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## Developmental Changes in Graduate Student Supervisory Needs and Expectations: A Longitudinal Investigation

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## Developmental Changes in Graduate Student Supervisory Needs and Expectations: A Longitudinal Investigation

### Abstract

Supervision of graduate students in the field of speech-language pathology during their pre-service training is critical to their professional development. The present study followed a cohort of graduate students ( $N=31$ ) over the course of their clinical training to track changes in their self-reported needs and expectations regarding clinical supervision practices. Over the course of one year, graduate students' self-reported supervisory needs and expectations decreased significantly with the exception of those variables associated with supervisor-controlled behaviors such as serving as a teacher rather than a colleague. Implications for incorporating supervisee perceptions into effective supervision practices and directions for future research are discussed.

### Keywords

supervision; graduate students

Supervision is critical to the pre-service professional development of graduate students in the field of speech-language pathology. As the goal of supervised practice is increased professional independence, it is important that supervisors identify the particular needs of their supervisees and address them accordingly in a developmentally sensitive manner. There is, however, evidence suggesting that speech-language pathologists may not always account for supervisee-level variables when conducting supervision (Christodoulou, 2016). When there is a disconnect between the supervisor's expectations and the needs and expectations of the supervisee, it is likely that the supervisee's professional development will be negatively affected (Christodoulou, 2016). As such, it is important that supervisors develop a good understanding of supervisees' strengths and weaknesses in order to foster the development of clinically independent practice (Ostergren, 2011; Taylor et al., 2012). Soliciting the input of supervisees on their perspectives regarding supervision practices, however, can be equally important for the implementation of effective clinical supervision (Christodoulou, 2016; Fencel & Mead, 2017) and to do that supervisors need quick and effective ways of obtaining information—even if supervisee perspectives are not entirely accurate (Woolhouse, 2002). While the American Speech-Language-Hearing Association (ASHA) has only recently begun to formally require professional development in this area for supervisors (ASHA, 2019; ASHA, n.d.), the existing literature on supervision provides some valuable insights into collecting these data.

## Literature Review

The current certification standards for speech-language pathologists require graduate students to demonstrate both knowledge and skill in preventing, assessing, and treating communication disorders as they occur across the lifespan (ASHA, 2020). Because of this emphasis on a narrow area of human growth and development, it is likely that speech-language pathologists (SLPs) are less familiar with topics such as working with typically developing adults who are not referred for clinical services (i.e., supervisees). Nevertheless, an understanding of the applications of learning theory to adult learners is necessary for the effective and efficient supervision of graduate students. Experiential learning theories such as those proposed by Kolb (1984) and Jarvis (1987) are conceptualizations of learning relevant to graduate student supervision. At their core, experiential learning theories—especially as they relate to adult learning—characterize development as a model of how learners respond to experience. In both Kolb's and Jarvis's models, individuals proceed through a series of increasingly complex responses to situations. For instance, Jarvis's model characterizes this development along a continuum ranging from non-learning responses to reflective learning responses while Kolb's model utilizes a stagewise progression beginning with concrete experience and culminating in active experimentation. Models such as these have been previously used in the field of speech-language pathology to describe the professional development of graduate students (e.g., Walden & Gordon-Pershey, 2013).

While experiential learning theories attempt to explain how individuals learn from experiences such as those encountered in clinical practice, supervisors also need to understand how graduate students develop their professional independence. In the field of speech-language pathology, the most widely cited model for such professional development is one developed by Jean Anderson (1988). Anderson's model of supervision is conceptualized as a continuum of fluid stages ranging from complete supervisory dependence to self-supervision. Essentially, novice practitioners begin with a need for more direct supervisory involvement and should fade that dependence as they

accrue experience in the field. In her model, the ultimate goal of supervision is the development of professional competence resulting in self-supervision using consultation from others as necessary. Despite Anderson's model being widely accepted in the field of speech-language pathology, it has been previously reported that "supervisors behave in a consistently active, dominant manner, regardless of the supervisee's experience, competencies, needs, or desires" (Brasseur, 1989, p. 276). Such "one size fits all" approaches to supervision are in direct contrast to a model of professional development whose ultimate goal is the development of professional independence. In fact, Brasseur went on to argue that—according to Anderson's model—supervisory behaviors should continually change based on a supervisee's professional competencies, expectations, and needs. Supervisors who do this by adjusting their feedback and support over time have been found to have more positive relationships with their supervisees (Fencel & Mead, 2017).

Anderson argued that pre-service SLPs need to be fully engaged in their supervision so that they can experience the responsibilities of independently practicing SLPs at a level appropriate for their present level of professional competence. As such, supervisors are expected to adapt their level of support and feedback to meet the needs of their supervisees at any point along Anderson's continuum of development so as to promote upward movement toward the self-supervision and professional responsibility expected of independently practicing SLPs. Such adjustments are also consistent with experiential learning theories. When supervisors fail to adjust their supervisory behaviors to meet the needs and expectations of their supervisees, they inhibit their supervisees' development of professional independence by artificially limiting the complexity of learning responses.

