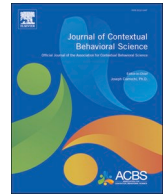




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Measuring intimacy as a contextual behavioral process: Psychometric development and evaluation of the Awareness, Courage, and Responsiveness Scale[☆]

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ABSTRACT

High quality relationships are essential to psychological health and well-being, and relational intimacy is a core feature of these relationships. Decades of research in relationship science have converged on a central model of intimacy wherein individuals develop close, trusting relationships with one another. Functional Analytic Psychotherapy (FAP) is a contextual behavioral intervention approach that is well-equipped to target interpersonal processes through the provision of in-session, therapist mediated reinforcement of skillful intimate relating. Single-subject level analyses of FAP's efficacy and mechanism of action are supportive; however, there is a need for group-level research to evaluate its efficacy and generalizability. This paper presents the development of the Awareness, Courage, and Responsiveness Scale (ACRS), a self-report measure of behaviors essential to intimate relating informed by contextual behavioral science principles and Reis and Shaver's (1988) Intimacy Process Model. In this five-part study, functioning of the ACRS is examined in undergraduate student samples (Studies 1–3), an adult community sample (Study 3), non-clinical dyadic relationships (Study 4), and a transdiagnostic clinical sample (Study 5). Strengths and limitations of the final measure are discussed.

1. Introduction

Functional Analytic Psychotherapy (FAP; Kohlenberg & Tsai, 1991; Tsai et al., 2009) is a contextual behavioral psychotherapy that targets clients' transdiagnostic constructive outcomes related to improved interpersonal functioning. With roots in early behavioral conceptualizations of the psychotherapy relationship, FAP proposes that a primary mechanism of effective psychotherapeutic change is the in-session, natural, social reinforcement of improved client behavior by the therapist. Explicit attention is paid to in-session, functionally defined clinically relevant client behavior (CRB). Based on a case conceptualization of the client's goals for treatment, problematic client

behaviors that occur in-session are referred to as CRB1 and improved in-session behaviors are referred to as CRB2. The FAP therapist is trained to observe, evoke, and reinforce CRB2s, and generalize the client's in-session learning to relevant outside contexts.

Congruent with FAP's emphasis on application of behavioral principles and idiographic case formulation, research on FAP has accumulated mostly in the form of case studies, controlled single-subject designs, and micro-process investigations of the impact of FAP and FAP processes on idiographically defined interpersonal behavioral targets (Kanter et al., 2017). This research supports FAP not as an empirically supported treatment for specific disorders but as a psychotherapeutic process that can produce positive change in specific, transdiagnostic

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behavioral targets. A recent meta-analysis of single-subject designs concluded that FAP was effective across a range of target behaviors (i.e., CRBs; Singh & O'Brien, 2018).

Despite promising single-subject and mechanism data, there continues to be a need for group-level clinical trial research to evaluate FAP's efficacy (Kanter et al., 2017). FAP researchers, however, have noted that FAP's idiographic approach, even though it has facilitated single-subject mechanism research, renders nomothetic group research more challenging (Follette & Bonow, 2009; Maitland & Gaynor, 2012). One promising avenue for progress involves the specification of transdiagnostic interpersonal functioning outcomes that enable varying levels of precision, scope, and depth as needed for a particular functional analysis (Hayes, Barnes-Holmes, & Wilson, 2012). Although any set of client problems theoretically can be targeted in FAP, the mechanism is necessarily interpersonal, leading Kohlenberg and Tsai (1991) and others (e.g., Weeks, Kanter, Bonow, Landes, & Busch, 2012) to describe FAP as an approach that prototypically targets interpersonal functioning outcomes. In 2009, Tsai and colleagues articulated techniques that squarely targeted intimacy, employing the terms *awareness*, *courage*, and *love* to describe desired therapeutic processes that facilitate more intimate exchanges between clients and therapists to improve these targets.

1.1. Theoretical foundations

Despite the focus on intimacy-related concerns in FAP (Maitland, Kanter, Manbeck, & Kuczynski, 2017), no model of intimacy has been advanced for use by FAP researchers or clinicians, leaving the determination of treatment targets up to individual case conceptualization (c.f., Callaghan, 2006), and leaving researchers without consensus on how to measure dependent variables in FAP outcome research. Herein, we present a model of intimacy that integrates established findings from relationship science with extant descriptions of FAP targets and processes, and propose this model as an approach for researchers and clinicians wishing to measure proximal behavioral outcomes related to intimacy.

Specifically, we employ the *Intimacy Process Model* (IPM; Reis & Shaver, 1988), a well-researched model of how intimacy develops which can be translated into clinical targets related to intimate relational functioning (Maitland et al., 2017). The IPM describes intimacy as a dynamic, behavioral process that is consistent with the emphasis placed on identifying behavioral actions-in-context in contextual behavioral science (Hayes et al., 2012). The model can be applied to psychotherapy or other relationships and thus is a good fit for FAP's emphasis on relational processes that occur both in therapy and in outside relationships. The constructs of this model, as will be described, map tightly on to the intimate exchanges targeted in FAP as per Tsai et al. (2009) and can be applied to the psychotherapy or other relationships. Thus, the model may be a good fit for FAP's emphasis on relational processes that occur both in therapy and in outside relationships. In fact, in a post-hoc analysis of published FAP research, 84% of published, ideographically defined FAP targets were consistent with this model (Maitland et al., 2017).

The IPM (1988) situates the intimacy process in a dyadic interaction in which two individuals are engaged in a series of reciprocal exchanges of vulnerability and empathically attuned responses to that vulnerability. Specifically, an intimate interaction begins when one individual ("Person A") engages in a vulnerable verbal or nonverbal self-disclosure/expression with another individual ("Person B") who, for successful intimate relating to occur, conveys understanding, validation, and care in response (referred to as "responsiveness"; Reis, Collins, & Berscheid, 2000; Reis & Gable, 2015). The extent to which both partners reciprocally engage in this pattern of vulnerability and responsiveness predicts relational closeness and is foundational to the development of close, trusting, and personally satisfying relationships over time (Canevello & Crocker, 2010; Laurenceau, Barrett, & Pietromonaco,

1998; Laurenceau, Barrett, & Rovine, 2005). The IPM also suggests that multiple perceptual, motivational, and dispositional processes influence these interactions, such as an individual's "interpretive filters" that include motives, needs, goals, and fears during the interaction.

1.2. A proposed clinical model

Herein, we propose a new measure called the *Awareness, Courage, and Responsiveness Scale* (ACRS), based on a model that integrates the IPM's intimacy process with FAP processes, and operationalizes the constructs in the model as behavioral targets amenable to intervention (including a behavioral reformulation of the IPM's "interpretive filter") and languaged for clinical use as described in Maitland et al. (2017). We briefly describe each of the major constructs of the model.

