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Using Functional Analytic Psychotherapy's Awareness, Courage, and Love Model to Generate Open-Heartedness Towards Others: A Pilot Randomized Controlled Trial

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Abstract

The Awareness, Courage, and Love (ACL) model of identifying Clinically Relevant Behavior in Functional Analytic Psychotherapy is thought to have enormous potential for enhancing social connection and mitigating loneliness. Informed by the ACL model, non-therapeutic social groups have emerged with the explicit goal of creating connection between members of the group, thus mitigating societal-level loneliness and social isolation. However, little is known about the efficacy or effectiveness of these groups in achieving their goal. In order to enhance understanding of the effects of attending these groups, we conducted two studies investigating ACL group processes and outcomes. In Study 1, 34 participants were randomly assigned to either a six-week ACL intervention group or a control group, where participants watched and discussed meetings. Findings suggested individuals in the experimental group were able to create connection and occasionally engage in essential processes during meetings. However, participants did not seem to generalize the changes to their day-to-day environment. In Study 2, we randomized 36 young adults to either an intervention group or a control group. In Study 2, we enhanced measurement techniques, assessed variables that might interfere with generalizing newly developed skills, and addressed several methodological limitations of Study 1. Findings suggested that behavior changes occurred in the group, and that difficulties in generalizing the newly developed repertoire may be partially explained by participant depression and anxiety.
Key words: Functional Analytic Psychotherapy, interpersonal intimacy, loneliness, contextual behavioral intervention, randomized controlled trial.

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Novelty and Significance

What is already known about the topic?

- Loneliness is a growing concern among the general population, particularly young adults.
- The ACL Model of social connection seeks to teach people how to share vulnerably and respond effectively to others, which may improve relationships and reduce loneliness.
- Group-level ACL interventions have been proposed as a solution to loneliness, but few studies have evaluated ACL groups.

What this paper adds?

- Reports two pilot randomized controlled trials testing an ACL group intervention for loneliness.
- Shows that ACL-consistent interpersonal behaviors can be strengthened within the group setting.
- Reveals limited generalization to daily life, highlighting challenges for scalable loneliness interventions.

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The United States is in the midst of what has been deemed a loneliness epidemic (Murthy, 2017) that may have immense ramifications for societal, physical, and mental health (Park *et alii*, 2020). A growing body of literature suggests that the rates of individuals reporting loneliness have been steadily increasing (Buecker, Mund, Chwastek, Sostmann, & Luhmann, 2021). This increase in loneliness impacts individuals of all ages but may be significantly more acute for those in emerging adulthood (Brandolin, Lappalainen, Gallego, Gorinelli, & Lappalainen, 2023; Restrepo, Chesin, & Jeglic, 2016; Shovestul, Han, Germine, & Dodell-Feder, 2020). Loneliness is predictive of a number of significant adverse health issues (Park *et alii*, 2020). Consequently, it is no surprise that loneliness is associated with an increase in all-cause mortality, even after accounting for health behaviors (Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015). In addition to profound impacts on physical health, loneliness is associated with an increased prevalence of mental health disorders (Park *et alii*, 2020). Loneliness is thought to have a causal impact on depression (Cacioppo, Hawkley, & Thisted, 2010) and is associated with anxiety (Beutel *et alii*, 2017), suicidality (McClelland, Evans, Nowland, Ferguson, & O'Connor, 2020), self-harm (Rönkä, Taanila, Koiranen, Sunnari, & Rautio, 2013), and substance use (Ingram *et alii*, 2020). The increased frequency and severity of the adverse effects of loneliness indicate the importance of understanding its etiology and developing effective, large-scale interventions.

Loneliness involves more than just individuals being objectively alone. In his seminal writings on loneliness, Weiss (1975) differentiates between feelings of loneliness that arise from being alone vs. feelings that arise from a lack of emotional connection with the people you are interacting with. This distinction gave rise to the discrepancy model of loneliness, which states that loneliness occurs when there is a discrepancy between one's desired and actual levels of interpersonal contact (Peplau & Perlman, 1982). Empirical investigations into the discrepancy model of loneliness have found that this discrepancy seems to only matter for those individuals we feel a close emotional connection to, such as close friends (Russell, Cutrona, McRae, & Gómez, 2012). As such, there is a qualitative component to relationships that is essential for understanding loneliness. Preliminary investigations and theoretical writings have suggested that the behaviors essential to building close relationships (i.e. social intimacy), thus enhancing the quality of relationships, may play an important role in loneliness and some of its distal outcomes, such as adverse mental health experiences (Maitland, 2020).

The development of interpersonal intimacy is thought to involve a reciprocal dyadic process. In this process, one individual engages in a vulnerable disclosure, and the other person responds in a way that is perceived as providing validation, understanding or care (Reis & Shaver, 1988). An accumulating body of research supports the basic tenets of this theory (e.g. Aron, Melinat, Aron, Vallone & Bator, 1997; Reis *et alii*, 2010) and recent reconceptualization of this model (Cordova & Scott, 2001; Kanter, Kuczynski, Manbeck, Corey, & Wallace, 2020) have facilitated more nuanced understanding of the therapeutic relevance of the theory (Haworth *et alii*, 2015; Maitland *et alii*, 2024; Manbeck, Kanter, Kuczynski, Maitland, & Corey, 2020). Additional research has provided support for specific components of this process, such as the relationship between sharing vulnerable information, effective responding, and increased closeness in relationships (Fryling & Hayes, 2019; Pereira *et alii*, 2022).

A current interpretation of the interpersonal process model of intimacy (Kanter *et alii*, 2020) highlights the importance of awareness of every step of the interpersonal process model. Kanter *et alii* (2020) identify three vulnerability-responsiveness sub-relationships: non-verbal emotional expression that is responded to by the provision of safety, self-disclosure that is responded to with validation, and asking, which is responded to with giving. In turn, the person who engaged in vulnerable behavior then accepts the

response as caring, validating, or helpful, often by expressing closeness with the other person. Although research on the explicit application of this model in a therapeutic context is limited (e.g. Maitland & Lewis, 2022), it is possible that incorporation of these elements may enhance the therapeutic outcomes of interventions targeting loneliness, which have demonstrated limited efficacy thus far (Lasgaard *et alii*, 2026).

