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Behavioral analysis in the athletic training clinical learning environment

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Behavioral Analysis in the Athletic Training Clinical Learning Environment

Steven Allen Denhup, Jr., ATC

**Master's Thesis submitted to the
School of Physical Education
at West Virginia University
in partial fulfillment of the requirements
for the degree of**

**Master of Science
in
Athletic Training**

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Department of Athletic Training

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Abstract

Behavioral Analysis in the Athletic Training Clinical Learning Environment

Steven A. Denhup, Jr

Context: A means has been identified of taking inventory of clinical interactions and coding behaviors within the clinical learning environment of athletic training. However, these research studies are limited in scope. Furthermore, there is a lack of research correlating actual observed clinical behaviors with the perceived behaviors by the athletic training student and clinical instructor. *Objective:* The purpose of this study is to correlate the frequency and duration of observed behaviors with perceived behaviors as they occur in the athletic training clinical learning environment and analyze clinical instruction behavior frequency and duration trends over a period of six observation sessions. *Design:* This study utilized two designs: a correlation design of observed versus perceived behavior of approved clinical instructors (ACI) and athletic training student (ATS) behaviors and a single subject descriptive quantitative design using linear trend analysis of ACI clinical behaviors over time. The independent variable was time and the dependent variable was the frequency and duration of eight selected behaviors. *Setting:* This study took place at an NCAA Division-III college, within the athletic training clinic of a CAAHEP approved athletic training education program. *Patients or other participants:* Two female certified athletic trainers credentialed with ACI credentials (26 years SD 0.41 years) and three male and four female athletic training students were asked to participate in this study (n=3 sophomores, 3 juniors and 1 senior, 20.29 years SD 0.95 years). *Interventions:* This study employed the use of the Clinical Instruction Analysis Tool-Athletic Training II (CIAT-AT II) placed into Behavioral Evaluation Strategy and Taxonomy (BEST) software by Educational Consulting, Inc. The quantitative behavior-environment data generated and analyzed with the CIAT-AT II was defined as a set of observable events that have a quantifiable start and stop time. In addition to the CIAT-AT II, a clinical instruction questionnaire was administered to the subjects to document their perceived frequency and duration of eight selected behaviors. Subjects were evaluated six time periods during a competitive season. *Main outcome measures:* There will be a strong positive correlation between the data collected with the CIAT-AT II⁷ and the data reported on the clinical instruction questionnaire by each clinical instructor and the athletic training students during each data collection session. There will be a significant increase in the frequencies and durations of eight selected behaviors by the ACI captured with the CIAT-AT II⁷ and BEST software over six data collection sessions. *Results:* Only two ACI correlations were considered strong in this study even though they lacked clinical significance. Those are Skill Feedback: Evaluative ($r = .814$, $P = .049$) and Skill Feedback: Descriptive ($r = .723$, $P = .105$). All other ACI correlations were considered moderate to weak and lacked significance ($P > .05$) for the remaining six behaviors. Only two ATS correlations were considered strong in this study with clinical significance. They are Screening and Evaluative Technique: Manipulation ($r = .669$, $P = .017$) and Screening and Evaluative Technique: Documentation ($r = .886$, $P = .000$). All other ATS correlations were moderate to weak with two negative correlations and lacked significance ($P > .05$). None of the R^2 values were higher than .39 for frequency statistics. They ranged from .00 to .39, with skill feedback: descriptive having the highest R^2 for both ACI's. *Conclusions:* The result of this study suggests that the individuals within the clinical learning environment are unaware of the behaviors they exhibit. Additionally, due to a low R-squared value, there is a lower degree of relationship between the independent variable of time and the dependent variables of the behaviors.

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INTRODUCTION

The clinical learning environment is defined as an interactive network of forces, which influence student learning outcomes in the clinical setting.¹ For the athletic training student, it is the arena of clinical education, which allows the student to develop crucial application skills. Purtilo² emphasizes that professional education is not the acquisition of classroom knowledge, but rather integrates several kinds of learning experiences, all directed toward gaining professional competence. While the clinical learning environment is structured to provide an arena for clinical education in athletic training, the opportunity for learning and interaction is dependent upon interactions of those within it, such as the clinical instructor and athletic training students. Athletic trainers in an educational setting have recently taken on dual responsibilities, both as an athletic trainer and an approved clinical instructor (ACI). Today such terms as supervising athletic trainer and approved clinical instructor have become melded.

Evaluation of the clinical environment has been evident in medical and nursing education. Hekelman and Blase³ emphasized that excellent one on one teaching within medical programs required both the educators' understanding of specific communication skills that create effective and humanistic instruction. Additionally, they must understand that teaching is the true heart of medical schools, therefore supporting the professional development of the faculty required to foster teaching programs. In nursing programs, specific teaching behaviors such as the ability to provide specific and timely feedback to students and the ability to convey a positive, concerned attitude have showed significant relationships with both cognitive and performance outcomes.⁴

Until a recent study by Laurent and Weidner⁵, which examined helpful clinical instructor characteristics as perceived by athletic training students (ATS), there was little research on the responses of both athletic training students and clinical instructors in reference to helpful teaching characteristics. Laurent and Weidner⁵ referred to the importance of the clinical instructor to serve as the facilitator and integrator of athletic training knowledge and skills. Curtis et al.^{4,6} found in an earlier critical incident study on clinical supervisor behaviors, that athletic training students desired more interaction with clinical instructors; for example, students desired to be included more in the application of clinical skills, such as injury evaluation and rehabilitation.

Recent literature has identified behaviors, which students perceive as helpful characteristics of clinical instructors, such as constructive feedback.⁶ However, questions exist as to whether clinical instructors are displaying these behaviors in the clinical learning environment and how can one assess the prevalence of clinical behaviors? Stemmans and Gangstead⁷ identified through observation, clinical instructor, athletic training student and student athlete behaviors in the clinical education setting of athletic training. The Clinical Instruction Analysis Tool-Athletic Training II⁷ (CIAT-AT II) identifies and inventories more than eleven behavioral items, which are either initiated by the clinical instructor, athletic training student or student athlete. Items within the Clinical Analysis Tool- Athletic Training II⁸, such as skill and behavioral feedback categories, can be related to findings suggesting that students desire similar behaviors associated with their clinical instructors.⁶

Taking into consideration the impact of the clinical instructor behaviors on the athletic training students' level of clinical education, there is increasing need to use

observational methods of assessing behaviors in clinical education. The literature has clearly defined clinical instructor characteristics, which athletic training students feel are the most and least beneficial in facilitating student learning.^{5,6} In addition, clinical research⁷ has identified a means of taking inventory of clinical interactions and coding behaviors within the clinical learning environment of athletic training. However, the research studies are limited in scope. To this day the CIAT-AT II tool, perfected by Stemmans with the combination of an expanded version to include additional evaluation and skill feedback intensive behaviors, has only been used to look at interactions within the athletic training clinical environment. The newly implemented ACI guidelines by the NATA Education Council provide a basis as to what is expected of the ACI, but provide no basis for evaluation to see if these behaviors are being demonstrated in the athletic training environment. The CIAT-ATII could be a viable tool to observe if these behaviors are being demonstrated. Therefore, it was the intent of the researcher to utilize the CIAT-AT II as an evaluative tool for ACI's in the athletic training environment by not only evaluating observed behaviors, but also correlating observed clinical behaviors with the perceived behaviors by the athletic training student and approved clinical instructor. Hence, the overall purpose of this study was to utilize the CIAT-AT II as an evaluative tool to determine if specific behaviors related to those required of an ACI are being demonstrated within the athletic training clinical environment through 1) correlating the frequency and duration of observed behaviors with perceived behaviors as they occur in the athletic training clinical learning environment and 2) analyzing clinical instruction behavior frequency and duration trends using the eight additional behaviors determined by Stemmans over a period of six observation sessions.

METHODS

This study utilized two designs: a correlation design of observed versus perceived behavior of ACI and ATS behaviors and a single subject descriptive quantitative design using linear trend analysis of ACI clinical behaviors over time. The independent variable was time and the dependent variable was the frequency and duration of eight selected behaviors within the CIAT-AT II^{7,10,11} instrument (Behavioral Feedback, Skill Feedback Corrective, Skill Feedback Evaluative, Skill Feedback Descriptive, Screening/evaluative technique: Questioning, Screening/evaluative technique: Clarifying, Screening/evaluative technique: Documentation and Screening/evaluative technique: Manipulation).

Subjects

Two female certified athletic trainers credentialed with ACI credentials and three male and four female athletic training students were asked to participate in this study (n=3 sophomores, 3 juniors and 1 senior). The mean age for the ACI's was 26 years \pm 0.41 and the mean age for the seven athletic training students was 20.29 years \pm 0.95. The ACI's mean years of being a certified athletic trainer was 3.5 years \pm 0.71. The approved clinical instructors received their clinical instructor training by a clinical instructor educator (CIE) not involved in this study, five months prior to initiation of this study. In addition to being trained by the CIE at the data collection site, one of the ATC's was credentialed as a CIE. All student athletes were intercollegiate NCAA Division-III athletes at the college. Subjects were observed while at the clinical site in clusters of one approved clinical instructor with three athletic training students and one student athlete. Approval from West Virginia University's Institutional Review Board for Protection of Human Subjects and Waynesburg College Professional Development

Committee was obtained prior to the start of the study. All subjects involved in the videotaping section of the study completed an informed consent prior to the study (Table C2) and received a cover letter if not involved in the videotaping portion (Table C3). All subjects completed a demographic questionnaire prior to the study (Table C4).

Instrumentation

This study employed the use of the CIAT-AT II. The CIAT-AT was originally developed by Gardner¹³ in an effort to systematically identify interaction behaviors within athletic training settings. Subsequent work by Stemmans and Gangstead⁷ modified the instrument to include a final list of interaction behaviors, specifically behaviors that were not covered under the original instrument CIAT-AT¹¹. The behavior modifications by Stemmans and Gangstead⁷ included expanding the Praise and Encouragement and Criticizes or Justifies Authority to include Behavioral Feedback and Skill Feedback (corrective, evaluative and descriptive). Additionally, a second modification included expansion of Gives Directions (non-verbal/demonstrates) behavior to also include Screening/Evaluative Techniques, such as Questioning, Explaining, Documentation and Manipulation. Stemmans and Gangstead's⁷ resulting modification of the CIAT-AT became known as the CIAT-AT II.

Seventeen behaviors are included in the CIAT-AT II. Each behavior is associated with a letter A-Q, (for example A = Behavioral Feedback) and then each initiation of behavior was coded 1-3, with 1 = clinical instructor, 2 = athletic training student and 3 = student athlete. The categories of Screening/Evaluative Techniques were used only when initiated by an approved clinical instructor or athletic training student.¹¹ Silent observation and non-interpretive behaviors were not coded with numbers, due to the

undeterminable nature of initiation.¹¹ There are a total of forty-three combinations of behaviors and initiators and the Non-interpretive behavior is identified in raw data only, thus excluded from further analysis.¹¹ Stemmans and Gangstead⁷ determined face validity of the CIAT-AT II through evaluation by a panel of three athletic training education research experts prior to conducting inter-observer agreement. The panels of three experts used for evaluation of face validity were researchers who act as program directors of allied health educational programs. After expert evaluation, their responses supported content validity and no substantive changes were made to the CIAT-AT II.

Determination of reliability of the CIAT-AT II was through inter-observer reliability procedures. Stemmans and Gangstead's⁷ observer training procedures included orientation to the CIAT-AT II, category learning, introduction to coding forms and practice of coding. Video records were used for inter-observer agreement. The trained observers independently coded and summarized the data from twenty-minute video records using the CIAT-AT II. Additionally, computation of the inter-observer agreement was accomplished through the scored-interval method. Eighty-five percent (85%) was determined as the accepted standard for an instrument with more than eleven categories. Lastly, two sets of raw data forms were used for comparison and percentage of agreement was determined as 95.4%. Thus, the CIAT-AT II instrument met the standard of 85%. Reliability analysis was utilized prior to this study to determine the intra-observer and inter-observer reliability of the CIAT-AT II as a real-time data collection tool of clinical behaviors. A second purpose of reliability analysis was to further familiarize the researcher with the use of this tool and the use of the method of recording real-time behavioral data. Reliability analysis using Kohen's Kappa statistic was utilized for

analysis of a five minute videotaped period of clinical instruction. It was the intention of using a pilot study to reduce the risk of error, by familiarizing the researcher with the CIAT-AT II tool and real-time recording procedures. Intra-observer reliability using Kohen's Kappa statistic was set at an interval of 1.00. Overall intra-observer reliability was at a level of $K= 0.9979$ and inter-observer reliability at a level of $K= 0.9344$ prior to the start of the study.

The CIAT-AT II was placed into Behavioral Evaluation Strategy and Taxonomy (BEST) software.¹² The BEST software is a flexible, real-time data collection and analysis system for observational data.¹² The quantitative behavior-environment data generated and analyzed will be defined as a set of observable events that have a quantifiable start and stop time

Administrative Procedures

The participants in the study completed an informed consent form for the videotaped reliability analysis, and received a cover letter that described the procedures and the study in detail when involved in the non-videotaped data collection. The participants were asked to fill out the demographic and clinical instruction questionnaire at the beginning of the data collection portion of the clinical period. All video recordings utilized for reliability analysis of the tool were destroyed at the end of this study to further protect confidentiality.

Both the video camera used for reliability analysis and the laptop computer/data collection tool and researcher were arranged in an area of the athletic training clinical setting, so that proper collection of clinical instruction data could occur and collection did not interfere with the daily activities of those within the clinical setting. The situations

analyzed were candid portions of a normal day, during normal clinical instruction time periods. Each data collection period focused on the approved clinical instructor chosen for that session. Clinical instructors and their assigned three athletic training students remained constant throughout the study; however, variations in the athletic training students did occur due to clinical scheduling. Variations in student athletes occurred, in reference to nature of treatment, rehabilitation and injury occurrence. Unlike Stemmans^{7,10,11} and Gardner¹³ who used the scored interval method of recording data, the clinical instruction period was analyzed using a real time computerized method to measure behavior frequency and duration of clinical behaviors. The Behavioral Evaluation Strategy and Taxonomy (BEST) software by Educational Consulting, Inc. and Skware¹² was utilized for data collection and analysis. The quantitative behavior-environment data generated and analyzed was defined as a set of observable events that have a quantifiable start and stop time. More specifically, in this study data collection alternated every 100 seconds between the clinical instructor, athletic training student and student athlete. This method of alternating time periods of data collection within collection periods had been utilized in the physical education teacher education field and allows for less confusion on the researcher's part while attempting to collect data on all three individuals across all behaviors. However, this also allowed for data collection to occur one-third (33%) of the 20-minute period for each individual. Data from the student athlete was recorded during the data collection period, because this individual has been included in the CIAT-AT II tool. Data from the student athlete was not correlated in this study due to the primary focus of study being on the correlation of observed behaviors and perceived behaviors from the ACI and ATS.

Data Collection

Data collection occurred over the winter athletic season at Waynesburg College. The collection of behavioral data (Table C6) occurred six times for the two ACI's for a total of twelve data collection sessions. The data collection tools, which include the laptop computer with the BEST software installed, the clinical instruction questionnaire and a list of behavioral definitions were stored in a locked room at the site of study. A coding system was constructed for the data collection tool in the BEST software for those involved in the study. Additionally, all ATS questionnaires were marked by one code for that day, by condensing ATS questionnaires data under one data file to match data collected for all ATS using the BEST software.

Following the 20-minute data collection period, the clinical instruction questionnaire was administered to the participants. The participants were asked to fill out the questionnaire and to record two numbers relating to the total number of times they perceived themselves exhibiting the behaviors found in the CIAT-AT II and the total perceived duration they exhibited the behaviors found in the CIAT-AT II. The individuals completing the questionnaire were given definitions of the behaviors on the questionnaire. The list of behavior definitions (Table C7) were collected once the questionnaire was completed for that day to decrease any learning factor associated with completion of the questionnaire.

Data Analysis

Data files to be analyzed (Table C8) could be found under the coding system pre-established. For example, if the data file for the clinical instructor was to be analyzed for data collection day 092202, selecting file CI092202 will allow for analysis of this file.

