The Tripartite Efficacy Framework in Client-Therapist Rehabilitation Interactions: Implications for Relationship Quality and Client Engagement

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Abstract

Purpose: Within supervised rehabilitation programs, Lent and Lopez (2002) proposed that clients and therapists develop a 'tripartite' network of efficacy beliefs, comprising their confidence in their own ability, their confidence in the other person's ability, and their estimation of the other person's confidence in them. To date, researchers have yet to explore the potential relational outcomes associated with this model in rehabilitation contexts.

Method: In Study 1, we recruited 170 exercise clients (M_{age} = 63.73, *SD* = 6.46) who were enrolled in a one-to-one aerobic exercise program with a therapist as a result of a lower-limb musculoskeletal disorder. Clients reported their tripartite efficacy beliefs and perceptions about the quality of their relationship with their therapist, and respective therapists rated each client's engagement in his/her exercise program. In Study 2, we recruited 68 separate exercise clients (M_{age} = 65.93, *SD* = 5.80) along with their therapists (*n* = 68, M_{age} = 31.89, *SD* = 4.79) from the same program, to examine whether individuals' efficacy perceptions were related to their own and/or the other person's relationship quality perceptions.

Results: In Study 1, each of the tripartite efficacy constructs displayed positive direct effects with respect to clients' relationship quality appraisals, as well as indirect effects in relation to program engagement. Actor-partner interdependence modeling in Study 2 demonstrated that clients and therapists reported more adaptive relationship perceptions when they themselves held strong tripartite efficacy beliefs (i.e., actor effects), and that clients viewed their relationship in a more positive light when their therapist was highly confident in the client's ability (i.e., partner effect).

Conclusion: These findings underscore the potential utility of the tripartite efficacy framework in relation to motivational and relational processes within supervised exercise programs.

Key words: APIM; self-efficacy; other-efficacy, relation-inferred self-efficacy; osteoarthritis

Impact

- In rehabilitation settings, the importance of the relationship between clients and therapists for promoting client engagement is well acknowledged. Within sport, exercise, and educational contexts, the tripartite efficacy model has been shown to provide insight into the social cognitions that promote effective interpersonal interactions. To date though, the potential implications of this framework have not received empirical attention in one-to-one rehabilitation relationships.
- These studies make a novel contribution to the rehabilitation literature, by underscoring the interdependence that exists between clients and therapists, and demonstrating that individuals' tripartite efficacy beliefs align with perceptions of relationship quality within clinic-based exercise rehabilitation programs. Analyses also revealed for the first time that each of the tripartite constructs may indirectly align with client rehabilitation program engagement.
- Efficacy-enhancing strategies that target the sources of the tripartite efficacy constructs may help strengthen client-therapist rehabilitation interactions, as well as bolstering client engagement in exercise programs designed to manage lower-limb musculoskeletal disorders.

The Tripartite Efficacy Framework in Client-Therapist Rehabilitation Interactions: Implications for Relationship Quality and Client Engagement

Musculoskeletal disorders are recognized as a significant barrier to health (see Dawson et al., 2004), and contribute to adverse personal (e.g., long-term pain, disability; Badley, Rasooly, & Webster, 1994) and societal outcomes (e.g., work disability, absenteeism, health care burden; Woolf & Pfleger, 2003). Epidemiologists estimate that one condition, osteoarthritis, affects 10% of males and 18% of all females worldwide over the age of 60, and that as many as 70% of people over the age of 65 may show some evidence of the disease (Woolf & Pfleger, 2003). The development of lower-limb osteoarthritis at the knee and hip is particularly common in this cohort, and is associated with reductions in quality of life as well as impacting upon pain and mobility (e.g., van der Waal, Terwee, van der Windt, Bouter, & Dekker, 2005). Exercise programs incorporating strength and aerobic activities are often recommended at the onset/diagnosis of osteoarthritis and other related lower-limb musculoskeletal conditions (e.g., osteoporosis, bursitis) (e.g., Roddy, Zhang, & Doherty, 2005), and the proposed benefits of such treatment approaches include weight loss and reductions in pain, as well as improvements in mobility, muscle strength, and quality of life (e.g., Ettinger et al., 1997). Recent literature reviews have confirmed the effectiveness of exercise programs in managing these diseases (e.g., Escalante, García-Hermoso, & Saavedra, 2011; Hernández-Molina, Reichanbach, Zhang, Lavalley, & Felson, 2008). In order to achieve long-term physical and psychosocial improvements as a result of exercise, however, it is crucial that individuals adhere to their activity regimes over time (e.g., Clay & Hopps, 2003).

There are a variety of contextual as well as personal factors that may facilitate the maintenance of exercise rehabilitation programs. For instance, adherence may vary according to the degree of social support that is provided within home-, hospital-, or clinic-based settings (e.g., King et al., 1992), and key personal factors, such as motivation and engagement, are also central in underpinning adherence to exercise (e.g., Chan & Hagger, 2012; Chan, Lonsdale, Ho, Yung, & Chan, 2009; Chan, Spray, & Hagger, 2011; Jensen & Lorish, 1994). With particular relevance to

the present investigation, research has also established that the *quality of the relationship* that clients form with their therapists may support positive behavioral, functional, and psychosocial outcomes. In particular, warm and supportive relationships, a shared perspective between clients and therapists, and the provision of autonomy to clients have each been demonstrated to improve client motivation and adherence to supervised activity programs (e.g., Chan & Hagger, 2012; Chan et al., 2009; Heszen-Klemens & Lapińska, 1984; Sluijs & Knibbe, 1991). Exercise programs associated with lower-limb musculoskeletal disorders require sustained effort and self-regulation on the part of clients, thus, Klaber Moffett and Richardson (1997) proposed that the client-therapist relationship "plays an especially important role in treatment programs requiring the patient to assume an active role in the management of their problem" (p. 90). Overall, the quality of the client-therapist interactions that occur within supervised exercise programs may play a pivotal role in supporting client engagement and adherence. Investigating the factors that predict effective client-therapist relationships may therefore help identify the interpersonal behaviors and perceptions that underpin rehabilitation success.