A meta-analysis of randomized clinical trials targeting loneliness indicated low-to-medium effect sizes for psychological treatments targeting loneliness, usually compared to a waitlist control (Hickin *et alii*, 2021). Research has suggested that four broad strategies are used in interventions targeting loneliness, (a) enhancing social skills; (b) providing social support; (c) increasing opportunities for social interaction; and (d) addressing maladaptive social cognition (Masi, Chen, Hawkley, & Cacioppo, 2011). Although all of these elements can at times be indicated in interventions for loneliness, researchers have noted that those experiencing loneliness are a heterogeneous group, and that a one-size-fits-all approach that is topographically bound may not be the most appropriate intervention strategy (Hickin *et alii*, 2021). A possible solution to this problem is to implement an intervention that is adaptive to the needs of clients and includes a strong interpersonal component. One such intervention that could meet that need is Functional Analytic Psychotherapy (FAP; Holman, Kanter, Tsai, & Kohlenberg, 2017; Kohlenberg & Tsai, 1991; Muñoz, Skinta, Sullivan Singh, Kohlenberg, & Tsai, 2025; Tsai *et alii*, 2009), a principle-driven treatment that prototypically targets interpersonal intimacy (Maitland & Gaynor, 2012; Marín Vila, Ortiz Fune, & Kanter, 2020).

FAP is a transdiagnostic form of contextual behavioral therapy that emphasizes the power of interpersonal connection. The general idea of FAP is that the clinically relevant behaviors (CRB) that maintain the client's daily life problems will manifest in the interpersonal relationship between the client and therapist. By effectively shaping CRB as they occur in-session, therapists can get clients to engage in new behaviors that will lead to decreases in the problems that brought the client to therapy. Five general principles guide the implementation of FAP in a flexible fashion, allowing clinicians to meet the needs of the client. The first rule of FAP is to watch for CRB. The second rule encourages therapists to intentionally evoke CRB, bringing the behavior into the room so that it can be shaped. Therapists then engage in the third rule, which is to contingently respond to the CRB. Specifically, the therapist blocks problematic behaviors and reinforces improvements in the client's behaviors (Weeks, Kanter, Bonow, Landes, & Busch, 2012). Therapists then assess the impact that the contingent responding has on the client (Rule 4) before providing interpretations and facilitating improvements in CRB outside of session (Rule 5). To increase the probability that the improvements in behavior will generalize outside of session, therapists are encouraged to use naturalistic rather than arbitrary reinforcement (Ferster, 1967). For example, the therapist may use their emotional reaction to clients to shape behavior, as this would be functionally similar to how another person might interact with the client outside of session. Improvements in CRB regularly involve clients being vulnerable, and therapist responses to CRB tend to be perceived as responsive. As such, it is common for a strong connection to form between therapists and clients throughout the course of FAP treatment.

Implementing FAP regularly incorporates engagement in the interpersonal process of intimacy and therefore may be useful for reducing loneliness. This has led researchers to conceptualize a FAP implementation framework, the Awareness, Courage, and Love (ACL) model. The ACL model can guide therapist conceptualization and responding by classifying CRB as aspects of the interpersonal process model of intimacy (Maitland, Kanter, Manbeck, & Kuczynski, 2017). Each aspect of the ACL model is connected to the interpersonal model of intimacy: awareness is needed to act with intention, courage maps onto vulnerability, and love maps onto responsiveness. Although FAP

may help individuals struggling with loneliness due to a lack of intimacy, it is not without limitations. Notably, FAP is typically implemented in a one-on-one setting, and relationships with therapists have limitations due to ethical considerations. It is possible that these limitations could be addressed by an ACL-informed intervention that is community-based and not designed to address mental health concerns.

The present investigation details two studies exploring how a group-based, real-world intervention that is informed by FAP's ACL model affects interpersonal behaviors and outcomes in the short- and long-term. Study 1 employed the group-based procedure to determine whether shaping ACL targets impacted feelings of connection, openness, and going beyond a person's comfort zone during the group, and ACL behaviors, loneliness, compassion, and fear of intimacy outside of the group (i.e., during participants' day-to-day lives).

In Study 2, a similar procedure was used, but a number of methodological limitations were addressed. Specifically, a correction was made to an error that prevented collection of demographic data in Study 1; connection, openness, and going beyond a person's comfort zone were captured using objective, psychometrically sound measurement strategies instead of subjective single question items; and exploratory measures were given to assess variables that may have impacted the day-to-day interpersonal behaviors of participants such as depression and anxiety.

STUDY 1

The primary objective of the study was to examine whether participation in the ACL intervention was associated with increases in open-heartedness, connectedness, behavior outside. Prior to engaging in any aspect of Study 1, all elements of the study were approved by the last author's institutional review board.

METHOD

Participants

The sample consisted of 77 individuals above the age of 18 who spoke fluent English. All participants provided informed consent prior to their inclusion in the study. Participants were recruited from Seattle Washington through flyers and social media advertisements. Of the 77 individuals who expressed interest in the study, 72 completed an intake assessment. Of these individuals, 38 completed the initial survey, but did not complete any subsequent surveys. Consequently, these individuals were excluded from analysis involving treatment outcomes, but their session-to-session data was analyzed. Of the remaining 34 participants, all completed the first post-session survey, but only 26 completed the follow-up assessment. Figure 1 contains a participant flow chart detailing involvement in the study. Demographic data was not captured due to an error in setting up the initial electronic survey that led to the question block containing demographic data being skipped.

