus we treated analyses with NA as exploratory. Additionally, previous research has found PA to predict better perceived physical health (Pressman & Cohen, 2005), and NA to predict poorer perceived physical health (Steptoe, Wardle, & Marmot, 2005; Watson, 1988), which we anticipated replicating as well, given that affective experiences are generalized to other perceptions (Schwarz & Clore, 1983). Putting these two paths together, we explored (Study 1) and sought to confirm (Study 2) a mediation model wherein greater relational self-expansion potential is linked to lower perceived physical health via higher PA and lower NA.

We expected the associations between relational self-expansion potential, affect, and perceived physical health to remain robust when statistically controlling for relevant covariates. Our primary variables of interest have been demonstrated in previous studies to be associated with several other factors, including gender (e.g., Vlassoff, 2007), age (e.g., Steptoe, Deaton, & Stone, 2015), body mass index (BMI; Nuttall, 2015), agreeableness and neuroticism[1] (Goodwin & Engstrom, 2002; Lahey, 2009), and PPR (Reis, 2012; Slatcher & Selcuk, 2017; Stanton, Selcuk, et al., 2019). We therefore included these key covariates in analyses to ensure that any links that emerged in our samples could not be attributed to demographic, health, personality, or other relationship variables.

2 | STUDY 1

Data were collected via Qualtrics Panel as part of a larger preregistered project entitled "Perceptions and Experiences in Romantic Couples 2017" (see osf.io/8qusj). Recruiters from Qualtrics Panel contacted a romantically involved subset of their participant pool of more than 4 million people and invited these individuals to take part in the parent project. Recruiters then contacted participating individuals' romantic partners and invited them to take part in the project as well. Not all romantic partners joined the study, however, and so a surplus sample of individuals was retained as a separate group of participants. Thus, the parent project includes both a sample of romantically involved individuals (which we present as Study 1) and a sample of romantic couples (which we present as Study 2) drawn from the general U.S. population, who completed the same series of questionnaires in one online session. Documents containing information about the parent project method and measures may be viewed at osf.io/g65sf and osf.io/w37gs, respectively. To date, no research outputs that use the data from the parent project have tested the research questions investigated in the current paper.

2.1 | Method

2.1.1 | Participants

The sample for Study 1 originally consisted of 402 American participants recruited via Qualtrics Panel, but 14 participants were excluded from analyses based on questionable response patterns (e.g., entering a relationship length close to or longer than their reported age, selecting the same numerical response for all items of multiple questionnaires). The final Study 1 sample consisted of 388 romantically involved individuals (317 women, 69 men, 2 undisclosed). Participants were between 25 and 71 years of age ($M_{years} = 44.02$, $SD_{years} = 9.64$) and were currently involved in relationships lasting 1 month to 48 years ($M_{years} = 15.62$, $SD_{years} = 10.26$). The majority of participants identified their race/ethnicity as White (63%), followed by Black (17%), Hispanic (10%), Asian (5%), biracial or multiracial (4%), and as other races/ethnicities (1%). Approximately 12% reported that they were dating their current partner, 5% were common-law, 3% were engaged, and 80% were married. Most participants were heterosexual (94%) and living with their current partner (95%).

2.1.2 | Measures and procedure

Descriptive statistics and reliability information for the primary variables and covariates used in both Study 1 and Study 2 are displayed in Table 1.

In a single online session, participants completed a battery of questionnaires that included the variables of interest to the present research. The full study took approximately 30 minutes to complete. After completing the study, participants viewed a debriefing screen and received compensation from Qualtrics Panel.

2.1.3 | Primary measures

Relational self-expansion potential
Lewandowski and Ackerman's (2006) five-item measure of potential for self-expansion via the partner and relationship was used to measure the extent to which participants felt their

TABLE 1 Study 1: Descriptive statistics and reliability information for study variables

Variable	Study 1				Study 2			
	Sample range	*M*	*SD*	*α*	Sample range	*M*	*SD*	*α*
Self-expansion	1.00–7.00	5.38	1.46	.90	1.00–7.00	5.71	1.30	.87
PA	0.63–4.00	2.67	0.72	.94	0.56–4.00	2.74	0.70	.93
NA	0.00–3.88	1.36	0.72	.93	0.00–3.50	1.19	0.70	.93
Physical health	−2.98–1.28	0.00	0.90	.87	−3.05–1.18	0.06	0.89	.84
BMI	15.50–50.07	28.67	7.12	—	16.24–49.04	27.90	6.51	—
Agreeableness	1.00–5.00	3.98	0.77	.55	1.67–5.00	3.94	0.77	.58
Neuroticism	1.00–5.00	2.78	1.19	.73	1.00–5.00	2.56	1.11	.55
PPR	1.00–9.00	6.60	2.08	.97	1.00–9.00	7.21	1.92	.98

Note: $N_{\text{Study 1}} = 388$ romantically involved individuals; $N_{\text{Study 2}} = 144$ romantic couples. Higher scores on continuous variables represent greater standing on the variable (e.g., greater self-expansion potential). In the Study 2 column, statistics for actor variables are presented. In Study 1, two participants had high outlier BMI scores that were winsorized to +3 *SD*s of the mean (i.e., 50.07). In Study 2, three participants had high outlier BMI scores that were winsorized to +3 *SD*s of the mean (i.e., 49.04).