Although the continuum proposed by Anderson has been helpful in developing the foundation for supervision in speech-language pathology, it is primarily descriptive in nature; there is no natural metric within it to quantitatively identify where an individual falls along the continuum at any given time. Because of this, supervisors must rely on external metrics for determining the strengths and needs of their supervisees. While rating scales can be helpful in quantifying supervisee performance on clinical tasks and may be preferred by both supervisees and supervisors (Harris, 1992), it is important that supervisors assess more than just their supervisees' performance in clinic. Including metrics of graduate students' own perceptions into their professional development is important in the development of effective supervision programming.

Larson (1981) developed one such metric that asks supervisees the extent to which they expect and/or need specific aspects of supervision. Such a survey can be used to track developmental changes in student independence and also help supervisors understand which aspects of the supervision experience students value more than others. Understanding student preferences doesn't mean that supervisors have to completely change their practices but rather gives supervisors information on how to best approach supervision for a given student. Larson's survey of supervision needs and expectations specifically delineates aspects of the supervisory relationship into whether they are supervisee-focused or supervisor-controlled, which can be helpful in identifying which components are more impactful or important within dyads of supervisors and supervisees. Most recently, Plexico et al. (2017) used this survey to examine the relationship between both supervisory needs and expectations and student anxiety in a small sample of graduate students ( $N = 7$ ). Plexico et al. (2017) found a decrease in supervision needs

and expectations throughout the course of graduate students' pre-service training but no statistically relevant change in anxiety over time; however, the small sample size in this study directly limits the generalizability of its results to the greater graduate student population. Still, such a developmental change in supervision needs and expectations is consistent with Anderson's continuum of supervision; as students progress through clinical placements, they should theoretically need less supervision and, hopefully, expect less to be provided when it's not necessary. The present study will, in part, seek to replicate the developmental changes observed by Plexico et al. (2017). by increasing the sample size of students surveyed and conducting the study at a different university in an accelerated, single year master's program.

**Aims and Objectives.** The primary goal of this study is to generally describe residential graduate students' supervision needs and expectations throughout the course of their program and provide insight into developmental changes. Specifically, does experience affect graduate students' self-reported supervision needs and expectations and, if so, are such changes observed consistently during the course of their program of study? Even within Anderson's supervision continuum, there is conflicting evidence regarding whether such developmental changes are to be expected.

A secondary goal of this study is to identify whether graduate students report similar supervision needs and expectations—that is, are their expectations for what will be observed during supervision consistent with what they report they need from supervision? The present study also aims to identify whether there are differences in graduate students' supervisory needs and expectations specifically related to behaviors that are considered to be supervisee-focused or supervisor-controlled within the original factor structure of the instrument used as reported by Larson (1981). Are there systematic differences in how graduate students' report either or both their supervisory needs and expectations related to the person responsible for a given behavior (i.e., the supervisor or the supervisee)?

Because these research questions are rooted in the development and comparison of the same individuals over time, a longitudinal research design is best suited to meet the needs of the present study. Longitudinal research designs reduce the number of participants required in order to achieve sufficient statistical power by sampling the same individuals over time, thus removing the variability in individual differences from the study (Maxwell & Delaney, 2004). Additionally, because there is no treatment serving as an independent variable, this study will focus wholly on describing changes over time rather than attempting to explain causal factors. Such studies can be beneficial in developing the field's understanding and serve as the bedrock for developing efficient methods for future research into potential explanations of developmental data.

## Method

All study activities were reviewed and approved by the university's Institutional Review Board prior to data collection. Each time data were collected, participants were provided with an electronic copy of information describing the study as well as contact information for the first author.

**Sampling Procedures.** The goal of the present study was to sample and then follow an entire cohort of pre-service SLPs throughout their residential graduate training program. As such, the

entire cohort of incoming students was the intended sample ( $N = 34$ ) with the exception of those requiring leveling coursework. No leveling students were enrolled in this cohort and thus no exclusionary criterion was actually implemented. At the beginning of the Fall 2018 semester, the principal investigator attended a new student orientation meeting and provided a brief description of the study activities and all attendees were approached to participate in this study. Over the course of the study, a total of 31 students participated in the survey making the total observed sample  $N = 31$ .

All participants were female, with ages ranging from 21 to 27 years ( $M = 22.41$ ,  $SD = 1.22$ ) at the time of initial data collection and all had completed sufficient undergraduate coursework in speech-language pathology to forego leveling coursework. The vast majority of participants (91%) identified as white. These data are relatively consistent with enrollment trends between 2010 and 2018 in which programs reported 80.9–86.4% of master's level SLP students as being white and 95–95.7% as being female (ASHA, 2019).