Research has focused on exploring the factors that stimulate positive client-therapist interactions for a number of years. Indeed, in both physical rehabilitation and psychotherapy contexts, high-quality therapeutic relationships have been shown to be underpinned by effective communication patterns (Stewart, 1995), therapists' respect for their clients (Bachelor, 1995), and clients' perceptions about the utility of the program (Saunders, 1999). Alongside these factors, recent theoretical and empirical evidence also indicates that the network of efficacy perceptions that exists within interpersonal contexts may also have important implications for relationship quality. Specifically, in their *tripartite efficacy model*, Lent and Lopez (2002) articulated that individuals develop a complementary pattern of efficacy beliefs within close interpersonal (e.g., client-therapist, student-teacher, athlete-coach) exchanges, comprising perceptions regarding their significant other as well as themselves.

Lent and Lopez's (2002) model consists of three distinct constructs. *Self-efficacy* relates to individuals' confidence in their own ability (cf. Bandura, 1997), *other-efficacy* refers to individuals' confidence in their significant other's ability, and *relation-inferred self-efficacy* (RISE) reflects an appraisal about how confident individuals believe their significant other is in their ability. In exercise rehabilitation relationships, for example, clients not only develop a degree of confidence in their own ability to carry out what is required of them (self-efficacy), they also form impressions about their therapist's capabilities (other-efficacy, e.g., "I've got a great therapist"), as well as gauging to what extent their therapist is confident in their ability as a client (RISE, e.g., "I think my therapist really believes in me"). Lent and Lopez contended that the 'relational' efficacy perceptions within their framework (i.e., other-efficacy and RISE) are positively related to one another and to self-efficacy beliefs, and that the three constructs are each independently associated with a range of desirable interpersonal outcomes. In particular, with implications for client-therapist relationship quality, Lent and Lopez outlined that individuals would report more positive perceptions about their interactions (e.g., feelings of satisfaction, rapport, support) when they (a) believed strongly in their own capabilities, (b) were highly confident in the other's ability, and (c) estimated that the other person was highly confident in them.

To date, sport- and education-based studies exploring coach-athlete (e.g., Jackson, Knapp, & Beauchamp, 2009; Jackson, Grove, & Beauchamp, 2010), coacting athletic (e.g., Dunlop, Beatty, & Beauchamp, 2011; Jackson, Knapp, & Beauchamp, 2008), and teacher-student (e.g., Jackson, Whipp, Chua, Pengelley, & Beauchamp, 2012) interactions have demonstrated support for the relational implications that are theorized to be associated with the tripartite constructs (e.g., relationship satisfaction, closeness, enjoyment, commitment), as well as documenting desirable predictive effects in relation to a range of behavioral and task-related variables (e.g., performance, motivation, effort). However, despite the potential for this framework to yield new insight into client-therapist relationship processes, the motivational and interpersonal outcomes associated with this model are yet to be examined within rehabilitation contexts. With this in mind, the overarching

aim of Study 1 was to recruit a cohort of rehabilitation clients undertaking a one-to-one clinic-based exercise program with a physical therapist (as a result of a lower-limb musculoskeletal disorder), and to explore the relationships between clients' tripartite efficacy constructs, their perceptions of relationship quality with their therapist, and their engagement in their exercise program.

Although tripartite efficacy research has yet to be applied in rehabilitation settings, there is an extensive literature examining the role of client self-efficacy beliefs in this context (for reviews see Bandura, 2004; McAuley & Blissmer, 2000), as well as some domain-specific evidence that substantiates Lent and Lopez's (2002) relational efficacy assertions. With respect to client self-efficacy, individuals who believe strongly in their own ability to carry out their exercise rehabilitation program display greater adherence (e.g., Blanchard, Rodgers, Courneya, Daub, & Knapik, 2002; Medina-Mirapeix et al., 2009), increased physical activity levels (e.g., Lorig & Holman, 1989), more positive affective responses (e.g., Novy, Simmonds, & Lee, 2002), and a range of desirable treatment outcomes (e.g., improved physical function; Fortinsky et al., 2002; Harrison, 2004). Alongside the development of Lent and Lopez's model, researchers in therapeutic settings acknowledge that other important efficacy beliefs beyond self-efficacy may promote rehabilitation success. Although not couched specifically within the tripartite framework, this limited body of literature supports the notion that clients' beliefs about their therapist's competence (what Lent and Lopez would term other-efficacy) may underpin adaptive outcomes. Formative work in this area demonstrated that clients report more positive self-perceptions when they believe strongly in their practitioner's ability (e.g., Thompson, Sobolew-Shubin, Galbraith, Schwankovsky, & Cruzen, 1993), and a series of more recent studies have shown that a high level of confidence in one's exercise instructor not only bolsters individuals' self-efficacy beliefs, but also accounts for more favorable exercise intentions and participation rates (Bray, Brawley, & Millen, 2006; Bray & Cowan, 2004; Bray, Gyurcsik, Culos-Reed, Dawson, & Martin, 2001; Bray, Gyurcsik, Martin Ginis, & Culos-Reed, 2004).

Notwithstanding the emerging support for the significance of interpersonal efficacy beliefs alongside self-efficacy, key aspects of Lent and Lopez's (2002) model are yet to be explored in rehabilitation contexts. First, there is little published evidence relating to the unique predictive capacity of clients' RISE beliefs (i.e., estimations of their therapist's confidence in them) alongside their self- and other-efficacy perceptions. Also, although existing studies have demonstrated some of the cognitive and behavioral outcomes associated with clients' confidence in their own (e.g., exercise adherence) and their therapist's ability (e.g., self-efficacy, exercise adherence), researchers have so far failed to explore Lent and Lopez's assertions regarding the 'relational' consequences associated with each of the tripartite constructs (e.g., relationship quality, interpersonal closeness), despite the significance of client-therapist interactions in promoting client engagement and rehabilitation success (e.g., Klaber Moffett & Richardson, 1997).

In Study 1, we sought to test the relationships between clients' tripartite efficacy beliefs, their perceptions about the quality of their relationship with their therapist, and their levels of engagement in their exercise program (see Figure 1 for the a priori model). Guided by theory (Lent & Lopez, 2002) and existing tripartite efficacy research (e.g., Jackson et al., 2009), we first hypothesized that clients' tripartite efficacy beliefs would be positively inter-related. Second, due to the feelings of trust, rapport, and support that are facilitated by favorable tripartite efficacy perceptions (Lent & Lopez, 2002), we expected that clients' confidence in their own ability, their confidence in their therapist's ability, and their estimation of their therapist's confidence in them, would each be positively related to their perceptions about the quality of their relationship with their therapist. In turn, we also hypothesized that clients would display greater engagement (i.e., motivation, persistence) in their rehabilitation program when they reported more positive appraisals about their therapeutic relationship (e.g., Chan et al., 2009).