Abbreviations: BMI, body mass index; NA, negative affect; PA, positive affect; PPR, perceived partner responsiveness.

romantic relationship would be likely to provide opportunities for personal growth in the future. Participants responded to each item (e.g., "I feel that if this relationship with my partner were to continue I would be able to gain more insights, experiences, and/or knowledge from my partner") on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*). Scores were calculated by averaging across items, with higher scores indicating greater self-expansion potential.

Affect
Watson and Clark's (1999) Positive and Negative Affect Schedule-Expanded Form (PANAS-X) was used to measure how frequently participants experienced 16 positive (e.g., "Enthusiastic") and 16 negative emotions (e.g., "Irritable"). Participants responded to each item on a 5-point scale (0 = *never*, 4 = *most of the time*). Scores were calculated by averaging across the items of each subscale, with higher scores indicating greater PA or NA, respectively.

Perceived health
Self-reported physical health was assessed using a measure of global health perceptions and a measure of physical illness symptoms. Participants responded to four global health perception items from the Medical Outcomes Study Short-Form General Health Survey (Stewart, Hays, & Ware, 1988). Participants responded to each item (e.g., "My health is excellent") on a 5-point scale (1 = *definitely false*, 5 = *definitely true*). Responses across the four items were then averaged such that higher scores indicated better global health perceptions. Physical symptoms were measured by asking participants to check any conditions or complaints related to physical health (e.g., "Nausea or vomiting," "Dizziness") they had experienced over the past month or were subject to at the present time using a list of 16 items taken from the Seriousness of Illness Rating Scale (Wyler, Masuda, & Holmes, 1968). Responses across the 16 items were then summed such that higher scores indicated experiencing more physical symptoms.

The two measures were highly negatively correlated ($r = -.63$), meaning that participants who had better perceptions of their overall health were very likely to also report experiencing fewer physical symptoms. Thus, for ease of understanding we decided to combine the two measures into a single measure of perceived physical health. To ensure that each measure was weighted equally in the composite score, we standardized the individual global health perception and physical symptoms scores. Next, to ensure that the composite variable was keyed such that higher scores indicated better perceived physical health, we multiplied the standardized physical symptoms scores by -1 (meaning that higher scores on that measure would indicate experiencing fewer physical symptoms). Finally, we created the composite perceived physical health scores by averaging the standardized values of the two individual measures.

2.1.4 | Covariates

Body mass index
Participants were asked to report their current height and weight using their choice of imperial or metric system; all values were later converted to the metric system for ease of calculation. BMI scores were created using the standard metric formula BMI = (weight in kg)/ (height in m)^2.

Height and weight items were free response, and some answers resulted in potentially erroneous BMI scores (e.g., participants reporting that they weighed more than 200 kg, resulting in a BMI score greater than 50). Outliers on BMI scores were therefore winsorized to ± 3 *SD*s of the mean, a relatively common practice in the health literature (see Wilcox, 1998). No participants were outliers on the low end of BMI, but some were outliers on the high end (see Table 1 for specific details).

Personality
Agreeableness and neuroticism were measured through the corresponding subscales of the 11-item version of the Big Five Inventory (Rammstedt & John, 2007). Participants indicated the extent to which they agreed with each statement (e.g., agreeableness, three items: "I am someone who is generally trusting"; neuroticism, two items: "I am someone who gets nervous easily") on a 5-point scale (1 = *disagree strongly*, 5 = *agree strongly*). Scores were calculated by averaging across the items of each subscale, with higher scores indicating greater agreeableness or neuroticism, respectively.

PPR
Participants completed the 12-item version of the Perceived Partner Responsiveness Scale (Reis, Crasta, Rogge, Maniaci, & Carmichael, 2017), which assesses how much individuals believe their partner cares about, understands, and appreciates them (e.g., "My current romantic partner values and respects the whole package that is the 'real' me") using a 9-point scale (1 = not at all true, 9 = completely true). PPR scores were calculated by averaging responses across items, with higher scores indicating greater PPR.

2.2 | Results and discussion

We began our analyses by examining bivariate correlations among the study variables (see Table 2). We then explored a mediation model using Model 4 of the PROCESS macro v3.0

TABLE 2 Study 1: Correlations among study variables

Variable	Correlations									
	1	2	3	4	5	6	7	8	9	10
1 Self-expansion	—									
2 PA	.51***	—								
3 NA	−.37***	−.49***	—							
4 Physical health	.23***	.41***	−.53***	—						
5 Gender	.04	.15**	−.21***	.12*	—					
6 Age	−.13**	.12*	−.09	−.02	.11*	—				
7 BMI	−.05	−.10	.05	−.21***	.05	.09	—			
8 Agreeableness	.23***	.39***	−.38***	.17**	.06	.11*	−.02	—		
9 Neuroticism	−.18***	−.53***	.58***	−.41***	−.23***	−.17***	.001	−.35***	—	
10 PPR	.71***	.56***	−.36***	.29***	.07	−.04	−.10	.27***	−.22***	—

Note: $N = 388$ romantically involved individuals. Higher scores on continuous variables represent greater standing on the variable (e.g., greater self-expansion potential). Gender was dummy-coded (0 = female, 1 = male).