1.2.1. Awareness

Tsai et al. (2009) characterized awareness as the quality of paying attention to one's own emotional reactions and the subtle emotions and behavior of the other individual in an interaction, consistent with the notion of "interpretive filters" proposed in the IPM (Reis & Shaver, 1988). In our model, awareness involves paying attention to the factors influencing an intimate interaction with the intention of gaining volitional control over behavior and increasing the likelihood of successful intimate relating. Our formulation includes both self-awareness (awareness of one's own motives, needs, and goals in the interaction) and other-awareness (awareness of the other's motives, needs, and goals). Self-awareness functions primarily to facilitate successful disclosures from Person A in the interaction, and multiple findings indicate that mindful emotional awareness improves emotional clarity, emotional expression, and relational outcomes (Atkinson, 2013). Other-awareness involves empathic accuracy and the related construct of perspective taking, which predict successful responsiveness and relational closeness (Ickes, 2000). Reis and Gable (2015) note that without empathic accuracy, the responsiveness attempts of even well-intentioned individuals may be perceived as insincere, insensitive, or out of sync with the discloser's goals and needs.

1.2.2. Courage

Tsai et al. (2009) describe a broad range of courageous, interpersonal risk-taking behaviors that function to increase relational closeness and improve overall functioning (e.g., committed valued action), including vulnerable self-disclosures as emphasized by the IPM. Cordova and Scott (2001) described these self-disclosures as courageous because they occur in a context of a heightened probability of punishment (e.g., rejection, criticism, embarrassment) without which intimacy would not occur. Kernis and Goldman (2006) documented the importance of authenticity in disclosure, which predicts higher relational satisfaction. Lopez and Rice (2006) defined this authenticity as "intimate risk taking" and found that it was the strongest predictor of relationship satisfaction among a number of alternate predictors (e.g., gender, self-esteem, adult attachment).

Consistent with self-determination theory (Ryan & Deci, 2002), which describes the interplay of relational and non-relational goal pursuits, Tsai et al. (2009) encourage courageous risk-taking behavior that is not necessarily intimate or relational in nature, such as any courageous self-expression or behavior that is experienced as risky but important because it is consistent with one's values, identity, and life-goals. These non-relational courageous expressions predict relational closeness, well-being, and attachment security (La Guardia, Ryan, Couchman, & Deci, 2000; Patrick, Knee, Canevello, & Lonsbary, 2007) and were important to include with vulnerable self-disclosures in our model and measurement strategy.

1.2.3. Responsiveness

Tsai et al. (2009) emphasized the term "love" to describe key qualities of one's response to another's courageous behavior, consistent in

many ways with Rogers (1951) client-centered therapy and with the IPM's term *responsiveness*, which describes Person B's response to Person A's vulnerable self-disclosure. Multiple findings identify components of responsiveness as important to intimacy, including providing responses that are experienced as understanding, validating, and caring (Canevello & Crocker, 2010), match the speaker's emotional versus instrumental needs (Cutrona, Shaffer, Wesner, & Gardner, 2007), do not undermine Person A's self-efficacy (Maisel & Gable, 2009), and express safety through synchronous emotional expression and mirroring. Longitudinal research shows that the perception of one's partner as responsive is essential to intimacy (Laurenceau et al., 1998, 2005) and experimental research documents that responsiveness to vulnerable self-disclosure is required for the development of closeness and, as per FAP's model, functions as a reinforcing process (Haworth et al., 2015).

1.3. Need for a new measure

Most previous attempts to measure the constructs of the IPM have been limited in either their precision, scope, or depth. For example, regarding their scope, several measures are either single-item measures developed for specific studies (e.g., Laurenceau et al., 1998, 2005; Maisel & Gable, 2009) or focus on only one IPM process (e.g., Canevello & Crocker, 2010; Pansera & La Guardia, 2012). However, research suggests that all three elements (awareness, courage, and responsiveness) are foundational to the development of intimacy. Other measures such as the Friendship-based Love Scale (FBLS; Grote & Frieze, 1994) and the Personal Assessment of Intimacy in Relationships Inventory (PAIR; Schaefer & Olson, 1981) have limited depth in that they were specifically designed for and validated on romantic partnerships, while the Relational Health Indices (RHI; Liang et al., 2002) was designed for non-romantic relationships. Extant measures differ in other ways, for example with respect to their target. The Miller Social Intimacy Scale (MSIS; Miller & Lefcourt, 1982), for example, requires the respondent to answer each item with respect to a particular individual; the Functional Analytic Psychotherapy Intimacy Scale (FAPIS; Leonard et al., 2014) asks the respondent to answer with respect to a particular individual during a one-week window. To our knowledge, no self-report measures exist that map onto the processes elaborated in the IPM that (a) define these processes as acts-in-context amenable to intervention and (b) balance the contextual behavioral values of precision, scope, and depth.

In this research, we were interested in developing a self-report measure of intimacy that is consistent with previous FAP conceptualizations and would capture the primary processes of the IPM (i.e., is precise with respect to its target) as applicable across a variety of relational dyads (i.e., has scope) and that reflects the most current findings from relationship science (i.e., has depth and integrates interdisciplinary findings). We conceptualized our constructs as skills amenable to change in FAP or other relationally oriented psychotherapies that could generalize to a wide range of situations and relational contexts. The following paper describes the development, validation, and cross-validation of the *Awareness, Courage, and Responsiveness Scale* (ACRS; Studies 1–3), examines its functioning in a non-clinical sample of dyads (Study 4), and examines its predictive validity in a clinical sample (Study 5). All study procedures were approved by the University of Washington Institutional Review board.

2. Study 1: Item Development, Reduction, and Psychometric Evaluation

The aims of Study 1 were to develop an initial set of items and construct a measure of awareness, courage, and responsiveness using confirmatory factor analysis (CFA).

2.1. Method

2.1.1. Item development

Items were developed by a team of researchers and practitioners with expertise in contextual behavioral science, FAP, relationship science, and measure development. The initial item pool comprised 64 items mapping onto four processes: Other-awareness (15 items), Self-awareness (18 items), Courage (15 items), and Responsiveness (16 items). Each item contained self-descriptive statements which respondents rated based on the degree to which it reflected true/false statements about them using a 7-point Likert scale ranging from 1 (*Never True*) to 7 (*Always True*).

2.1.2. Participants and procedure

The sample consisted of 1,457 undergraduate student participants recruited from the University of Washington (Sample 1; $n = 723$), University of Louisville (Sample 2; $n = 467$), Utah State University (Sample 3; $n = 171$), and Bowling Green State University (Sample 4; $n = 95$). All participants completed an online battery of measures in exchange for extra credit in their introductory psychology courses. Participants in Samples 1, 2, and 4 were invited to take a shorter survey seven days after the first survey ($n = 602, 57, \text{ and } 67$, respectively). See Table 1 for detailed demographic information.

