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The Learning Alliance Inventory: Instrument Development and Initial Validation

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Keywords

Alliance, Collaboration, Student-teacher interaction, Teaching, Higher education, Classroom research

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The Learning Alliance Inventory: Instrument Development and Initial Validation

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Abstract

Despite potential applications to educational contexts, the working alliance concept has largely been confined to psychotherapy intervention research. Some have explored theoretically related concepts (e.g., immediacy, rapport), but no measure currently exists of the working alliance between a teacher and student within an academic course. The aim of this study was to develop such a measure. Results of exploratory and confirmatory factor analyses led to the creation of the Learning Alliance Inventory (LAI), which contained three factors (Collaborative Bond, Teacher Competency, and Student Investment). Reliability and validity analyses indicated that the LAI has temporal stability, distinguishes between instructors, and correlates with numerical course grades when controlling for GPA. As a result, the LAI provides a psychometrically sound instrument for measuring aspects of student-teacher interactions pertaining to their collaborative, purposive work. As such, the LAI may prove helpful in furthering our understanding of student learning and teaching effectiveness.

Keywords: Alliance, Collaboration, Student-Teacher Interaction, Teaching, Higher Education, Classroom Research

Introduction

Each time a student seeks to learn and a teacher facilitates this learning, a collaboration occurs. At its outset, such collaboration involves a negotiation. Power differences between the two parties and variations in the explicitness of the negotiation are common, but some level of agreement about the teacher and student's aims for the interaction is reached. Both parties then engage in behaviors designed to help the student meet the identified learning outcomes. The purposive and collaborative nature of these behaviors produces what can be conceptualized as a working alliance.

Research on the working alliance concept has occurred primarily in intervention contexts. This work has focused on how qualities of the collaborative relationship between a therapist and client contribute to treatment or intervention outcomes. Among these, Bordin (1979, 1980, 1994) articulated one of the most influential conceptualizations. In his 1979 paper, Bordin argued that a working alliance occurs when one person makes an effort to change and another person serves as a facilitator of that change. He suggested that the working alliance forms as a consequence of this collaboration and relies on three components: agreement on the goals, agreement on the tasks to achieve those goals, and the emotional bond. Goal and task agreement occur when there is a mutual understanding of the collaboration objectives and the steps involved in meeting them. Bond involves trust and confidence, which are part of the emotional attachment that develops during collaboration. Bordin claimed that these three components determine the characteristics of a particular working alliance. As a result, assessments of the components within a collaboration should

yield information about the state of the alliance and the effectiveness of the work in creating the desired change. Based on Bordin's conceptualization, working alliance theory now occupies a prominent position in the psychotherapy literature given its ability to consolidate information about diverse change processes in treatment (Castonguay, Constantino, & Holtforth, 2006). Researchers have also shown the concept to be among the strongest predictors of treatment outcome (for meta-analytic reviews, see Horvath & Symonds, 1991; Martin, Garske, & Davis, 2000).

Although most often examined in psychotherapy research and practice, the working alliance concept has potential applications to any change process that involves the collaboration of invested parties. Educational contexts provide one such outlet. This context holds particular appeal given the correspondence between working alliance theory and the burgeoning scholarship of teaching and learning (Rogers, 2009). In recent years, several authors have considered applications of the working alliance concept to educational contexts. Robertson (1996, 1999, 2000) described the potential applications of clinical concepts to the helping relationships that occur in teacher-student interactions. Koch (2004) outlined ways teachers can build stronger working alliances with students. Ursano, Kartheiser, and Ursano (2007) argued that because student-teacher interactions share some core features with client-therapist interactions, the working alliance concept could prove useful in educational contexts. And Myers (2008) encouraged teachers to use the working alliance concept in order to better recognize the impact of classroom social relationships on student learning. Others have considered the implications of the working alliance to collaborations that occur between graduate students and mentors (Schlosser & Gelso, 2005) and between supervisees and supervisors (Efstation, Patton, & Kardash, 1990; Ladany & Friedlander, 1995).