Once the file was selected data analysis occurred under the statistics function the option of Time Frequency Analysis will be selected. This function allowed for a table to appear, which included all recorded behaviors for Key, Frequency, Duration, Mean-Duration, Percent-Duration and Rate. Analysis of the frequency and duration data was utilized for statistical correlation between observed data and perceived data in the statistical analysis section. The Time Frequency Analysis occurred for each individual (CI, ST and SA) after the data collection period commenced.

Prior to statistical analysis, the frequencies and durations reported on the clinical instruction questionnaire were calculated by a correction factor of 0.33. This correction factor was necessary, due to the alternating collection of data between the clinical instructor, athletic training student and student athlete. Alternation between the ACI, athletic training student and student athlete allowed for only one-third of each individual's behavior to be captured on through the CIAT-AT II on BEST software. Each data collection period occurred for precisely 20-minutes or 1200 seconds, thus each individual's behavior was collected for a total of 400 seconds ($400 \text{ seconds} / 1200 \text{ seconds} = \text{Correction factor of } 0.33$). Due to the collection of only one-third of clinical behaviors with the CIAT-AT II and BEST software, the correction factor was necessary for equivalent comparisons of data sets. Without this correction factor of 0.33, the clinical behaviors captured with the CIAT-AT II and BEST software would be for a time span of 400 seconds and the clinical behaviors reported with the questionnaire would be for a time span of 1200 seconds, thus leaving incomparable data sets.

Statistical Analysis

Using SPSS-11.5, a Pearson bivariate correlation (P-value set at $P = 0.05$) analysis was utilized for each data collection time period for analysis between the total mean of observed behaviors with the BEST software and the total means of perceived behaviors documented by each individual on the questionnaire (Table C9).

Initially, a 1x6 Analysis of Variance (ANOVA) Repeated Measures was to be utilized but was unable to be performed due to low power values. Linear trend analysis occurred using Microsoft Excel graphical display of the sum mean frequency and duration of the eight selected behaviors of the clinical instructors over the six observation periods (Table C10). Included in the linear trend analysis is a line of best fit, giving the predicted trend line based on the relationship between the dependent variable on the independent variable. There are eight selected behaviors, which were chosen due to their emphasis on clinical instruction provided during the selected observation periods. The selected behaviors from the CIAT-AT II are, Behavioral Feedback, Skill Feedback Corrective, Skill Feedback Evaluative, Skill Feedback Descriptive, Screening/evaluative technique: Questioning, Screening/evaluative technique: Clarifying and Explaining, Screening/evaluative technique: Documentation and Screening/evaluative technique: Manipulation

RESULTS

The following tables summarize the ACI and ATS frequencies and durations for the eight selected behaviors for each session. Table D1 summarizes ACI 1 and ATS Group 1 for session one. Table D2 summarizes ACI 2 and ATS Group 2 for session one. Table D3 summarizes ACI 1 and ATS Group 1 for session two. Table D4 summarizes

ACI 2 and ATS Group 2 for session two. Table D5 summarizes ACI 1 and ATS Group 1 for session three. Table D6 summarizes ACI 2 and ATS Group 2 for session three. Table D7 summarizes ACI 1 and ATS Group 1 for session four. Table D8 summarizes ACI 2 and ATS Group 2 for session four. Table D9 summarizes ACI 1 and ATS Group 1 for session five. Table D10 summarizes ACI 2 and ATS Group 2 for session five. Table D11 summarizes ACI 1 and ATS Group 1 for session six. Table D12 summarizes ACI 2 and ATS Group 2 for session six.

Approved Clinical Instructor Correlation Between Perceived and Observed Behavior

Pearson correlation coefficients for each perceived behavior frequencies were compared to the actual behavior frequency (Table D13) utilizing the mean of the two approved clinical instructors. Only one strong correlations was present in this study with statistical significance. This was Skill Feedback: Evaluative ($r = .814$, $P = .049$). One correlation was strong yet lacked statistical significance, this was Skill Feedback: Descriptive ($r = .723$, $P = .105$). All other correlations were considered moderate to weak starting with Screening and Evaluative Technique: Clarifying and Explaining ($r = .599$, $P = .209$), Screening and Evaluative Technique: Questioning ($r = .430$, $P = .394$), Screening and Evaluative Technique: Manipulation ($r = .301$, $P = .562$), Skill Feedback: Corrective ($r = -.272$, $P = .602$), Screening and Evaluative Technique: Documentation ($r = .243$, $P = .643$) and Behavioral Feedback ($r = -.174$, $P = .742$).

Pearson correlation coefficients for each perceived behavior duration was compared to the actual behavior duration (Table D13) utilizing the mean of the two approved clinical instructors. Only two correlations were considered strong in this study even though they lacked statistical significance. Those are Skill Feedback: Descriptive (r

= .780, $P = .067$) and Screening and Evaluative Technique: Questioning ($r = .700$, $P = .122$). All others were considered moderate to weak starting with Screening and Evaluative Technique: Manipulation ($r = .416$, $P = .412$), Skill Feedback: Corrective ($r = -.368$, $P = .473$), Screening and Evaluative Technique: Documentation ($r = -.361$, $P = .482$), Behavioral Feedback ($r = .267$, $P = .609$) and Duration of Skill Feedback: Evaluative ($r = .169$, $P = .749$).

Pearson correlation coefficients for each perceived behavior frequency were compared to the actual behavior frequency (Table D14) utilizing the mean of the seven athletic training students. All the correlations were in the moderate to weak range with some values in the negative range. The values are Screening and Evaluative Technique: Documentation ($r = .560$, $P = .058$), Screening and Evaluative Technique: Manipulation ($r = .317$, $P = .316$), frequency of Skill Feedback: Evaluative ($r = .058$, $P = .859$), Skill Feedback: Corrective ($r = .018$, $P = .955$), Skill Feedback: Descriptive ($r = -.246$, $P = .441$), Screening and Evaluative Technique: Questioning ($r = -.089$, $P = .784$), Screening and Evaluative Technique: Clarifying and Explaining ($r = -.062$, $P = .848$) and Behavioral Feedback ($r = -.041$, $P = .899$).

Pearson correlation coefficients for each perceived behavior duration was compared to the actual behavior duration (Table D14) utilizing the mean of the seven athletic training students. Only two correlations were considered strong in this study with statistical significance. They are Screening and Evaluative Technique: Manipulation ($r = .669$, $P = .017$) and Screening and Evaluative Technique: Documentation ($r = .886$, $P = .000$). All other correlations were moderate to weak with two negative correlations. They are Skill Feedback: Evaluative ($r = .261$, $P = .413$), Behavioral Feedback ($r = .030$,

P = .925), Screening and Evaluative Technique: Questioning (r = .027, P = .933), duration of duration of Skill Feedback: Corrective (r = .178, P = .579), Skill Feedback: Descriptive (r = -.218, P = .496), and Screening and Evaluative Technique: Clarifying and Explaining (r = -.150, P = .642).

Approved Clinical Instructor Observed Behavior Frequency Over Time

None of the R^2 values were higher than .39 for frequency statistics. They ranged from .00 to .39, with skill feedback: descriptive having the highest R^2 for both ACI's. According to the line of best fit, over the six time periods, the dependent variables should have remained the same, rose steadily or decreased steadily.

For Screening and Evaluative Technique: Manipulation an R^2 value for ACI 1 was recorded at $R^2 = 0.03$, while for ACI 2 $R^2 = 0.19$ (Table D15). Thus 3% and 19% of variance in behavior frequency is accounted for by the predictor variable of time, respectively. According to the predicted line of best fit, frequency values for ACI 1 use of Screening and Evaluative Technique: Manipulation should have decreased steadily over the six sessions and ACI 2 increased over the six sessions (Figure D1).

For Behavioral Feedback an R^2 value for ACI 1 was recorded at $R^2 = 0.07$, while ACI 2 $R^2 = 0.10$ (Table D15). Thus 7% and 10% of variance in behavior frequency is accounted for by the predictor variable of time, respectively. According to the predicted line of best fit, frequency values for ACI 1 and ACI 2 use of Behavioral Feedback should have risen steadily over the six sessions (Figure D2).

For Skill Feedback: Descriptive an R^2 value for ACI 1 was recorded at $R^2 = 0.39$, while ACI 2 $R^2 = 0.32$ (Table D15). Thus 39% and 32% of variance in behavior

frequency is accounted for by the predictor variable of time, respectively. According to the predicted line of best fit, frequency values for ACI 1 use of Skill Feedback: Descriptive should have decreased steadily over the six sessions while ACI 2 should have risen steadily over the six sessions (Figure D3)

For Screening and Evaluative Technique: Questioning an R^2 value for ACI 1 was recorded at $R^2 = 0.26$, while ACI 2 $R^2 = 0.02$ (Table D15). Thus 26% and 2% of variance in behavior frequency is accounted for by the predictor variable of time, respectively. According to the predicted line of best fit, frequency values for ACI 1 use of Screening and Evaluative Technique: Questioning should have risen steadily over the six sessions and ACI 2 should have decreased steadily over the six sessions (Figure D4).

For Skill Feedback: Evaluative an R^2 value for ACI 1 was recorded at $R^2 = 0$, while ACI 2 $R^2 = 0.12$ (Table D15). Thus 0% and 12% of variance in behavior frequency is accounted for by the predictor variable of time, respectively. According to the predicted line of best fit, frequency values for ACI 1 use of Skill Feedback: Evaluative should have remained constant over the six sessions and ACI 2 should have risen steadily over the six sessions (Figure D5).

For Skill Feedback: Corrective an R^2 value for ACI 1 was recorded at $R^2 = 0.28$, while ACI 2 $R^2 = 0.17$ (Table D15). Thus 28% and 17% of variance in behavior frequency is accounted for by the predictor variable of time, respectively. According to the predicted line of best fit, frequency values for ACI 1 use of Skill Feedback: Corrective should have decreased steadily over the six sessions and ACI 2 should have risen steadily over the six sessions (Figure D6).

For Screening and Evaluative Technique: Documentation An R^2 value for ACI 1 was recorded at $R^2 = 0.02$, while R^2 values for ACI 2 was recorded at $R^2 = 0$ (Table D15). Thus 2% of variance in behavior frequency is accounted for by the predictor variable of time. According to the predicted line of best fit, frequency values for ACI 1 use of Screening and Evaluative Technique: Documentation should have risen steadily over the six sessions and no change in ACI 2 should have occurred over the six sessions (Figure D7).

For Screening and Evaluative Technique: Clarifying and Explaining an R^2 value for ACI 1 was recorded at $R^2 = 0.09$, while ACI 2 $R^2 = 0.26$ (Table D15). Thus 9% and 26% of variance in behavior frequency is accounted for by the predictor variable of time, respectively. According to the predicted line of best fit, frequency values for ACI 1 use of Screening and Evaluative Technique: Clarifying and Explaining should have risen steadily over the six sessions and ACI 2 should have risen steadily over the six sessions (Figure D8).

Approved Clinical Instructor Observed Behavior Duration Over Time

None of the R^2 values were higher than .47 for duration statistics. They ranged from .003 to .47, with Skill Feedback: Descriptive recording the highest R^2 values for each ACI. According to the line of best fit, over the six time periods, the dependent variables should have remained the same, rose steadily or decreased steadily.

For Screening and Evaluative Technique: Manipulation an R^2 value for ACI 1 was recorded at $R^2 = 0.03$, while for ACI 2 $R^2 = 0.25$ (Table D16). Thus 3% and 25% of variance in behavior duration is accounted for by the predictor variable of time,

respectively. According to the predicted line of best fit, duration values for ACI 1 and ACI 2 use of Screening and Evaluative Technique: Manipulation should have rose steadily over the six sessions (Figure D9).

For Behavioral Feedback an R^2 value for ACI 1 was recorded at $R^2 = 0.12$, while ACI 2 $R^2 = 0.06$ (Table D16). Thus 12% and 6% of variance in behavior duration is accounted for by the predictor variable of time, respectively. According to the predicted line of best fit, duration values for ACI 1 and ACI 2 use of Behavioral Feedback should have risen steadily over the six sessions (Figure D10).

For Skill Feedback: Descriptive an R^2 value for ACI 1 was recorded at $R^2 = 0.44$, while for ACI 2 was recorded at $R^2 = 0.47$ (Table D16). Thus 44% and 47% of variance in behavior duration is accounted for by the predictor variable of time, respectively. According to the predicted line of best fit, duration values for ACI 1 use of Skill Feedback: Descriptive should have decreased steadily over the six sessions and ACI 2 should have risen steadily over the six sessions (Figure D11).

For Screening and Evaluative Technique: Questioning an R^2 value for ACI 1 was recorded at $R^2 = 0.18$, while for ACI 2 $R^2 = 0.003$ (Table D16). Thus 18% .03% of variance in behavior duration is accounted for by the predictor variable of time, respectively. According to the predicted line of best fit, duration values for ACI 1 use of Screening and Evaluative Technique: Questioning should have risen steadily over the six sessions and ACI 2 should have remained constant over the six sessions (Figure D12).

For Skill Feedback: Evaluative an R^2 value for ACI 1 was recorded at $R^2 = 0.01$, while for ACI 2 $R^2 = 0.07$ (Table D16). Thus 1% and 7% of variance in behavior duration is accounted for by the predictor variable of time, respectively. According to the

predicted line of best fit, duration values for ACI 1 use of Skill Feedback: Evaluative should have decreased steadily over the six sessions and ACI 2 use of Skill Feedback: Evaluative should have risen steadily over the six sessions (Figure D13).

For Skill Feedback: Corrective an R^2 value for ACI 1 was recorded at $R^2 = 0.18$, while for ACI 2 $R^2 = 0.31$ (Table D16). Thus 18% and 31% of variance in behavior duration is accounted for by the predictor variable of time, respectively. According to the predicted line of best fit, duration values for ACI 1 use of Skill Feedback: Corrective should have decreased steadily over the six sessions and ACI 2 should have risen steadily over the six sessions (Figure D14).

For Screening and Evaluative Technique: Documentation an R^2 value for ACI 1 was recorded at $R^2 = 0.02$, while for ACI 2 $R^2 = 0$ (Table D16). Thus 2% and 0% of variance in behavior duration is accounted for by the predictor variable of time, respectively. According to the predicted line of best fit, duration values for ACI 1 use of Screening and Evaluative Technique: Documentation should have risen steadily over the six sessions and ACI 2 should have remained constant over the six sessions (Figure D15).

For Screening and Evaluative Technique: Clarifying and Explaining an R^2 value for ACI 1 was recorded at $R^2 = 0.14$ while for ACI 2 $R^2 = 0.07$ (Table D16). Thus 14% and 7% of variance in behavior duration is accounted for by the predictor variable of time, respectively. According to the predicted line of best fit, duration values for ACI 1 and ACI 2 use of Screening and Evaluative Technique: Clarifying and Explaining should have risen steadily over the six sessions (Figure D16).

DISCUSSION

Research hypothesis number one was rejected, because the results for the behavior correlations demonstrated that ACI and ATS did not show a strong positive correlation with all perceived and observed behaviors. ACI use of Skill Feedback: Evaluative showed a strong positive correlation ($r = .814, P < 0.05$) between the perceived frequency of behavior use and the observed behavior frequency, thus the ACI's perception of frequency of Skill Feedback: Evaluative increased along with their observed frequency of behavior. Furthermore, the ACI use of Skill Feedback: Descriptive showed a strong correlation ($r = .723, P > 0.05$); between the perceived frequency of behavior use and the observed behavior frequency; however, this correlation lacked statistical or clinical significance. Additionally, the ACI duration of Skill Feedback: Descriptive and Screening and Evaluative Technique: Questioning showed strong correlations ($r = .780, P > 0.05$ and $r = .700, P > 0.05$) between the perceived duration of behavior and the observed duration of behavior; however these correlations lacked statistical or clinical significance. All other ACI behavior perceived versus observed frequency and duration correlations demonstrated moderate to weak correlation values and lacked statistical significance. The ATS correlation results demonstrated that the ATS use of Screening and Evaluative Technique: Manipulation and Documentation showed strong positive correlations ($r = .669, P < 0.05$ and $r = .886, P < 0.01$) between the perceived durations of behavior use and the actual observed behavior durations, thus as the ATS's perception of duration of skill use increased along with their observed duration of skill use. All other ATS behavior perceived versus observed frequency and

duration correlations demonstrated weak correlation values and lacked statistical significance.