Procedure

Participants were randomized into either the ACL intervention or the control group. All participants completed a pre-consent document online and then completed an informed consent procedure upon arriving for the first session. Both groups consisted of six weekly two-hour meetings at the University of Washington. In both groups, participants' social functioning was assessed during a pre-survey and again in the days

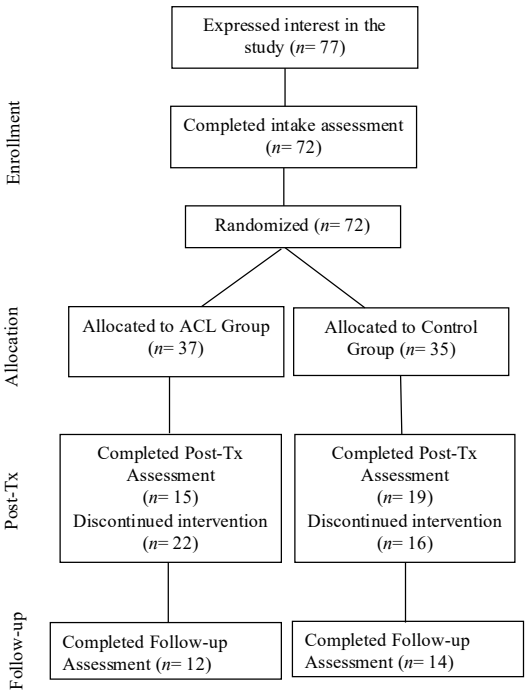

Figure 1. Participant Enrollment Flow in Study 1 at Significant Time Points.

following the final session. Participants also completed a brief exit questionnaire at the end of each session. This questionnaire assessed open-heartedness, connectedness, and comfort. Each group was led by trained co-facilitators who were research assistants (graduate and undergraduate students) in the lab and did not have formal clinical credentials. Co-facilitators participated in weekly experiential lab meetings focused on the Awareness, Courage & Love (ACL) model, including practices in self-awareness, vulnerable self-disclosure, and responsive reflection. In addition, each session followed a detailed protocol that co-facilitators rehearsed in advance and received feedback on from other lab members and supervisors prior to implementation.

In the control condition, participants gathered to watch and discuss popular films, controlling for time and participation in a facilitated discussion. Each week, the facilitator would show a film that was approximately 90 minutes in duration. Afterward, participants engaged in approximately 30 minutes of discussion about the themes, cinematic techniques, and artistic choices made by the filmmakers.

The ACL intervention condition was designed to didactically and experientially introduce participants to basic principles of the ACL model. Participants received a handout describing the skills as follows: 1) Awareness Skills: Being aware involves being mindful and present, and noticing one's own thoughts and feelings as well as what another may be experiencing, thus increasing empathic connection. 2) Courage Skills: Being courageous involves stepping outside of one's comfort zone by being bold, honest, vulnerable, authentic, expressing oneself, being confrontive but kind, taking thoughtful interpersonal risks, and trying new things. 3) Love Skills: Being loving includes the ability to both give and receive caring, compassion, support, appreciation, acknowledgment, respect, and encouragement. The themes of the six sessions were: 1)

Self-Assessment of ACL (Awareness, Courage, & Love) Skills; 2) Creating What Your Heart Desires; 3) Listening Deeply to Self and Others; 4) Cultivating Resilience with Interpersonal Mindfulness; 5) Agape Love and Creating Extraordinary Interactions; and 6) Living with Intention; Dying without Regrets. Each ACL session began with a video demonstrating one of these themes, followed by brief discussion. After the video, facilitators led a meditation related to the session theme, after which participants shared reflections about their experience of the meditation. Next, participants would journal responses to contemplation questions related to the theme of the meeting and designed to evoke vulnerability.

The core of the ACL sessions consisted of structured conversational exercises that participants completed in pairs or triads. In these exercises, participants were encouraged to share vulnerably in response to prompts they had just journaled on. Within each pair or small group, each person was given three minutes to share an answer to the prompt. After this sharing, their partner(s) had two minutes to provide a response before the original speaker was given one minute to share how this response had impacted them. This sharing process was modeled in front of the whole group by the facilitators each session before participants engaged in it. Participants had a weekly homework assignment to practice awareness, courage, and love in their lives, and this homework was reviewed in each meeting after the first week.

Instruments and Measures

Open-heartedness Scale. As part of their exit survey at the end of each session, participants responded on a 7-point Likert scale to the question, "Compared to how you typically feel in life, how open-hearted do you feel right now?" The scale anchors were 1 (Much less than usual), 4 (About as much as usual), and 7 (Much more than usual). This one-item measure was thought to be comparable to metrics of interpersonal responsiveness.

Connectedness Scale. As part of their exit survey at the end of each session, participants responded on a 7-point Likert scale to the question, "Compared to how you typically feel in life, how connected to others do you feel right now?" The scale anchors were 1 (Much less than usual), 4 (About as much as usual), and 7 (Much more than usual).

Outside of Comfort Zone Scale. As part of their exit survey at the end of each session, participants responded on a 7-point Likert scale to the question, "How far outside your comfort zone were you during this meeting?" The scale anchors were 1 (Totally within my comfort zone), 4 (Outside my comfort zone but OK), and 7 (Too far outside my comfort zone). This one-item measure was thought to be comparable to metrics of interpersonal vulnerability.

UCLA Loneliness Scale -Short Form (UCLA-SF; Hays & DiMatteo, 1987). The Short Form of the UCLA was administered to assess participants' experiences of loneliness. The UCLA-SF consists of eight items scored on a graded response scale from 1 (Never) to 4 (Often). It consists of positively scored items ("I lack companionship.") and negatively scored items ("I can find companionship when I want it."), accounting for inattentive or random responding. The UCLA-SF demonstrates good reliability (r= .84). Scores on the UCLA-SF are highly correlated with the 20-item version of the UCLA (r= .91). Cronbach's alpha scores for the measure in the seminal article were reported to be "high" but are unspecified (Hays & DiMatteo, 1987).

Awareness, Courage, and Responsiveness Scale (ACRS; Kuczynski et alii, 2020). Participants' engagement in ACL-consistent behaviors was measured by the ACRS. The ACRS consists of 24 items that are positively scored on a Likert scale from 1 (Never True) to 7 (Always True). Reliability of the total ACRS is excellent (α= .93). Items load across four subscales: Other-awareness (α= .79), Self-awareness (α= .81), Courage (α= .78), and Responsiveness (α= .89). The ACRS has demonstrated validity for use among both undergraduates and community samples ages 18-65.