Study 1

Method

Participants. Participants were exercise clients attending one-to-one clinic-based rehabilitation sessions with a qualified physical therapist (N = 170, M_{age} = 63.73, SD = 6.46, n_{male} = 82, n_{female} = 88). Clients were participating in low-impact strength and aerobic exercise programs, in which they had initially enrolled as a result of a lower-limb degenerative musculoskeletal condition (i.e., osteoarthritis, osteoporosis, bursitis). Participants reported that they believed sporting (n = 19), work (n = 50), or other activities (n = 94), such as accidents and genetic or lifestyle factors, had been the primary contributor to the development of their disorder (seven participants did not answer). On average, participants had been enrolled in their exercise program for approximately three months (M = 13.47 weeks, SD = 3.15), and spent a total of 2.73 hours per week (SD = .51) one-to-one with their therapist at the clinic, either exercising or in consultation.

Measures.

Efficacy perceptions. In the absence of pre-existing measures, we developed domain-specific tripartite efficacy instruments using existing recommendations (Bandura, 2006). A separate group of clients (N = 20, M_{age} = 64.42, SD = 4.17) who were enrolled in one-to-one clinic-based exercise programs (in relation to a lower-limb condition) completed an open-ended two-section questionnaire. This questionnaire was designed to allow clients to identify the primary behavioral, emotional, and self-regulatory tasks that they felt contributed to optimal functioning for themselves (i.e., self-efficacy/RISE items) and their therapist (i.e., other-efficacy items). In the first section, clients were asked to "list the most important things that *you have to do* in order to make the best possible progress with your exercise program", and were prompted to "consider the things that you think are really important, but aren't always easy for you to do", in order to ensure that a sufficiently challenging range of items emerged. In the second section, clients were instructed to "list the most important things that *a great therapist does* in order to enable you to make the best possible progress with your exercise program". Drawing from the desirable therapist/practitioner behaviors and characteristics that have been documented in the therapeutic and rehabilitation literature (e.g., Ackerman & Hilsenroth, 2003; Bray et al., 2006; Clay & Hopps, 2003), clients were

also given the prompt, "please think about the various things your therapist does, which could include the instructions and advice that they give you, the support they provide you with, their ability to motivate you, and the quality of the program they develop for you, among other things". Clients were again asked to "reflect upon the things that might be difficult for therapists to do, but are really important for you and your program". Having identified recurring client- and therapist-related themes from the questionnaire, we presented a preliminary pool of 11 self-efficacy/RISE and 12 other-efficacy items to two experienced self-efficacy researchers and three qualified physical therapists, who provided feedback on representativeness, understanding, and overlap. After review, the final self-efficacy/RISE and other-efficacy instruments comprised eight client- and eight therapist-related items, respectively (see Appendix).

To measure self-efficacy, clients were presented with the eight client-related items, preceded by the instruction, "please honestly rate your confidence in your ability at this moment in time to…". In line with Bandura's (2006) recommendations, responses were made on an 11-point scale anchored at 0 (*no confidence at all*) and 10 (*complete confidence*). Other-efficacy was operationalized by instructing clients, "please honestly rate your confidence in your therapist's ability at this moment in time to...", followed by the eight therapist-related items. Clients' RISE beliefs were assessed using the exact same eight items that were used to measure their confidence in their own ability; however, in this instance clients were asked to honestly estimate how confident they thought their therapist was in their (the client's) ability. Consistent with the self-efficacy instrument, participants' other-efficacy and RISE responses were measured on the same 11-point scale. Measures derived from each of these efficacy instruments displayed acceptable internal consistency ($\alpha_{\text{self-efficacy}} = .93$, $\alpha_{\text{other-efficacy}} = .93$, $\alpha_{\text{RISE}} = .92$).

Client-therapist relationship quality. Clients' perceptions about the quality of their relationship with their therapist were measured using five items from Hendrick's (1988) seven-item Relationship Assessment Scale (RAS), which was devised as a generic measure of relationship satisfaction. Previous psychometric evaluations have demonstrated acceptable structural properties

for the RAS, as well as evidence of criterion validity via favorable correlations with theoretically-related variables (e.g., Hendrick, Dicke, & Hendrick, 1998). Revised versions of the RAS have been employed previously across a wide range of close interaction contexts (e.g., Renshaw, McKnight, Caska, & Blais, 2011), and example items in the present study included "how well does your relationship with your therapist meet your needs as a client?" and "in general, how satisfied are you with your relationship with your therapist?" Two items from the original instrument that refer specifically to romantic relationships were excluded in this study. Respondents were instructed to consider their relationship with their therapist at that moment in time, and to provide ratings on a seven-point scale, where higher scores represented more positive perceptions. The alpha coefficient for the measure derived from this instrument ($\alpha = .86$) was acceptable.

Engagement. In an attempt to maximize the objectivity of client engagement ratings, therapists were asked to complete a brief three-item instrument with reference to each client under their guidance who was participating in the study. In line with similar practitioner-rated measures used in previous studies (e.g., Brewer, Petitpas, Van Raalte, Sklar, & Ditmar, 1995), this instrument was designed to provide a global index of client engagement, and be sufficiently brief so as to avoid placing a heavy burden on therapists who were required to rate multiple clients. Using a five-point response scale anchored by 1 (*very little*) and 5 (*a great deal*), therapists were presented with the following three questions, "how much commitment does this client show when s/he is at the clinic completing his/her exercise sessions with you?", "what level of motivation does this client display in relation to his/her exercise program as a whole?", and "on the whole, what level of perseverance does this client show when faced with challenges and obstacles in his/her program?" Therapists were instructed to (a) disregard the clients' personality and the quality of their working relationship with the client, and focus solely on rating his/her engagement, (b) consider the engagement of the focal client in relation to all the other clients whom they were supervising, and (c) report their feelings about that client at that specific moment in time. The internal consistency of the engagement measure derived from this instrument was acceptable ($\alpha = .86$).