To determine the influence of the dependent variable of behaviors as influenced by time, linear trend analysis was utilized to determine R-squared value or the coefficient of determination. The R^2 tells the percent of the variation in the independent variable that is explained (determined) by the model and the dependent variable. Low R-squared values were confirmed during analysis, which means the existence of a low degree of relationship and a high degree of variance between the independent variable of time and the dependent variable of behavior. Thus, a true relationship was not found to exist between time or data sessions and behavior frequency and duration. Within the linear trend model, there were other variables that accounted for the large degree of variance between the changes in linear trends over time.

Research hypothesis number two was rejected, because the results for the ACI 1 and ACI 2 linear trend analysis of behavior frequency and durations over the six data sessions demonstrated low R-squared values (ACI 1: $R^2 = 0.39, 0.44$ and ACI 2: $R^2 = 0.32, 0.47$) for the duration of Skill Feedback: Descriptive. Furthermore, the results for ACI 1 and ACI 2 linear trend analysis of behavior frequencies and durations over the six data sessions verified low R-squared values for all behaviors.

Relationship Between Perceived and Observed Behavior

Significant correlations with the ACI use of Skill Feedback: Evaluative and the ATS duration of Screening and Evaluative Technique: Manipulation occurred as a result of this study. This can be associated with a combination of behaviors relating to

occurrence of mentoring. The most important behavior by the clinical instructor, which athletic training students feel is of greatest concern to them, is mentoring.⁴ The CIAT-AT II defines the specific ACI evaluative behavior of skill feedback as “a response to a psychomotor skill in which the intent is to have the subject synthesize the value about the skill.”¹¹ This behavior is one that an ACI would be expected to exhibit in a mentoring capacity. The ACI use of reinforcement through skill feedback behaviors, could likely affect the ATS use of screening and evaluative behaviors, such as with the positive correlation of manipulation. As the student synthesized the value of certain skills, their initiation of clinical behaviors, such as manipulation of the athlete demonstrated an ability to recognize their performance of this skill.

The concept of self-efficacy or one’s belief about competence to successfully perform a task can be related to mentoring. The idea of self-efficacy in the athletic training clinical environment can affect motivation, interests and achievement.¹⁴ As previously mentioned, when an ACI performed a skill feedback behavior, the student may have responded through using more manipulation of the athlete (special tests and manual muscle testing), through the use of special testing techniques. Peer and McClendon¹⁴ note that educational activities in the clinical environment should foster self-efficacy through the use of social interaction. This will enable the learning environment to be structured with the de-emphasizing of competition and highlighting self-comparison of progress, to build a sense of self-efficacy and promote academic achievement.

At first, it was thought that weaker correlations between perceived behaviors and observed behaviors could be associated with the use of the correction factor. Data was

rerun without the use of a correction factor and it was determined that the correction factor was not an issue in the analysis of data.

Lastly, the time delay between the end of behavior observations and the subject filling out the clinical instruction questionnaire could have been another factor. Due to the dynamic environment of the athletic training clinic, there was limited time to fill out the questionnaire immediately following the twenty-minute observation period, thus a subject may have been unable retain memory of specific behavior frequency and durations.

Approved Clinical Instructor Observed Behavior Frequency Over Time

The CIAT-AT II tool originally included seven behaviors that were determined by Gardner¹³ and then later perfected by Stemmans and Gangstead¹¹ with the addition of eight more behaviors. Those eight behaviors were then selected for this study because they best reflect what should be incorporated by an ACI in the clinical setting. However, the scenario (evaluation or rehabilitation), the assigned sport, the level of the athletic training student assigned (sophomore, junior or senior status) and the ACI level of clinical instructor experience also influenced the results.

The least amount of variance between time and behavior duration was seen with the ACI's use of Skill Feedback: Descriptive. This behavior possibly was influenced by time the greatest, because the behavior centers on description of a skill to the ATS. Explanation for this closer relationship with time could include that as an ACI became increasingly familiar over the season with the ATS's and student athletes the ACI began to elaborate in greater detail on ATS clinical techniques. Thus, by increasing their

elaboration (duration) of certain skills to the ATS, there was a stronger graphical relationship of the behavior over time.

A higher degree of variance (as seen by the high outliers) was demonstrated between time and behavior frequency and durations for all other behaviors. Whether the situation observed was evaluation or new injury rehabilitation in nature could explain the high degree of variance between time and behavior frequency and durations. For example, out of the six sessions, ACI 1 in session five during an evaluative intensive (new injury) demonstrated high levels of all exhibited behavior frequencies except for documentation (mean = 43.38) and durations (mean = 27.03). This suggests that within the clinical learning environment behaviors are possibly highest as a new injury evaluation takes place. However, documentation was not recorded for any sessions related to injury evaluation by the ACI's. The reason behind this is that ATS's at this clinical site are more involved in the documentation during injury evaluation and rehabilitation.

Three out of four screening and evaluative technique behaviors increased with both ACI 1 and ACI 2 when looking at the linear trend over the six sessions; however, the situations included both evaluative and new injury rehabilitation intense situations. This could suggest that throughout an injury evaluation and the initiation or application of a new injury rehabilitation program, constant evaluation and monitoring of the patient occurs.

The sport in season during data observations could also explain the high degree of variance between time and behavior frequency and duration. The two sports, around which this study focused, were wrestling and men's basketball. The sport of basketball is

classified as primarily being a lower extremity injury sport and wrestling being a mixed extremity injury sport. Miller and Berry¹⁵ found that with increased exposure to lower extremity or mixed extremity sports, such as basketball and wrestling, students assigned to these sports spend significantly more time engaged in active learning. The association with this study around basketball and wrestling may provide significant evidence for the increasing trends in behaviors over the six sessions.

The level of athletic training students assigned to the ACI could be another variable associated with the relationship between time and increasing behavior trends. ACI 2 provided coverage to the sport of basketball and through demographic analysis had the greatest number of first-year athletic training students assigned to her throughout the study. A student's academic standing has a profound effect on their level of clinical education or interactions.¹⁵ Advanced students spend 41% of their time engaged in active learning compared with novice students who spend 22 % of their time engaged in active learning. Novice students are unsure of their roles and withdraw from active participation to become a passive observer. Freshman and sophomore athletic training students also have been found to complete more directly supervised clinical education experiences, thus possibly adding more evidence for the increasing ACI trend of clinical behaviors over the six data sessions.¹⁶ This may have some degree of effect on the trend of increasing clinical behaviors for the ACI over the six sessions as they worked with novice students and attempted to promote clinical interactions, given the fact students were attempting to become passive observers.

Further account for the high degree of variance between behavior frequencies and durations over the data sessions could be related to factors such as, the difficulty in

capturing behaviors in the dynamic athletic training environment, the alternating periods of observations between subjects and the novice ACI levels within the study. Data collection provided inconsistent observations sessions at times as it was sometimes difficult to capture subjects involved in a period of evaluation or rehabilitation that would last for the twenty-minute period. In a study by Miller and Berry¹⁵, results indicated that approximately 59% of athletic training student clinical placement time was spent in unengaged activities, such as socialization (discussions or activities not related to athletic training clinical skills or behaviors), waiting and moving between practice facilities. This lack of engagement in clinical learning activities possibly decreased the availability of clinical behaviors during data observation sessions. This was even more evident as the athletic seasons progressed towards the end of the season. Related to data collection, the use of the three-keyboard setup with the CIAT-AT II, which provided for alternating periods of data collection between the ACI, ATS and student athlete may have eliminated adequate data collection. This setup differed from Stemmans and Gangstead¹¹ study by using real time instead of video taping to capture clinical interactions. However, numerous data collection sessions occurred in which the subject became involved in a period of high behavior frequency. During some of these times the data collection tool was not focused on that individual during their display of these behaviors.

Lastly, another factor associated with the low level of relationship between behaviors and time most likely can be explained by the clinical instructor's experience level. Within this study, each ACI was newly credentialed as an Approved Clinical Instructor and the mean previous experience in clinical instruction was one-half years. Thus, one could classify the two ACI's in the study as novice clinical instructors, due to

their clinical instruction experience falling below one year.¹¹ Furthermore, Stemmans and Gangstead¹¹ found that athletic training student interactions are less likely to occur with novice clinical instructors provides some evidence that clinical instructor experience level has an effect on student behavior. In addition, documentation has indicated that a clinical instructor with more than six years of clinical instruction experience found more time for instruction and developed more diverse methods of clinical instruction than those with no previous experience.¹⁷

A novice clinical instructor may be less likely to differentiate between a teaching patient case and a non-teaching patient case. This can provide further explanation for outliers influencing the lines of best fit as some situations observed were of higher or lower levels of clinical interaction due to the ACI differentiation between a teaching case or non-teaching case. This may cause a situation to occur that is likely to hinder an athletic training student from participating in activities that a more experienced clinical instructor would encourage.¹¹ With the a large number of ACI's being graduate assistants at the collegiate level, this may call for concern as the graduate assistants provide clinical education to curriculum athletic training students. Most graduate assistants would fall in the novice category of clinical instructor as they reach their first year of experience and become credentialed as an ACI. Laurent and Widener¹⁸ have recommended that a clinical instructor should have the appropriate experience and a sincere interest in the professional preparation of athletic training students. Clinical instructors are the most important factor in student satisfaction with clinical-education experience. This makes it important to select clinical instructors who not only have expertise but also understand students as learners.

CONCLUSIONS

The results of this study indicated that there were only a few strong positive correlations between the perceived behaviors and the observed behaviors possibly related to the level of mentoring within the athletic training clinical learning environment. The clinical significance of this study is that the individuals within the clinical learning environment are unaware of the behaviors they exhibit. This should specifically call for concern, as newly credentialed ACI's are unaware of their frequency and duration of clinical behaviors related to the level of mentoring occurring in the athletic training clinical learning environment. Therefore, additional studies need to investigate the credentialing of certified athletic trainers as approved clinical instructors, to determine if the current ACI training is sufficient enough to educate individuals on the appropriate evaluative and skill feedback behaviors necessary within the clinical learning environment.

Additionally, there were both increasing and decreasing trends of behavior frequencies and durations over the six data collection sessions. However, there was a lower degree of relationship between the independent variable of time and the dependent variables of the behaviors. Although, there can't be strong comparison to the impact of time on the increase or decrease of behavior frequency or duration, there is suggestion that many other variables account for the degree of variance. The variables most noted in the literature to have an influence on clinical behaviors are the scenario (evaluation or rehabilitation), the assigned sport, the level of the athletic training student and the ACI level of clinical instructor experience. Future research should also investigate the previous variables and their impact on the behavior trends over data collection sessions.

From this study, entry-level ACI's within the clinical learning environment are unaware of the behaviors they exhibit. Students desire similar behaviors associated with their clinical instructors. If the subjects in this study were not aware of their behaviors, what traits are they demonstrating to the athletic training student under their supervision? Students also desire more interaction with clinical instructors and to be included more in the application of clinical skills, such as injury evaluation and rehabilitation. It was only in these situations where more evaluation and skill feedback intensive behaviors were demonstrated. Therefore, entry-level ACI's should become aware of their expression of behaviors presented in any clinical scenario, in an effort to bring out behaviors of their students. This will allow for a clinical learning opportunity to take place.

REFERENCES

1. Dunn SV, Hansford B. Undergraduate nursing students' perceptions of their clinical learning environment. *J Adv Nurs*. 1997; 25: 1299-1306.
2. Purtilo R. *The Allied Health Professional and the Patient*. Philadelphia, PA: W.B. Saunders; 1978:3-4.
3. Hekelman FP, Blase J. Excellence in clinical teaching: the core of the mission. *Acad Med*. 1996;71: 738-742.
4. Krichbaum K. Clinical teaching effectiveness described in relation to learning outcomes of baccalaureate nursing students. *J Nurs Educ*. 1994;33: 306-316.
5. Laurent T, Weidner TG. Clinical instructor's and student athletic trainers' perceptions of helpful clinical instructor characteristics. *J Athl Train*. 2001;36: 58-61.
6. Curtis N, Helion JG, Domsohn M. Student athletic trainer perceptions of clinical supervisor behaviors: a critical incident study. *J Athl Train* 1998;33: 249-253.
7. Stemmans CL, Gangstead SK. A psychometric investigation of the clinical instruction analysis tool-athletic training II. *Perceptual Motor Skills*. 2000;91:1040-1044.
8. Thomas JR, Nelson JK. *Research Methods In Physical Activity*. Champaign, IL: Human Kinetics; 1997:348.
9. National Athletic Trainers' Association. *Clinical instructor educator seminar packet*. Dallas, TX. NATA;2001
10. Stemmans CL, Gangstead SK.. Athletic training student-initiated behavior occurs less frequently when supervised by novice clinical instructors. *J AthlTrain*. 2002;37: S-255-S-260.

11. Stemmans CL. Athletic training student-initiated behavior occurs less frequently when supervised by novice clinical instructors. [Dissertation Microform] *University Microfilms International Ann Arbor, Mich.* 1999, 1 microfiches.
12. Sharpe T. Koperwas T. *BEST Behavioral Evaluation Strategy and Taxonomy*: California Sage Publications, Inc. 1999.
13. Gardner GA. Clinical instruction in athletic training. [Dissertation Microform] *University Microfilms International Ann Arbor, Mich.* 1996, 2 Microfiches (98fr).
14. Peer KS, McClendon RC. Sociocultural learning theory in practice: Implications for athletic training educators. *J Athl Train.* 2002;37: S-136-S-140.
15. Miller MG, Berry DC. An assessment of athletic training students' clinical-placement hours. *J Athl Train.* 2002;37: S-229-S-235.
16. Weidner TG, Pipkin J. Clinical supervision of athletic training students at colleges and universities needs improvement. *J Athl Train.* 2002;37: S-241-S-247.
17. Turocy PS. Overview of athletic training education research publications. *J Athl Train.* 2002;37: S-162-S-167.
18. Laurent T, Weidner TG. Clinical education—setting standards are helpful in the professional preparation of employed, entry-level certified athletic trainers. *J Athl Train.* 2002;37: S-248-S-254.

APPENDICES

APPENDIX A

THE PROBLEM

Research Question

With the lack of research in athletic training clinical education, it became increasingly evident to focus on clinical instruction and more specifically on the behaviors, which occur between the certified athletic trainer, athletic training student and student athlete. This study was performed to evaluate behaviors within an already existing clinical behavior assessment tool, the CIAT-AT II. Furthermore, there has not been comparisons of the CIAT-AT II to self-reported frequency and duration of behaviors on a questionnaire and to examine clinical instructor behaviors over a series of six data collection sessions. Additionally, a tool has been developed, but not reported in real time behavior analysis from its original scored interval method. Specific research questions are:

1. What is the relationship between the observed clinical behaviors captured with the CIAT-AT II⁷ and BEST software and the perceived frequency and duration of individual behaviors reported on the clinical instruction questionnaire?
2. Is there a significant trend increase in the observed frequencies and durations of eight selected behaviors by the ACI's captured with the CIAT-AT II⁷ and BEST software over six data collection sessions?

Experimental Hypotheses

1. There will be a strong positive correlation between the data collected with the CIAT-AT II⁷ and the data reported on the clinical instruction questionnaire by

each clinical instructor and the athletic training students during each data collection session.

2. There will be a significant increase in the frequencies and durations of eight selected behaviors by the ACI captured with the CIAT-AT II⁷ and BEST software over six data collection sessions.

Assumptions

1. The addition of data collection tools and the researcher to the setting did not present out of the ordinary behaviors in the participants, therefore reducing the Hawthorne Effect.⁸
2. The researcher is trained in the inventory, category learning and coding practice.
3. Athletes that are observed in the study presented a normal athletic injury response, illness or medical condition, which required standard injury evaluation or the implementation of a rehabilitation program.
4. Clinical instructors and athletic training students completed questions on the questionnaire honestly about the frequency and duration of behaviors during the data collection time period.
5. There was an opportunity for the individuals to become familiar with each other's pattern of behaviors as the athletic season progresses.