*$p < .05$.
**$p < .01$.
***$p < .001$.

(Hayes, 2018). Bias-corrected 95% confidence intervals for indirect effects were estimated based on 5,000 bootstrap samples. Relational self-expansion potential was entered as the predictor variable, PA and NA were entered as simultaneous mediators, and perceived physical health was entered as the outcome variable. We tested two models: Model 1 included only primary variables, and Model 2 added covariates (i.e., gender, age, BMI, agreeableness, neuroticism, and PPR). For ease of interpretation and to provide estimates of effect size, continuous predictors and mediators were standardized across the entire sample. All models were conducted in SPSS 24.0.

As seen in Figure 1, greater relational self-expansion potential was indirectly associated with better perceived physical health via both greater PA (top half) and lower NA (bottom half). These associations remained robust when covariates were added to the model.

The results of Study 1 demonstrated that perceiving one's romantic partner and relationship to offer future opportunities for growth and new experiences was linked to both higher general PA and lower general NA, both of which were linked, in turn, to reporting better physical health. Study 1, therefore, provides the first evidence that relational self-expansion potential may have indirect ties to health outcomes. In this initial investigation, we sampled romantically involved individuals; however, self-expansion processes in relationships are necessarily dyadic (Aron et al., 2013). Thus, a logical extension of this study would be to examine the same links cross-sectionally in a sample of romantic couples. Doing so would reveal if the mediation path observed in Study 1 is replicable, as well as whether the interdependence inherent in relationships allows for partners' self-expansion potential to predict not only their *own* but *each other's* health perceptions.

3 | STUDY 2

Study 1 revealed preliminary evidence that self-expansion potential may be a meaningful relationship-level "active ingredient" involved in predicting perceived health. The goal of Study 2 was to replicate and extend Study 1 using a sample of romantic couples. Study 2 was therefore a confirmatory study, and we preregistered our hypotheses and analytic plan at osf. io/xfv2d. Following from the results of Study 1, we expected that individuals' own self-expansion would be linked to their own perceived physical health via their own PA and NA (i.e., actor effects). We did not make firm a priori predictions about partner effects in Study 2, as there was little prior dyadic research on self-expansion in a health context to draw on. However, we explored the links between partner self-expansion and affect predicting actor perceived physical health.

3.1 | Method

3.1.1 | Participants

The sample originally consisted of 150 American couples recruited via Qualtrics Panel, but six couples were excluded based on missing data or questionable response patterns (see Study 1). The final Study 2 sample comprised 144 romantic couples (138 heterosexual, 2 gay, 4 lesbian). Participants were between 25 and 72 years of age ($M_{years} = 46.20$, $SD_{years} = 9.58$) and were currently involved in
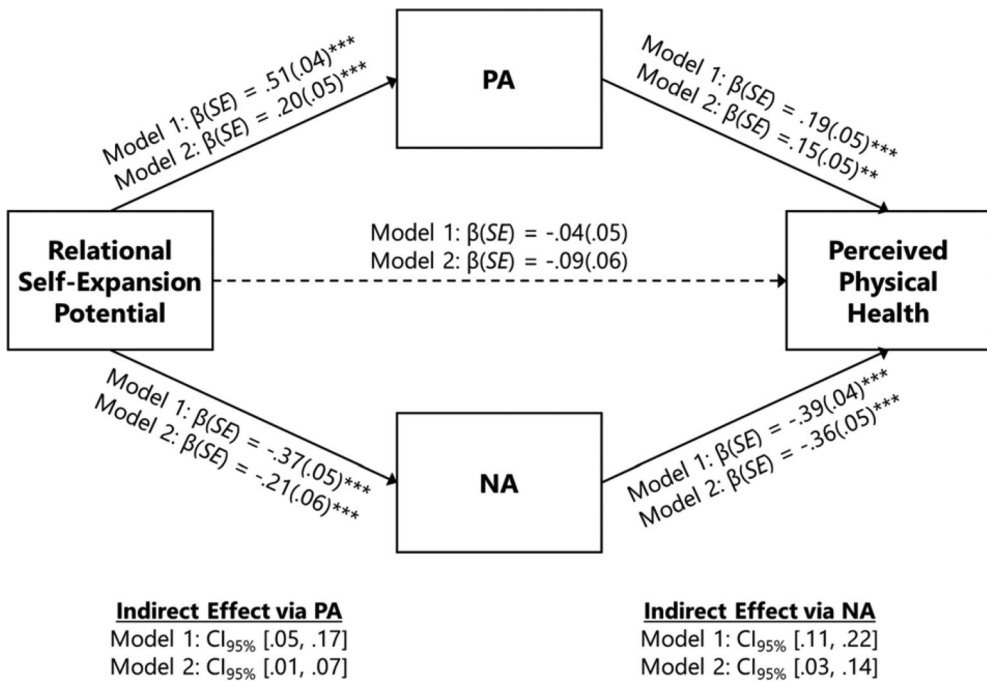
FIGURE 1 Direct and indirect associations of relational self-expansion potential, positive affect (PA), negative affect (NA), and perceived physical health in Study 1. *SE*, standard error; CI$_{95\%}$, 95% confidence interval. Model 1, analysis excluding covariates; Model 2, analysis including gender, age, body mass index, agreeableness, neuroticism, and perceived partner responsiveness. Higher scores on continuous variables represent greater standing on the variable (e.g., greater self-expansion potential). Continuous variables were standardized. Solid paths are statistically significant in both models. *$p < .05$, **$p < .01$, ***$p < .001$