2.1.3. Data analytic strategy

We employed CFA to test a five-factor hierarchical model of skills important to intimacy as per the IPM and Maitland et al. (2017), in which Self-awareness, Other-awareness, Courage, and Responsiveness were conceptualized as lower-order factors that collectively form a higher order "Intimacy" factor. We estimated a series of CFA models on the full sample using full information maximum likelihood (FIML; Lee, Poon, & Bentler, 1990) and Huber-White robust standard errors (Huber, 1967; White, 1982). This approach was used to balance the data-driven (i.e., exploratory) nature of item reduction with the theory-driven approach of measuring our contextual-behavioral reformulation of the IPM. The item with the lowest loading on each factor was eliminated until a total of 5 items remained on each factor. Then, to achieve simple structure (Revelle & Rocklin, 1979), we observed item residual matrices and removed those items with large standardized residuals. Finally, we re-inserted items that were judged to be necessary for content validity (i.e., to fully measure the intended constructs). Cronbach's alpha (α) assessed internal consistency and the two-way mixed Intraclass Correlation Coefficient (ICC; Shrout & Fleiss, 1979) assessed test-retest reliability. All analyses in this and subsequent studies were performed using R (R Core Team, 2018).

2.2. Results

2.2.1. Factor structure

After determining an initial set of 20 items based our CFA, we removed four items due to having large residuals (two from Self-awareness, one from Courage, and one from Responsiveness) and replaced each with the last item removed from each respective subscale during the initial pruning of items. We re-introduced four items (one on Self-awareness and Courage and two on Responsiveness) that were judged as necessary for content validity, resulting in a final measure that includes 24 items. All replacements and additions were done in iterative blocks to test for overall model fit.

To examine fit of the final model, as recommended by Hu and Bentler (1999), we used the Yuan-Bentler χ^2 (χ^2_{YB} ; Yuan & Bentler, 1999), the χ^2 ratio (χ^2_{YB}/df), comparative fit index (R-CFI), Tucker-Lewis Index (R-TLI), standardized root mean residual (SRMR), and the Root Mean Square Error of Approximation (R-RMSEA). Each fit index is prefixed with "R-" to indicate the use of the χ^2_{YB} statistic in their calculation.

Table 1
Demographic characteristics of samples included in studies 1–4.

	Sample									
	1 ^a		2 ^b		3 ^c	4 ^d		5 ^e	6 ^f	
	T ₁	T ₂	T ₁	T ₂	T ₁	T ₁	T ₂	T ₁	T ₁	
Female <i>n</i> (%)	404 (55.88)	337 (56.07)	324 (69.38)	42 (73.68)	102 (59.65)	74 (77.89)	50 (74.63)	141 (77.05)	196 (76.26)	
Age	19.09 (1.46)	19.06 (1.46)	20.31 (2.81)	20.33 (1.99)	20.75 (3.47)	19.33 (1.46)	19.22 (1.35)	21.27 (4.79)	34.98 (12.43)	
<i>M</i> (<i>SD</i>)										
Race/Ethnicity <i>n</i> (%)										
White	240 (33.20)	206 (34.28)	348 (74.52)	45 (78.95)	158 (92.40)	82 (86.32)	57 (85.07)	–	–	
Black	20 (2.77)	15 (2.50)	61 (13.06)	4 (7.02)	0 (0.00)	4 (4.21)	3 (4.48)	–	–	
Non-white Hispanic	24 (3.32)	18 (3.00)	9 (1.93)	0 (0.00)	6 (3.51)	1 (1.05)	1 (1.49)	–	–	
Asian & Southeast Asian	385 (53.25)	315 (52.41)	24 (5.14)	5 (8.77)	4 (2.34)	2 (2.11)	2 (2.99)	11 (6.01)	3 (1.17)	
Other	54 (7.47)	47 (7.82)	25 (5.35)	3 (5.26)	3 (1.75)	6 (6.32)	4 (5.97)	28 (15.30)	77 (29.96)	
Australian	–	–	–	–	–	–	–	144 (78.69)	177 (68.87)	

T₁ = Time 1; T₂ = Time 2; Samples 5-6 were queried for different demographic characteristics than Samples 1-4.

^a University of Washington undergraduates

^b University of Louisville undergraduates

^c Utah State University undergraduates

^d Bowling Green State University undergraduates

^e Curtin University undergraduates

^f Adults in Perth, Australia.

Table 2
Internal consistency estimates, standardized factor loadings, and descriptive statistics of the final item set in study 1.

ACRS Subscale and Item (Total $\alpha = 0.93$)	Loading	r^2	Mean (<i>SD</i>)	Median
Other-awareness ($\alpha = 0.79$)	0.97	0.94	5.23 (0.91)	5.40
1. I am aware of the times when I could be caring, supportive, and loving towards others.	0.76	0.57	5.61 (1.19)	6.00
2. I am able to listen deeply to others.	0.69	0.48	5.62 (1.23)	6.00
3. I ask questions of others to help me understand exactly what is happening for them in the moment.	0.62	0.38	5.03 (1.29)	5.00
4. I am aware of times when others are trying to be caring, supportive, or loving toward me.	0.62	0.38	5.12 (1.27)	5.00
5. I can anticipate people's wants and needs.	0.60	0.36	4.80 (1.20)	5.00
Self-awareness ($\alpha = 0.81$)	0.85	0.72	5.16 (0.88)	5.17
6. I notice how other people affect how I feel.	0.69	0.47	5.24 (1.22)	5.00
7. I know when I am doing what matters to me.	0.68	0.46	5.33 (1.27)	5.00
8. I notice how what I feel affects what I do.	0.67	0.45	5.26 (1.21)	5.00
9. I am aware of what makes me feel vulnerable.	0.63	0.40	5.20 (1.28)	5.00
10. I am aware of my reactions or responses to others as they occur.	0.62	0.38	4.94 (1.18)	5.00
11. I am aware of my feelings as they happen.	0.61	0.38	4.99 (1.20)	5.00
Courage ($\alpha = 0.78$)	0.70	0.48	4.74 (0.90)	4.67
12. I will not back down from conflict if it leads me towards what I value.	0.73	0.53	4.86 (1.27)	5.00
13. If there is an important reason to face something that's uncomfortable for me, I will face it.	0.71	0.51	5.14 (1.22)	5.00
14. I will risk feeling uncomfortable in the service of improving my relationships with others.	0.71	0.51	4.68 (1.29)	5.00
15. I will act for something I believe in even if I feel fear or doubt.	0.65	0.42	4.67 (1.22)	5.00
16. I persevere when moving forward is difficult.	0.60	0.36	4.76 (1.26)	5.00
17. I am willing to be vulnerable in relationships.	0.37	0.13	4.34 (1.54)	4.00
Responsiveness ($\alpha = 0.89$)	0.87	0.76	5.28 (1.00)	5.29
18. I engage in compassionate actions towards others when they are in need.	0.78	0.61	5.36 (1.22)	5.00
19. I express love towards those I care about.	0.77	0.60	5.49 (1.37)	6.00
20. I support others when they need it.	0.77	0.59	5.59 (1.18)	6.00
21. I create moments of warmth and connection with others.	0.77	0.59	5.10 (1.27)	5.00
22. I let other people know that I understand how they feel when they are struggling.	0.73	0.53	5.18 (1.26)	5.00
23. When people close to me share that they love me, I share my love back to them.	0.69	0.47	5.50 (1.39)	6.00
24. I am able to express love and caring to others just with my eyes and face in key moments.	0.62	0.39	4.74 (1.40)	5.00

Table 3
ACRS factor variances and correlations in study 1.