Santa Clara Brief Compassion Scale (Hwang, Plante, & Lackey, 2008). The Santa Clara Brief Compassion Scale measures compassion, defined as the attitude of caring, concern,

and tenderness toward others. It consists of five items scored on a Likert scale from 1 ("Not at all true of me") to 7 ("Very true of me"). The Santa Clara Brief Compassion Scale is an abbreviated version of the 21-item *Compassionate Love Scale* (Sprecher & Fehr, 2005), and it performs as well as its longer counterpart in terms of reliability (α= .95). The correlation between the original scale and the brief scale is .95 (Hwang *et alii*, 2008).

Fear of Intimacy Scale (Descutner & Thelen, 1991). The Fear of Intimacy Scale is a 35-item measure of how willing the respondent is to engage in vulnerable behavior in a hypothetical close relationship, as well as within their previous close relationships. The Fear of Intimacy Scale consists of 20 positively scored items and 15 negatively scored items, on a scale of 1 (Not at all characteristic of me) to 5 ("Extremely characteristic of me").

Group take aways. At the end of the final ACL group session, facilitators asked participants to respond verbally to the question, "What are you taking away from this group experience?" The verbal responses of the participants in the ACL group were recorded verbatim and examined for overarching themes. This question was thought to gauge the impact of the ACL intervention on participants. The prompt was not given to individuals in the control group.

Data Analysis

The two groups were compared for retention using a chi-square at post-treatment and follow-up. Given that there was no anticipated time by treatment effect, independent sample *t*-tests were conducted to assess differences in connection, open-heartedness, and outside-of-comfort zone on a session-by-session basis. Repeated-measures ANOVAs were used to compare the patterns of change in measures of interpersonal relating from pre to post and from pre to follow-up. These analyses were conducted separately due to high levels of dropout between post-treatment and follow-up. Separating the analysis preserved the higher statistical power from pre to post while giving some insight into the long-term effects of the intervention in an underpowered exploratory analysis.

RESULTS

Of those who attended the pretreatment assessment, 48.7% of those in the control group returned for the post-treatment assessment, compared to only 34.1% in the intervention group, $\chi^2(1, N= 83)= 1.83$, $p= .18$. Of those who attended the pre-treatment assessment, 35.9% of those in the control group returned for the follow-up assessment, compared to only 27.3% in the intervention group, $\chi^2(1, N= 83)= 0.715$, $p= .40$.

Participants typically reported higher levels of Connectedness, Outside of Comfort Zone, and Open-heartedness in the ACL group compared to the control group (Table 1). Participants in the ACL group reported significantly higher levels of Connectedness than members of the control group in each of the six sessions. Participants in the ACL group reported significantly higher levels of feeling Outside of their Comfort Zone compared to the control group in three of the six sessions. Participants in the ACL group reported significantly more Open-heartedness than those in the control group in two of the six sessions.

A repeated-measure ANOVA indicated no time by group effect, $F(2, 44)= 2.35$, $p= .11$, and no significant main effect of time, $F(2, 44)= 0.97$, $p= .39$), or group, $F(1, 22)= 0.06$, $p= .81$, of the interventions on UCLA Loneliness Scale scores. A repeated-measures ANOVA indicated a significant time-by-group interaction on ACRS scores, $F(2, 46)= 4.06$, $p= .02$. Post-hoc analysis using a pairwise t-test indicated that participants in the ACL group scored significantly higher on the ACRS at Time 1 than participants in the control condition, *Mdiff*= 13.64, *SE*= 6.17, $p= .04$, 95%*CI* [0.88, 26.40]. Similar

Table 1. Study 1. Session by Session Variables by Time, with Independent Samples *t*-test Results for each Condition.

Measure		ACL *M* (*SD*)	Control *M* (*SD*)	*t*	*p*
Open-heartedness	Session 1	5.00 (1.12)	4.00 (1.24)	3.19	<.01
	Session 2	5.41 (.939)	4.83 (1.03)	1.85	.07
	Session 3	5.64 (1.01)	4.75 (1.83)	1.49	.15
	Session 4	5.93 (1.34)	4.25 (1.67)	2.64	.02
	Session 5	6.00 (.953)	5.14 (1.07)	1.81	.09
	Session 6	6.15 (.899)	4.88 (1.73)	1.94	.09
Outside of Comfort Zone	Session 1	3.93 (1.45)	3.41 (1.47)	1.30	.20
	Session 2	4.71 (.69)	2.43 (1.20)	7.56	<.01
	Session 3	5.14 (.86)	2.88 (1.64)	4.28	<.01
	Session 4	4.13 (1.60)	2.88 (2.10)	1.61	.12
	Session 5	4.00 (1.65)	2.29 (1.50)	2.56	.04
	Session 6	4.31 (1.44)	2.88 (1.89)	1.97	.06
Connectedness	Session 1	4.86 (.97)	4.04 (1.06)	3.00	<.01
	Session 2	5.47 (1.07)	4.43 (1.20)	2.83	<.01
	Session 3	5.86 (1.03)	4.63 (1.19)	2.56	.02
	Session 4	6.07 (1.10)	4.25 (1.28)	3.57	<.01
	Session 5	6.08 (.79)	4.71 (1.11)	3.13	<.01
	Session 6	6.31 (1.03)	4.25 (1.28)	4.05	<.001

Note: ACL= Awareness, Courage, & Love.

to the effects of the interventions on loneliness, a repeated-measures ANOVA identified no significant time by group interaction effects, $F(2, 48)= 0.76$, $p= .47$, time main effects, $F(2, 48)= 0.63$, $p= .54$, or group main effects, $F(1, 24)= 0.53$, $p= .47$, for Fear of Intimacy Scale scores. Results of a repeated-measures ANOVA indicated a significant main effect of time, $F2, 48)= 3.66$, $p= .03$, but no significant time by group interaction, $F(2, 48)= 0.86$, $p= .43$, or group main effect, $F(1, 24)= 0.22$, $p= .65$, of scores on the Santa Clara Brief Compassion Scale. A full list of means and standard deviations of pre-treatment, post-treatment, and follow-up data are presented in Table 2.