relationships lasting 1–44 years ($M_{years} = 18.31$, $SD_{years} = 9.35$). The majority of participants identified their race/ethnicity as White (71%), followed by Black (13%), Hispanic (9%), Asian (5%), biracial or multiracial (1%), and as other races/ethnicities (1%). Approximately 7% reported that they were dating their current partner, 4% were common-law, 4% were engaged, and 85% were married. Most participants were heterosexual (96%) and living with their current partner (97%).

3.1.2 | Measures and procedure

Couples completed the same measures and procedure as in Study 1. Partners were instructed to complete the study separately from one another and to avoid discussing the questionnaires until after the study was finished.

3.2 | Results and discussion

Consistent with Study 1, we first examined bivariate correlations among the study variables (see Table 3). We then tested dyadic mediation using an Actor–Partner Interdependence Mediated Model (APIMeM). The Actor–Partner Interdependence Model (Kenny, 1996; Kenny &

TABLE 3 Study 2: Correlations among study variables

Variable	Correlations									
	1	2	3	4	5	6	7	8	9	10
1 Self-expansion	—	.49***	−.36***	.25***	.04	−.07	−.04	.35***	−.22***	.72***
2 PA		—	−.57***	.51***	.03	.10	−.13*	.45***	−.46***	.51***
3 NA			—	−.60***	−.15**	−.18**	.11	−.42***	.58***	−.52***
4 Physical health				—	.14*	.03	−.26***	.20***	−.46***	.35***
5 Gender					—	.14*	.06	−.04	−.27***	.07
6 Age						—	.01	.06	−.11	.01
7 BMI							—	−.02	.08	−.11
8 Agreeableness								—	−.32***	.28***
9 Neuroticism									—	−.32***
10 PPR										—

Note: N = 144 romantic couples. Higher scores on continuous variables represent greater standing on the variable (e.g., greater self-expansion potential). Gender was dummy-coded (0 = female, 1 = male). Actor correlations are presented.

*p < .05.
**p < .01.
***p < .001.

Cook, 1999) is an ideal tool for testing effects with dyadic data, as it allows for an individual's outcome variable to be predicted by both their own predictor variable (*actor effect*) and their partner's predictor variable (*partner effect*) while accounting for the interdependence between the individual's and their partner's scores. The APIMeM (Ledermann, Macho, & Kenny, 2011) is an extension of this model, and allows for the testing of additional pathways associated with actor and partner mediators (in our case, PA and NA). As in Study 1, bias-corrected 95% confidence intervals for indirect effects were estimated based on 5,000 bootstrap samples. The Study 2 dyads were indistinguishable. All models were conducted in MPlus 8.0.

We tested separate models with either PA or NA as the mediator. This differs somewhat from Study 1, where PA and NA were entered as simultaneous mediators; however, in Study 2, a single model that included both PA and NA as mediators would not converge, and thus we had to conduct separate analyses for the two mediators. As in Study 1, we also tested Model 1 with only the primary variables, and Model 2 with actor covariates. For ease of interpretation and to provide estimates of effect size, continuous predictors and mediators were again standardized across the entire sample.

As seen in Figure 2, the findings of Study 1 were replicated for PA. An indirect association emerged such that actor relational self-expansion potential was positively associated with actor general PA, which was then positively associated with perceived physical health. These associations remained robust when covariates were added to the model. Interestingly, a second indirect association emerged such that *partner* relational self-expansion potential was also associated with better perceived physical health via greater actor general PA. No other significant actor or partner effects emerged in these analyses.

As seen in Figure 3, however, the findings of Study 1 were not replicated for NA. An indirect association emerged in the non-covariate model such that both actor and partner relational self-expansion potential were associated with better perceived physical health via lower actor general NA, but these associations became nonsignificant when covariates were added to the model. Across both models we found that actor NA negatively predicted actor perceived physical health. This means that when individuals' own NA was higher, individuals' own reports of perceived physical health were lower.

In sum, the findings from Study 1 were replicated in Study 2 for PA (but not NA). That is, participants who felt their romantic partner and relationship offered opportunities for future experiences and growth tended to also experience higher general PA, which, in turn, was linked to a reporting better perceived physical health. Additionally, Study 2 revealed a novel partner effect such that when one's *partner* reported greater self-expansion potential, this was related to greater actor PA and, in turn, better actor perceived physical health. These findings demonstrate that, when investigating self-expansion, affect, and health outcomes, it is important not only to take individuals' *own* relationship experiences into account, but to also consider their *partner's* relationship experiences.