Additional research on topics related to teacher-student interactions are likely related to the working alliance concept. For example, some have emphasized the role of instructional immediacy, or the teacher's psychological availability (Mehrabian, 1969). Immediacy is often considered to manifest via a teacher's verbal and nonverbal communications, and it has been shown to predict such student outcomes as motivation and perceived learning (Allen, Witt, & Wheelles, 2006; Christensen & Menzel, 1998; Wilson & Locker, 2008). Others have examined student-teacher rapport, or the degree of caring and friendliness conveyed in the interaction (Altman, 1990). Rapport has been shown to correlate with students' pro-academic behaviors and perceptions of learning (Benson, Cohen, & Buskist, 2005; Teven & McCroskey, 1996; Wilson, Ryan, & Pugh, 2010). With the working alliance conceptualized as a byproduct of purposive, collaborative endeavors, it seems likely that immediacy and rapport could contribute to stronger working alliances. For example, instructors who effectively convey their psychological availability and are friendly and considerate in their interactions with students would seem well positioned to achieve a strong working alliance. However, the working alliance concept, with its emphasis on a sustained, collaborative endeavor, is likely a larger construct than rapport or immediacy, which tend to emphasize instructor behavior.

In total, the picture emerging from this research suggests that investigating qualities of collaborative interactions between students and teachers could contribute to our understanding of teaching effectiveness and student learning. But thus far these qualities have been investigated either as separate constructs (e.g., rapport) or as collections of teacher behaviors thought to be related to a particular construct (e.g., immediacy). What is often lacking in this research is an emphasis on the combined contributions of students and teachers in educational contexts. Given the broad range of student and teacher factors that could be investigated, research on these collaborative interactions would benefit from

grounding in a theory that identified key components and offered predictions about their effects. Working alliance theory provides such a resource. Yet research in this area will also require sound measures of the working alliance in educational contexts. Although measures have been developed for mentoring and supervisory contexts, no measure has emerged for assessing the working alliance between a teacher and student within an academic course. Were such a measure to exist, researchers could determine whether the working alliance is involved in student learning and how variations in the alliance across individuals and contexts might impact learning outcomes.

The purpose of this investigation was to develop a theoretically grounded and psychometrically sound instrument for measuring students' perceptions of the working alliance they experience with their teacher. I report on this effort by describing a series of three studies. In Study 1, I describe the generation and revision of potential items as well as the exploratory factor analysis (EFA) and item retention procedures that gave rise to a final version of the measure. In Study 2, I describe a confirmatory factor analysis (CFA) designed to test the factor structure arrived at in Study 1. In Study 3, I describe initial evidence for the temporal stability and criterion validity of the measure, as well as its relationship to student learning.

Study 1

The purpose of Study 1 was to develop and evaluate items for inclusion in a measure of the working alliance that occurs between students and teachers within an academic course. I designed the measure to assess the student perspective on the working alliance. It is hereafter referred to as the Learning Alliance Inventory (LAI). To accomplish this goal, the initial items had to 1) adhere to a general conceptual model of working alliance, 2) exhibit clear structure through EFA and multiple criteria for item retention, and 3) demonstrate reliability in the form of internal consistency.

Method

Item construction and content validation. Item construction was accomplished by generating a large pool of items deemed to have relevance both to Bordin's (1979) general conceptual model of the working alliance and to students' course experiences. Relevance was ensured by including a working alliance researcher and three advanced undergraduate students on the item construction team. Item construction occurred in four phases. First, this group independently generated items we believed captured aspects of Bordin's working alliance concept as it might occur between students and teachers. Second, we consulted existing measures of the working alliance construct to generate ideas for additional items. Measures examined included the Working Alliance Inventory (Horvath & Greenberg, 1989), the revised Helping Alliance Questionnaire (Luborsky et al., 1996), the California Psychotherapy Alliance Scales (Gaston & Marmar, 1994), the Advisory Working Alliance Inventory Student Version (Schlosser & Gelso, 2001), and the Supervisory Working Alliance Inventory (Efstation et al., 1990). Third, we combined all items, sorting them according to content and theme, and eliminated redundant items. Finally, the team members evaluated the items for consistency with working alliance theory and relevance to students' experiences of a course. Team members also noted issues with item redundancy and clarity.

This initial item generation process yielded 93 content valid items to be used for further analysis. These items were pilot tested on a sample of 235 undergraduate students.

Based on an examination of the distributions and intercorrelations of the items, the team made several revisions that resulted in a final set of 73 items for use in Study 1.

Participants. A total of 779 undergraduate students enrolled in psychology courses at a large southeastern university participated in the study. The majority earned either course credit or extra credit for their participation. Participants ranged in age from 18 to 50 years ($Mdn = 19$, $M = 21.19$, $SD = 5.12$), with 88% being between 18 and 26 years-old. The participants were predominantly female (77%) and Caucasian (75%).