	1	2	3	4
1. Other-awareness	0.715	0.557	0.451	0.678
2. Self-awareness	0.821	0.642	0.373	0.560
3. Courage	0.675	0.589	0.624	0.454
4. Responsiveness	0.844	0.736	0.605	0.902

Note. Values below the diagonal are factor correlations. Values in the diagonal are factor variances. Values above the diagonal are factor covariances.

The χ^2_{YB} was statistically significant, $\chi^2_{YB}(248) = 863.393, p < 0.001$. The other fit indices, however, supported overall fit of the model: $\chi^2_{YB}/df = 3.48$, R-CFI = 0.94, R-TLI = 0.94, R-RMSEA = 0.048 (CI_{0.90} = [0.044, .051]), and R-SRMR = 0.039. Factor loading estimates (see Table 2) indicated that items were strongly associated with their respective factors (mean item $r^2 = 0.49$), with the exception of one item under Courage that was retained for the purpose of content validity. The lower order factors loaded strongly onto the higher order intimacy factor, consistent with the notion that these processes work in concert in intimate relational functioning: Other-awareness ($\lambda = 0.97$), Self-awareness ($\lambda = 0.85$), Courage ($\lambda = 0.70$), and Responsiveness ($\lambda = 0.87$).

Factor variances ranging from 0.62 to 0.90 and factor correlations ranged from 0.59 to 0.84 (see Table 3).

2.2.2. Internal consistency and test-retest reliability

Cronbach's α s were adequate, and remained stable across time: ACRS Total $\alpha = 0.93$; Other-awareness $\alpha = 0.79$; Self-awareness $\alpha = 0.81$; Courage $\alpha = 0.77$; and Responsiveness $\alpha = 0.89$. Test-retest reliability of the ACRS total and subscale scores suggests that, although scores are relatively stable over a one-week period, there is some variance likely accounted for by contextual factors that change within this timeframe, especially with Self-awareness: ACRS Total ICC = 0.82 ($CI_{0.95} = [0.80, 0.85]$); Other-awareness ICC = 0.70 ($CI_{0.95} = [0.66, 0.74]$), Self-awareness ICC = 0.47 ($CI_{0.95} = [0.38, 0.54]$); Courage ICC = 0.71 ($CI_{0.95} = [0.66, 0.75]$); Responsiveness ICC = 0.83 ($CI_{0.95} = [0.81, 0.86]$).

3. Study 2: Construct Validity

The aim of Study 2 was to evaluate the construct validity of the final model. As a measure of skills vital to intimate relational functioning, the ACRS total and subscale scores should predict other indices of interpersonal functioning (e.g., feelings of intimacy with one's romantic partner, loneliness).

3.1. Method

3.1.1. Participants and procedure

Study 2 was conducted using Samples 1–4 of Study 1. The battery of measures given to participants included several measures of interpersonal functioning (described below) that were chosen *a priori* to evaluate the construct validity of the ACRS.

3.1.2. Data analytic strategy

Pearson's product-moment correlation coefficients (r) were computed between ACRS total and subscale scores and other measures of interpersonal functioning. Missing data were imputed at the item level using Amelia (Honaker, King, & Blackwell, 2011), which estimates missing values using maximum-likelihood. We imputed 100 datasets, analyzed each, and computed the mean of each parameter estimate across all 100 analyses to produce one final set of estimates.

3.1.3. Measures

3.1.3.1. The Social Connectedness Scale. The SCS is an 8-item measure of perceived connectedness with one's social world. The SCS demonstrated strong internal consistency in the current sample ($\alpha = 0.96$). We predicted a moderate (0.30–0.50), positive association with ACRS Total.

3.1.3.2. UCLA Loneliness Scale (UCLALS; Russell, 1996). The UCLALS is a 20-item measure of perceived loneliness and isolation. The UCLALS had strong internal consistency in the current study ($\alpha = 0.93$). We predicted a moderate, negative association with ACRS Total.

3.1.3.3. Schutte Self-Report Emotional Intelligence Test (SSEIT; Schutte et al., 1998). The SSEIT is a 33-item measure emphasizing emotional expression, appraisal, regulation, and use of emotions. There is substantial evidence of strong psychometric properties of the SSEIT (e.g., Brackett & Mayer, 2003). The SSEIT had strong internal consistency in the current study ($\alpha = 0.92$). We predicted a moderate, positive association with ACRS Total.

3.1.3.4. MOS Social Support Survey (SSS; Sherbourne & Stewart, 1991). The SSS is a 19-item measure of one's perceived level of emotional/informational, affectionate, and tangible support, and positive social interactions. The SSS had strong internal consistency in the current study ($\alpha = 0.96$). We predicted a moderate, positive

association with ACRS Total.

3.1.3.5. Functional Analytic Psychotherapy Intimacy Scale (FAPIS; Leonard et al., 2014). The FAPIS is a 14-item measure of engagement in intimacy-related behaviors with a particular partner (e.g., friend, family member, romantic partner; chosen by respondent). The FAPIS demonstrated good factor structure, internal consistency, test-retest reliability, and construct validity in the original validation sample. The FAPIS had strong internal consistency in the current study ($\alpha = 0.92$). We predicted a moderate, positive association with ACRS Total.

3.1.3.6. Miller Social Intimacy Scale (MSIS; Miller & Lefcourt, 1982). The MSIS is a 17-item measure of intimacy experienced in a particular romantic relationship. In the current study, it was only administered to participants who indicated being in a current romantic relationship ($n = 597$). The MSIS had strong internal consistency in the current study ($\alpha = 0.93$). We predicted a moderate, positive association with ACRS Total.

3.1.3.7. Interpersonal Reactivity Index (IRI; Davis, 1980). The IRI is a 28-item measure of empathy comprised of four subscales: Perspective taking (PT), Fantasy (FS), Empathic Concern (EC), and Personal Distress (PD). The IRI subscales demonstrated moderate internal consistency in the current sample (α s = 0.73–0.81). We predicted moderate, positive associations between PT and Other-awareness and EC and Responsiveness, and a negative correlation between PD and Courage.

3.1.3.8. Fear-of-Intimacy Scale (FIS; Descutner & Thelen, 1991). The FIS is a 35-item measure of anxiety about close, dating relationships, and has been shown to improve over the course of FAP treatment (Maitland et al., 2016). The FIS demonstrated strong internal consistency in the current sample ($\alpha = 0.93$). We predicted a moderate, negative association with Courage.