Procedure. Having obtained ethical approval from the lead author's institution, physical therapists (and their respective clinics) were informed via email about the nature of the study and intended participants. Upon registering their interest with the lead author, exercise rehabilitation clinics were provided with a batch of participant booklets, each of which included a blank questionnaire along with all relevant supplementary materials (i.e., instructions, information sheet, consent form, return envelope). Clinics were also asked to display recruitment advertisements, and to inform clients verbally about the investigation. Subsequently, clients who were willing to complete the questionnaire were able to collect all relevant materials from their clinic. A participant instruction sheet was attached to the front cover of the booklet, and included assurances of confidentiality as well as brief instructions for completing the forms (i.e., to read the information sheet and provide consent before completing the survey, and to do so privately, away from the clinic). Participants then completed the survey before returning all materials directly to the lead investigator using a pre-paid envelope. Immediately upon receiving each completed participant booklet, the lead investigator contacted the relevant clinic by email and requested that the participant's therapist complete the engagement instrument.

Data analysis. Univariate and multivariate normality checks were first performed, before latent means were estimated for all variables of interest using AMOS Version 19. Subsequently, we examined overall fit indices and the hypothesized pathways for our structural model using maximum likelihood procedures. Specifically, we created a structural equation model where each latent efficacy variable was represented by eight indicators (i.e., items), and interaction quality and engagement were represented by five and three indicators, respectively. To assess model parsimony we utilized a range of relevant indices, namely the χ^2 goodness-of-fit index, comparative fit index (CFI), Tucker-Lewis index (TLI), standardized root mean square residual (SRMR), and root mean square error of approximation (RMSEA). Estimates for CFI/TLI $\geq .95$ and SRMR/RMSEA $\leq .08$ (with the upper bound of the 90% RMSEA CI $\leq .10$) were used as evidence of close fit (Hu & Bentler, 1999; Marsh, Hau, & Wen, 2004). We computed direct as well as

indirect estimates between latent variables as specified in Figure 1, and used bootstrapped confidence intervals (CIs) to assess the significance of all total indirect pathways.

Results

Having replaced missing data (which represented 0.3% of all data points) using the expectation-maximization method (see Graham, 2009), all item-level skewness and kurtosis estimates were acceptable, and preliminary analyses revealed that none of the data violated assumptions of univariate ($z < \pm 3$) or multivariate (Mahalanobis distance at $p < .001$) normality (Tabachnick & Fidell, 2007). Estimated latent means are presented for all variables in Table 1. Close fit indices were observed for a structural model comprising five latent variables (with 32 total indicators) as indicated in Figure 1, $\chi^2 (457) = 648.80$, $p < .001$, CFI = .95, TLI = .95, SRMR = .07, and RMSEA = .050 (90% CI .041 - .058). In terms of structural pathways, direct effects demonstrated that favorable self-efficacy, other-efficacy, and RISE appraisals were each significantly related to clients' perceptions of relationship quality. That is, when clients believed strongly in their own ability, felt that they were working under a highly capable therapist, and/or estimated that their therapist was highly confident in their ability (as a client), they reported more adaptive perceptions about the quality of their relationship with that therapist. Collectively, the tripartite efficacy constructs were able to explain 60% of the variance in relationship quality scores. Increases in perceptions of relationship quality were also directly related to improvements in engagement scores, accounting for 18% of the variance in engagement ratings. Aside from direct effects, bootstrapped analyses also revealed significant indirect pathways between self-efficacy (self-efficacy → engagement; $\beta = .11$, SE = .05, 90% CI = .03 to .20, $p = .025$), other-efficacy (other-efficacy → engagement; $\beta = .22$, SE = .09, 90% CI = .08 to .39, $p = .020$), and RISE (RISE → engagement; $\beta = .21$, SE = .10, 90% CI = .08 to .44, $p = .010$) in relation to engagement, via perceptions of relationship quality.

Study 2

Our analyses in Study 1 supported the hypothesized pathways in our a priori model, and demonstrated that clients' efficacy beliefs aligned with their perceptions about the quality of their relationship with their rehabilitation therapist. In close interactions, however, individuals' relationship perceptions may be underpinned not only by their own cognitions and emotions, but also by the cognitions and emotions of their interaction partner. This notion of mutual influence, or interdependence, in dyadic contexts has been discussed at length in the relationship literature (see Kenny, Kashy, & Cook, 2006), and has also been described specifically in relation to client-therapist interactions. For example, Kenny and colleagues recently noted that individuals in therapeutic relationships "have the potential to influence each other's cognitions, emotions, and behaviors in a reciprocal way" (Kenny et al., 2010, p.763). Kenny et al. (2006) outlined two general classifications of predictive effects that may arise in dyadic exchanges, and noted that a comprehensive examination of relational processes requires the consideration of both potential effects. *Actor effects* exist when a predictor variable held by one person is associated with an outcome for that same individual (e.g., client other-efficacy → client relationship quality perceptions). *Partner effects*, on the other hand, arise due to the interdependence that is inherent in dyadic interactions, when one person's predictor variable accounts for changes in an outcome for the other person in the relationship (e.g., client other-efficacy → therapist relationship quality perceptions).

The notion of actor and partner effects within rehabilitation relationships has been discussed previously in the tripartite efficacy literature (Dillman et al., 2010), and empirical evidence of partner (as well as actor) effects has been documented for the tripartite constructs in athletic relationships. For instance, in coach-athlete interactions, it has been shown that when one person reports strong other-efficacy appraisals, this predicts increased relationship commitment for the other person in the dyad (Jackson & Beauchamp, 2010), and that athletes report increased feelings of interpersonal closeness when their coach believes strongly in their capabilities (Jackson et al., 2010). Partner effects of this kind are theorized to occur as an individual processes the supportive

and encouraging behaviors displayed by the other person (see Rosenthal & Jacobson, 1968). For example, if a therapist is highly confident in his/her client, then s/he will likely provide support, reinforcement, and affirmation to the client, which the client may detect and internalize, leading to improved perceptions of relationship quality for the client (Lent & Lopez, 2002; Snyder & Stukas, 1999). Tripartite efficacy actor and partner effects have yet to be examined in the context of physical rehabilitation interactions, so in Study 2 we aimed to model actor and partner effects for clients' and therapists' efficacy beliefs in relation to perceptions of relationship quality. In particular, we sought to build on Study 1 by adopting a dyadic approach, and we examined the extent to which clients' and therapists' self-efficacy, other-efficacy, and RISE beliefs were related to their own (i.e., actor effects) *as well as* the other person's (i.e., partner effects) perceptions of interaction quality.