Materials and procedure. Participants responded to the 73 generated items in a Web-based format using a 7-point scale to indicate the frequency with which the item occurred or the level at which it was endorsed (anchored by 1-*not at all* and 7-*very much*). The scale instructions directed participants to rate each item based on their current attitudes, thoughts, feelings, and behaviors about a current teacher and course. To eliminate effects of participants selecting the course and instructor they rated, and to increase the generalizability of the resulting scale, participants were asked to respond to items while thinking only of the first face-to-face course that occurred in their weekly schedule. As a result, participants rated instructors from courses that varied widely in content and structure. To reduce the influence of students giving ratings early in the semester (when they may have limited experience in the course) or late in the semester (when their course grade may be more certain), all participants completed the measure between the 4th and 12th weeks of a 16-week semester.

Results and Discussion

Data screening. I evaluated the appropriateness of the data for multivariate data analysis using several screening techniques (Tabachnick & Fidell, 2007). Beginning with the initial data set of 779 participants and 73 items, I eliminated 18 cases with missing data. I did not find multicollinearity and singularity among the squared multiple correlations (highest SMC = .87). Employing univariate and multivariate methods to detect outliers among observations and cases, I identified 23 cases (3% of the sample) as multivariate outliers based on a Mahalanobis distances analysis criteria of $D^2/df > 2.5$. Each of these cases had a total completion time for the measure that was substantially below the sample mean, suggesting inadequate reading of items. The result was a data set consisting of 761 participants and 73 items. I used two statistical tests to determine the adequacy of the data for factor analysis. Bartlett's test of sphericity was significant, $\chi^2(2628, N = 761) = 57791.75$, $p < .001$. The Kaiser-Meyer-Olkin test of sampling adequacy was .99, which is within Kaiser's (1974) "marvelous" range for factorial simplicity.

EFA. Given the importance of data reduction, and the likelihood that working alliance factors would correlate, principal components analysis with oblique (Promax) rotation was used to examine the factor structure of the 73 items. The number of factors retained was determined by combining criteria that identified an upper and lower bound (Ford, MacCallum, & Tait, 1986). The upper bound, defined by factors whose eigenvalues > 1 , yielded six factors. The lower bound, determined using a parallel analysis (O'Connor, 2000), indicated an interpretable three factor solution for both the mean and 95th percentile eigenvalues. A scree test also confirmed a three factor solution. Based on these findings, I selected a three-factor solution.

In order to identify the items with the strongest psychometric properties, I first eliminated 30 items on the basis of low factor loadings ($< .40$), low communalities ($< .40$), and/or high cross-factor loadings ($> .30$). I then examined the intercorrelations and content of the

remaining items for redundancy and eliminated an additional nine items. This left a total of 34 items (12 on Factor 1, 13 on Factor 2, 9 on Factor 3), all with factor loadings > .50.

In order to develop a more parsimonious measure, the items comprising each factor were examined for possible reduction based on the factor loadings, item-total correlations, squared multiple correlations, and changes in alpha if deleted. This analysis resulted in the elimination of an additional six items from Factor 1, seven items from Factor 2, and three items from Factor 3. The results of this process yielded a three factor solution, with six items per factor, that accounted for 73.96% of the variance in the items. Factor 1 contributed the most to the explained variance (56.02%), followed by Factor 2 (10.01%) and Factor 3 (7.93%). The six items comprising each factor were deemed salient as there were no communalities < .60, no factor loadings < .60, and no cross-factor loadings > .20. These items, along with their factor loadings, communalities, and item-total correlations for the final three-factor solution, are presented in Table 1. These 18 items comprise the final version of the LAI.