These quantitative results were expanded upon by comments made during the last session by the participants in the ACL group that reflected the impact of the experience for them. Table 3 presents a sample of what participants stated in response to the question, "What are you taking away from this group experience?"

Table 2. Primary Outcome Variables by Time, Results for each Condition in Study 1.

Measure		ACL		Control	
		n	*M* (*SD*)	*n*	*M* (*SD*)
Awareness Courage & Responsiveness Scale	Pre	34	128.24(14.65)	32	123.5(16.73)
	Post	15	126.53(17)	17	124.47(13.64)
	FU	12	126.92(15.51)	14	122.07(10.33)
Fear of Intimacy Scale	Pre	37	87.92(19.8)	35	86(22.17)
	Post	15	86.47(21.47)	19	88.74(17.1)
	FU	12	84.58(19.97)	14	92.5(22.99)
Santa Clara Brief Compassion Scale	Pre	32	25.47(7.19)	35	26(7.01)
	Post	15	28.47(7.5)	19	26.37(5.39)
	FU	12	24.83(6.9)	14	24.21(6.44)
UCLA Loneliness Scale	Pre	34	18.74(5.58)	33	20.45(5.11)
	Post	15	19.8(5.95)	19	18.95(4.52)
	FU	12	19.25(6.88)	13	19.77(3.49)

Notes: ACL= Awareness, Courage, & Love; FU= Follow-Up; Pre= Pre-Treatment; Post= Post-Treatment.

Discussion

Table 3. Verbal Responses from ACL Group in Study 1.

	Participant Quote
Participant 1	"I feel really elated…I have an arsenal of tools… to bring people's true self out."
Participant 2	"I just didn't know that humans can gather together in circles like this and communicate in this way, this has been crazy, fun, exciting."
Participant 3	"These kinds of relationships, these interactions are the ones that I crave every single day."
Participant 4	"It has taught me to be so much more intentional and aware in a very guided way -I've always wanted to do those things, but I didn't know how… it's been so rewarding I can't even believe it."
Participant 5	"I'm more comfortable in emotions, accepting them and expressing them. I've been told by people that I'm glowing like I'm pregnant!"
Participant 6	"I'm an introvert and have a hard time reaching out… But in my first marathon, I kept pace with a stranger, and after the race was over, we both expressed our appreciation for each other… it was such a great moment, and I was proud of myself for talking to someone I didn't know. It's such a good analogy for life… you need other people to keep you going and it could make both of you stronger if you make those connections."

This preliminary study evaluated a six-session intervention designed to increase feelings of Open-heartedness, Outside of Comfort Zone, and Connectedness. The intervention group consistently rated themselves as feeling more connected than usual, and their rates of Connectedness were significantly higher than the control group. Additionally, the intervention group occasionally rated themselves higher on Open-heartedness and Outside of Comfort Zone. However, no significant time by treatment effects were identified that indicated the intervention led to enhanced interpersonal functioning.

Although participants demonstrated the ability to form meaningful connections with other group members during the intervention sessions, these relational behaviors did not appear to extend consistently to participants' everyday lives. Without evidence of generalization of these behaviors beyond the group context, broader changes in daily experiences of connection or loneliness would not be expected. This interpretation is supported by the absence of significant change on measures of interpersonal functioning outside the group context, including the Fear of Intimacy Scale. It is worth noting that participants in the ACL group experienced a higher rate of attrition than the control group. It is possible that this reflects participants being unprepared for the emotional intensity of the experience compared to the control group. Although the greater attrition in the intervention group was unexpected and should be explored, it does not appear to be significant or account for the differences in the groups' outcomes. Thus, these results suggest that the feeling of connection towards others may be a momentary experience of connectedness during the intervention. It stands to reason that if this experience could be better generalized outside of the study context, it might better intervene upon loneliness.

STUDY 2

Study 1 had several notable limitations that, if addressed, would help contextualize the results of the intervention. The measures of Open-heartedness, Connectedness, and Outside of Comfort Zone each consisted of only a single item that had not been previously validated. Thus, the construct validity of these measures can be called into question. These measures were also collected in such a way that growth over time was not tracked. Rather, participants reported how they felt during a given session. It is also unclear how the findings from Study 1 can be generalized given the lack of demographic data. Additionally, more participants from the ACL group dropped out compared to the control group. It remains to be seen if any specific variable contributed to overall attrition

or the difference in attrition between groups. Finally, the reason for the lack of changes in interpersonal behaviors and experiences is not fully understood. It is possible that the skills introduced by the intervention do not directly affect the constructs measured by the selected instruments. Alternatively, as suggested by the verbal feedback from participants in Study 1, ACL skills may affect the constructs of interest, but participants may need intentional support to incorporate these new skills into their daily life. Finally, it is possible that experiences such as anxiety or depression may impact willingness or ability to engage in new behaviors. Thus, in Study 2, the first study was replicated in such a way to address or explore these limitations. Rather than relying on single-item questions, validated measures were used to assess the constructs of interest. Specifically, the State Self-Compassion Scale–Short Form was used in place of the open-heartedness item, the Relational Health Indices–Community was used to assess connectedness, and the Acceptance and Action Questionnaire-II was used instead of the Outside of Comfort Zone item. The use of these measures also allowed for the evaluation of change over time, rather than limiting assessment to evaluations of a single session. Additionally, demographic data were systematically collected. The study employed a slightly different control condition that was thought to be appropriate for its setting and sample.

METHOD

Prior to engaging in any element of research, all aspects of the study were approved by the second authors institutional review board.