By measuring both dyad members' tripartite perceptions, we were able to (a) attempt to replicate the positive effects that we observed for clients in Study 1, (b) determine whether similar effects were apparent for therapists as well as clients, and (c) explore whether individuals' efficacy beliefs were associated with one another's relationship quality appraisals (i.e., partner effects). On the basis of Lent and Lopez's (2002) proposals, and the findings reported in Study 1, we hypothesized that self-efficacy, other-efficacy, and RISE would independently display positive actor effects with respect to ratings of relationship quality. Specifically, we predicted that individuals would report greater relationship quality perceptions when they were highly confident in their own and the other person's ability, and/or when they estimated that the other person believed strongly in their capabilities. In terms of partner effects, in light of related dyadic studies (e.g., Jackson et al., 2010), we also anticipated that more favorable efficacy beliefs on the part of one individual would be associated with stronger relationship quality perceptions for the other person. That is, we hypothesized that one person's relationship quality perceptions would be elevated when the other person in the dyad reported favorable self-efficacy, other-efficacy, and RISE perceptions. Finally, given the distinct roles that dyad members occupy in rehabilitation interactions, and the

resultant imbalances that exist in terms of authority and dependence within the dyad, we acknowledged that the tripartite constructs may not exert identical actor and partner effects for clients and therapists, and incorporated moderator (i.e., role-based interaction) analyses to determine whether any emergent effects differed significantly for clients and therapists. Despite expecting positive main actor and partner effects (above), in light of the exploratory nature of these supplementary role-based (i.e., interaction) analyses, we did not formulate specific a priori hypotheses about the potential for role-based differences in actor or partner effects.

Method

Participants. A total of 68 exercise clients (M_{age} = 65.93, SD = 5.80, n_{male} = 27, n_{female} = 41) and their therapists (n = 68, M_{age} = 31.89, SD = 4.79, n_{male} = 37, n_{female} = 31) were recruited. Clients in Study 2 were distinct from those in Study 1; however, they were again enrolled in one-to-one, clinic-based exercise programs as a result of the same lower-limb musculoskeletal disorders. Clients in this sample cited sport (n = 6), work (n = 12), and other (n = 41) factors as the primary contributor to their condition (9 did not answer), had again been enrolled in their exercise program for approximately three months (M = 14.70 weeks, SD = 2.98) at the time of data collection, and reported 2.58 hours (SD = .63) of weekly exercise- or consultation-based one-to-one time with their therapist at the clinic. On average, therapists had been accredited and working in a clinic for 5.98 years (SD = 3.63).

Measures.

Clients. Clients' efficacy and relationship quality perceptions were measured using the same instruments that were employed in Study 1 (engagement was not assessed in Study 2). Acceptable estimates of internal consistency were demonstrated for clients' tripartite efficacy and relationship quality perceptions in this sample (see Table 1).

Therapists. Therapists' self-efficacy beliefs were measured by modifying the referent of the eight therapist-related items that were used in Study 1 to assess clients' other-efficacy. For instance, the original client other-efficacy item, "devise effective goals that meet your individual

needs", was revised to "devise effective goals that meet your client's individual needs" in order to measure therapist self-efficacy. These revised items were presented following the common stem: "Please honestly rate your confidence in your ability at this moment in time to…". Therapist responses were made on an 11-point scale anchored at 0 (*no confidence at all*) and 10 (*complete confidence*). Using the same process to measure therapist other-efficacy, we changed the referent of the client-related skills from Study 1, and used the instruction, "please honestly rate your confidence in your client's ability at this moment in time to...". For instance, the original client self-efficacy item, "schedule your time so that you can attend all your exercise sessions", was revised to "schedule his/her time so that s/he can attend all his/her exercise sessions". Finally, therapists' RISE perceptions were assessed with the same revised items that were used to measure their confidence in their own ability, with the instruction, "please estimate how confident your client is in your ability at this moment in time to…". An example item included, "develop an effective program for him/her and make effective adjustments when needed". Responses were again provided on the same 11-point scale, and estimates of internal consistency were acceptable for therapists' self-efficacy ($\alpha = .87$), other-efficacy ($\alpha = .87$), and RISE ($\alpha = .91$) measures.

A revised version of Hendrick's (1988) RAS was utilized to assess therapists' perceptions about their relationships with their clients, with the same five items modified to suit therapists (e.g., "how well does your relationship with this client meet your needs as a therapist?", "in general, how satisfied are you with your relationship with this client?"). Therapists were requested to consider their relationship with the focal client in relation to all the other clients with whom they were working at that moment in time, and the seven-point rating scale was employed in line with Study 1. An acceptable alpha coefficient was observed for this measure ($\alpha = .78$).

Procedure. The same protocol was followed as in Study 1, although in this instance when clients collected their questionnaire booklet at the clinic they were also asked to note their participation on a form provided. This served to notify the therapist that their client was participating in the study, and as a result, we requested that the therapist completed his/her

questionnaire at that point in time. Therapists were provided with an information sheet outlining the nature of the investigation and their rights as a participant (i.e., assurances of confidentiality, right to withdraw or refuse to answer any question), and were asked to provide their informed consent prior to completing the questionnaire package. Given that we sought to recruit unique dyads, therapists were instructed to complete one questionnaire only (i.e., about the first of their clients who took part).

Data analysis. Descriptive statistics and normality checks were computed separately for client and therapist data, and in order to assess the degree of nonindependence we followed Cook and Kenny's (2005) recommendations by performing Pearson product moment correlations between clients' and therapists' relationship quality perceptions. Further Pearson correlations were computed to explore the within- and between-person associations amongst client and therapist variables. Finally, an actor-partner interdependence model (APIM) was estimated using the MIXED command in IBM SPSS Version 19, in line with Kenny et al.'s (2006) guidelines. Data were arranged in a pairwise setup and all variables were standardized prior to computing estimates reflecting main actor effects (i.e., where one's efficacy perception aligned with one's own relationship quality), main partner effects (i.e., where one's efficacy perception aligned with the other's relationship quality), actor interaction effects (i.e., where the actor effect differed significantly between clients and therapists), and partner interaction effects (i.e., where the partner effect differed significantly between clients and therapists). Relevant demographic variables (i.e., age, relationship length) were also entered in the APIM as potential correlates of relationship quality, alongside dyad members' efficacy beliefs.