Table 1. Item Properties from the Exploratory Factor Analysis

Item	Factor	λ	h^2	ITC	<i>M</i>	<i>SD</i>
1 My teacher knows me.	1	.98	.75	.63	3.71	1.93
2 My teacher and I have connected.	1	.96	.80	.70	3.68	1.82
3 My teacher and I have formed a good working relationship.	1	.96	.82	.72	4.06	1.87
4 My teacher understands me.	1	.73	.77	.79	4.78	1.78
5 My teacher genuinely cares about me.	1	.71	.76	.78	4.88	1.77
6 My teacher and I work well together.	1	.69	.79	.81	4.85	1.72
7 My teacher is knowledgeable about the course material.	2	.91	.69	.62	6.24	1.21
8 My teacher is experienced.	2	.89	.67	.63	6.12	1.33
9 My teacher is actively engaged in this course.	2	.89	.80	.74	6.01	1.36
10 My teacher welcomes all student input and feedback.	2	.79	.72	.72	5.90	1.45
11 My teacher treats students fairly.	2	.77	.64	.66	6.07	1.23
12 My teacher has clearly explained the things I'm required to do in this course.	2	.67	.62	.70	5.88	1.38
13 This course will be useful to me in the future.	3	.93	.72	.67	5.36	1.68
14 This course is worthwhile.	3	.92	.81	.63	5.10	1.75
15 I want to learn about the topics that my teacher selected for this course.	3	.88	.75	.72	5.13	1.66
16 The goals for this course are a good fit for my needs.	3	.80	.75	.71	5.06	1.72
17 I enjoy doing the required tasks for this course.	3	.78	.66	.68	4.51	1.75
18 The things we are doing in this course are helping me learn.	3	.64	.77	.82	5.25	1.67

Note. $N = 761$. λ = factor loadings; h^2 = communalities; ITC = corrected item-total correlations. Factor: 1 = Collaborative Bond; 2 = Teacher Competency; 3 = Student Investment.

I labeled the factors of the LAI after a careful review of the item content and themes, which included consideration of their correspondence to working alliance theory. A group of

psychologists well-versed in the current teaching and learning literature provided insight and suggestions concerning the labels. Factor 1 was labeled *Collaborative Bond* because the items focus on aspects of relationship building that mirror those developed to assess bond in psychotherapy contexts. Factor 2 was labeled *Teacher Competency* because the items capture teacher behaviors that are fundamental to effectively structuring, delivering, and managing a course. Factor 3 was labeled *Student Investment* because the items focus on student attitudes and behaviors that reflect a confident, optimistic engagement with the course material and processes. Collectively the three factors and their corresponding items comprise the LAI. Correlations between the LAI factor and total scores were all statistically significant (see Table 2).

Table 2. Correlations Among LAI Factors and Total Score

Factor	Collaborative Bond	Teacher Competency	Student Investment
Teacher Competency	.69**		
Student Investment	.66**	.71**	
Total Score	.90**	.88**	.89**

Note. N = 761.

** $p < .001$

Reliability. The internal consistency for the three factors were judged to be adequate based on the following coefficient alphas: Collaborative Bond = .94, Teacher Competency = .91, Student Investment = .93. The internal consistency of the LAI total score showed a coefficient alpha of .95.

Demographic variations. A MANOVA comparing male and female participants on the LAI factors and total score yielded no statistically significant differences. Males and females' means were nearly identical (all $F_s < .10$). Pearson correlations between the LAI and participant variables were examined. Participant age was positively correlated with the LAI Collaborative Bond, $r(744) = .13, p < .01$, Student Investment, $r(744) = .08, p < .05$, and total score, $r(744) = .11, p < .01$, but not Teacher Competency. This suggests that although older participants appear to report being more invested and forming stronger bonds with their instructors, they do not appear to differ in their perceptions of teacher competency. Credit hours earned was positively correlated with the LAI Collaborative Bond, $r(736) = .12, p < .01$, Teacher Competency, $r(736) = .12, p < .01$, Student Investment, $r(736) = .13, p < .001$, and total score, $r(736) = .14, p < .001$. This suggests that participants with more coursework experience tend to report forming stronger working alliances with their instructor. Participants' self-reported GPA did not correlate with the LAI factors or total score suggesting that previous academic achievement may be independent of the working alliance formed in a specific course.

Study 2

The purpose of Study 2 was to cross-validate the factor structure of the LAI derived in Study 1. To accomplish this, I conducted a maximum likelihood CFA on data from a new set of participants.

Method

Participants. A total of 166 undergraduate students enrolled in psychology courses at a large southeastern university participated in the study. This sample was independent from the Study 1 sample. The majority earned either course credit or extra credit for their participation. Participants ranged in age from 18 to 63 years (*Mdn* = 22, *M* = 24.78, *SD* = 7.88), with 79% being between 18 and 26 years-old. The participants were predominantly female (76%) and Caucasian (68%).