Participants

Participants in Study 2 were college undergraduates who spoke fluent English and were enrolled in at least one class at Antioch University Seattle. All participants provided informed consent prior to their inclusion in the study. Similar to Study 1, participants were recruited via flyers and social media posts. Participants self-selected into the study before completing a pre-treatment survey including the GAD-7 and PHQ-9. Those who had severe depression or endorsed suicidality underwent a more detailed risk assessment conducted by a trained research assistant and a licensed psychologist. Any individual who was determined to be high risk for suicide was excluded from the study, and those at moderate risk were considered on a case-by-case basis. All participants determined to be at any level of risk for suicide were provided with suicide prevention resources and referrals for treatment. A total of 36 individuals enrolled in the study. Participants' ages ranged from 18 to 26 (M= 19.22, SD= 1.57). Most participants self-identified as White (55.56%), Asian (30.56%), or White and Asian (11.11%). Most of the sample identified as Female (66.67%), though individuals identifying as Male (22.22%) and Non-binary (11.11%) also participated in the study.

Instruments and Measures

State Self-Compassion Scale -Short Form (SSCS; Neff *et alii*, 2021). This 6-item scale assesses self-compassion. The SCSS is scored on a 5-point Likert scale, ranging from 1 (Not at all true for me) to 5 (Very true for me). Across a series of three studies reported by Neff *et alii* (2021), the state scale demonstrated strong reliability ($\alpha \geq .88$) with a unitary factor structure. It also correlated highly with the long-form version of the scale and with positive and negative affect in the expected directions, suggesting strong construct validity. The State Self-Compassion Scale is interpreted as a mean score. Scores ranging from 1.0 to 2.49 are interpreted as "Low," scores from 2.5 to 3.5 are considered "Moderate," and scores from 3.51 to 5.0 are "High."

Relational Health Indices -Community (RHI; Frey, Beesley, & Newman, 2005; Liang *et alii*, 2002; Liang, Tacy, Glenn, Burns, & Ting, 2007). This 14-item scale was developed and validated to measure an individual's sense of connection to a particular community. The RHI is scored on a 5-point Likert scale ranging from 1 (Never) to 5 (Always). It consists of both positively scored items ("I feel understood by members of this community") and negatively scored items ("There are parts of myself I feel I must hide from this community"). Liang *et alii* (2002) found the overall scale to have strong reliability in a sample of college-age women (α= .90), and later in a male sample (α= .88) (Liang *et alii*, 2007).

Acceptance and Action Questionnaire-II (AAQ; Bond *et alii*, 2011). A validated 7-item measure of psychological flexibility. The AAQ-II is scored on a 7-point Likert scale from 1 (Never True) to 7 (Always True). Scores of 24 to 28 are considered more likely to be associated with more psychological inflexibility and related symptoms such as depression and anxiety. Developers reported that across 2,816 participants in six distinct samples, the measure demonstrated good reliability (α= .84) and was correlated highly in the expected direction with measures of related constructs such as thought suppression, suggesting convergent validity.

Awareness, Courage, and Responsiveness Scale (ACRS; Kuczynski *et alii*, 2020). A 24-item measure developed to determine its utility for measuring the three essential constructs of the ACL model. It has been validated in college students, an adult community sample, non-clinical dyads, and a transdiagnostic community sample, with strong internal consistency (α= .93).

Patient Health Questionnaire -9 (PHQ-9; Spitzer, Kroenke, & Williams, 1999). The PHQ-9 is 9-item measure of depression severity within the last two weeks, and it is commonly used in clinical settings. Each item is scored on a 4-point graded response scale from 0 (Not at all) to 3 (Nearly every day). In addition, the PHQ-9 assesses how difficult the respondent's depressive symptoms have made it for them to engage in daily tasks, graded on a 4-point scale of "Not difficult at all" to "Extremely difficult." Kroenke, Spitzer, and Williams (2001) found that it has strong internal reliability (α= .86-.89). Total scores are used to interpret the severity of depressive symptoms, with 0 to 4 being considered None-minimal, 5 to 9 being Mild, 10 to 14 being Moderate, 15 to 19 being Moderately Severe, and 20 to 27 being Severe.

Generalized Anxiety Disorder -7 (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006). The GAD-7 is a 7-item measure of anxiety symptoms within the last two weeks and is commonly used in clinical settings. Each item is scored on a 4-point graded response scale from 0 (Not at all) to 3 (Nearly every day). In addition, the GAD-7 assesses how difficult the respondent's anxiety symptoms have made it for them to engage in daily tasks, graded on a 4-point scale of "Not difficult at all" to "Extremely difficult." Spitzer *et alii* (2006) confirmed that despite some overlap with depression, anxiety as measured by this scale loaded onto a distinct factor, solidifying its construct validity. The scale was also found to have very strong internal reliability (α= .92). Total scores are used to interpret the severity of anxiety symptoms, with 0 to 4 being considered Minimal anxiety, 5 to 9 being Mild, 10 to 14 being Moderate, and 15 to 21 being Severe.

Qualitative Questions. The end of the post survey included three feedback questions designed to capture a more holistic picture of participants' experience in the group. The three questions, reprinted with permission, are: (1) "What impact, if any, did this group have on you?" (2) "Did you enjoy participating in this group? Why or why not?" and (3) "What else is important for us to know about your experience in this group?"

Randomization

It was suspected that one reason for the intervention group's slightly higher dropout rate in Study 1 may have been participants not being prepared for the experimental condition. As such, a screening process was added to the protocol in Study 2. Randomization was completed prior to the initial screening call with a research assistant. During this phone call, those who were randomized into the experimental condition completed an abbreviated vulnerability-responsiveness exercise with the research assistant. This

process was added to the recruitment procedure to help ensure that participants were truly aware of what the study entailed.

Intervention Protocol

The protocol utilized for the ACL group in Study 2 was similar to that used in Study 1. Minor modifications were made in Study 2 to ensure the protocols were relatable for the college student population. The weekly themes and wordings of the materials were simplified and altered to be friendlier to young people. In contrast to Study 1, the weekly videos were not selected by the facilitator after the first week. Instead, participants were invited to share a video, song, or other piece of multimedia that felt relevant and meaningful to share. This was theorized to help generate participant buy-in.

Control Protocol

In the control condition, participants gathered for a weekly academic support group. The facilitator encouraged some structured conversation, as in the intervention group. However, the conversation was focused on more everyday topics of the kind that might more regularly come up in a college class (e.g., sharing about one's major, explaining the pros and cons of one's dorm building, or discussing how college has been different from high school).