3.1.3.9. Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). The FFMQ is a 39-item measure of engagement in mindfulness-based activities. The FFMQ is comprised of five subscales, two of which were examined in the present study: Observing (OBS) and Non-reactivity to inner experience (NR). Both subscales demonstrated strong internal consistency in the current sample (α s = 0.76–0.77). We predicted moderate, positive associations between the OBS subscale and Self-awareness and between the NR subscale and Courage.

3.2. Results

All correlations reported below are statistically significant at the $p < 0.001$ level. Table 4 presents the correlation coefficients along with their respective 95% confidence intervals. The majority (71%) of hypothesized correlations were in the moderate range ($0.3 \leq r < 0.5$) and the remainder (29%) were strong ($r \geq 0.5$).

3.2.1. ACRS total

Collectively, strong support for the construct validity of the ACRS total score was found. Pearson r values for the ACRS Total and emotional intelligence (SSEIT; $r = 0.74$) and social support (SSS; $r = 0.55$) were strong, while those with social connectedness (SCS; $r = 0.33$), loneliness (UCLALS; $r = -0.41$), intimacy-related behaviors (FAPIS; $r = 0.39$) and intimacy (MSIS; $r = 0.46$) were significant and moderate in size.

3.2.2. ACRS subscales

The correlation of Other-awareness with perspective taking (IRI-PT) was significant and moderate ($r = 0.42$), providing support for the construct validity of the Other-awareness subscale. Support for the Self-awareness and Courage subscales was also provided as Self-awareness

Table 4
Construct Validity Correlations from Study 2 and Study 4.

Construct	ACRS Component				
	ACRS Total	Other-awareness	Self-awareness	Courage	Responsiveness
Social connectedness ^a	0.33 [0.29, 0.38] <i>0.54 [0.36, 0.72]</i>	0.29 [0.24, 0.34] <i>0.42 [0.17, 0.68]</i>	0.20 [0.15, 0.25] <i>0.40 [0.19, .61]</i>	0.27 [0.22, 0.32] <i>0.37 [0.18, 0.56]</i>	0.34 [0.30, 0.39] <i>0.55 [0.38, 0.72]</i>
Loneliness ^b	– .41 [– 0.46, – 0.37]	– 0.36 [– 0.41, – 0.32]	– 0.25 [– 0.30, – 0.20]	– 0.37 [– 0.41, – 0.32]	– 0.39 [– 0.43, – 0.35]
Emotional intelligence ^c	0.74 [0.72, 0.77] <i>0.68 [0.50, .86]</i>	0.65 [0.62, 0.68] <i>0.55 [0.36, .74]</i>	0.58 [0.55, 0.62] <i>0.56 [0.40, 0.72]</i>	0.58 [0.54, 0.61] <i>0.39 [0.19, 0.59]</i>	0.67 [0.64, 0.70] <i>0.69 [0.49, .90]</i>
Social support ^d	0.55 [0.51, 0.58]	0.46 [0.42, 0.50]	0.37 [0.33, 0.42]	0.43 [0.38, 0.47]	0.54 [0.51, 0.58]
Intimacy with chosen individual ^e	0.39 [0.35, 0.43] <i>0.45 [0.26, 0.64]</i>	0.33 [0.28, 0.37] <i>0.21 [0.01, 0.42]</i>	0.28 [0.23, 0.32] <i>0.30 [0.12, 0.49]</i>	0.28 [0.23, 0.33] <i>0.42 [0.24, 0.59]</i>	0.40 [0.36, 0.44] <i>0.48 [0.31, 0.65]</i>
Intimacy with romantic partner ^f	0.46 [0.39, 0.52]	0.38 [0.31, 0.45]	0.31 [0.24, 0.38]	0.38 [0.31, 0.45]	0.48 [0.42, 0.54]
Perspective taking ^g	0.46 [0.41, 0.50]	0.42 [0.38, 0.46]	0.36 [0.31, 0.40]	0.36 [0.31, 0.40]	0.39 [0.35, 0.43]
FFMQ Observing ^h	0.39 [0.34, .43]	0.34 [0.29, 0.38]	0.35 [0.31, 0.40]	0.31 [0.26, 0.36]	0.31 [0.27, 0.36]
General Disclosiveness ⁱ	<i>0.30 [0.08, 0.52]</i>	<i>0.19 [– 0.03, .42]</i>	<i>0.27 [0.09, 0.44]</i>	0.33 [0.13, 0.53]	<i>0.16 [– 0.10, 0.43]</i>
Fear-of-intimacy ^j	– 0.51 [– 0.55, – 0.47] <i>– 0.37 [– 0.57, – 0.18]</i>	– 0.40 [– 0.44, – 0.36] <i>– 0.20 [– 0.40, .00]</i>	– 0.31 [– 0.35, – 0.26] <i>– 0.25 [– 0.41, – 0.10]</i>	– 0.49 [– 0.53, – 0.45] – 0.35 [– 0.55, – 0.14]	– 0.49 [– 0.53, – 0.45] <i>– 0.37 [– 0.59, – 0.16]</i>
Empathic concern ^k	0.52 [0.49, 0.56]	0.44 [0.39, 0.48]	0.38 [0.34, 0.43]	0.33 [0.28, 0.38]	0.56 [0.53, 0.60]

Note. Hypothesized convergent correlations are bold-faced; Values from Study 4 are italicized; 95% Confidence Intervals are presented in square brackets.

^a Social Connectedness Scale.

^b UCLA Loneliness Scale.

^c Schutte Self-Report Emotional Intelligence Test.

^d MOS Social Support Survey.

^e FAP Intimacy Scale.

^f Miller Social Intimacy Scale.

^g Interpersonal Reactivity Index, Perspective Taking subscale.

^h Five Facet Mindfulness Questionnaire, Observing subscale.

ⁱ General Disclosiveness Scale.

^j Fear-of-Intimacy Scale.

^k Interpersonal Reactivity Index, Empathic Concern subscale.

correlated significantly and moderately with the FFMQ Observing subscale ($r = 0.35$) and Courage correlated significantly and moderately with fear-of-intimacy (FIS; $r = -0.49$). The correlation between Responsiveness and compassionate love (CLS; $r = 0.50$) was significant and strong.

4. Study 3: Cross Validation of Factor Structure on an Independent Sample

The aim of Study 3 was to examine the psychometric properties of the ACRS in an independent sample, employing multi-groups confirmatory factor analysis (CFA) to examine measurement invariance between the combined samples used in Study 1 and a new sample.

4.1. Method

4.1.1. Participants and procedure

Samples 1–4 were included in this study and compared with a new sample of 440 participants recruited from Curtin University in Perth, Australia, including undergraduate students (Sample 5; $n = 183$) and members of the general public (Sample 6; $n = 257$). See Table 1 for detailed demographic information about the samples. Participants in Sample 5 participated in exchange for extra course credit, while those in Sample 6 participated in exchange for a chance to win a \$50 iTunes or Amazon gift voucher. Both Samples 5 and 6 were treated as one independent sample for current analyses.