Materials and procedure. Participants responded to a Web-based version of the LAI derived from Study 1. The 18 items and response scale were unchanged. As in Study 1, participants were required to respond while thinking of the first face-to-face course that occurred in their weekly schedule. All participants completed the measure between the 4th and 12th weeks of a 16-week semester.

Results and Discussion

CFA. I conducted a maximum likelihood CFA using AMOS software version 18.0 (Arbuckle, 2009) with the 18 LAI items as markers of the three factors derived in Study 1. In order to evaluate the overall and relative adequacy of the model derived in the EFA, I compared five models for the data: a null model, a one-factor model, and three three-factor models (uncorrelated, correlated, and hierarchical; Noar, 2003). For each model, I examined several indices of fit in order to mitigate the limitations of any given one. I evaluated the ratio of the overall model chi-square to degrees of freedom, the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR; for a discussion of fit indices, see Hu & Bentler, 1999). I evaluated the overall fit using the following criteria as indices of *good* fit: $\chi^2/df < 3$ (Kline, 1998); CFI > .97 (Schermelleh-Engel, Moosbrugger, & Müller, 2003); RMSEA < .05 (Browne & Cudeck, 1993), and an SRMR < .05 (Hu & Bentler, 1995). Slightly more lenient criteria for each statistic are discussed in the literature as indices of *acceptable* fit (Schermelleh-Engel et al., 2003).

The results indicated that no model achieved good fit on all indices, but the correlated factors and second order hierarchical models achieved acceptable fit on all indices (see Table 3). As a result, the factor structure of the LAI derived in Study 1 was validated by the CFA from the new sample.

Table 3. Confirmatory Factor Analysis Fit Indices

Model	χ^2	<i>df</i>	χ^2/df	CFI	RMSEA (90% CI)	SRMR
Null	2796.11	153	18.28			
One factor	930.68**	135	6.89	.70	.19 (.18-.20)	.11
Uncorrelated factors	500.83**	135	3.71	.86	.13 (.12-.14)	.39
Correlated factors	312.52**	132	2.37	.93	.09 (.08-.10)	.06
Second order hierarchical	312.52**	131	2.39	.93	.09 (.08-.10)	.06

Note. *N* = 163. CFI = comparative fit index; RMSEA = root mean square error of approximation; CI = confidence interval; SRMR = standardized root mean square residual.