In contrast to Study 1, the results for the NA mediation pathway were not robust in Study 2, as the links disappeared when covariates were included in the model. However, the negative association between actor NA and actor perceived health that remained robust in the covariate model is consistent with prior evidence (e.g., Watson, 1988; see also Farrell et al., 2018, for a review). In Study 2, then, it seems that our covariates that were—from a theoretical perspective—most strongly linked to NA (i.e., neuroticism, PPR) subsumed the variance that was accounted for by self-expansion potential in the non-covariate model. We speculate on why this was the case in Study 2, but not Study 1, in the following section.
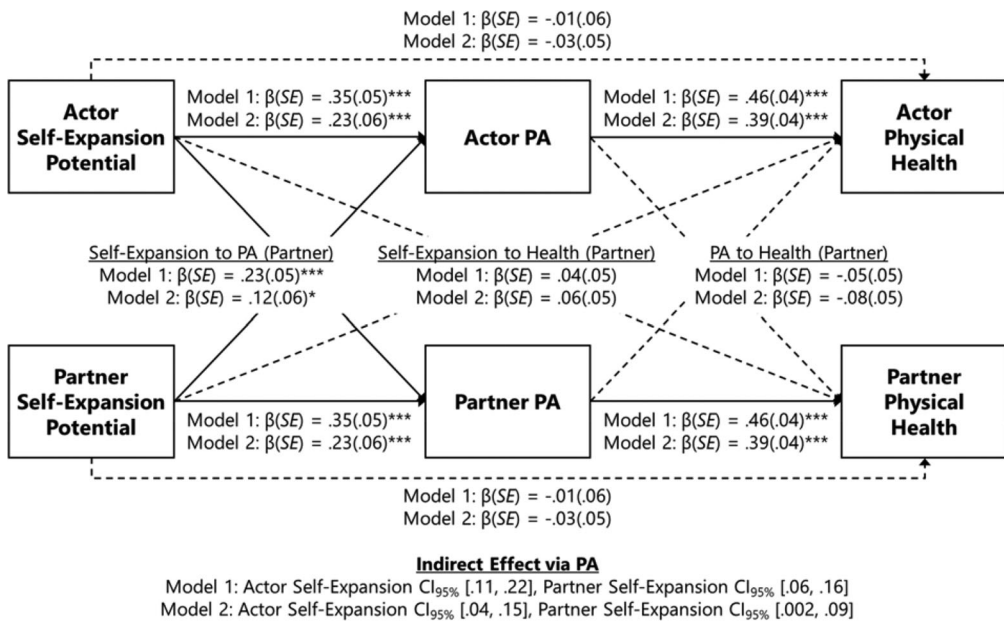
FIGURE 2 Direct and indirect associations of actor and partner relational self-expansion potential, positive affect (PA), and perceived physical health in Study 2. Model 1, analysis excluding covariates; Model 2, analysis including gender, age, body mass index, agreeableness, neuroticism, and perceived partner responsiveness. In Model 2, actor covariates were added. Higher scores on continuous variables represent greater standing on the variable (e.g., greater self-expansion potential). Continuous variables were standardized. Solid paths are statistically significant in both models. In these analyses, actor–partner covariances for self-expansion potential were .58 (Model 1) and .59 (Model 2); actor–partner covariances for PA were .29 (Model 1) and .20 (Model 2); and actor–partner covariances for perceived physical health were .16 (Model 1) and .14 (Model 2). All actor–partner covariance estimates were statistically significant at $p < .001$. *$p < .05$, **$p < .01$, ***$p < .001$

4 | GENERAL DISCUSSION

The present research was the first to systematically investigate the mediation links between relational self-expansion potential, PA, NA, and perceived physical health. Study 1 revealed, in a sample of romantically involved individuals, initial evidence that perceiving one's romantic partner and relationship to offer opportunities for future experiences of personal growth was indirectly linked to better perceived physical health via both greater general PA and lower general NA. Study 2 extended the investigation of these links in a sample of romantic couples, replicating the indirect association with PA that emerged in Study 1. However, in Study 2 the indirect associations between self-expansion potential, NA, and perceived physical health were weak, as they became nonsignificant when covariates were included in analyses. Interestingly, Study 2 revealed a novel indirect association of *partner* self-expansion potential, with better actor perceived physical health via actor PA as well. Thus, our findings suggest that both one's own beliefs about the self-expanding potential of the relationship, as well as one's partner's beliefs about that potential, predict greater levels of one's own general PA and, in turn, higher levels of one's own perceived physical health.