Delimitations of the Study

1. The clinical instructors consisted of approved clinical instructor and one clinical instructor educator at a CAAHEP accredited athletic training curriculum.

2. The athletic training students consisted of undergraduate athletic training students formally accepted into the CAAHEP accredited athletic training curriculum of the selected institution.
3. The athletes consisted of intercollegiate athletes at the selected NCAA Division III institution.
4. Behaviors identified within the CIAT-AT II were the only behaviors analyzed for correlation between the CIAT-AT II and the clinical instruction questionnaire.
5. Data collection occurred over the winter athletic season only using athletes involved in a winter sport.

Operational Definitions

1. Approved Clinical Instructor (ACI)- NATA Board of Certification certified athletic trainer with a minimum of one year work experience as an athletic trainer and has completed clinical instructor training.⁹
2. Athletic Training Student- any athletic training student who is formally enrolled in a CAAHEP-accredited entry-level athletic training education program.⁹
3. Behavior- the portion of an organism's interaction with its environment that is characterized by detectable displacements in space through time of some part of the organism and that results in a measurable change in at least one aspect of the environment.¹³
4. Clinical Education- the athletic training students' formal acquisition, practice, and ACI evaluation of Entry-Level Athletic Training Clinical Proficiencies through classroom, laboratory, and clinical experiences under the direct supervision of an ACI or a clinical instructor.⁹

5. Clinical Instructor (CI)- NATA Board of Certification certified athletic trainer or other qualified health care professional with a minimum of one year of work experience in their respective academic or clinical area.⁹
6. Clinical Instruction Analysis Tool-Athletic Training II (CIAT-AT II)- a behavior focused direct observational interval recording system.^{7,10,11}
7. Clinical Learning Environment- an interactive network of forces influencing student learning outcomes in the clinical setting.¹

Limitations

There were no known limitations to this study.

Significance of the Study

Behaviors such as skill feedback have been identified by students as performance enhancing in the clinical setting, thus in turn providing enhancement of the overall clinical experience.⁵ The use of data gathered through behavioral observations in the clinical learning environment provided a vivid picture of the behaviors exhibited by the clinical instructor, athletic training student and student athlete. Furthermore, this study provided data on the relationship between actual observed clinical behaviors and the perceived frequency and duration of behaviors by the clinical instructor and athletic training student. By researching the relationship between actual observed behavior frequency and duration to the perceived frequency and duration of behaviors, further insight into clinical instruction can be gained during this study. This research allowed for possible future research into means of expanding upon evaluation and implementation of applied behavioral analysis in the athletic training clinical learning environment, thus

shedding light on a possible means of objectively evaluating athletic training clinical education as it occurs.

APPENDIX B

LITERATURE REVIEW

Introduction

Great milestones in didactic athletic training education have occurred since the origination of the first athletic training program in 1959. However, in comparison to classroom education, clinical education in athletic training has seen most of its reformation in recent years, undoubtedly as clinical education moves from a mandated set of clinical hours, to a competency base. The question arises if athletic trainers in clinical education, who share dual roles in providing care to the athletes and education to the students, will be able to handle the added responsibilities of a formal role in the athletic training student's education. Recent advances, such as the approved clinical instructor courses and credentialing, provide the clinical instructor with education towards the role they play in clinical education. Evaluation of the clinical learning environment has increased support of clinical educator behaviors within other medical professions, such as physician, physical therapy and nursing. Hekelman and Blase³ emphasized that excellent one on one teaching within medical programs required both the educator's understanding of specific communication skills that create effective and humanistic instruction. Additionally, they must understand that teaching is the true heart of medical schools, therefore supporting the professional development of the faculty required to foster teaching programs.¹⁹ In nursing programs, specific teaching behaviors, such as the ability to provide specific and timely feedback to students and the ability to convey a positive, concerned attitude, have showed significant relationships with both cognitive and performance outcomes.⁴ Included in this review will be Evolution of Athletic

Training Education, The Athletic Trainer as a Clinical Instructor, Evaluation of Clinical Education, Clinical Behavior Interactions and Experience Level on Clinical Instruction. Evolution of Athletic Training Education

Soon after the origination of the National Athletic Trainers' Association (NATA) in 1950 the development of education programs in athletic training began. In 1955, the NATA established the Committee on Gaining Recognition that focused its attention on professional advancement and the development of athletic training education.¹⁹ The Committee began to develop a model of athletic training education in 1956.¹⁹ In 1959 the first athletic training curriculum model was approved by the NATA and attempted to specifically identify a body of knowledge for the athletic trainer.¹⁹ This earlier model had two important features based on the emphasis on attainment of secondary-level teaching credentials and the inclusion of courses that represent prerequisites for acceptance into physical therapy schools.¹⁹ However, this newly accepted curriculum had few features that distinguished it from the typical physical education major and the curriculum was essentially a package of the most relevant courses available in relation to the academic areas necessary. Specific course requirements included anatomy and physiology, exercise physiology, kinesiology, psychology, coaching techniques, first aid and safety, nutrition, remedial exercise, organization and administration of health and physical education, personal and community hygiene, techniques and advanced techniques of athletic training, and laboratory practices totaling 600 hours.¹⁹ No attempt was made to establish new educational experiences specific to the athletic training profession nor were there any attempts to determine appropriate clinical experiences other than laboratory practices. With the newly emerged profession of athletic training

and the lack of adequate experienced professionals to educate prospective athletic trainers, the so-called “packaging” of relevant courses had its placement during the time period.

During 1959 the Committee on Gaining Recognition was renamed to the Committee for Professional Advancement. It was divided into two subcommittees consisting of the Subcommittee on Professional Education and the Subcommittee on Certification.¹⁹ The subcommittee on Professional Education later became known as the Professional Education Committee and would in the future years place additional revisions on education.¹⁴

Later in 1969 the first undergraduate athletic training education programs were officially recognized by the NATA and with the inclusion of a national certification exam in 1970, athletic training education quickly emerged and proliferated throughout the United States. Coursework in this newly revised curriculum included, anatomy and physiology, exercise physiology, kinesiology, psychology, first aid and safety, nutrition, remedial exercise, personal, community, and school health, basic athletic training, and advanced athletic training. The curriculum also included laboratory or practical experiences in athletic training for a minimum of 600 clock hours under the direct supervision of a certified athletic trainer.¹⁹

Great advances in athletic training programs occurred between 1982 and 1999, in providing programs with the necessary guidance to develop their clinical education portion of the athletic training students’ education.⁹ In 1991 the NATA and the Commission on Accreditation of Allied Health Education (CAAHE) approved and adopted a national set of guidelines written and produced by the Joint Review Committee

on Education Programs in Athletic Training (JRC-AT) called the Standards and Guidelines.¹⁹ These newly developed guidelines have paved the way for a formal method to develop, evaluate and provide self-analysis of athletic training education programs.¹⁹ Initially, clinical education for athletic training students was documented through the use of clinical hours; however, after a review issued by the JRC-AT newly proposed standards for clinical education include competency based education. The new ACI requirement places greater emphasis on the clinical instructor who is credentialed as an ACI and the question remains if athletic trainers will adapt in their clinical instruction behaviors while this new clinical education reform occurs?

The Athletic Trainer as a Clinical Instructor

In today's modern athletic training education environment the certified athletic trainer evolved into a clinical instructor, which can be evident by the synonymous nature of supervising athletic trainer and clinical instructor in the clinical learning environment. Undergraduate athletic training education lacks educational support for the athletic trainer in providing knowledge on effective clinical instructor methods. The newly organized Clinical Instructor Educator (CIE) and Approved Clinical Instructor (ACI) workshops have recently provided a formal method for the athletic trainer in a clinical setting to gain the necessary knowledge on clinical instruction and as well as allow for a means to heighten the level of instruction provided to the athletic training student.

The JRC-AT's *Standards and Guidelines*²⁰ (effective June 2002) stated that evaluation of clinical proficiencies in athletic training education must be performed by an ACI. Consequently, all ACI's at an institution within the clinical learning environment will be responsible for the formal instruction and evaluation of the athletic training

student's clinical proficiencies. These newly credentialed ACI's will be the primary quality control as a student progresses through the athletic training program and ensures that every student enrolled in the athletic training curriculum obtains a minimum level of competence in each of the clinical proficiencies.⁹

Clinical education provides 23 to 30 percent of the total curriculum in allied health professions.⁹ The nature of the clinical environment alone presents close social interaction among the ACI, athletic training student and student athlete, thus the behaviors of the ACI will have a great impact on the level of education the athletic training student receives within the dynamic and flexible clinical learning environment. Additionally, when student success on the NATA Board of Certification exam is researched, the emphasis has been on the quality of clinical experience and a positive learning environment to reflect the overall structure of the student's educational experience.

Evaluation of Clinical Education

Evaluation of athletic training clinical education and investigations in athletic clinical education are extremely limited and mostly subjective in nature and related to the perceptions of clinical instruction and behaviors associated with the quality of education. Two studies have determined clinical instructor perceptions of the importance of clinical instructor behaviors. In a study by Laurent and Weidner⁵, they surveyed clinical instructors in CAAHEP accredited entry-level undergraduate athletic training education programs to determine their perceptions of clinical instructor characteristics regarded as the most and least beneficial in facilitating student learning. Laurent and Weidner³ used a 42- item questionnaire developed from the literature comprising eight categories of

behaviors which included student participation, clinical instructor attitude toward teaching, problem solving, instructional strategy, humanistic orientation, knowledge and research, modeling and self perception. Analysis of the data indicated that behaviors in the modeling category were perceived as the most helpful, and behaviors in the knowledge and research category were perceived as the least helpful. There was no clear discrimination among the other categories within their study. Curtis et al.⁶ attempted to identify and describe helpful and hindering clinical teaching behaviors of supervising athletic trainers as perceived by athletic training students. Using the critical incident technique, which allowed students to document specific behavioral events, this study heightened the fact that supervising athletic trainers are an important factor in the athletic training students development and can clearly affect the students feelings and attitudes during their clinical education time in the athletic training room environment.⁵ The most prevalent behavior which the athletic training student felt was of greatest concern to them was mentoring. The behavior of mentoring relates greatly with such behaviors of constructive feedback, the use of good explanations and proper demonstration of athletic training skills.

Clinical Behavior Interactions

Clinical education research in the field of athletic training has been limited to subjective measurement tools and lacks the strength of objective evaluation. Objective behavioral research in the clinical education environment of athletic training has been limited to one instrument, the Clinical Instruction Analysis Tool- Athletic Training. The origination of this instrument began in 1995 as Gardner¹³ conducted a review of literature to determine the nature and extent of documentation of clinical instruction behaviors.

From his survey an initial list of teaching behaviors was generated and then compared to the behaviors of existing systematic observation systems. The instrument that was selected was Cheffer's Adaptation of Flanders Interaction Analysis System (CAFIAS)²¹. This instrument was modified for accommodation of the list of behaviors developed from Gardner's research into clinical instruction behaviors. With the development of this new instrument, entitled Clinical Instruction Analysis Tool- Athletic Training (CIAT-AT)¹³ Gardner set out to perform formative evaluation of the instrument, so that reliability may be established and further investigation into the usage of this tool could be performed.

While Gardner's development and research into the use of the CIAT-AT¹³ tool was a hallmark event in athletic training clinical education research, his recommendations for further development of the CIAT-AT were accomplished by Stemmans and Gangstead.¹⁰

Stemmans and Gangstead⁷ developed a final list of new behaviors including those, which had not been included in the original work by Gardner. This new list of behaviors and subsequently the development of the Clinical Instruction Analysis Tool- Athletic Training II^{7,10,11} included the following behaviors: giving praise, encouragement, criticizing and justifying authority were included in the behavior feedback categories. Additionally, three skill feedback categories including corrective, evaluative and descriptive were included along with a second modification to include the expansion of screening and evaluative techniques.

With the redevelopment of the instrument and a reliability study performed by Stemmans and Gangstead, there was a need for putting the CIAT-AT II^{7,10,11} to use in the evaluation of clinical interactions within the athletic training clinical learning

environment. There has only been one study performed, which has used the CIAT-AT II^{7,10,11} in the setting of clinical education. This study performed by Stemmans^{10,11} set out to identify and compare behaviors of clinical instructors on the clinical instruction experience level of the athletic trainer. Findings in this study suggested that athletic training students are more likely to initiate interactions under the supervision of intermediate and advanced clinical instructors and therefore, provide evidence that the experience level of the clinical instructor has an effect on student behaviors^{10,11}

In relation to the study by Stemmans^{10,11}, further research in nursing education can greatly be related to her findings. Windsor²² through interviewing senior nursing students found that students expressed their need for knowledgeable clinical instructors who are willing to share their experience with the students as the foremost desire of the students. Additionally, research by Windsor²² found that the effective clinical instructor does not let their anxiety level affect the situation and give understanding explanations to the students. One could propose that the clinical instructor with the least amount of experience could be the clinical instructor with the greatest anxiety level. Although, the clinical instructor may not attempt to be the least effective instructor, their anxiety and apprehension towards clinical instruction could lead to a lower level of interaction between the student and clinical instructor.

Experience Level on Clinical Instruction

In the 2002-2003 academic year, clinical instructors with one year of athletic training experience, such as graduate assistants will be allowed to become an approved clinical instructor.⁹ Consequently because of the prevalence of graduate assistants and

their ability to become ACI's, there will be a majority of ACI's who fall into novice and intermediary clinical instructor categories.

Experience level of clinical instructors has the potential to play a big part in the level of clinical interactions within the clinical learning environment. Stemmans^{10,11} found in her research that athletic training student-initiated behavior occurred less frequently when supervised by novice clinical instructors. Conclusions were made that the novice certified athletic trainers lack the requisite knowledge, skills and abilities of clinical instruction to facilitate behavior of the athletic training student in the clinical setting.^{10,11} Earlier research into athletic training mentors can shed some light on the conclusions made by Stemmans,^{10,11} in that the younger mentor may be unable to offer all the help that can be given by the established athletic trainer.²³ However, research into mentoring in the clinical education environment has additionally found that the majority of mentors have become younger and less experienced for the most recent generation of athletic trainers.²³

Summary

Research has demonstrated the great advances in athletic training education since its origination in the 1950's; however, in relation to clinical education, many alterations and reform are occurring now and will continue to occur in the years to come. With the a large part of the undergraduate student's athletic training clinical education being provided by clinical instructors of various years of experience level, necessary research is slowly emerging on the relationship between clinical instruction experience level and the clinical interactions present in the clinical learning environment. While much research has been centered on the perceived behaviors of clinical instructors and those, which

students perceive as helpful and hindering, there is little research in objective measuring the behaviors of the clinical instructor, athletic training student and student athlete, as they relate to the level of interactions in athletic training clinical education. The objective data from Stemman's^{7,10,11} and Gardner's¹³ research in clinical interactions, has enhanced the need for additional research in the area of clinical interactions in athletic training clinical education.

Appendix C

ADDITIONAL METHODS

TABLE C1. Clinical Instructor Analysis Tool – Athletic Training II ^{7,10,11}

Behavior	Initiated by Clinical Instructor	Initiated by Athletic Training Student	Initiated by Student Athlete
Behavioral Feedback	A1	A2	A3
Skill feedback: corrective	B1	B2	C3
Skill feedback: evaluative	C1	C2	C3
Skill feedback: descriptive	D1	D2	D3
Accepts or uses the ideas of others	E1	E2	E3
Asks questions	F1	F2	F3
Gives information	G1	G2	G3
Gives verbal directions	H1	H2	H3
Predictable response	I1	I2	I3
Interpretive response	J1	J2	J3
Initiative response	K1	K2	K3
Screening / evaluative technique: Questioning	L1	L2	L3
Screening / evaluative technique: Clarifying & Explaining	M1	M2	M3
Screening / evaluative technique: Documentation	N1	N2	N3
Screening / evaluative technique: Manipulation	O1	O2	
Silent observation	P		
Non-interpretive	Q		

Table C2. Informed Consent

Behavioral Analysis in the Athletic Training Clinical Learning Environment

Introduction

I, _____, have been asked to participate in this research study, which has been explained to me by Steven A. Denhup, Jr., ATC. This study is being conducted by Steven A. Denhup, Jr., ATC of the School of Physical Education at West Virginia University, to fulfill partial requirements for the completion of a Master of Science in Athletic Training.