Results

Descriptives and correlations. Missing data comprised 0.2% of the total sample, and were replaced using the expectation-maximization method. Normality checks indicated that no data violated assumptions of univariate or multivariate normality, item-level analyses revealed acceptable skewness and kurtosis estimates, and the significant correlation between clients' and

therapists' relationship quality scores demonstrated that dyad members' data were nonindependent (see Table 2). Within-person correlations (e.g., client other-efficacy in relation to client self-efficacy) showed positive associations between one's tripartite efficacy beliefs, as well as positive correlations between one's efficacy beliefs and one's own relationship quality perceptions (see Table 2). Between-person correlations (e.g., client other-efficacy in relation to therapist relationship quality) demonstrated that when one person in the dyad reported favorable efficacy beliefs, this was also associated with higher perceptions of relationship quality for the other person.

Actor and partner effects. With respect to demographic variables, analyses revealed no significant effect for relationship length ($\beta = .02$, $t_{59} = .37$, $p = .71$), as well as no actor or partner effects for dyad member age ($\beta = .01$, $t_{81} = .78$, $p = .44$ and $\beta = -.02$, $t_{105} = -1.09$, $p = .28$, respectively). As illustrated in Table 3, however, significant main actor effects (with no interactions according to dyad member role) did emerge for self-efficacy, other-efficacy, and RISE. That is, dyad members reported greater perceptions of relationship quality when (a) they were highly confident in their own capabilities as a client or therapist, (b) they were highly confident in the other person's ability, or (c) they believed that the other person was highly confident in their ability. Aside from these actor effects, a main partner effect was also observed for other-efficacy. This indicated that dyad members' confidence in the other person's ability was related to enhanced perceptions of relationship quality for the other person (as well as for themselves). That said, a significant interaction effect was also apparent alongside this main partner effect, which demonstrated that the effect of one person's other-efficacy on the other's perceptions of relationship quality was moderated by the role of the individual (i.e., client or therapist). Follow-up analyses for this interaction identified that whilst the effect for therapist other-efficacy on client perceptions of relationship quality was highly significant, $\beta = .59$, $t_{61} = 3.22$, $p = .002$, the effect of client other-efficacy on therapist perceptions of relationship quality was much smaller in magnitude and not significant, $\beta = .09$, $t_{61} = 1.27$, $p = .21$.

General Discussion

Supervised exercise programs are a common treatment method for the various lower-limb musculoskeletal disorders that are prevalent in aging populations, and high-quality relationships between clients and therapists have been shown to provide a foundation for desirable client outcomes in these programs (e.g., Chan et al., 2009; Heszen-Klemens & Lapińska, 1984; Klaber Moffett & Richardson, 1997). Lent and Lopez's (2002) tripartite model provides one framework for understanding relationship processes, though to date researchers have yet to examine the range of interpersonal outcomes associated with these efficacy constructs in rehabilitation settings. With that in mind, we examined the relations between clients' and therapists' tripartite beliefs and their perceptions of relationship quality (Studies 1 & 2), as well as clients' engagement in their exercise program (Study 1).

In Study 1, clients were rated (by their therapist) as displaying greater engagement in their exercise program when they reported favorable perceptions about the quality of their relationship with their therapist, supporting existing findings in therapeutic contexts (e.g., Sluijs & Knibbe, 1991). In addition, in line with hypotheses and recent tripartite efficacy studies (e.g., Jackson et al., 2010), we also demonstrated that clients' self-efficacy and relational efficacy beliefs were associated with more favorable appraisals about their relationship with their therapist. These findings not only underscore how client-therapist interactions may relate to client program engagement, they also highlight for the first time the significance of the tripartite efficacy framework for supervised exercise rehabilitation clients.

Although Study 1 advanced our understanding regarding the tripartite model in exercise rehabilitation settings, our failure to measure therapists' efficacy perceptions provided a somewhat myopic perspective on the nature of client-therapist interactions. In order to acknowledge the interdependence that exists within client-therapist interactions, and to model the partner effects that may emerge alongside actor effects, our dyadic approach in Study 2 assessed clients' *and* therapists' tripartite and relationship quality perceptions. In particular, we examined how dyad members' confidence in their own ability (self-efficacy), their confidence in the other's ability

(other-efficacy), and their estimations of the other person's confidence in them (RISE), were related to their own (i.e., actor effects) or the other person's (i.e., partner effects) perceptions of relationship quality. As hypothesized, and consistent with Lent and Lopez's (2002) theoretical assertions, significant positive actor effects emerged for each of the tripartite constructs with respect to perceptions of relationship quality. For clients, these effects substantiated the findings that were reported in Study 1, insofar as this separate group of exercisers also displayed greater satisfaction with their client-therapist interactions when they reported favorable efficacy perceptions. In addition, we observed no role-related interactions for any of these main actor effects (i.e., no differences between clients and therapists), demonstrating that therapists' tripartite beliefs also positively aligned with their own appraisals about their relationship with their client. Alongside these intra-individual effects (i.e., actor), we also found some support for inter-individual (i.e., partner) effects in client-therapist relations (see Cook & Kenny, 2005), whereby the cognitions held by one individual may have implications for the other person's outcomes. In particular, a significant partner effect was observed between therapists' other-efficacy and clients' relationship quality perceptions, demonstrating that clients reported more favorable interpersonal appraisals when their therapist believed strongly in their (i.e., clients') ability.

This is the first investigation to document tripartite efficacy partner effects in therapeutic settings; however, existing rehabilitation research supports the general notion that therapist behaviors and perceptions may underpin client outcomes (e.g., Learman, Avorn, Everett, & Rosenthal, 1990). Empirical evidence also exists in relation to the distinct causal steps that are proposed to underlie partner effects, in as much as therapists' feelings about their clients have been shown to influence their behavior toward their client (e.g., Rosenthal, Blanck, & Vannicelli, 1984), which, in turn, may impact upon cognitive and functional outcomes for clients (e.g., Ambady, Koo, Rosenthal, & Winograd, 2002). Given that therapists' other-efficacy beliefs were associated with increases in their own relationship quality perceptions in this investigation (i.e., actor effect), it is possible that this may have been reflected in the therapist engaging in more pro-social behavior

toward the client (e.g., support, encouragement, body language), leading to improvements in the client's perceptions of relationship quality (see Snyder & Stukas, 1999). Our approach precludes any inferences regarding the causal mechanisms associated with this partner effect; however, these findings do substantiate Lent and Lopez's (2002) assertions that one's relational efficacy beliefs may activate outcomes for the target (as well as the holder) of these interpersonal perceptions.