Data Analysis

The two groups were compared for retention using a chi-square at each timepoint. Repeated-measures ANOVAs were conducted, assessing change on all measures from pretreatment to post-treatment except the RHI where no pre-treatment assessment was collected. Additional repeated-measures ANOVAs were conducted to assess session-by-session change. Post-hoc independent samples t-tests were conducted to identify specific time points in which differences were observed. Pre-treatment PHQ-9 and GAD-7 scores were correlated with the residualized change scores from pre- to post-treatment for the AAQ-II, SSCS, RHI, and ACRS to assess if depression and anxiety had an impact on social outcomes.

RESULTS

Chi-squared tests of independence found no relationship between condition and the number of participants not in attendance during a given week (Table 4). Both groups started with 18 individuals and ended with 14 in attendance. Mean score for each measure at each time point is presented in Table 5. Pre-post repeated-measures

Table 4. Session by Session Attendance by Condition and Chi-Square results in Study 2.

Week	ACL	Control	χ^2	*p*
Session 1	16	17	.36	.55
Session 2	15	16	.23	.63
Session 3	15	15	.0	1.00
Session 4	10	13	1.08	.30
Session 5	12	14	.55	.46
Session 6	14	14	.0	1.00

ANOVAs suggested no significant time by condition interactions on the ACRS, $F(1, 25)= 2.704$, $p= .11$, the GAD-7, $F(1, 25)= 0.03$, $p= .95$, the PHQ-9, $F(1, 25)= 1.75$, $p= .20$, or the AAQ-II, $F(1, 25)= 0.11$, $p= .75$. However, significant interaction effects were found on the SSCS $F(1, 25)= 12.41$, $p < .01$. Main effects of time were identified for the PHQ-9, $F(1, 25)= 11.68$ $p < .01$, GAD-7, $F(1, 25)= 14.321$, $p < .001$, and ACRS, $F(1, 25)= 6.74$, $p= .02$, but not for the AAQ-II, $F(1, 25)= 1.21$, $p= .28$. No main effects of condition were identified for any measure. Repeated-measures ANOVAs conducted on all

Table 5. Study 2 Primary Outcome Variables by Condition and Time.

Measure	Live with ACL		Control	
	Pre *M* (*SD*)	Post *M* (*SD*)	Pre *M* (*SD*)	Post *M* (*SD*)
State Self-Compassion Scale (Short Form)	2.68 (.29)	3.44 (.45)	3.04 (.65)	3.01 (.73)
Acceptance and Action Questionnaire -II	29.57 (7.38)	28.14 (10.19)	25.23 (7.32)	24.46 (8.37)
Awareness, Courage, and Responsiveness Scale	112.14 (24.86)	125.50 (19.10)	128.54 (11.91)	131.54 (13.77)
Relational Health Indices (Community)*	40.69 (6.96)	52.31 (8.27)	43.77 (7.91)	41.92 (10.90)
Generalized Anxiety Disorder -7	9.86 (3.80)	7.07 (4.18)	9.92 (5.20)	7.23 (4.75)
Patient Health Questionnaire -9	12.00 (5.46)	9.21 (6.02)	11.46 (5.35)	10.23 (4.88)

Note: *= Relational Health Indices (Community) pre score reflects score after week 1 as pre-treatment assessment was not appropriate.

session-by-session data suggested significant differences on the RHI, $F(2.92, 43.851)$, $p < .001$, when a Greenhouse-Geisser correction was applied, and on the SSCS, $F(6, 90)= 2.25$, $p= .05$. No significant time-by-condition effects were identified on the AAQ-II, $F(6, 90)= 1.33$, $p= .25$, but a main effect of condition, suggesting higher psychological inflexibility in the ACL group, was identified for AAQ-II scores, $F(1, 15)= 7.93$, $p= .01$. Correlations between PHQ-9, GAD-7, and residualized change scores indicated a significant relationship between ACRS scores and PHQ-9 and GAD-7 scores. No other significant correlations were observed. A full table of correlations is presented in Table 6.

Participant feedback responses were examined independently by the first author and

Table 6. Correlations Between Pre-treatment Anxiety and Depression Scores and Residualized Change Scores on Primary Outcome Measures in Study 2.

	1	2	3	4	5
1. Residualized change score of the Acceptance and Action Questionnaire -II	-				
2. Residualized change score of the State Self-Compassion Scale (Short Form)	-.43*	-			
3. Residualized change score of the Awareness, Courage, and Responsiveness Scale	.31	-0.34	-		
4. Residualized change score of the Relational Health Indices (Community)*	-0.05	0.05	-0.05	-	
5. Pre treatment score on the Patient Health Questionnaire -9	0.07	<0.01	-0.38	-0.14	-
6. Pre treatment score on the Generalized Anxiety Disorder -7	0.10	0.08	-.50**	-0.02	.63**

Notes: *= $p < .05$; **= $p < .01$.

a research assistant to code them as either positive or negative, and then to determine general themes. These two researchers' impressions of the participant feedback were then compared to one another and were found to be essentially identical, indicating that there was high interrater reliability between the two coders' feedback. Results showed that participants' experiences in the study were favorable overall regardless of condition, with each group recording one participant response that was coded as negative.

Two key themes that were identified among participants in the control group were "Appreciation of opportunity to socialize" and "Appreciation of opportunity to study." Examples of these themes are provided in Table 7. In the intervention group, participants also seemed to appreciate the social connections they had formed; indeed, "Appreciation of opportunity to socialize" was also the most prevalent theme in the intervention group.

Table 7. Common Themes Among Control Group Participants in Qualitative Data in Study 2.

Appreciation of Opportunity to Socialize	Appreciation of Opportunity to Study
"It was a good opportunity to meet new people."	"It was a relaxing space to get a little work done."
"I met some really nice people and I looked forward to having people to socialize with."	"It was nice forced studying and reflection time."
"I got to chat with nice people."	"I looked forward to coming here and getting things done."
"It was nice and fun to connect and talk with other people."	"It gave me a good space to be very productive."