Purposes of the Study

The purpose of this study is to correlate the frequency and duration of observed behaviors with perceived behaviors as they occur in the athletic training clinical learning environment and to investigate athletic trainer clinical behaviors over an athletic season.

Description of Procedures

This study will be conducted at Waynesburg College, in the athletic training clinic. This study involves the following procedures and will take approximately thirty-minutes to complete.

As a participant in the study I understand that the procedures will be explained to me and I will be asked to complete an informed consent form. This informed consent will be distributed to all subjects included in the data collection, and will explain my rights as a research participant. I will also be asked to complete a demographic and clinical instruction questionnaire at the end of the data collection portion of the clinical period.

If videotaping materials are utilized, I will be informed of the procedures in which the videotapes will be destroyed following completion of the study, so that my confidentiality and privacy is maintained.

I understand that the data collection tool and researcher will be arranged in an area of the athletic training clinical setting, which will not interfere with my daily activities within the clinical setting. I understand that the situations analyzed will be candid portions of a normal day, during normal pre or post practice time periods. Each data collection period will focus on the approved clinical instructor chosen for that day. If I am the clinical instructor and I become separated from the athletic training student or student athlete, I understand the collection tool and researcher will follow me during the time period. I am aware that clinical instructors and their assigned three athletic training students will remain constant throughout the study; however, variations in the athletic training student numbers could occur due to clinical scheduling. I understand that variations in student athletes will occur, in reference to their treatment, rehabilitation program and injury status.

I am aware my behaviors will be analyzed using a real time computerized method to measure behavior frequency and duration of clinical behaviors. It has become known

to me that the Behavioral Evaluation Strategy and Taxonomy (BEST) software by Educational Consulting, Inc., will be utilized for data collection and analysis.

I am aware that quantitative behavior-environment data generated and analyzed using a laptop computer will be defined as a set of observable events that have a quantifiable start and stop time. In this study, data collection will alternate every 100 seconds between the clinical instructor, athletic training student and student athlete. However, I am aware that this will only affect the researcher and my daily activities will not have to be altered while I am observed.

At the conclusion of the twenty-minute observation period, if I am the student athlete I am finished with my participation in the study.

At the conclusion of the twenty-minute observation period, if I am the clinical instructor or athletic training student, at this point I will be asked to complete a clinical instruction questionnaire. This questionnaire will ask me to record a number relating to my perceived frequency and duration of the behaviors listed on the questionnaire.

Risks and Discomforts

There are no known or expected risks from participating in this study, except for anxiety associated with being observed in the athletic training clinical setting for the designated observation period.

Alternative

I understand that I do not have to participate in this study.

Benefits

I understand that this study is not expected to be of direct benefit to me, but the knowledge gained may be of benefit to others.

Contact Persons

For more information about this research, I can contact Steven A. Denhup, Jr., ATC at 599-9186, or Dr. Michelle A. Sandrey at 293-3295 ext. 5220. For information regarding my rights as a research subject, I may contact the Executive Secretary of the Institutional Review Board at 304/293-7073.

Confidentiality

I understand that any information about me obtained as a result of my participation in this research will be kept as confidential as legally possible. The data collected from my participation in this study will be labeled only as a subject number. If videotaping materials are utilized, all video records will be destroyed upon completion of this study. In any publications that result from this research, neither my name nor any information from which I might be identified will be published without my consent.

Voluntary Participation

Participation in this study is voluntary. I understand that I am free to withdraw my consent to participate in this study at any time. Refusal to participate or withdrawal will involve no penalty or loss of benefits and will not affect my grades, class standing or athletic standing. I have been given the opportunity to ask questions about the research, and I have received answers concerning areas I did not understand. Upon signing this form, I will receive a copy.

I willingly consent to participate in this study.

_____	_____	_____
Signature of Subject or Subject's Representative	Date	Time

_____	_____	_____
Signature of Investigator or Representative	Date	Time

Table C3. Cover Letter

You have been invited to participate in a thesis entitled *Behavioral Analysis in the Athletic Training Clinical Learning Environment*. This study is being conducted by Steven A. Denhup, Jr., ATC of the School of Physical Education at West Virginia University, to fulfill partial requirements for the completion of a Master of Science in Athletic Training. The purpose of this study is to analyze the relationship between observed and perceived frequencies and duration of clinical instruction behaviors. Additionally, as second purpose of this study is to analyze athletic trainer clinical instructor behaviors as they occur over a winter athletic season.

Information obtained as a result of participation in this research will be kept as confidential as legally possible. The data collected from participation in this study will be labeled only as a subject number. If videotaping materials are utilized, all video records will be destroyed upon completion of this study. In any publications that result from this research, neither name nor any information from which subjects might be identified will be published without their consent.

Participation in this study is voluntary. As a participant you are free to withdraw your consent to participate in this study at any time. Refusal to participate or withdrawal will involve no penalty or loss of benefits and will not affect grades, class standing or athletic standing. You will be given the opportunity to ask questions about the research, and will receive answers concerning areas you may not understand.

If you have any questions or concerns please contact Steven A. Denhup, Jr., ATC at (304) 599-9186 or sdenhupjr@yahoo.com or Dr. Michelle Sandrey, Chairperson of thesis committee, at (304) 293-3295 x 5220 or msandrey@mail.wvu.edu.

Table C4. Demographic Questionnaire

Athletic Training Student

Please fill in the blank with the appropriate response

1. Date of Birth ___/___/_____ (mm/dd/yyyy)
2. Gender: Male Female
3. Class Status at Waynesburg College, please circle response.
 - a. Sophomore
 - b. Junior
 - c. Senior
4. Year in Athletic Training Program, please circle response.
 - a. First
 - b. Second
 - c. Third
5. Sport Assignment _____

Clinical Instructor

Please fill in the blank with the appropriate response

1. Date of birth ___/___/_____ (mm/dd/yyyy)
 2. Gender: please circle appropriate response. Male Female
 3. Number of years in a clinical instruction position
 - a. 5 years or greater
 - b. 2-4 years
 - c. 1 or less
 4. Date of Approved Clinical Instructor Certification ___/___/_____ (mm/dd/yyyy)
 5. Primary sport responsibility: _____
 6. Have you ever instructed in the clinical setting the current students under your supervision now?
 - a. Yes
 - b. No
 7. Date of NATA-BOC Certification ___/___/_____ (mm/dd/yyyy)
-

Table C5. Clinical Instruction Questionnaire

Please write a number corresponding to the total number of times you exhibited the behaviors.

Additionally, please write a number corresponding to the total amount of time each behavior was noted during the past 20-minute period.

Only fill in under your classification, whether ATC or Student.

Behavior	<u>ATC</u>		<u>Student</u>	
	ATC # of times	ATC Duration	Student # of times	Student Duration
Behavioral Feedback	_____	_____	_____	_____
Skill feedback: corrective	_____	_____	_____	_____
Skill feedback: evaluative	_____	_____	_____	_____
Skill feedback: descriptive	_____	_____	_____	_____
Screening / evaluative technique: Questioning	_____	_____	_____	_____
Screening / evaluative technique: Clarifying & Explaining	_____	_____	_____	_____
Screening / evaluative technique: Documentation	_____	_____	_____	_____
Screening / evaluative technique: Manipulation	_____	_____	_____	_____

Table C6: Data Collection Instructions

1. Activate Data Collection Icon by Double-Clicking
 2. Under Recorder Hit Enter
 3. Choose Configuration File CIATATII
 4. Enter Data File 1: CImmddy
 5. Enter Data File 2: STmmddy
 - 1. Enter Data File 3: SAmddy
 - 2. Click Recorder
 - 3. Click User Variables
 - 4. Click Page Down
 - 5. Click Accept
 - 6. Click START
 - 7. HOLD Key Down During Behavior
 13. Click F5 Every 100 Seconds
 - CI data first 100 seconds
 - ST data second 100 seconds
 - SA data third 100 seconds
 - Repeat for 20 minutes
 14. F9 May Be Activated To Pause Data Collection
 15. Click Save Data To End
 16. Click Quit Program
-

TABLE C7. CIAT-AT II ^{7,10,11} Behaviors, Definitions & Examples

Behavior	Definition	Example
Behavioral Feedback head	Positive, negative, verbal or nonverbal response to an affective or cognitive behavior	An athletic training student nods as the clinical instructor discusses an ultrasound treatment
Skill Feedback: Corrective	Response to a psychomotor skill in which the intent is to correct or refine the skill	The clinical instructor says, "Move your thumbs up one inch to feel the tibial plateau", after the student athletic trainer incorrectly palpated the tibial tubercle
Skill Feedback: Evaluative	Response to a psychomotor skill in which the intent is to have the subject to synthesize a value about the skill	Clinical instructor says, "Good job", after an athletic training student correctly palpates the tibial plateau
Skill Feedback: Descriptive	Response to a psychomotor skill in which the skill is described to the subject	The clinical instructor says, "Your thumbs are now on the insertion of the quadriceps group", after the athletic training student incorrectly describes the tibial plateau
Accepts or Uses the Ideas of Others	Any behavior that demonstrates acceptance, develops, or clarifies the ideas or input of another person	The athletic training student says, "I read that in Dr. Leonard's protocol", after the clinical instructor explains the use of ACL rehabilitation
Asks Questions	Includes asking questions that require verbal or nonverbal response	The clinical instructor asks, "Why would we avoid using ultrasound on this athlete?"
Gives Information	Giving facts, opinions, ideas, lecturing or asking rhetorical questions	The clinical instructor says, "The brachial plexus involves C5 – T1"
Gives Verbal Directions	Giving directions, usually skill related, that will result a in immediate observable response	The clinical instructor asks the athletic training student to prepare the cold whirlpool

Table C7. CIAT-AT II^{7,10,11} Behaviors, Definitions & Examples cont'd

Behavior	Definition	Example
Predictable Response	Any response that is entirely predictable and does not reflect extensive higher level thinking	An athletic training student immediately responds “Valgus stress”, when asked about the mechanism of an injury
Interpretive Response	A response in which some degree of analysis, synthesis, or interpretation is required	An athletic training student says “75 %” after the clinical instructor asks, “What is the percentage of left quadriceps strength as compared to the right”. A delay occurred when the athletic training student looked at the BIODEX report.
Initiated Response	A response that is not solicited from the source but is spontaneous. This type of response may be productive or non-productive	An athletic training student says “ACL”, as the clinical instructor quietly performs the Lachman’s test
Screening/Evaluative Technique: Questioning	A verbal behavior which is initiated by either the clinical instructor or student athletic trainer during assessment. The student athlete is questioned on the nature, site or severity of an injury. This category may also include determining the student athlete’s perception of a treatment or rehabilitation	An athletic training student asks, “Where is your pain?” to an athlete
Screening/Evaluative Technique: Clarifying and Explaining	A verbal behavior which is initiated by either the clinical instructor or student athletic trainer during assessment. This category includes verbal interactions when questions are not used	A clinical instructor states, “You stated earlier that there is pain in your arm, can you describe it?”

Table C7. CIAT-AT II^{7,10,11} Behaviors, Definitions Examples cont'd

Behavior	Definition	Example
Screening/Evaluative Technique: Documentation	A non-verbal behavior that is initiated by either the clinical instructor or student athletic trainer during assessment. This may include writing SOAP notes or computer documentation	An athletic training student writes SOAP notes
Screening/Evaluative Technique: Manipulation	A non-verbal behavior initiated by either the Clinical instructor or student athletic trainer during assessment. This includes the psychomotor component of assessment	A clinical instructor performed or manual muscle testing
Silent Observation	Pauses or periods of silence in which no communication occurs	Time which elapses when a clinical instructor, athletic training student and athlete remain silent while the clinical instructor turns up the intensity of a modality
Non-Interpretive	Any behavior in which the communication can not be understood by the observer.	The wireless microphone transmission hisses when the battery is low

Table C8: Data Analysis Instructions

1. Select Data File: CImmdyy, STmmdyy or SAmmdyy
 2. Enter Yes
 3. Select Grouping File: CIATATII
 4. Click Statistics
 5. Choose Time Frequency Analysis
 6. When Finished Analyzing Data Click Quit Program
-

Table C9. Correlations Statistical Analysis Instructions

1. Open the SPSS program.
 2. Select the “type in data” option on SPSS 11.5
 3. Construct 32 new scale variables: 8 behavior frequencies recorded with CIAT-AT II, 8 behavior durations recorded with CIAT-AT II, 8 behavior frequencies recorded with the questionnaire and 8 behavior durations recorded with the questionnaire.
 4. Type in data under each behavior with either the recorded frequency or duration for each session.
 5. Once data is entered, there will be a total of 32 columns with a total of 6 (one for each session) data entries under each behavior column.
 6. Under the “analyze” menu, choose “correlate” and then “bivariate.”
 7. Select the behavior frequency or duration as collected by the CIAT-AT II and the questionnaire from the list and place this in the “variable” box.,
 8. Make sure “Pearson,” “two-tailed” and “flag significant correlations” has been checked.
 9. Click “ok”
 10. Evaluate the output for the r-value and level of significance.
-

Table C10. Linear Trend Analysis Instructions with Microsoft Excel

1. Open Microsoft Excel
 2. Enter data in such a format that data collection session 1-6 head the columns.
 3. Enter ACI 1 use of Screening and Evaluative Technique: Manipulation behavior frequency under each data collection session column.
 4. Repeat step 3 for ACI 2.
 5. Repeat steps 3-4 for each behavior.
 6. Enter ACI 1 use of Screening and Evaluative Technique: Manipulation duration under each data collection session column.
 7. Repeat step 6 for ACI 2.
 8. Repeat steps 6-7 for each behavior.
 9. Once data has been entered, there will be a total of 16 spreadsheets of 6 columns and 2 rows.
 10. Select a data set to be analyzed and highlight the data within this set.
 11. Open the “Chart Wizard” icon or option.
 12. Select “scatter-plot”
 13. Click “next”
 14. Set “series1” as ACI 1 and “series2” as ACI 2
 15. Click “ok”
 16. Open the “Chart” option under the menu.
 17. Click “Add Trendline”
 18. Select “Linear”
 19. Under “options” click display R-squared value on chart”
 20. Click “ok”
-

Appendix D

ADDITIONAL RESULTS

Table D1. Session 1: ACI 1 and ATS Group 1 Behavior Frequency and Duration

Subject	Behavior	Perceived Frequency	Observed Frequency	Perceived Duration	Observed Duration
ACI 1	O SETMa	0	4	0	23.61
	A BehFd	0.66	3	3.3	1.91
	D SFDes	0	3	0	4.53
	L SETQu	0.66	0	15	0
	C SFEva	0.66	1	40	1.21
	B SFCor	0.33	3	6.6	2.93
	N SETDo	0	0	0	0
	M SETCe	0	1	0	1.91
ATS 1	O SETMa	0	6	0	23.94
	A BehFd	5.61	2	40.92	1.54
	D SFDes	1	0	3.3	0
	L SETQu	0.66	4	40	3.90
	C SFEva	0.33	1	1.65	1.11
	B SFCor	0.33	0	1	0
	N SETDo	0	0	0	0
	M SETCe	0	0	0	0

ACI = Approved Clinical Instructor, ATS = Athletic Training Student, O SETMa = Screening and Evaluative Technique: Manipulation, A BehFD = Behavioral Feedback, D SFDes = Skill Feedback: Descriptive, L SETQu = Screening and Evaluative Technique: Questioning, C SFEva = Skill Feedback: Evaluative, B SFCor = Skill Feedback: Corrective, N SETDo = Screening and Evaluative Technique: Documentation and M SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D2. Session 1: ACI 2 and ATS Group 2 Behavior Frequency and Duration