4.1.2. Data analytic strategy

We began measurement invariance analyses with the least restrictive test – configural invariance – which tests for invariant factor structure across samples. Then, we examined fit of a weak invariance model, which tests for invariant covariance structure. Finally, we looked at strong invariance, which constrains factor intercepts to equivalence across groups to test for invariant mean structure. All

parameter estimates used robust Huber-White standard errors and the Yuan-Bentler χ^2 correction. Internal consistency and missing data procedures were identical to Study 1.

4.2. Results

The χ^2_{YB} was statistically significant for the configural invariance model, however other measures of global fit indicated adequate model fit to the data: $\chi^2_{YB}(496) = 1377.383$, $p < 0.001$, $\chi^2_{YB}/df = 2.78$, R-CFI = 0.94, R-TLI = 0.93, R-RMSEA = 0.049 ($CI_{0.90} = [0.046, 0.052]$), and R-SRMR = 0.042. These results suggest invariant factor structure of the ACRS across the samples used in Study 1 and the new samples in Study 3. The χ^2_{YB} was statistically significant for the weak invariance model, however other indices of global fit suggested moderate fit to the data: $\chi^2_{YB}(519) = 1403.646$, $p < .001$, $\chi^2_{YB}/df = 2.70$, R-CFI = 0.94, R-TLI = 0.93, R-RMSEA = 0.048 ($CI_{0.90} = [0.045, 0.051]$), and R-SRMR = 0.045. The likelihood ratio test comparing the configural invariance model to the weak invariance model was non-significant, suggesting invariant factor structure and loadings across samples. The χ^2_{YB} value was statistically significant for the strong invariance model, $\chi^2_{YB}(538) = 1623.115$, $p < 0.001$. Other fit indices are mixed, however: $\chi^2_{YB}/df = 3.02$, R-CFI = 0.92, R-TLI = 0.92, R-RMSEA = 0.052 ($CI_{0.90} = [0.049, 0.055]$), and R-SRMR = 0.047. The R-CFI and R-TLI were below generally accepted levels (> 0.95 ; Hu & Bentler, 1999), but the R-RMSEA, R-SRMR, and χ^2_{YB}/df were within acceptable ranges (Hu & Bentler, 1999; Steiger, 2007; Wheaton, Muthén, Alwin, & Summers, 1977). The likelihood ratio test comparing the strong invariance model with the weak invariance model was statistically significant, suggesting that the ACRS may not be mean invariant across samples.

5. Study 4: Validity in a Non-Clinical Sample of Dyads

Study 4 examined the convergent and discriminant validity of the ACRS in a community sample of participants in ongoing relationships,

broadly defined (i.e., inclusive of romantic, friendship, and familial). We were also interested in how ACRS scores functioned within these relational dyads. Specifically, we looked at the percentage of variation in ACRS scores that was uniquely accounted for by dyad-level variation and by individual-level variation. We expected a moderate amount of dyad-level variation given the interpersonal focus of this measure.

5.1. Method

5.1.1. Participants and procedure

Participants were recruited via fliers and online and newspaper advertisements calling for participation in a study to evaluate a coaching intervention to improve relationships with a partner of their choosing (e.g., family member, romantic partner, friend). For the purpose of the current analysis, only the baseline data were examined. The sample comprised 70 participants (35 dyads) with ages ranging from 18 to 65 years ($M = 31.22$, $SD = 12.26$), the majority of whom identified as white (63%), female (54%), single/never married (64%), and in a romantic relationship with their study partner (66%). Participants completed a battery of online measures in the lab in a private room (i.e., not in the presence of their study partner).

5.1.2. Measures

5.1.2.1. FAP Intimacy Scale (FAPIS; Leonard et al., 2014). The FAPIS is described in Study 2 and had good internal consistency in the current sample ($\alpha = 0.91$). We predicted a moderate, positive association with ACRS Total.

5.1.2.2. Schutte Self-Report Emotional Intelligence Test (SSEIT; Schutte et al., 1998). The SSEIT is described in Study 2 and had good internal consistency in the current sample ($\alpha = 0.88$). We predicted a strong, positive association with ACRS Total.

5.1.2.3. Social Connectedness Scale, Version 2 (SCS-2; R. M. Lee, Draper, & Lee, 2001). The SCS-2 is a 20-item measure of perceived connectedness with one's social world derived from the SCS (R. M. Lee & Robbins, 1995). The SCS-2 had good internal consistency in the current sample ($\alpha = 0.93$). We predicted a moderate, positive association with ACRS Total.

5.1.2.4. Fear-of-Intimacy (FIS; Dcutner & Thelen, 1991). We modified the FIS (described in Study 2) to reflect each respondent's fear-of-intimacy with respect to their study partner. The FIS had good internal consistency in the current sample ($\alpha = 0.89$). We predicted a moderate, negative association with Courage.

5.1.2.5. General Disclosiveness Scale (GDS; Wheeless, 1976). The GDS is a 31-item measure of one's tendency to engage in self-disclosure, including five subscales: Intent, Amount, Positiveness, Depth, and Honesty/Accuracy. The GDS had good internal consistency in the current sample ($\alpha = 0.85$). We predicted a moderate, positive association with Courage.

5.1.3. Data analytic plan

In order to investigate construct validity of the ACRS while accounting for participants nested within dyads, we regressed each measure on the ACRS scale using generalized estimating equations (GEE), which allows for each individual participant's scores to be used as predictor variables. All scores were standardized to produce a standardized effect size as output. We computed Intraclass Correlation Coefficients (ICC) to examine the proportion of variation in ACRS as a function of both the dyad-level and individual-level variables.

5.2. Results

5.2.1. Convergent validity

The data provided strong support for the convergent validity of the ACRS total score. We found strong, positive correlations between the ACRS Total and FAPIS ($r = 0.45$), SSEIT ($r = 0.68$), and SCS-2 ($r = 0.54$) scores. Additionally, Courage was significantly correlated with FIS ($r = -0.35$), and general disclosiveness ($r = 0.33$), providing support for convergent validity of this subscale.

5.2.2. ACRS variation

ACRS scores within dyads were moderately correlated across all subscales. Specifically, dyad-level variation accounted for 27% of ACRS Total scores, 12% of Other-awareness, 36% of Self-awareness, 6% of Courage, and 22% of Responsiveness. Individual-level variation, on the other hand, accounted for 53% of ACRS total, 54% Other-awareness, 41% Self-awareness, 56% Courage, and 50% Responsiveness.

6. Study 5: Predictive Validity in a Clinical Sample

Study 5 investigated the predictive validity of the ACRS with respect to psychiatric functioning and quality of life in a clinical sample of psychotherapy clients over time. Given empirical support for the relationships between social functioning and psychiatric functioning and quality of life (e.g., Hawkley & Cacioppo, 2010; Holt-Lunstad, Smith, & Layton, 2010), we hypothesized that ACRS total would predict scores in these domains while accounting for autocorrelation across time.