Our findings are consistent with broad theoretical models of how close relationships predict physical health (e.g., Kiecolt-Glaser & Newton, 2001; Slatcher & Selcuk, 2017; see also Robles
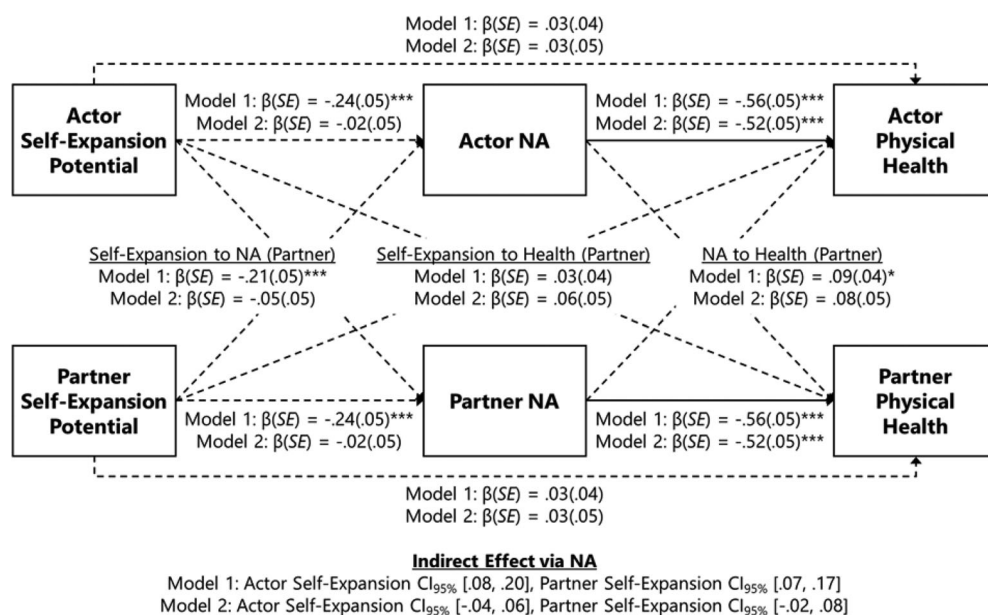
FIGURE 3 Direct and indirect associations of actor and partner relational self-expansion potential, negative affect (NA), and perceived physical health in Study 2. Model 1, analysis excluding covariates; Model 2, analysis including gender, age, body mass index, agreeableness, neuroticism, and perceived partner responsiveness. In Model 2, actor covariates were added. Higher scores on continuous variables represent greater standing on the variable (e.g., greater self-expansion potential). Continuous variables were standardized. Solid paths are statistically significant in both models. In these analyses, actor–partner covariances for self-expansion potential were .58 (Model 1) and .59 (Model 2); actor–partner covariances for NA were .45 (Model 1) and .28 (Model 2); and actor–partner covariances for perceived physical health were .12 (Model 1) and .10 (Model 2). All actor–partner covariance estimates were statistically significant at $p < .001$. $*p < .05$, $**p < .01$, $***p < .001$

et al., 2014), as well as with theoretical accounts specifying the potential mediating role of affective processes in explaining relationship-health links (Farrell et al., 2018; Sbarra & Coan, 2018). The results of our studies also provide further evidence that specific markers of relationship quality tend to be indirectly, rather than directly, associated with health outcomes. Additionally, our findings dovetail with self-expansion theory in particular by showing that believing one's partner and relationship to offer opportunities for new experiences and personal growth are linked robustly to greater PA (Aron et al., 2013; Gordon & Baucom, 2009). Prior work has begun to investigate how individual-level self-expansion is related to changes in health behaviors (e.g., Xu et al., 2010, 2016). We extend these previous studies by examining the potential for self-expansion via the relationship specifically (rather than non-relationship self-expansion), by testing a global report of perceived physical health more broadly, and by exploring affect as a potential mediator underlying the associations between self-expansion and perceived health.

Importantly, the associations among relational self-expansion potential, affect, and perceived physical health remained robust when statistically accounting for PPR, a marker of higher relationship quality that has been robustly and consistently linked to immediate and longer-term health outcomes via affective processes (e.g., Slatcher et al., 2015; Stanton, Selcuk, et al., 2019; Stanton, Slatcher, & Reis, 2019) and has been argued to be a key relationship-level "active ingredient" in the health domain (Farrell & Stanton, 2019). By demonstrating that self-

expansion potential is a predictor of health over and above the PPR, the present research may have identified an additional target for researchers interested in improving health outcomes by improving relationships. In the interest of isolating whether self-expansion potential is indeed a *unique* relationship-level "active ingredient" in the health domain, it will be important to contrast its effects with those of other positive elements of relationship quality, such as capitalization (i.e., the act of sharing good news with a romantic partner, and being enthusiastic and responsive to a partner sharing their good news; Gable, Reis, Impett, & Asher, 2004). Capitalization has not yet been examined in the health domain, but may be linked to health via similar affective mediators. Disentangling which markers of high relationship quality are true "active ingredients" for health, and which are derivatives of a broader "active ingredient" will help researchers design and implement more effective interventions in the future.