However, an additional theme commonly expressed by intervention participants was a sense of personal growth due to their participation in the group. This theme was labeled "Personal growth." Examples of the themes in the intervention group are presented in Table 8. Of note, several control participants also expressed sentiments about having undergone personal growth. One control participant stated, "The form of studying we did in the group helped me focus really well, and I'll continue doing so outside of this group." Notably, two control participants appeared to have experienced growth related to their social functioning as a result of their participation. One of these individuals stated, "I'm more aware of my ability to make friends and have connections with others." The other noted that "I needed to regain confidence in myself as a person and this group helped me do so." However, such comments were noticeably less common in responses from control participants. A much more frequent theme among these participants was the group's overall "Lack of impact," presented in Table 9.

Table 8. Common Themes Among Intervention Group Participants in Qualitative Data in Study 2.

Appreciation of Opportunity to Socialize	Personal Growth
"It was really heartwarming and meaningful to talk and connect with people."	"[I] feel less afraid and intimidated by people and interacting with them."
"Given the pandemic, I feel like everyone has been craving connection and this group gave us the opportunity to fulfill that desire."	"I felt like everyone has really helped make me want to be a better person and friend, really thank you guys for doing something like this."
"[This group] provided me with a lot of emotional support."	"This group taught me that vulnerability is indeed scary, but at the same time, being vulnerable is such a meaningful and beautiful experience when you are in the right space with someone who truly validates and listens to how you feel. I have learned that connecting with people can be so impactful!"
"I felt heard and appreciated in each session."	"This group was more effective for me than going to actual one-on-one therapy has been in the past, ngl."
"I wish there wasn't a pandemic so I could give you all a hug, if you like hugs haha."	"I think this made me a lot more open and willing to share my issues, [rather] than just help others. It also helped me better socially [sic] and talk to people."

Table 9. Control Group No Impact Theme Examples from Qualitative Data in Study 2.

Lack of Impact
"I don't think this group had a big enough impact on me for me to remember a lot of it."
"It's a small chunk of time and isn't all that important in my daily life."
"It's not a very big impact but I found it interesting that interacting with people could affect my mood."
"On my mental health, this study had little to no effect."
"Very little impact, but it was still enjoyable."

DISCUSSION

The present study evaluated the effects of a 6-week intervention for college undergraduates informed by the ACL model of FAP, compared to an academic support

control group that incorporated similar activities, but without the elements thought crucial to building feelings of connection. Compared to the control condition, participants in the intervention group reported significantly greater levels of relational health with the group and higher levels of self-compassion. These results are consistent with the hypothesized effects of the group in creating compassion and sense of connection. However, no differences associated with the intervention were found on anxiety, depression, psychological inflexibility, or awareness, courage, and responsiveness. Some of the findings suggested that a larger sample size may result in significant findings of the effect of the intervention, such as on the ACRS and PHQ-9. One facet that may have impacted some of the outcomes is participant mental health. Depression and anxiety scores significantly predicted deviations from expected change on the ACRS, as demonstrated by the correlation between depression, anxiety, and residual change scores on the ACRS. This is notable given that the ACRS is the assessment tool that most closely maps on to the behaviors that would be expected to change as a function of the intervention.

The feedback responses largely followed anticipated patterns, with participants in the intervention group reporting personal growth as a result of the study. Participants' reports about their experiences seem to indicate that the ACL intervention produced more reliable, pronounced personal growth, particularly in interpersonal domains. Both members of the study team who coded feedback responses noted that although the theme "Appreciation of opportunity to socialize" was present in both groups, participants in the intervention condition seemed to be more effusive in their expressions of feeling connected and inspired by the group. It is worth noting that the feedback responses were based on survey questions. As such, no follow-up questioning or clarification was conducted. It is possible that researcher bias contributed to the extracted themes.

General Discussion

In the current research, we investigated the impact of a group intervention designed to facilitate social connection both within and beyond the confines of the group. In Study 1, we demonstrated the effectiveness of the intervention in changing the self-reported behavior of participants within the group but found evidence that the newly formed social behaviors did not seem to generalize to participants day-to-day lives. Study 2 replicated Study 1 with psychometrically sound measurement strategies and addressed a number of methodological errors made in Study 1. Results from Study 2 provided further evidence for the outcomes of Study 1, in that within-group behaviors related to relational health and self-compassion increased significantly more in the intervention group than the control group. However, no significant group-by-time differences were reported for behavior outside of the group setting. It may be that the ACL groups are quite effective at changing behavior (and creating connectedness) within their particular setting but are less effective at producing more global behavior change. The lack of change in ACL-related behaviors outside of session may be a function of pre-existing participant anxiety and depression.

Taken together, the two studies suggest some potential promise of the ACL group format for intervening upon societal issues such as loneliness but indicate that refinement of the intervention is needed. The intervention under investigation in these studies may yet fill the need for effective scalable interventions for loneliness but requires more research. The intervention that was assessed is based on the work of a 501(c)(3) nonprofit organization called ACL Global, which is dedicated to alleviating global loneliness and social isolation. ACL Global operates in 92 cities, in 69 countries on six continents and thus has the potential to meet large-scale societal demands. Further,

existing literature suggests the importance of components of the ACL model in building social connection (Kanter *et alii*, 2020; Tsai *et alii*, 2020) and that improving upon deficits in these behaviors may impact loneliness (Maitland, 2020).

The interventions we assessed seem to be able to make meaningful changes to ACL behaviors during the intervention session, but our findings indicate that those behaviors might not effectively be generalizing outside of session. Other investigations that utilized ACL-based interventions reported similar findings (Maitland & Lewis, 2022). The discrepancy between these findings and the expansive literature base of FAP interventions on social connection (Kanter *et alii*, 2017) warrants investigation into the differences in treatment modalities, especially as it relates to Rule 5 (generalization of the behaviors to novel contexts). It may be beneficial to understand the social environment of the individuals who attend these groups. It is possible that group attendees are unable, rather than unwilling, to engage in the newly developed behaviors outside of the group setting. Finally, further assessment of the effects of the group are needed in individuals who would conceivably benefit most from the treatment: those who report high levels of loneliness or high levels of fear of intimacy.

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