6.1. Method

6.1.1. Participants and procedure

The sample consisted of 50 participants undergoing psychotherapy in community clinics across the globe (7 participants from South America, 31 from North America, 10 from Europe, and 2 from Australia). Participants were recruited by their individual therapist, who provided a flier in their waiting room with a brief explanation of the study. The therapists, in turn, were recruited via a posting to a therapist listserv. With the exception of recruitment, participants' therapists were not involved with the study and had no knowledge of whether the subject participated or not. Given that the sample comprised individuals in ongoing psychotherapy, the total number of sessions participants reported having with their current therapist varied, with values ranging from 4 to 200 ($M = 54.04$, $SD = 52$, $Mdn = 37.5$). Participants' ages ranged from 25 to 61 ($M = 41.57$, $SD = 10.46$), and the majority of participants identified as white (90%), female (80%), and single/never married (42%). Participants identified the following reasons for seeking mental health services: stress (44%), interpersonal problems (48%), work problems (28%), depression (60%), anxiety (60%), substance abuse (2%), and "other" (26%). Notably, most participants indicating interpersonal problems also indicated at least one additional reason for seeking treatment (87.5%). The majority of participants reported attending psychotherapy on a weekly basis (58%).

Participants were invited to participate once per month for a total of 5 months, and provided informed consent to participate prior to the first survey administration. A total of 50 participants participated for at least 1 month, 28 for two months, 22 for three months, 21 for four months, and 17 for all five months. Participants were compensated with a \$10 gift card for each survey they completed. Analyses indicated no significant differences between those who completed all 5 surveys and those who did not on age, gender, ethnicity, marital status, income, whether they thought therapy was helping, and whether they indicated seeking treatment for interpersonal problems.

6.1.2. Measures

6.1.2.1. UCLA Loneliness Scale, Version 3 (UCLALS; Russell, 1996). The UCLALS is described in Study 2 and had good internal consistency in

the current sample ($\alpha_s = 0.95\text{--}0.97$).

6.1.2.2. MOS Social Support Survey (SSS; Sherbourne & Stewart, 1991). The SSS is described in Study 2 and had good internal consistency in the current sample ($\alpha_s = 0.97\text{--}0.98$).

6.1.2.3. Symptom Checklist – 10 (SCL-10; Rosen et al., 2000). The SCL-10 is a measure of general psychiatric distress based on the SCL-90 (Derogatis, Lipman, & Covi, 1973). The SCL-10 had good internal consistency in the current sample ($\alpha_s = 0.86\text{--}0.89$).

6.1.2.4. World Health Organization Quality of Life Scale (WHOQOL; World Health Organization Quality of Life Group, 1998). The WHOQOL is a 26-item measure of quality-of-life across 4 domains: Physical health, Psychological health, Social, and Environment. The WHOQOL had strong internal consistency in the current sample ($\alpha_s = 0.89\text{--}0.91$).

6.1.3. Data analytic plan

We used generalized estimating equations (GEE) to examine the degree to which the ACRS Total predicted general psychiatric distress (SCL-10) and quality-of-life (WHOQOL), specifying an autoregressive correlation matrix to account for the repeated measures design. We took a hierarchical approach by first estimating the predictive validity of the ACRS Total without any covariates then subsequently entering loneliness and social support into the model. We expected that loneliness and social support, which are powerful predictors of these outcomes (e.g., Hawkey & Cacioppo, 2010; Holt-Lunstad et al., 2010), would weaken but not completely erase the predictive ability of the ACRS. We also explored the predictive ability of ACRS subscale scores using similar models but did not make specific predictions about the relative contributions of subscale scores.

6.2. Results

6.2.1. SCL-10

ACRS Total was a strong predictor of SCL-10 scores ($b = -4.53$, $CI_{0.95} = [-6.63, -2.43]$, $SE = 1.07$, $p < 0.001$) when examined as the only predictor. When loneliness and social support were added into the model, loneliness emerged as a statistically significant predictor, with a strong effect size ($b = 0.48$, $CI_{0.95} = [0.31, 0.66]$, $SE = 0.09$, $p < 0.001$), and ACRS Total was no longer significant. Regarding subscale analyses, only Courage remained a significant predictor of SCL-10 scores ($b = -1.68$, $CI_{0.95} = [-3.08, -0.28]$, $SE = 0.72$, $p = 0.02$) when loneliness and social support were in the model, with a large effect size for loneliness ($b = 0.41$, $CI_{0.95} = [0.26, 0.56]$, $SE = 0.08$, $p < 0.001$).

6.2.2. WHOQOL

ACRS Total strongly predicted quality of life ($b = 9.25$, $CI_{0.95} = [4.23, 14.30]$, $SE = 2.56$, $p < 0.001$), when examined as the only predictor. However, when loneliness and social support were added into each model, loneliness was the only significant predictor of quality-of-life ($b = -0.68$, $CI_{0.95} = [-1.02, -0.33]$, $SE = 0.18$, $p < 0.001$).

6.2.3. Loneliness

Given the strength of loneliness as a predictor of psychiatric distress and loneliness, we explored the predictive validity of ACRS Total on loneliness. ACRS Total was a strong predictor of loneliness ($b = -9.58$, $CI_{0.95} = [-12.01, -7.06]$, $SE = 1.29$, $p < 0.001$) such that, for every one-unit increase in ACRS scores, loneliness scores decreased 9.58 units on average, which suggests that the effect of ACRS on psychiatric distress and quality of life may operate through its effect on loneliness.

7. Discussion

This paper reports on the development of a self-report measure of

relational intimacy skills, informed by the primary relational processes identified by the Intimacy Process Model and subsequently supported by multiple research findings (e.g., Reis et al., 2000; Reis & Shaver, 1988), by contextual behavioral science principles that emphasize focusing on human actions-in-context, and in particular by the processes and targets of FAP to facilitate FAP outcome research. Our proposed structure is consistent with findings reported by Maitland et al. (2017) that FAP often targets client outcomes related to intimacy and in particular the four dimensions measured by the ACRS subscales. We conceptualize these constructs as behaviors amenable to change that could generalize to a wide range of situations and relational contexts.

The measure represents a bi-factor model with four first-order factors: Self-awareness, Other-awareness, Courage, and Responsiveness. Self-awareness measures one's mindful awareness of their own emotional state and other processes that influence intimate relating per the IPM and other-awareness measures the degree to which one is attuned to these processes in the other individual in the interaction. The Courage subscale measures one's engagement in courageous, values-based actions and interpersonal vulnerability that is fundamental to the intimacy process. Finally, Responsiveness measures an individual's provision of understanding, validating, and caring responses to a speaker's courage. Collectively, the ACRS measures one's self-reported likelihood of engaging in behaviors essential to the development of intimacy.