Subject	Behavior	Perceived Frequency	Observed Frequency	Perceived Duration	Observed Duration
ACI 2	O SETMa	0	0	0	0
	A BehFd	0	1	0	0.51
	D SFDes	0	0	0	0
	L SETQu	0	3	0	3.15
	C SFEva	0	0	0	0
	B SFCor	0	0	0	0
	N SETDo	0	0	0	0
	M SETCe	0	0	0	0
ATS 2	O SETMa	0	0	0	0
	A BehFd	1.32	5	40	4.10
	D SFDes	0	4	0	9.43
	L SETQu	0.66	2	115.5	2.60
	C SFEva	0.66	0	60	0
	B SFCor	0	1	0	0.65
	N SETDo	0.33	6	115.5	19.08
	M SETCe	1	2	115.5	3.46

ACI = Approved Clinical Instructor, ATS = Athletic Training Student, O SETMa = Screening and Evaluative Technique: Manipulation, A BehFD = Behavioral Feedback, D SFDes = Skill Feedback: Descriptive, L SETQu = Screening and Evaluative Technique: Questioning, C SFEva = Skill Feedback: Evaluative, B SFCor = Skill Feedback: Corrective, N SETDo = Screening and Evaluative Technique: Documentation and M SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D3. Session 2: ACI 1 and ATS Group 1 Behavior Frequency and Duration

Subject	Behavior	Perceived Frequency	Observed Frequency	Perceived Duration	Observed Duration
ACI 1	O SETMa	3.96	6	100	66.09
	A BehFd	1	3	59.4	0.65
	D SFDes	0.33	2	20	1.43
	L SETQu	4.95	2	100	1.86
	C SFEva	0.33	1	20	2.11
	B SFCor	0.33	0	20	0
	N SETDo	0	0	0	0
	M SETCe	3.3	1	100	0.1
ATS 1	O SETMa	0	0	0	0
	A BehFd	0.33	2	2	1.06
	D SFDes	0	0	0	0
	L SETQu	0	0	0	0
	C SFEva	0	0	0	0
	B SFCor	0.33	0	2	0
	N SETDo	0	0	0	0
	M SETCe	0	0	0	0

ACI = Approved Clinical Instructor, ATS = Athletic Training Student, O SETMa = Screening and Evaluative Technique: Manipulation, A BehFD = Behavioral Feedback, D SFDes = Skill Feedback: Descriptive, L SETQu = Screening and Evaluative Technique: Questioning, C SFEva = Skill Feedback: Evaluative, B SFCor = Skill Feedback: Corrective, N SETDo = Screening and Evaluative Technique: Documentation and M SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D4. Session 2: ACI 2 and ATS Group 2 Behavior Frequency and Duration

Subject	Behavior	Perceived Frequency	Observed Frequency	Perceived Duration	Observed Duration
ACI 2	O SETMa	0	3	0	13.93
	A BehFd	0	2	0	0.84
	D SFDes	0.33	1	10	0.39
	L SETQu	0.66	1	20	1.50
	C SFEva	2	2	10	2.5
	B SFCor	0	0	0	0
	N SETDo	0	0	0	0
	M SETCe	1.32	5	20	10.43
ATS 2	O SETMa	0.66	2	120	115.94
	A BehFd	0.33	12	60	9.88
	D SFDes	0.33	0	1.65	0
	L SETQu	0.66	0	40	0
	C SFEva	0.33	0	3.3	0
	B SFCor	0	0	0	0
	N SETDo	0	0	0	0
	M SETCe	0.33	0	20	0

ACI = Approved Clinical Instructor, ATS = Athletic Training Student, O SETMa = Screening and Evaluative Technique: Manipulation, A BehFD = Behavioral Feedback, D SFDes = Skill Feedback: Descriptive, L SETQu = Screening and Evaluative Technique: Questioning, C SFEva = Skill Feedback: Evaluative, B SFCor = Skill Feedback: Corrective, N SETDo = Screening and Evaluative Technique: Documentation and M SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D5. Session 3: ACI 1 and ATS Group 1 Behavior Frequency and Duration

Subject	Behavior	Perceived Frequency	Observed Frequency	Perceived Duration	Observed Duration
ACI 1	O SETMa	0.33	5	20	26.47
	A BehFd	1.65	3	40	1.27
	D SFDes	0.33	2	20	5.39
	L SETQu	0	0	0	0
	C SFEva	1.65	1	20	1.54
	B SFCor	0	0	0	0
	N SETDo	0.33	0	40	0
	M SETCe	0	0	0	0
ATS 1	O SETMa	1	6	103	36.68
	A BehFd	0	5	0	4.22
	D SFDes	0	2	0	1.35
	L SETQu	1.66	4	43.3	7.75
	C SFEva	0	0	0	0
	B SFCor	0.33	0	20	0
	N SETDo	0	0	0	0
	M SETCe	0.33	2	20	6.89

ACI = Approved Clinical Instructor, ATS = Athletic Training Student, O SETMa = Screening and Evaluative Technique: Manipulation, A BehFD = Behavioral Feedback, D SFDes = Skill Feedback: Descriptive, L SETQu = Screening and Evaluative Technique: Questioning, C SFEva = Skill Feedback: Evaluative, B SFCor = Skill Feedback: Corrective, N SETDo = Screening and Evaluative Technique: Documentation and M SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D6. Session 3: ACI 2 and ATS Group 2 Behavior Frequency and Duration

Subject	Behavior	Perceived Frequency	Observed Frequency	Perceived Duration	Observed Duration
ACI 2	O SETMa	0	7	0	35.55
	A BehFd	2	10	40	8.34
	D SFDes	1.65	0	40	0
	L SETQu	1	1	13.2	1.56
	C SFEva	3.3	2	20	2.56
	B SFCor	1.65	2	0.33	2.19
	N SETDo	3.3	0	100	0
	M SETCe	0.66	1	20	1.31
ATS 2	O SETMa	0	2	0	6.91
	A BehFd	2.31	9	49.5	6.84
	D SFDes	0.66	2	14.85	5.31
	L SETQu	0.33	0	9.9	0
	C SFEva	2.31	0	79.2	0
	B SFCor	0.66	0	14.85	0
	N SETDo	0.33	16	99	85.18
	M SETCe	0.33	0	9.9	0

ACI = Approved Clinical Instructor, ATS = Athletic Training Student, O SETMa = Screening and Evaluative Technique: Manipulation, A BehFD = Behavioral Feedback, D SFDes = Skill Feedback: Descriptive, L SETQu = Screening and Evaluative Technique: Questioning, C SFEva = Skill Feedback: Evaluative, B SFCor = Skill Feedback: Corrective, N SETDo = Screening and Evaluative Technique: Documentation and M SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D7. Session 4: ACI 1 and ATS Group 1 Behavior Frequency and Duration

Subject	Behavior	Perceived Frequency	Observed Frequency	Perceived Duration	Observed Duration
ACI 1	O SETMa	0	0	0	0
	A BehFd	0.66	4	10	1.88
	D SFDes	0	0	0	0
	L SETQu	1	0	20	0
	C SFEva	0	0	0	0
	B SFCor	1.65	0	40	0
	N SETDo	0	0	0	0
	M SETCe	2	3	60	3.05
ATS 1	O SETMa	0.66	0	10	0
	A BehFd	1.32	4	40	4.63
	D SFDes	0	0	0	0
	L SETQu	0	0	0	0
	C SFEva	0	0	0	0
	B SFCor	0.33	0	1.65	0
	N SETDo	0	0	0	0
	M SETCe	0	5	0	34.30

ACI = Approved Clinical Instructor, ATS = Athletic Training Student, O SETMa = Screening and Evaluative Technique: Manipulation, A BehFD = Behavioral Feedback, D SFDes = Skill Feedback: Descriptive, L SETQu = Screening and Evaluative Technique: Questioning, C SFEva = Skill Feedback: Evaluative, B SFCor = Skill Feedback: Corrective, N SETDo = Screening and Evaluative Technique: Documentation and M SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D8. Session 4: ACI 2 and ATS Group 2 Behavior Frequency and Duration

Subject	Behavior	Perceived Frequency	Observed Frequency	Perceived Duration	Observed Duration
ACI 2	O SETMa	0	0	0	0
	A BehFd	4	1	198	0.61
	D SFDes	0	0	0	0
	L SETQu	0	0	0	0
	C SFEva	0	1	0	1.47
	B SFCor	0.66	0	10	0
	N SETDo	1.65	1	40	0.10
	M SETCe	1.32	1	40	1.84
ATS 2	O SETMa	0	2	0	3.61
	A BehFd	1.65	7	20	4.36
	D SFDes	0	1	0	4.45
	L SETQu	1.32	1	40	1.39
	C SFEva	0	0	0	0
	B SFCor	0	0	0	0
	N SETDo	3	11	200	92.62
	M SETCe	0.66	3	6.6	3.81

ACI = Approved Clinical Instructor, ATS = Athletic Training Student, O SETMa = Screening and Evaluative Technique: Manipulation, A BehFD = Behavioral Feedback, D SFDes = Skill Feedback: Descriptive, L SETQu = Screening and Evaluative Technique: Questioning, C SFEva = Skill Feedback: Evaluative, B SFCor = Skill Feedback: Corrective, N SETDo = Screening and Evaluative Technique: Documentation and M SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D9. Session 5: ACI 1 and ATS Group 1 Behavior Frequency and Duration

Subject	Behavior	Perceived Frequency	Observed Frequency	Perceived Duration	Observed Duration
ACI 1	O SETMa	1.3	9	40	175.68
	A BehFd	0.66	23	100	20.56
	D SFDes	2.3	2	120	0.20
	L SETQu	1	5	20	11
	C SFEva	1	3	40	3.88
	B SFCor	1	1	40	1.6
	N SETDo	0.33	0	60	0
	M SETCe	1.3	3	40	3.98
ATS 1	O SETMa	0.66	5	40	78
	A BehFd	0	8	0	10.43
	D SFDes	0	0	0	0
	L SETQu	0	1	0	1.9
	C SFEva	0	0	0	0
	B SFCor	0	0	0	0
	N SETDo	0	1	0	6.02
	M SETCe	0	2	0	5.84

ACI = Approved Clinical Instructor, ATS = Athletic Training Student, O SETMa = Screening and Evaluative Technique: Manipulation, A BehFD = Behavioral Feedback, D SFDes = Skill Feedback: Descriptive, L SETQu = Screening and Evaluative Technique: Questioning, C SFEva = Skill Feedback: Evaluative, B SFCor = Skill Feedback: Corrective, N SETDo = Screening and Evaluative Technique: Documentation and M SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D10. Session 5: ACI 2 and ATS Group 2 Behavior Frequency and Duration

Subject	Behavior	Perceived Frequency	Observed Frequency	Perceived Duration	Observed Duration
ACI 2	O SETMa	0	5	0	7.54
	A BehFd	1.3	5	6.6	4.16
	D SFDes	0	6	0	7.58
	L SETQu	2	2	100	4.49
	C SFEva	1.65	0	20	0
	B SFCor	0.66	0	20	0
	N SETDo	0	0	0	0
	M SETCe	1.3	2	60	2.11
ATS 2	O SETMa	0.66	1	10	0.8
	A BehFd	6.6	4	100	3.24
	D SFDes	1.65	0	20	0
	L SETQu	13.2	0	200	0
	C SFEva	1.65	0	20	0
	B SFCor	1.65	0	20	0
	N SETDo	0	0	0	0
	M SETCe	5	0	90	0

ACI = Approved Clinical Instructor, ATS = Athletic Training Student, O SETMa = Screening and Evaluative Technique: Manipulation, A BehFD = Behavioral Feedback, D SFDes = Skill Feedback: Descriptive, L SETQu = Screening and Evaluative Technique: Questioning, C SFEva = Skill Feedback: Evaluative, B SFCor = Skill Feedback: Corrective, N SETDo = Screening and Evaluative Technique: Documentation and M SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D11. Session 6: ACI 1 and ATS Group 1 Behavior Frequency and Duration

Subject	Behavior	Perceived Frequency	Observed Frequency	Perceived Duration	Observed Duration
ACI 1	O SETMa	0.33	1	5	3.46
	A BehFd	0.33	0	0.66	0
	D SFDes	0	1	0	0.45
	L SETQu	0.66	2	68	1.31
	C SFEva	1	0	20	0
	B SFCor	0.33	0	6.6	0
	N SETDo	0	0	0	0
	M SETCe	0.33	1	6.6	1.45
ATS 1	O SETMa	2	2	30	25.3
	A BehFd	0.66	4	40	1.25
	D SFDes	1	0	30	0
	L SETQu	0	0	0	0
	C SFEva	0	0	0	0
	B SFCor	0	0	0	0
	N SETDo	0	0	0	0
	M SETCe	0	0	0	0

ACI = Approved Clinical Instructor, ATS = Athletic Training Student, O SETMa = Screening and Evaluative Technique: Manipulation, A BehFD = Behavioral Feedback, D SFDes = Skill Feedback: Descriptive, L SETQu = Screening and Evaluative Technique: Questioning, C SFEva = Skill Feedback: Evaluative, B SFCor = Skill Feedback: Corrective, N SETDo = Screening and Evaluative Technique: Documentation and M SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D12. Session 6: ACI 2 and ATS Group 2 Behavior Frequency and Duration

Subject	Behavior	Perceived Frequency	Observed Frequency	Perceived Duration	Observed Duration
ACI 2	O SETMa	2	5	50	49
	A BehFd	5	5	20	2.8
	D SFDes	0	2	0	3.7
	L SETQu	2.3	2	60	1.35
	C SFEva	1.3	3	20	3
	B SFCor	0.66	2	20	4
	N SETDo	0	0	0	0
	M SETCe	1.3	7	10	9.45
ATS 2	O SETMa	1.3	8	20	37.4
	A BehFd	1.65	10	1.65	6.31
	D SFDes	0	0	0	0
	L SETQu	0	0	0	0
	C SFEva	0.66	0	3.3	0
	B SFCor	0.33	1	20	0.65
	N SETDo	0	0	0	0
	M SETCe	0	0	0	0

ACI = Approved Clinical Instructor, ATS = Athletic Training Student, O SETMa = Screening and Evaluative Technique: Manipulation, A BehFD = Behavioral Feedback, D SFDes = Skill Feedback: Descriptive, L SETQu = Screening and Evaluative Technique: Questioning, C SFEva = Skill Feedback: Evaluative, B SFCor = Skill Feedback: Corrective, N SETDo = Screening and Evaluative Technique: Documentation and M SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D13. ACI Correlation Between ACI Questionnaire Behavior Frequency/Duration and CIAT-AT II Behavior Frequency/Duration

	SETMa	BehFD	SFDes	SETQu	SFEva	SFCor	SETDo	SETCe
Pearson Correlation								
Frequency	.301	-.174	.723	.430	.814*	-.272	.243	.599
Duration	.416	.267	.780	.700	.169	-.368	-.361	.545

*Correlation is significant at the $P < 0.05$ (2-tailed)

ACI = Approved Clinical Instructor, SETMa = Screening and Evaluative Technique: Manipulation, BehFD = Behavioral Feedback, SFDes = Skill Feedback: Descriptive, SETQu = Screening and Evaluative Technique: Questioning, SFEva = Skill Feedback: Evaluative, SFCor = Skill Feedback: Corrective, SETDo = Screening and Evaluative Technique: Documentation and SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D14. ATS Correlation Between ACI Questionnaire Behavior Frequency/Duration and CIAT-AT II Behavior Frequency/Duration

	SETMa	BehFD	SFDes	SETQu	SFEva	SFCor	SETDo	SETCe
Pearson Correlation								
Frequency	.316	-.041	-.246	-.089	.058	.018	.560	-.062
Duration	.669*	.030	-.218	.027	.261	.178	.886**	-.150

* Correlation is significant at the $P < 0.05$ level (2-tailed).