When considering NA as a mediator of the link between self-expansion potential and perceived health, our findings were inconsistent. In Study 1, relational self-expansion potential was indirectly linked to better perceived health via lower levels of general NA. In Study 2 this pathway was replicated in the non-covariate model; however, including covariates in the model made this indirect effect nonsignificant. Indeed, the only significant NA effect to emerge in both models in Study 2 was an association between greater actor NA and poorer actor perceived health. This negative association is consistent with prior evidence (see Farrell et al., 2018; Sbarra & Coan, 2018), but it remains an open question why covariates removed the indirect pathway in Study 2 but not in Study 1. From a theoretical standpoint, one possibility for the discrepant findings might lie in the function of self-expansion processes to upregulate PA as opposed to downregulate NA (c.f. Aron et al., 2013). In contrast, PPR—the relationship covariate included in our analyses—is argued to downregulate NA as a primary function.[2] In Study 2, which involved romantic dyads, it is possible that partners' interdependence in their reports of PPR captured more of the variance than in Study 1, where only individuals were sampled. In fact, our finding that self-expansion potential is linked to better perceived physical health most consistently through greater PA may contribute a complementary piece to the relationships-health puzzle, given that PPR is linked to better perceived physical health most consistently through lower NA (e.g., Slatcher et al., 2015; Stanton, Selcuk, et al., 2019). The possible salutary "double-whammy" of promoting both self-expansion and PPR may therefore predict better health via multiple affective pathways, an idea readily amenable to future studies of relationships and health.

In the present research, our measure of relational self-expansion focused on individuals' beliefs about the degree to which their partner and relationship would offer the potential to grow in the future. This raises an intriguing question about whether the salubrious links found in our studies would replicate when investigating enacted relational self-expansion (i.e., engaging in novel, challenging, and interesting activities as a couple) or perceptions of past or current self-expansion opportunities in the relationship. Perceptions of past, current, and future relational self-expansion potential and actual self-expansion via the partner and relationship are likely all correlated, and each may play an interesting role in predicting health outcomes. The present research, therefore, raises interesting questions about whether the timing of self-expansion processes is an important factor when considering health outcomes. Systematically examining both perceived and enacted self-expansion in the health domain will lend insight into whether beliefs about future self-expansion opportunities are weaker, equal, or stronger predictors of health than self-expansion opportunities in reality or current perceptions of how self-expanding the relationship is. Put another way, researchers may wish to understand if "seeing" the potential for self-expansion is sufficient for enhancing physical health

(c.f. Visserman et al., 2019), or if enacted self-expansion or current beliefs about self-expansion are necessary. If perceptions of the potential for future self-expansion are uniquely predictive of health outcomes, it may also be important to understand what happens, both in terms of the quality of the relationship and the quality of partners' health, when individuals' optimistic hopes for future self-expansion are not realized.

The present research opens the door to many potentially exciting additional avenues for future studies. For example, our findings provide a snapshot of how relational self-expansion, affect, and perceived physical health appear in couples at a single time point; however, it remains an open question if and how relational self-expansion predicts changes in affect and health outcomes over time. Longitudinal study designs would uncover not only how these associations unfold day-to-day (e.g., how partners' self-expansion 1 day predicts changes in affect and health outcomes the following day), but also how these associations unfold over longer periods of time (e.g., how partners' self-expansion might predict changes in affect 1 year later which, in turn, might predict onset of disease 4 years after that). Using longitudinal methods would also allow researchers to examine if relational self-expansion is associated with temporally dynamic affective processes known to be linked to health outcomes, such as affect reactivity to stressors (e.g., Mroczek et al., 2013; Piazza, Charles, Sliwinski, Mogle, & Almeida, 2013) or emodiversity (e.g., Ong, Benson, Zautra, & Ram, 2018; Quoidbach et al., 2014).

In both of our studies, participants' relationships were longer in length, and more committed, compared to prior relationship studies relying on undergraduate samples. This introduces the question of whether the length or marital status of the relationship matters in a health domain. Early in relationships, self-expansion opportunities are frequent, as partners become more intimate and learn more about each other. However, opportunities to further develop intimacy—and presumably opportunities for self-expansion—decline over time (c.f. Baumeister & Bratslavsky, 1999). Thus, in terms of PA and health, partners who have been together for a long time may benefit more from believing their relationship can help them expand in the future, since opportunities for the relationship to do so likely require more effort and creativity. On the other hand, in fledgling and less lengthy relationships, where opportunities for partners to grow are presumably readily available because intimate knowledge is still being developed, a *lack* of self-expansion potential may be particularly detrimental for downstream PA and health outcomes. Investigating the links between self-expansion potential, affect, and health across multiple stages of relationships would offer interesting and potentially important information about *when*, and *for whom*, self-expansion potential most strongly predicts health.

Future research may also seek to understand how these individual and dyadic processes operate within their broader social context (c.f. Holt-Lunstad, 2018). One context that may be particularly important to investigate involves socioeconomic status (SES). A substantial amount of prior research has demonstrated that lower-SES individuals face a greater risk of perceived physical health (Adler et al., 1994), and report more environmental constraints and lower self-efficacy in accomplishing goals (Gallo, Bogart, Vranceanu, & Matthews, 2005). These negative outcomes can be buffered for low-SES individuals, however, by positive relationship experiences (Chen & Miller, 2013; Hooker, Campos, Zoccola, & Dickerson, 2018). Unfortunately, SES was not assessed in the current studies, so we are unable to explore the interplay of relational self-expansion potential and SES predicting affect and health. Perhaps, like other psychosocial factors (e.g., social support; Hooker et al., 2018), self-expansion may also buffer against the frequently harmful SES-health links, possibly through increasing individuals' self-efficacy or sense of control (see Zilioli, Imami, & Slatcher, 2017).