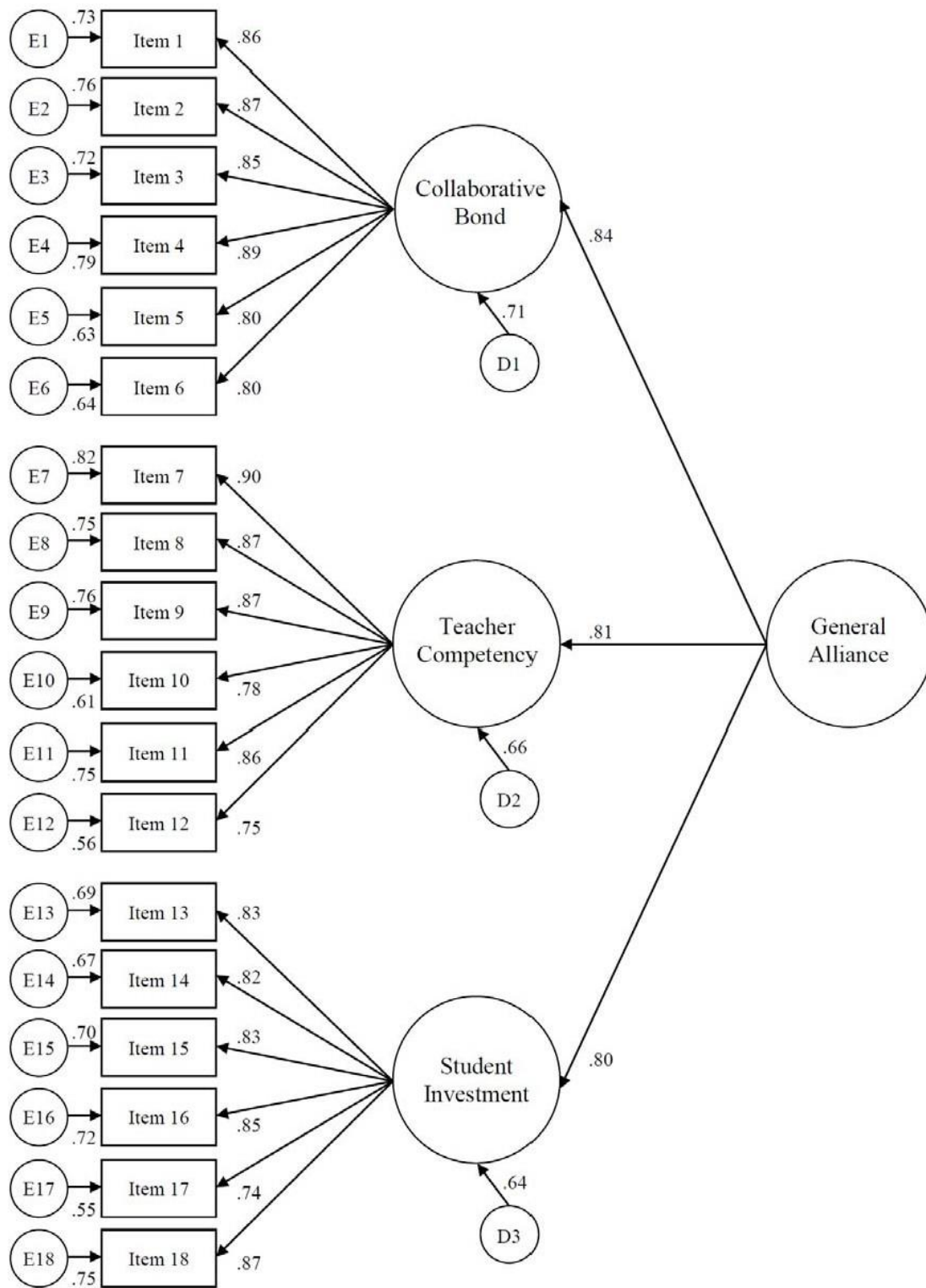
** *p* < .001

The lack of differentiation between the correlated, three-factors model and the second order hierarchical model may in part be due to the ability of the correlations between factors to approximate the higher order factor observed in the second order model. Given its ability to describe both general and specific components of the working alliance, I choose the hierarchical model as the best model to capture the data (see Figure 1). Importantly, the

path estimates between each item and the three constructs were all $> .70$ and statistically significant.

Reliability. The internal consistency for the three factors were judged to be adequate based on the following coefficient alphas: Collaborative Bond = .94, Teacher Competency = .93, Student Investment = .93. The internal consistency of the LAI total score was .95.

Figure 1. Second order hierarchical model of the Learning Alliance Inventory. All path coefficients are statistically significant ($ps < .01$).



Study 3

The purpose of Study 3 was to examine the temporal stability and criterion validity of the LAI, as well as its relationship to student learning.

Method

Participants. A sample of 123 participants, independent from those in Studies 1 and 2, were recruited from seven sections of an undergraduate psychology course at a large southeastern university. The majority earned either course or extra credit for their participation. Participants ranged in age from 18 to 63 years ($Mdn = 21$, $M = 23.73$, $SD = 7.43$), with 82% being between 18 and 26 years-old. The participants were and were predominantly female (74%) and Caucasian (71%).

Materials and procedure. The seven sections of the course each had a different instructor but were consistent in size, core content, and learning objectives. Participants were asked on two separate occasions to complete the 18-item LAI that resulted from the EFA in Study 1 and was confirmed by the CFA in Study 2. The LAI was administered in an online survey format each time. Participants completed the LAI in the 10th and 15th weeks of a 16-week semester in reference to their psychology course instructor. The time between completions ranged from 30 to 42 days ($M = 37.02$, $SD = 2.01$), with 80% of the participants' falling within the 35 to 41 day range. Of the 123 participants who completed the LAI at Time 1, 116 completed the LAI at Time 2. Participants also completed a 12-item teaching effectiveness evaluation form (TEEF) that is standard in all courses within the college unit. The items largely pertain to teacher performance in structuring, delivering, and administering the course (e.g., is prepared for class, effectively presents, gives timely feedback). This TEEF was completed in the 16th week of the semester. These evaluations are confidential, so response data were available for each of the seven instructors but could not be linked to a particular participant. Instructors for each section also reported participants' final numerical grades in the course after the conclusion of the semester.