** Correlation is significant at the $P < 0.01$ level (2-tailed).

ATS = Athletic Training Student, SETMa = Screening and Evaluative Technique: Manipulation, BehFD = Behavioral Feedback, SFDes = Skill Feedback: Descriptive, SETQu = Screening and Evaluative Technique: Questioning, SFEva = Skill Feedback: Evaluative, SFCor = Skill Feedback: Corrective, SETDo = Screening and Evaluative Technique: Documentation and SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D15. ACI 1 R² Values For Observed Behavior Frequency and Duration Over Time

	SETMa	BehFD	SFDes	SETQu	SFEva	SFCor	SETDo	SETCe
R-Squared								
Frequency	0.03	0.07	0.39	0.26	0.0	0.28	0.02	0.09
Duration	0.03	0.12	0.44	0.18	0.01	0.18	0.02	0.14

ACI = Approved Clinical Instructor, SETMa = Screening and Evaluative Technique: Manipulation, BehFD = Behavioral Feedback, SFDes = Skill Feedback: Descriptive, SETQu = Screening and Evaluative Technique: Questioning, SFEva = Skill Feedback: Evaluative, SFCor = Skill Feedback: Corrective, SETDo = Screening and Evaluative Technique: Documentation and SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Table D15. ACI 2 R² Values For Observed Behavior Frequency and Duration Over Time

	SETMa	BehFD	SFDes	SETQu	SFEva	SFCor	SETDo	SETCe
R-Squared								
Frequency	0.19	0.10	0.32	0.02	0.12	0.17	0.00	0.26
Duration	0.25	0.06	0.47	0.003	0.07	0.31	0.00	0.07

ACI = Approved Clinical Instructor, SETMa = Screening and Evaluative Technique: Manipulation, BehFD = Behavioral Feedback, SFDes = Skill Feedback: Descriptive, SETQu = Screening and Evaluative Technique: Questioning, SFEva = Skill Feedback: Evaluative, SFCor = Skill Feedback: Corrective, SETDo = Screening and Evaluative Technique: Documentation and SETCe = Screening and Evaluative Technique: Clarifying and Explaining.

Figure D1. Frequency of ACI use of Screening and Evaluative Technique: Manipulation

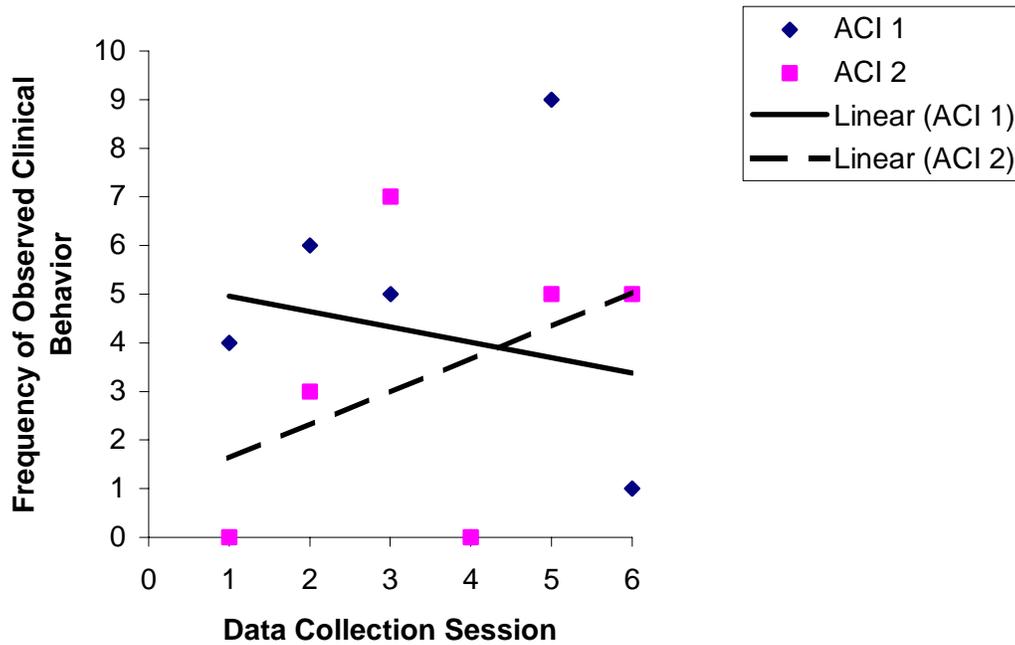


Figure D2. Frequency of ACI use of Behavioral Feedback

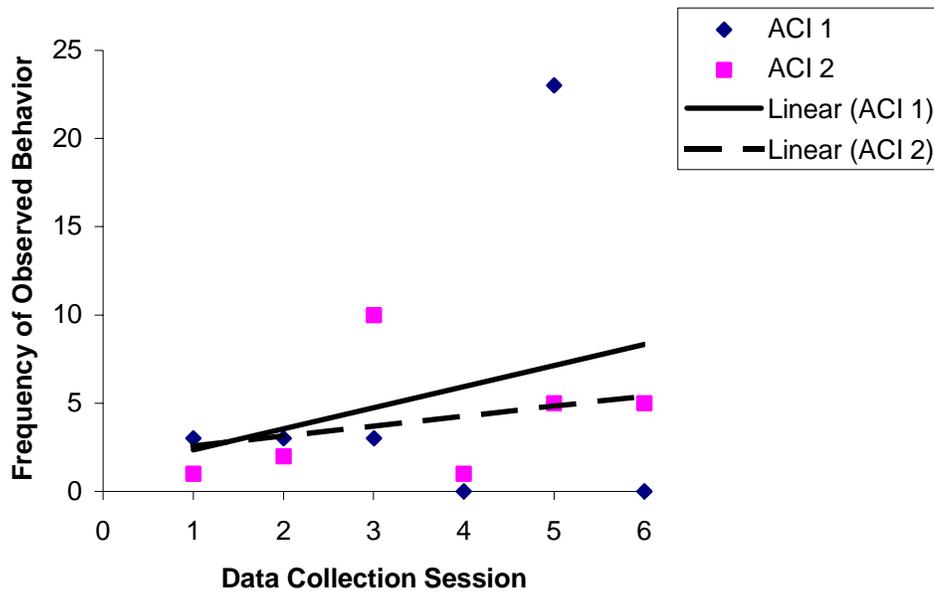


Figure D3. Frequency of ACI use of Skill Feedback: Descriptive

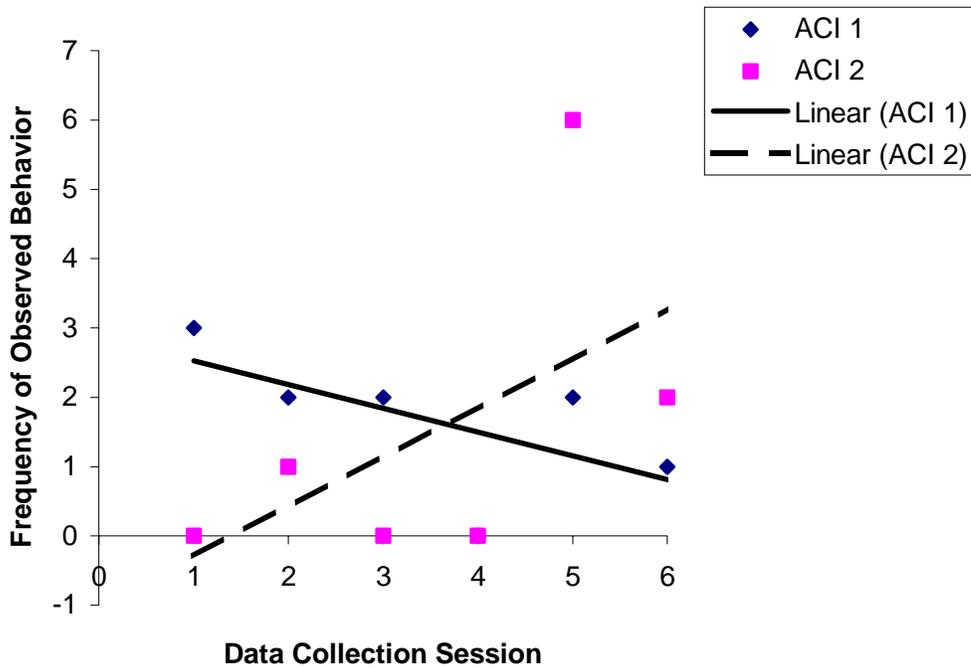


Figure D4. Frequency of ACI use of Screening and Evaluative Technique: Questioning

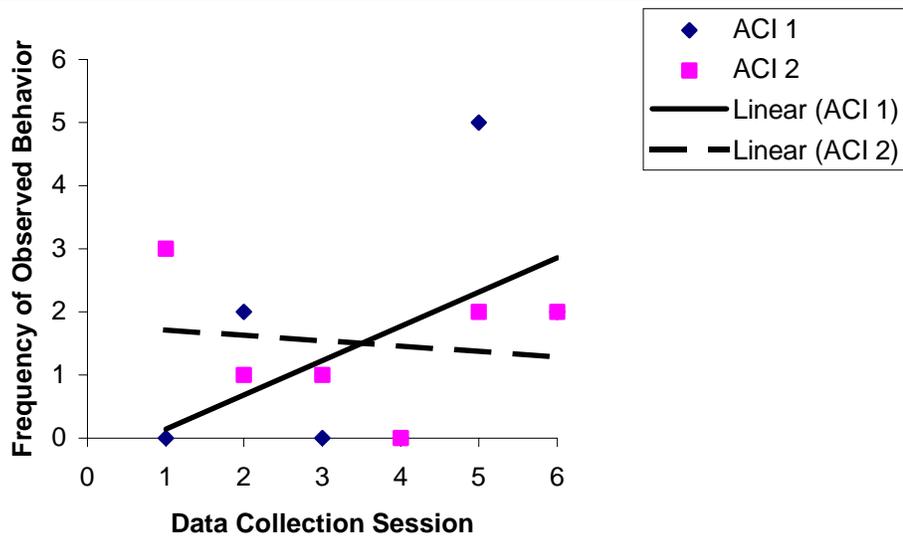


Figure D5. Frequency of ACI use of Skill Feedback: Evaluative

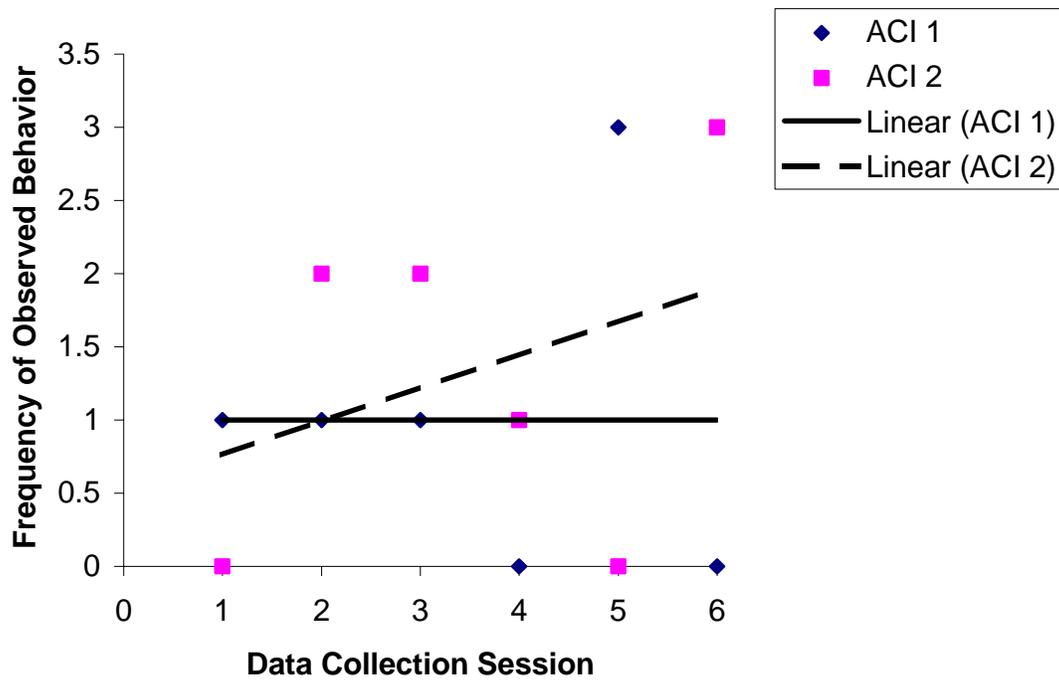


Figure D6. Frequency of ACI use of Skill Feedback: Corrective

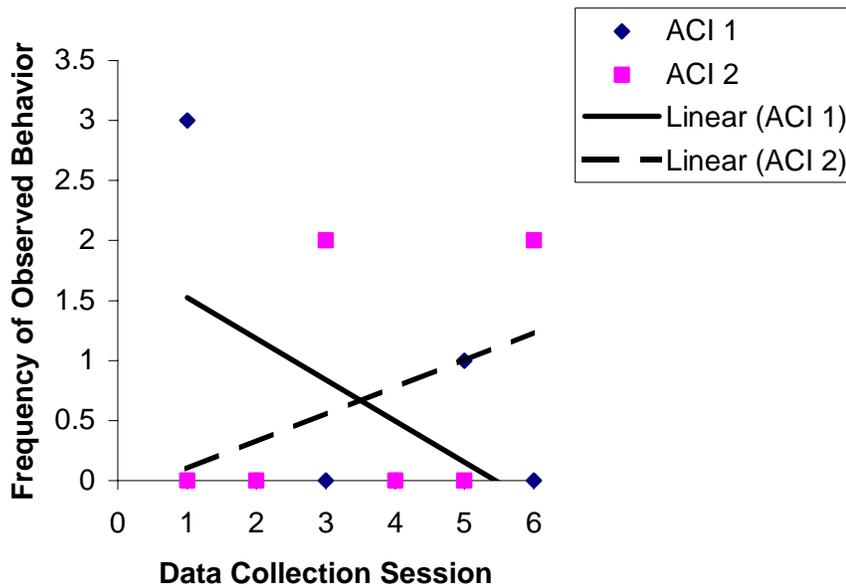


Figure D7. Frequency of ACI use of Screening and Evaluative Technique: Documentation

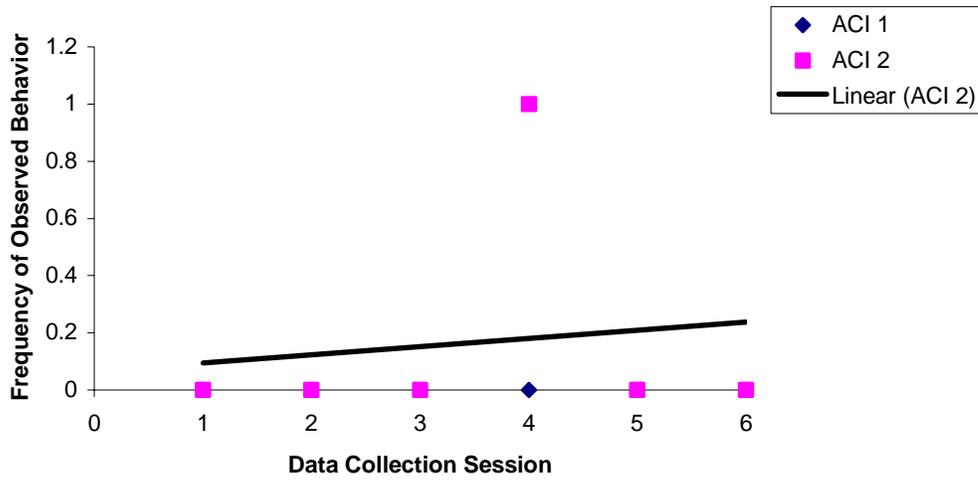


Figure D8. Frequency of ACI use of Screening and Evaluative Technique: Clarifying and Explaining