Potentially the most important next step for future research is to test whether changes in relational self-expansion are causally linked to changes in affect and health outcomes. Within the romantic relationships domain, experimental lab studies have shown that when couples engage in self-expanding (vs. neutral or familiar) activities together, they experience greater relationship quality immediately and over short periods of time (Aron et al., 2000; Graham & Harf, 2015; Muise et al., 2019). Additionally, in one study, couples who were randomly assigned to a 4-week online intervention that asked them to engage in shared exciting and interesting activities reported greater pre- to post-measurement increases in relationship quality compared to couples in a waitlist control group (Coulter & Malouff, 2013). A logical extension of this promising research would be to test the efficacy of these experimental manipulations in predicting couples' affect and health over time. In light of research showing that individual-level self-expansion may also be beneficial for people (e.g., Mattingly & Lewandowski, 2013; Xu et al., 2010, 2016), experimental work may also wish to compare individual-level versus relational self-expansion within the health domain.

Before concluding, we acknowledge some limitations of the present research. These data are correlational and cross-sectional, making it impossible to make causal claims about the links between self-expansion potential, affect, and health outcomes. Theoretical models of relationships and health argue that markers of relationship quality should predict health outcomes via psychological mechanisms (e.g., affective processes) rather than the reverse (Burman & Margolin, 1992; Farrell et al., 2018; Kiecolt-Glaser & Newton, 2001; Slatcher & Selcuk, 2017), which gives us confidence that these links should be ordered as they were in our studies. As discussed above, however, researchers will be unable to definitively conclude that relational self-expansion predicts health outcomes until these links are demonstrated causally over time. Moreover, the associations found in the present research are likely recursive in some way, meaning that people in worse health may be less happy, which might, in turn, predict their beliefs about how self-expanding their relationships will be in the future. This might be particularly true if individuals are so ill that they are unlikely to be physically able to participate in self-expanding activities. Although from a theoretical standpoint factors within the relationships domain are likely to have stronger downstream effects on the health domain than in the other direction, future research should seek to clarify the temporal dynamics between self-expansion, affect, and physical health.

An additional limitation is that we relied on self-report measures of physical health, meaning that our health outcome measure reflects perceived health rather than an objective health assessment. Although we employed frequently used and validated measures of physical health perceptions and physical symptoms, and perceived health and objective health outcomes are correlated with each other, future research in this area should strive to examine other physical health assessments, such as medical records or a direct physical health outcome (e.g., diurnal cortisol patterns, cardiovascular disease). Finally, we note that both samples of participants were drawn from a relatively healthy population, which somewhat constrains the generalizability of our findings. Even in a comparatively unhealthy population, however, we may expect that self-expansion potential would predict lower perceived physical health via PA, in light of research demonstrating that high-quality social relationships have beneficial links to health outcomes in both healthy and unhealthy groups (Holt-Lunstad et al., 2010; Idler, Boulifard, & Contrada, 2012).

4.1 | Concluding remarks

Taken together, these findings establish relational self-expansion potential as a novel and potentially meaningful predictor of health outcomes via affective mediators, with implications for the health of individuals in addition to their romantic partners. The present research raises interesting questions about how the associations between relational self-expansion, affect, and physical health may operate longitudinally, and whether the previously demonstrated beneficial malleability of relational self-expansion in the romantic domain carries over into the health domain. Future studies that investigate these processes in couples over time, and establish causal links between these variables where possible, will continue to advance our understanding of this novel "active ingredient" in the relationships-health literature.

DATA AVAILABILITY STATEMENT
As part of International Association for Relationship Research's encouragement of open research practices, the authors have provided the following information: This research is a sub-project of the preregistered project "Perceptions and Experiences in Romantic Couples 2017" (see osf.io/8qusj). The parent project general method can be viewed at osf.io/g65sf, and the full compendium of measures can be viewed at osf.io/w37gs. To date, no research outputs that use the data from the parent project have tested the research questions investigated in the current paper. In this sub-project, the Study 1 analyses were exploratory and not preregistered. However, the Study 2 analyses were preregistered, and the hypotheses and analytic plan can be viewed at osf.io/xfv2d. The data used in the present research are available and can be obtained from the corresponding author.

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ENDNOTES
[1] Although other personality traits are sometimes linked to health (e.g., Goodwin & Engstrom, 2002), we chose to focus mainly on neuroticism and agreeableness as personality covariates in the present research because those traits play the most consistent role in predicting affective processes as well as relationship dynamics (e.g., Suls, Martin, & David, 1998).

[2] We do not suggest that relational self-expansion cannot downregulate NA, nor that PPR cannot upregulate PA. We simply draw attention to the idea that, in the literature to date, the two elements of relationship quality appear to be more robustly linked with one dimension of affect.

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