Despite acknowledging that therapists' other-efficacy beliefs accounted for variation in clients' relationship appraisals, it is also important to consider why this effect failed to occur in the reverse direction (i.e., client other-efficacy → therapist relationship quality perceptions). Similar findings have been reported previously in distinguishable sport-based interactions; specifically, Jackson et al. (2010) demonstrated that whilst coach other-efficacy beliefs predicted athlete outcomes, this effect did not occur in the reverse direction. Jackson and colleagues proposed that divergent partner effects such as these may arise due to asymmetries between dyad members' relative levels of authority, expertise, and influence (cf. Rusbult & Van Lange, 2003; Snyder & Stukas, 1999). In supervised rehabilitation interactions, therapists typically hold a greater degree of expertise and authority in relation to their client, and client rehabilitation success is dependent upon effective instruction and guidance from their therapist. As a result, when therapists (i.e., the higher-power individual within the dyad) believe strongly in their client's ability, and overtly display this confidence via their interpersonal behaviors toward the client, then this may substantively reinforce the client's (i.e., the dependent dyad member's) feelings about his/her interactions with the therapist. On the other hand, client other-efficacy may be less likely to influence therapist relationship appraisals, as the high-power individual may not be influenced to the same extent by the perceptions and behaviors of the dependent dyad member (Snyder & Stukas, 1999). Clearly, these suggestions are somewhat speculative in nature, and future tripartite research is warranted that explores relational processes with diverse client-therapists samples, as well as examining whether partner effects may be more consistent between dyad members when the interaction is not characterized by discrepancies in authority and influence (e.g., training partners).

These studies represent the first attempt to model the interpersonal implications associated with the tripartite efficacy network within rehabilitation interactions. That said, it is important to highlight the design limitations inherent in our work, as well as identifying worthwhile avenues for future research that may further our understanding of the tripartite model in client-therapist settings. First, given that data in both studies were collected in a cross-sectional manner, it is not possible for us to infer causal relations between our variables of interest. In future, it would be interesting to test the causal relationships at the heart of Lent and Lopez's (2002) framework, by targeting self-efficacy and relational efficacy beliefs using intervention and quasi-experimental approaches, and exploring resultant changes in interpersonal (e.g., relationship quality), motivational (e.g., effort), and functional (e.g., fitness, mobility) outcomes. Similarly, prospective and longitudinal designs that enable researchers to assess program adherence and behavior maintenance as a result of individuals' tripartite perceptions would be extremely valuable. Our findings also apply only to those individuals who are participating in clinic-based supervised exercise programs as a result of lower-limb musculoskeletal disorders. Sustained research with diverse patient populations who are experiencing varied condition severity, treatment approaches (e.g., hospital-based programs, community-based programs), delivery methods (e.g., one-to-one and group-based programs), and program components (e.g., land-based and water-based programs) would enable a much more comprehensive assessment regarding the utility of the tripartite efficacy model in rehabilitation interactions.

In terms of measurement issues, we recognize that our tripartite efficacy instruments were devised specifically for this investigation, and that a larger sample size would have been desirable when assessing measurement properties in Study 1. We did follow established scale construction recommendations when devising items (Bandura, 2006), and the fit indices indicated that our instruments displayed acceptable psychometric properties; nonetheless, it is important that additional work seeks to provide further support for the reliability and validity of these instruments using larger (and more diverse) client and therapist samples. In addition, researchers are

encouraged in future to use these instruments in order to examine the extent to which clients' and therapists' tripartite efficacy beliefs predict relational outcomes whilst controlling for effects associated with trait-based or compatibility perceptions. For instance, it would be worthwhile to explore whether one's perceptions about another's capabilities (i.e., other-efficacy) account for improvements in relationship quality over and above one's general perceptions about the other's personality (e.g., agreeableness). Finally, although we addressed the limitations that accompany self-report assessments of program engagement in Study 1 (i.e., by having therapists rate client engagement), we did not obtain any measures that would have enabled us to make objective inferences regarding rehabilitation success. As well as continuing to explore the important interpersonal consequences associated with self-efficacy, other-efficacy, and RISE in future, it would also be fascinating to examine whether clients' and therapists' tripartite efficacy beliefs account for changes in key functional outcomes for clients (e.g., pain, mobility, fitness).

The significance of client self-efficacy in promoting rehabilitation outcomes is well understood, and a number of practical recommendations for enhancing clients' personal agentic perceptions have been outlined previously (e.g., Bandura, 2004; McAuley & Blissmer, 2000). As well as underscoring the utility of self-efficacy, the present findings also provide novel applied implications, demonstrating that it may be necessary to explore ways to bolster clients' relational efficacy beliefs alongside their confidence in their own ability. On that note, interventions that target therapists' verbal and non-verbal communication styles, as well as their provision of support and reinforcement, may serve to stimulate clients' other-efficacy and RISE appraisals. By strengthening clients' relational efficacy beliefs, these approaches may benefit therapists in their efforts to promote client engagement (in light of the indirect effects observed in Study 1) and to develop harmonious relationships with their clients. As well as targeting clients' relational efficacy perceptions and rehabilitation experiences, Study 2 demonstrated that the tripartite framework may also be of practical significance for therapists. For example, training and professional development programs that bolster therapists' confidence in their own capabilities might provide a foundation for

promoting high-quality interactions with their clients. Similarly, our analyses underline the potential for clients to play an active role in promoting therapists' relationship appraisals. To illustrate, therapists may report strengthened RISE appraisals if they detect that their clients are expressing a high level of appreciation and support, and displaying a high degree of motivation during their interactions (Lent & Lopez, 2002), which may, in turn, promote their perceptions about their relationship with the client.

Overall, these findings not only support the desirable consequences that have been previously associated with high-quality client-therapist relationships, they also make a novel contribution to the tripartite efficacy and rehabilitation literature by demonstrating that (a) clients' tripartite efficacy beliefs may promote adaptive relationship appraisals and enhanced program engagement, (b) therapists' self-efficacy, other-efficacy, and RISE beliefs are also important in shaping their own relationship appraisals, and (c) clients report more favorable relationship quality perceptions when their therapist is highly confident in their ability. In light of the prevalence of debilitating musculoskeletal disorders, and the functional benefits derived from supervised exercise programs, sustained tripartite efficacy research promises to advance our understanding of the social cognitive factors that contribute to client well-being and rehabilitation success.