The final 24-item measure had strong psychometric properties; with the exception of the χ^2 value, which is unduly restrictive when sample sizes are large (Kline, 2015), the final factor structure of the ACRS fit the data well. Local fit indices (i.e., factor loadings, item residuals) were also adequate, with one exception; because of its importance to the processes outlined in the IPM (and thus to the content validity of the ACRS), we added one item onto the Courage factor that had a weak loading (Item 17: "I am willing to be vulnerable in relationships"; $\lambda = 0.37$). This may have resulted from a misinterpretation of the word "vulnerable" in the question and should perhaps be replaced with another term (e.g., "I am willing to *take risks* in relationships") or elaborated upon (e.g., "I am willing to be vulnerable *in the service of improving* my relationships"). More research is also needed to evaluate whether the low test-retest reliability of the Self-awareness subscale is a sample specific anomaly, a function of the item wording, or true variation in the construct. Consistent with CBS views, evidence suggests that mindfulness may be a function of contextual characteristics rather than purely one's disposition (Brown & Ryan, 2003). It is thus possible that contextual features exert a greater influence on one's responses to the Self-awareness items than those on other subscales. It is also a possibility that the construct itself influences individuals' scores on this subscale. In this way, intervention approaches that target self-awareness (e.g., mindfulness-based approaches) may actually improve one's reliability (i.e., a more self-aware individual's responses may be less influenced by contextual variables).

Findings from this series of studies generally support the construct validity of the ACRS, including an initial, preliminary exploration of predictive validity in community and clinical samples. The total scale was moderately to strongly associated with a range of relevant interpersonal variables across multiple samples, including social connectedness, emotional intelligence, and feelings of intimacy. Our administration of the scale in a sample of community dyads documents that a substantial portion of the variance of the scale is shared within dyads, suggesting that individuals who form relationships together share similarities in their self-reported engagement in awareness, courage, and responsiveness. The total scale also significantly predicted psychiatric distress, quality of life, and loneliness in our clinical sample. The findings, although preliminary, are important in light of research that suggests loneliness is a strong predictor of psychiatric distress and quality-of-life (Hawkey & Cacioppo, 2010). Findings from this study suggest that awareness, courage, and responsiveness may mediate the relationships between loneliness and psychiatric distress and quality of

life, however more rigorous research designs are needed to examine this question. Overall, our findings paint a promising picture for the construct validity of the ACRS.

Measurement invariance analyses in Study 3 provided evidence that the ACRS functions similarly in the U.S. (on whom the scale was initially constructed in Study 1) and Australian samples. Specifically, there was sufficient evidence to suggest an invariant factor structure (i.e., configural invariance) and factor loadings (i.e., weak invariance) across these two groups. However, because the fit of the strong invariance model was significantly worse than that of the weak invariance model, we cannot conclude with as much certainty that the mean structure of the ACRS is invariant across these two groups. Findings with respect to the absolute fit of this model (i.e., not in comparison to the weak invariance model), however, were mixed. Future research is needed to evaluate the degree to which the mean structure of the ACRS is invariant across groups, especially before it is used to examine mean differences across these groups.

One of our primary aims in this research was to develop a contextual behavioral measure of intimacy that has both research and clinical utility. The results reported in Study 5 are encouraging with respect to use of the ACRS and targeting ACRS constructs in therapy in that ACRS scores appear to be related to major therapeutic outcomes of interest, specifically psychiatric distress, quality of life, and loneliness, in a clinical, treatment seeking sample. Thus, the ACRS may be a useful tool to determine whether functional deficits related to awareness, courage, and/or responsiveness are functionally related to various forms of psychiatric distress or loneliness that a client may be experiencing. In a similar vein, the ACRS may also be useful in pre-treatment stages of therapy, either as a screening tool to determine whether a client is a good fit for a particular clinic/treatment approach, or as a tool to inform and catalyze a clinician's behavioral case formulation.

Despite these strengths, more research is needed to evaluate different aspects of the ACRS as it relates to clinical utility. An understanding of how ACRS scores change across longer periods of time (more than one week) would provide clinicians with a benchmark to evaluate client changes in ACRS scores over the course of therapy. Similarly, change in ACRS scores in response to intervention strategies that target each component must be established before we can be confident in its ability to meaningfully track therapy outcomes. Future research would also benefit from examining other contextual factors that influence self-reported ACRS scores such as, for example, variability in one's intimate functioning across various relationships in their life (e.g., romantic versus non-romantic relational functioning), allowing more precise and contextually-sensitive interpretations to be made. Clinical use of the ACRS would also benefit from understanding how changes in ACRS scores are related to changes in therapy outcomes such as loneliness and psychiatric distress. For example, do improvements in ACRS components lead to decreased loneliness and isolation, do changes in loneliness and isolation lead to improved intimate functioning, or are the associations bidirectional? Stated differently, should the ACRS be used as a measure of the therapy process, an outcomes measure, or both? Lastly, given the importance of in-session contingent reinforcement of client clinically relevant behavior in FAP, it will be important to establish the degree to which therapist responses on the ACRS relate to client outcomes related to intimate relational functioning.

The ACRS also represents an important contribution to clinical science in that it can be used to develop and evaluate intervention approaches that target interpersonal processes broadly and intimacy in particular. On a basic science level, the ACRS may aid in the discovery of potential mechanisms underlying the association between the quality of one's social relationships and important health outcomes (Holt-Lunstad et al., 2010). These results are preliminary, however, and more work is needed to understand the measure's functioning within various clinical populations. Given the importance of social functioning as a risk factor for psychopathology, research that provides normative data

on larger, transdiagnostic clinical samples would allow researchers and clinicians to efficiently assess, and tailor treatment for, clients with interpersonal difficulties. Psychometric investigations with these clinical samples, such as measurement invariance analysis, will also improve understanding of the measure's functioning and allow for more informed clinical and research uses.

It is possible that one's perception of their engagement in awareness, courage, and responsiveness differs from their actual engagement in these behaviors, and future observational research is needed to examine this question more thoroughly. In one's clinical work, use of the ACRS as a quick assessment of these behaviors should thus not necessarily be taken at face-value, but instead inform a more exhaustive behavioral analysis. In research where the unit of analysis is at the group-level (and thus wherein idiographic analyses of one's ACRS scores are less useful), observational assessment methodology should be employed until more is known about the correspondence between self-reported and actual engagement in ACRS targets.

An important limitation of the current research concerns the representativeness of the samples used throughout Studies 1–5. The majority of participants in these samples identified as White and female, with a substantial proportion of Sample 1 identifying as Asian. Thus, it is unknown how well our findings generalize to other populations, especially to other ethnic, racial, and cultural groups. Future research should include more diverse samples to explore whether there are differences across these populations, specifically with respect to how intimate relational functioning is measured (i.e., measurement invariance analyses of the ACRS).

Limitations notwithstanding, the ACRS appears to be a valid and reliable self-report measure of behaviors essential to relational intimacy that may be of use to researchers and clinicians. Importantly, the ACRS provides a means of assessing group-level outcomes in FAP efficacy and effectiveness research, which could pave the way for a broader application of contextual behavioral treatment of individuals who experience social functioning deficits.

Conflict of interest statement

The authors declare that there are no conflicts of interest.

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