Results and Discussion

Reliability. I examined the test-retest reliability of the LAI across the two points in the semester. I expected the working alliance to fluctuate over time given its basis in the participant's current perspective on interactions with the instructor and experience of the course. Research on the working alliance in psychotherapy contexts has highlighted such variability and sought to investigate its ramifications (e.g., Stiles, Agnew-Davies, Hardy, Barkham, & Shapiro, 1998). As a result, I anticipated that the levels of reliability between LAI completions would be moderate.

Pearson correlations for the 18 items across the two completions ranged from .50 to .78, with 15 of the 18 items having coefficients in to .50 to .65 range. Pearson correlations for the three scales across the two completions were as follows: Collaborative Bond = .63, Teacher Competency = .66, and Student Investment = .73. The Pearson correlation for the total score across the two completions was .68. All item, scale, and total score correlations were statistically significant at $p < .001$. Considering the elapsed time period, the magnitude of these test-retest correlations was consistent with those reported for other alliance measures (Luborsky et al., 1996; Schlosser & Gelso, 2005). As such, the test-retest reliability of the items, scales, and total score were judged to be good.

Validity. To examine the construct validity of the LAI, I used the Time 2 data to examine whether the LAI discriminated among instructors (Keeley, Smith, & Buskist, 2006). I conducted ANOVAs comparing the seven instructors on each of the three LAI scales and the

total score. To correct for the increased family-wise error rate, I used an alpha level of .0125. The instructors showed statistically significant differences on each of the four LAI indices, and I conducted Tukey post-hoc tests to identify statistically significant differences between instructors (see Table 4). The results of these analyses suggest that the LAI differentiated between instructors, with a general pattern of Instructors 1, 5, and 7 obtaining higher ratings than Instructor 2.

To further evaluate the construct validity of the LAI, I examined its correspondence to participants' evaluations of their instructors using the TEEF. There was considerable correspondence between the TEEF and LAI total score means. Instructors 5 and 7 received the highest and similar ratings on both measures, and Instructors 2 and 6 received the lowest and similar ratings. The clearest correspondence appeared between the TEEF and the LAI Teacher Competency scale, where the rank ordering of instructor means was identical. This likely occurred because the majority of TEEF items pertain to teacher performance.

Table 4. Differences Between Instructors on the LAI

Scale	F ^a	post-hoc comparisons
Collaborative Bond	4.83**	Instructor 2 < Instructors 1, 4, 5, 7
Teacher Competency	4.45**	Instructor 2 < Instructors 1, 5 Instructor 6 < Instructors 1, 5, 7
Student Investment	4.11**	Instructor 2 < Instructors 1, 5, 7
Total Score	5.51**	Instructor 2 < Instructors 1, 5, 7

Note. *N* = 116.

** *p* < .001

^a*df* = (6, 109).

Finally, I examined the relationship between the LAI and participants' numerical course grades. Partial correlations were used to control for participants' cumulative grade point averages (GPAs) at the beginning of the course. Results indicated statistically significant correlations between participants' course grade and the LAI Collaborative Bond, $r(113) = .19, p < .05$, Teacher Competency, $r(113) = .21, p < .05$, Student Investment, $r(113) = .25, p < .01$, and total score, $r(113) = .26, p < .01$.

General Discussion

Study 1 utilized iterative item development procedures and EFA to produce an 18-item measure of the working alliance with three distinct factors: Collaborative Bond, Teacher Competency, and Student Investment. These LAI factors and the total score showed good internal consistency. Efforts to produce items and a factor structure consistent with Bordin's (1979) general conceptual model of the working alliance appeared to be partially successful. The Collaborative Bond factor corresponded well to Bordin's model, and the Student Investment factor contained multiple items related to both goal agreement and task agreement. Although Bordin conceptually differentiated these two components, others have grouped them together both conceptually (Hougaard, 1994) and empirically (Hatcher & Barends, 1996). Their shared location on the Student Investment factor of the LAI suggests that students do not clearly differentiate task and goal agreement components of the working alliance they form with their instructor. I anticipated that items related to teacher characteristics and behaviors would load on bond, task, or goal factors according to their specific content. Instead, these items emerged as a distinct factor, Teacher Competency.

There is some debate regarding this construct in the working alliance literature related to clinical contexts. Some have sought to distinguish therapist variables from the working alliance, while others have argued that such characteristics are a critical piece of the working alliance (Asay & Lambert, 2002). In terms of the LAI, teacher characteristics and behaviors emerged as a critical component of the students' perceived working alliance.