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Table 1. Descriptive statistics and alpha coefficients

	Study 1 (Client-Only Sample)			Study 2 (Dyad Sample)		
Variable	*M*	*SD*	*α*	*M*	*SD*	*α*
Self-efficacy	7.62	1.35	.93	8.25 / 8.72	1.10 / .74	.91 / .87
Other-efficacy	7.42	1.46	.93	8.11 / 7.60	1.02 / .87	.89 / .87
RISE	7.29	1.35	.92	8.07 / 8.24	1.16 / .93	.93 / .91
Relationship Quality	5.59	.89	.87	5.77 / 5.57	.68 / .55	.80 / .78
Engagement	4.04	.78	.86	-	-	-

Note. Efficacy items measured 0-10, relationship quality 1-7, and engagement 1-5, where higher scores represent more positive perceptions. Study 2 data are presented in the form ‘client score’ / ‘therapist score’.

Table 2. Within- and between-person correlations for Study 2

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. Client SE	-	.06	.66***	.21	.69***	.27*	.26*	.26*
2. Therapist SE		-	.09	.52***	.03	.59***	.33**	.29*
3. Client OE			-	.08	.64***	.28*	.36**	.28*
4. Therapist OE				-	.34**	.65***	.49***	.43***
5. Client RISE					-	.42***	.35**	.26*
6. Therapist RISE						-	.38**	.35**
7. Client Relationship Quality							-	**.30***
8. Therapist Relationship Quality								-

Note. SE = self-efficacy, OE = other-efficacy, RISE = relation-inferred self-efficacy. Nonindependence correlation between client and therapist relationship quality perceptions presented in bold. *** p <.001, ** p <.01, * p <.05.

Table 3. Main and interaction actor/partner effects for self-efficacy, other-efficacy, and RISE with respect to relationship quality perceptions in Study 2

	Actor effect						Partner effect					
	Main effect			Interaction effect			Main effect			Interaction effect		
APIM predictors	β	*t*	*df*	β	*t*	*df*	β	*t*	*df*	β	*t*	*df*
Self-efficacy	.25*	2.08	92	-.05	-.48	103	.01	.06	94	-.14	-1.31	106
Other-efficacy	.31**	3.09	86	-.10	-1.38	104	.34**	3.26	81	-.25**	-2.69	101
RISE	.31**	2.85	100	.11	1.02	85	.04	.35	102	-.12	-1.02	85

Note. $N = 68$ dyads. Estimates computed using standardized (i.e., z-scored) predictor and criterion variables. Degrees of freedom are estimated using the Satterthwaite procedure, and are rounded down to the nearest whole integer. ** $p < .01$, * $p < .05$.

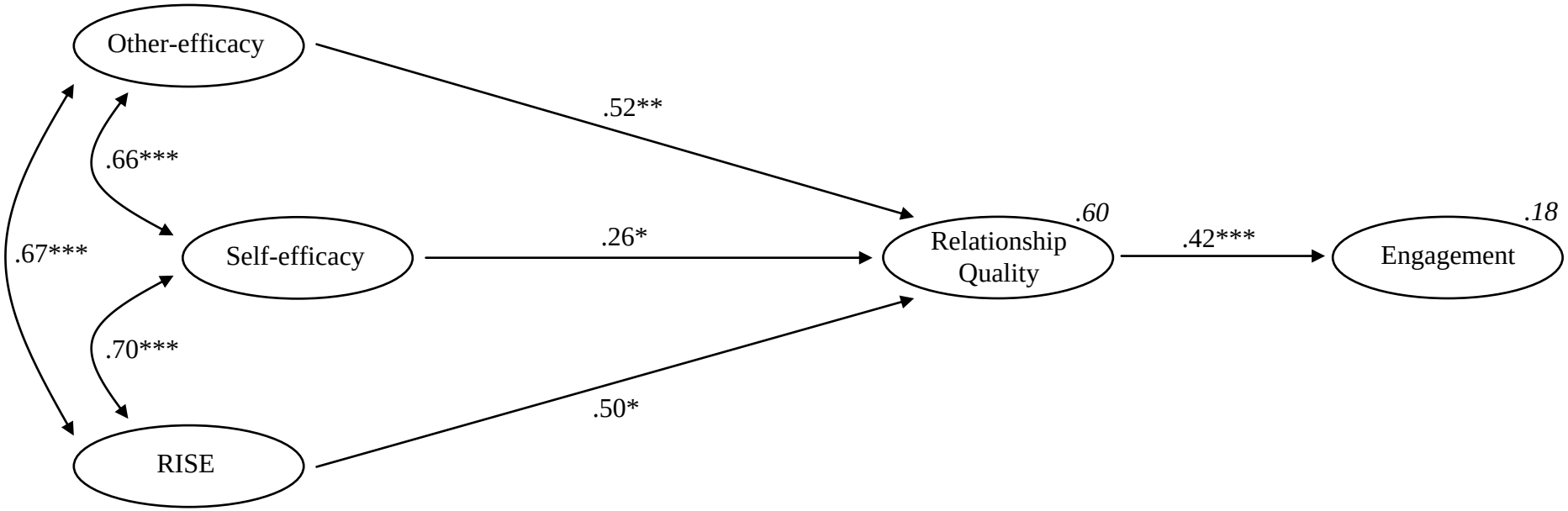

Figure 1. Predictive pathways between latent variables. Indicators were included in the model, but are excluded from the figure for clarity. Values above/below arrows represent standardized path estimates. Squared multiple correlations are presented in italics above exogenous variables. RISE = relation-inferred self-efficacy. *** p <.001, ** p <.01, * p <.05.

Appendix

Client-related items

1. Schedule your time so that you can attend all your exercise sessions
2. Use the correct technique for all exercises
3. Remain motivated during difficult periods in your program
4. Communicate effectively toward your therapist at all times
5. Maintain a positive outlook during stressful periods in your program
6. Reach your goals for your program
7. Overcome barriers that you face in your program
8. Carry out your therapist's instructions at all times

Therapist-related items

1. Keep you highly motivated you throughout your program
2. Develop an effective program for you and make effective adjustments when needed
3. Help you to adhere to your program at all times
4. Provide you with expert advice about your program whenever you need it
5. Help you overcome any barriers you face in your program
6. Devise effective goals that meet your individual needs
7. Provide emotional support to you at all times
8. Communicate effectively toward you at all times