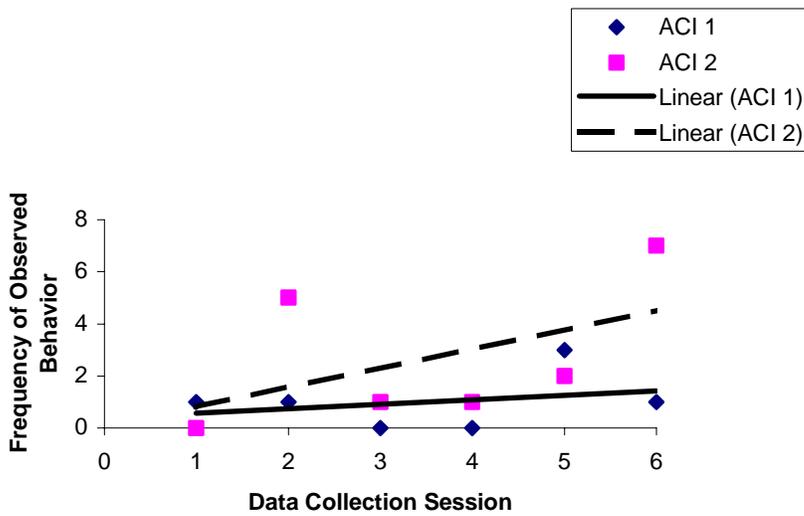


Figure D9. Duration of ACI use of Screening and Evaluative Technique: Manipulation

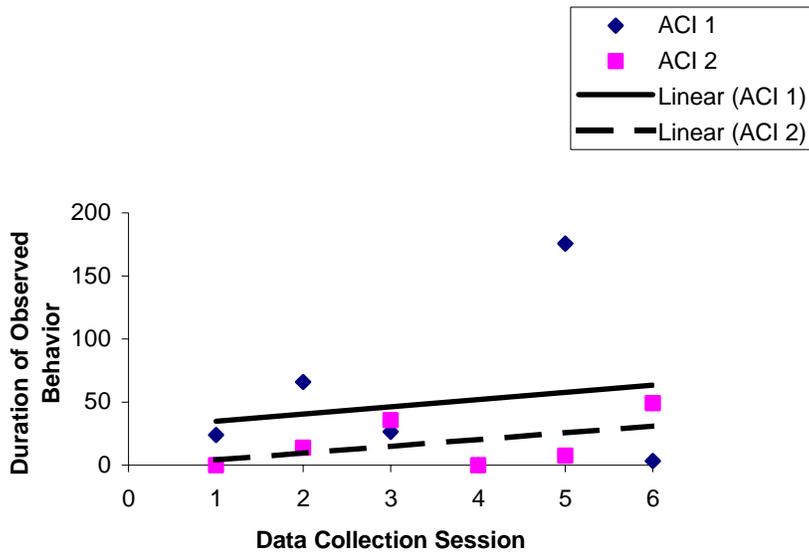


Figure D10. Duration of ACI use of Behavioral Feedback

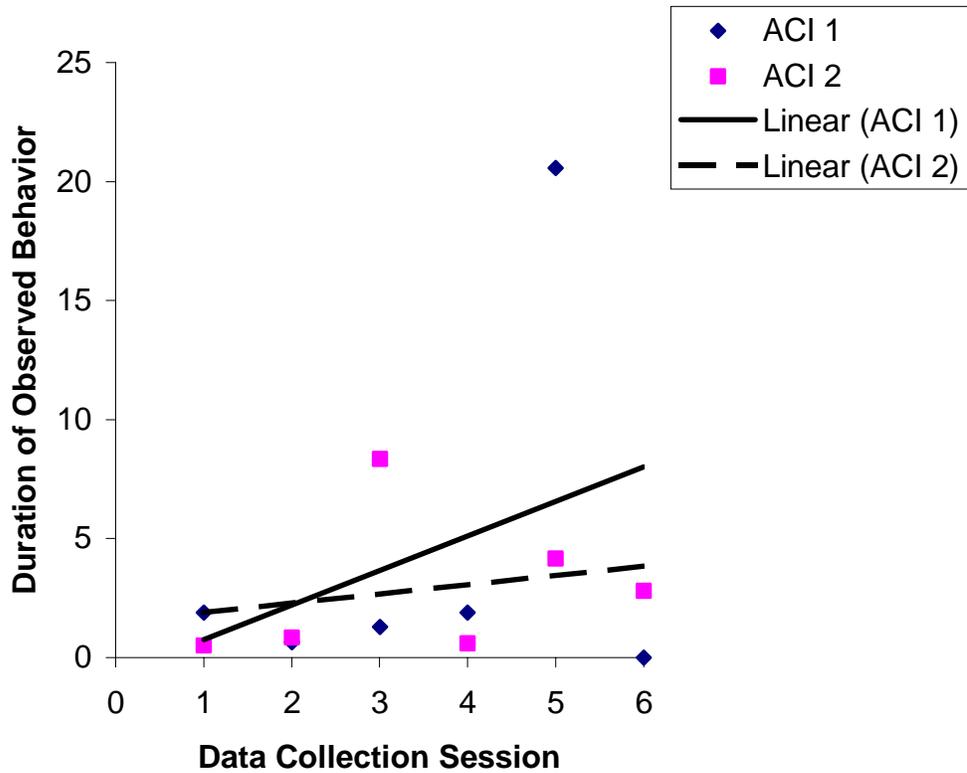


Figure D11. Duration of ACI use of Skill Feedback: Descriptive

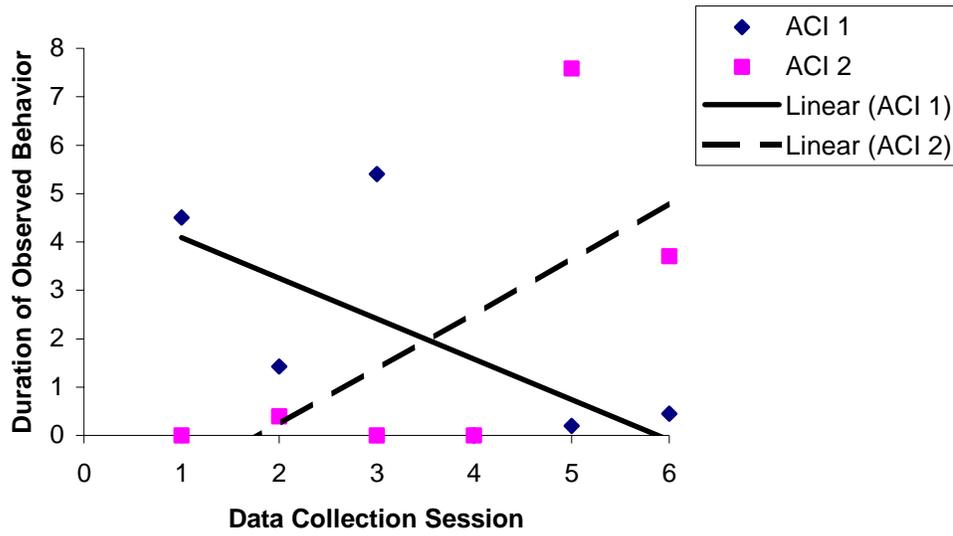


Figure D12. Duration of ACI use of Screening and Evaluative Technique: Questioning

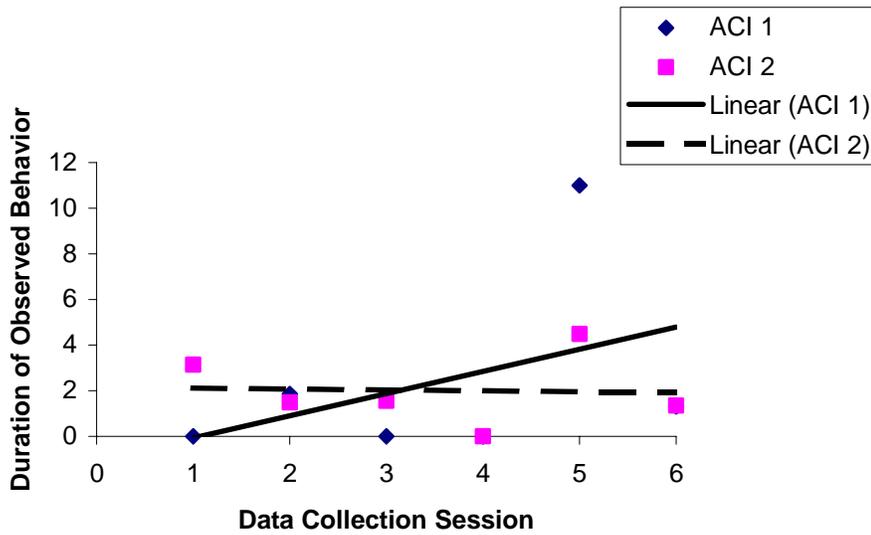


Figure D13. Duration of ACI use of Skill Feedback: Evaluative

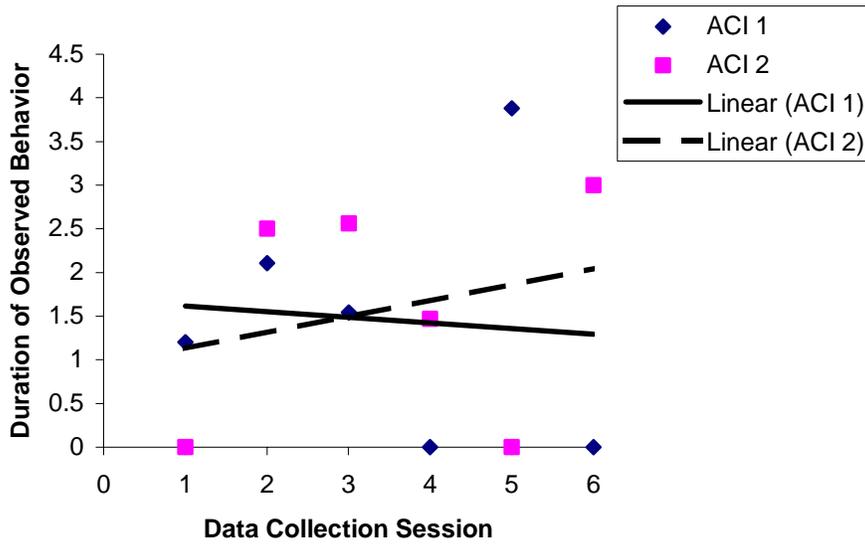


Figure D14. Duration of ACI use of Skill Feedback: Corrective

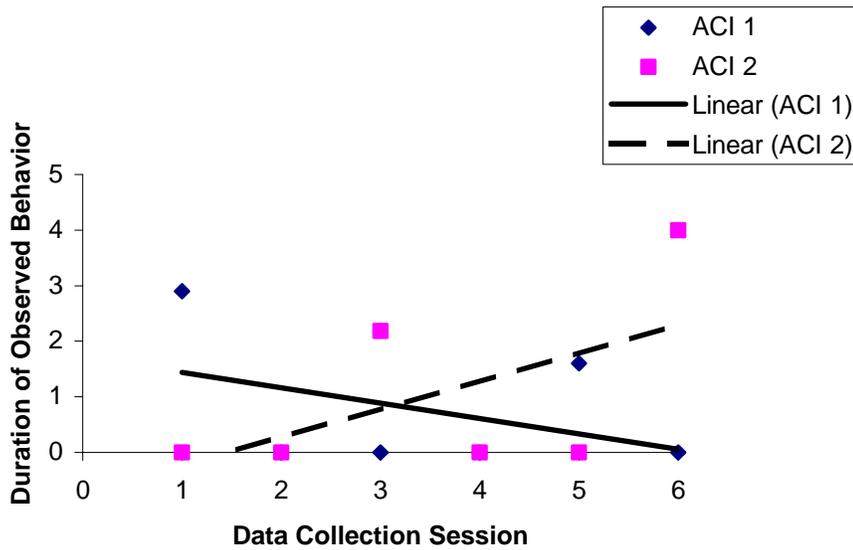


Figure D15. Duration of ACI use of Screening and Evaluative Technique: Documentation

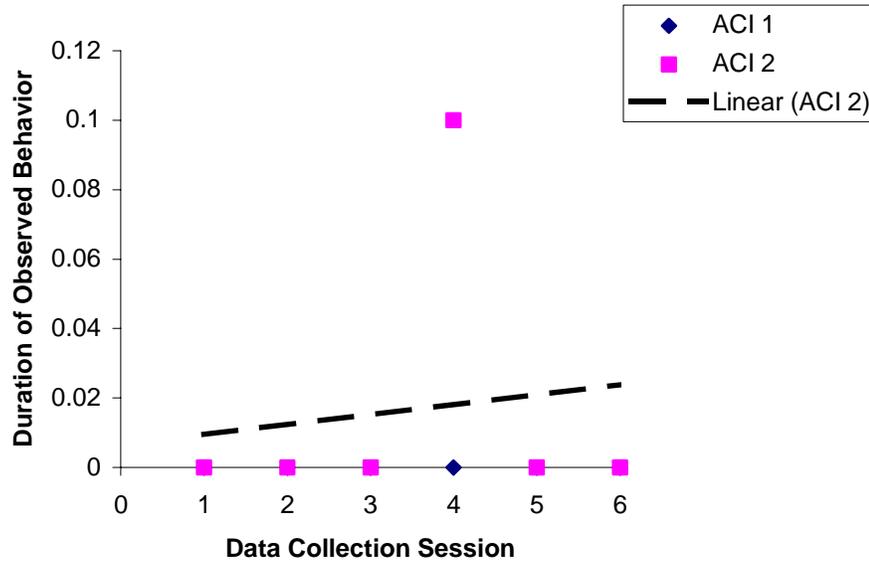
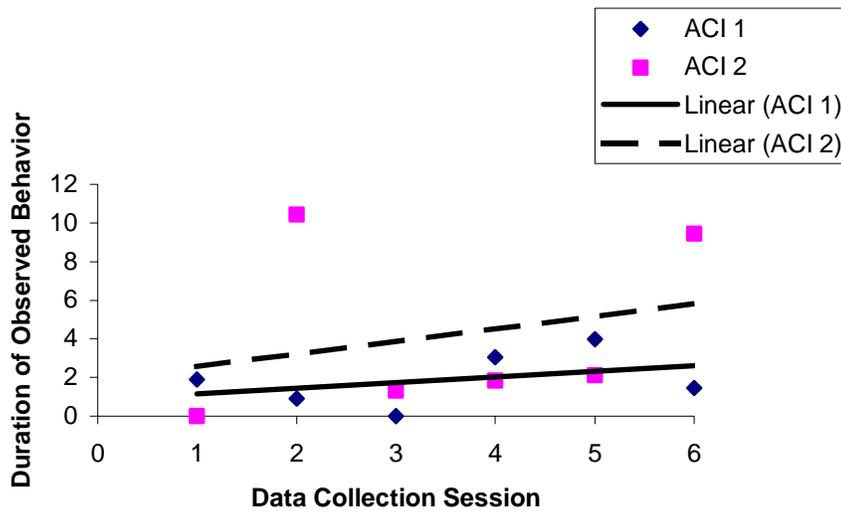


Figure D16. Duration of ACI use of Screening and Evaluative Technique: Clarifying and Explaining



Appendix E

RECOMMENATIONS FOR FUTURE RESEARCH

1. Future research should focus on providing greater instruction and examples of CIAT- AT II behaviors to the subjects or utilize the CIAT-AT II as an intervention. Utilizing the CIAT-AT II as an intervention could provide interesting data as one could observe the effects on behavior trends and levels after providing training to an individual in specific CIAT-AT II behaviors.
2. Greater data points or data collection sessions to provide a greater example of linear trends over the data collection period.
3. Emphasize data collection around one subject and do not alternate collection every 100 seconds. Data collection could be focused on the approved clinical instructor or the athletic training student.
4. Emphasize data collection around subjects with different clinical instruction experience levels.
5. Gather data around sports and seasons, such as pre-season and post-season.

ADDITIONAL REFERENCES

19. Delforge G, Behnke RS. The history and evolution of athletic training education in the United States. *J Athl Train.* 1999;34: 53-61.
20. Commission on Allied Health Education Accreditation. *Standards and guidelines for an accredited educational program for the athletic trainer.* Chicago, IL. CAAHEP;2001.
21. Cheffers JT, Mancini VH, Cheffers' Adaptation of Flander's Interactional Analysis System (CAFIAS). In: Darst PW, Zakrajsek DB, Mancini VH, eds. *Analyzing Physical Education and Sport Instruction.* Champaign, IL: Human Kinetics. 1989:119-136.
22. Bergman K, Gaitskill T. Faculty and student perceptions of effective clinical teachers. *J Prof Nurs:* 1990;6:33-44.
23. Kuznets NJ. Mentor relationships in athletic training. *J Athl Train.* 1991;26:313-319.