Study 2 utilized CFA to validate the LAI factor structure in a new sample. Various indices revealed a mixture of good and acceptable levels of fit. When considered in conjunction with path estimates, the data supported the LAI factor structure derived in Study 1. The factors and total score again showed good internal consistency. Study 3 gave preliminary evidence of the LAI's reliability and construct validity. The three scales and total score demonstrated good test-retest reliability correlations over a 4-6 week period. The LAI also differentiated between instructors and did so in a manner that corresponded well to an additional measure of teacher effectiveness. Finally, the LAI factors and total score were positively correlated with participants' final, numerical grades in the course, as reported by instructors, even when controlling for their cumulative GPA. In total, the LAI appears to offer a theoretically grounded and psychometrically sound instrument for measuring the alliance that occurs between a student and teacher engaged in collaborative, purposive work.

By providing information about the quality of student-teacher collaboration, the LAI assess important aspects of students' learning experience that are not always well captured by existing measures. The LAI factor structure suggests that the student-teacher working alliance is enhanced when students perceive: 1.) their teacher as an engaged, welcoming, and competent expert; 2) the course as engaging and worthwhile; and 3.) their interactions with their teacher as based in understanding, genuine concern, and cooperation. Existing measures of students' perceptions tend to have a different focus. Institutional course evaluations, as well as standardized measures of teaching performance like the Course Experience Questionnaire (Ramsden, 1991), are geared more towards assessing the quality of the course and its delivery. Whereas course and teaching evaluations are often focused on aspects of the course as a product (e.g., appropriateness of the workload, assessments, content delivery, feedback), the LAI focuses on elements of the collaborative process engaged in by students and teachers.

Some limitations of the current study bear mentioning. First, assuming that the working alliance varies across a course, participants' responses to the LAI at any given point provide a better indication of the alliance at that moment than overall in the course. As such, the results of any administration of the LAI likely convey information about the immediate, contextual experiences of the student and must be used cautiously to infer a more global assessment. For the current studies, this aspect was deemed acceptable so long as the time of LAI completion during the semester was controlled to a degree. However, there may have been systematic differences in the working alliance for those completing the LAI earlier rather than later. Such potential differences were not examined. Second, there are likely differences in the working alliance across types of courses (e.g., large lecture vs. small seminar). There may also be differences across student characteristics (e.g., undergraduate vs. graduate, traditional vs. nontraditional). Although such differences would be consistent with working alliance theory, and may prove to be beneficial in using the working alliance to impact learning, I did not control for or examine these differences in the current studies.

The LAI holds much potential for use in future research. Subsequent studies must first examine the validity of the measure in greater detail. Specifically, the relation of the LAI to

existing measures of student and teacher behaviors and attributes (e.g., effective teaching behaviors, student motivation/engagement) must be determined. In particular, comparisons of the LAI to existing measures of teacher immediacy and student-teacher rapport are needed. The relationship between working alliance and measures of student learning must also now be thoroughly investigated. This work could include consideration of different aspects of the working alliance. For example, its level at various points during the semester may not have equal bearing on student learning. Fluctuations, such as sudden drops or ruptures, may jeopardize student learning. The pattern of working alliance development over time may also serve as a predictor of student learning.

With such future research, applications of the working alliance concept in the classroom will become clearer. Investigations into best practices for establishing, enhancing, and repairing the working alliance will be needed. Ultimately, instructors may benefit from assessing the alliance early in a semester and working to solidify it through interactions tailored to a particular student or group of students' needs. Until such research can provide more specific guidelines, the items and structure of the LAI offer a preliminary framework for instructors interested in enhancing the working alliances they form with their students.

First, the collaborative bond can likely be enriched by getting to know students individually and establishing a connection around something in addition to the course (e.g., shared interests). Instructors should also convey genuine concern for students' course performance and their wellbeing. Second, students are more likely to perceive a good working alliance with instructors they view as competent. But competency need not solely be about proven teaching experience and effectiveness. The LAI items suggest that instructors will be well served by demonstrating a passion for and a solid understanding of the course material. Instructors can also boost their perceived competency by welcoming a wide range of student ideas while maintaining clear and consistent standards. Lastly, student investment in the course appears key to a good working alliance. Students may more readily invest in a course when instructors have clearly established the goals and learning outcomes. Instructors should frequently communicate the immediate and long-term value of the course and provide engaging tasks that are linked to these goals.

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