**Measures and Data Collection.** The supervision needs and expectations rating scales were originally published as the focus of Jean Larson's dissertation in 1981 and internet searches indicate that several universities provide these surveys to clinical supervisors as a reference for use in the supervision of graduate students. These two rating scales contain 26 matched questions, with 25 using a five-point Likert scale for responses. The twenty-sixth item for each scale was an open-response item soliciting input on supervision topics not addressed by the previous 25 items; because the data for this project were not shared with supervisors in order to protect participant confidentiality, this question was omitted from the present study. Additionally, item 25 on the original survey asked participants to indicate the sources that influenced their responses on the previous 24 items as well as a rank-ordered listing of their level of importance. This question was also omitted to facilitate participants' sense of confidentiality. As such, the first 24 items from the Supervisory Needs and Expectations Rating Scales (Larson, 1981) were used for the purposes of this study in addition to demographic questions. Both rating scales and the demographic questions were combined into a single 54 item survey in order to facilitate participation. Readers interested in the items assessing supervisory needs and expectations are referred to Larson's original work.

All data were collected using Qualtrics, an online survey platform. A week prior to the beginning of each term, the principal investigator sent an email to all potential participants that included a link to the survey as well as a brief reminder about the survey's purpose, confidentiality, and financial incentive. Participants had approximately two weeks to complete the survey each term: one week preceding the term and the first week of classes prior to beginning direct clinical work in practicum. Surveys were emailed to participants at the beginning of each academic term consistent with the department's policy aligning clinical practicum experiences with the university's course schedule. Because the department offers an accelerated master's program to be completed in four semesters including two summer sessions, this resulted in five time points for data collection including the baseline collected immediately after new student orientation. At each time point, participants who completed the survey in its entirety were entered into a drawing for one \$25 gift card.

In order to minimize the effect of non-response bias on the outcomes of these data, several steps were taken to facilitate participant responses based on the recommendations of Rogelberg and Stanton (2007). First, the principal investigator actively notified participants about the survey via

email during each data collection period; this notification included information on the purpose of the survey, how results would be used, and promised confidentiality. Second, the survey was designed to ensure that participants could respond using a mobile phone, tablet, or computer while maintaining the aesthetics and readability of items. Third, a financial incentive (discussed above) was included as compensation for participation. Finally, a single reminder was emailed to participants halfway through each data collection period reminding them about the survey being available to them and requesting their participation.

**Data Diagnostics.** Because survey-based data collection often suffers from low response rates and longitudinal research methods generally involve some level of attrition, several data diagnostics were planned to support the reliability and validity of study outcomes. First, visual inspection of the data for each time point was conducted to identify participants who opened the survey but completed five or fewer questions. A review of these cases indicated that they generally represented duplicate attempts at completing the survey.

After the data were inspected for missingness, a model was constructed to perform multiple imputation. Multiple imputation was conducted using the *mice* package (van Buuren & Groothuis-Oudshoorn, 2011) in R. The imputation model utilized the longitudinal design to use the current and previous timepoint data to inform missingness for each variable at each timepoint. This autoregressive model design for the imputation of missing data was built to inform the missing data with information that was most temporally related. The discrete nature of the observed responses was modeled using an ordered proportional odds model. Fifty unique datasets were generated using this approach and each resulting dataset was checked for appropriateness to the observed data at each timepoint to evaluate the validity of the imputations in accordance with best practices in missing data analysis (Enders, 2010).

Outliers were detected using a robust variant of Mahalanobis distances (Leys et al., 2018). Accordingly, outliers were identified by first computing the first and second moments of the multivariate responses using the central 66% of each variable and then by computing the Mahalanobis distances for each observation from these moments. Distances greater than 11.1, the .975 quantile of the chi-square distribution with four degrees of freedom, were considered statistical outliers and were removed from further analyses. This method was applied to each imputed dataset.

**Analytic Strategy.** The impact of experience on graduate students' self-reports of supervisory needs and expectations was investigated using repeated measures analysis of variance (RM-ANOVA). This analysis was conducted in three ways. First, a linear mixed effects model was fit to each outcome over time treating observations as being nested within participants. Here, a single complete dataset was constructed based on the imputation model (see Data Diagnostics). The results from this model were used to test the time factor for significance. If the time factor was statistically significant after controlling for type one error (discussed below), then paired comparisons were tested. Testing the paired comparisons over time helps answer the second question as to whether the changes occur consistently over the course of the study. Second, the same mixed effect model was fit using the 50 imputed datasets. The results were pooled using Rubin's (1987) rules for aggregating estimates from multiply imputed datasets using the *mitml* package (Grund et al., 2016). These results were used to validate the estimated between timepoint

differences found from the first analysis method. All random effects models were fit using the *lme4* package (Bates et al., 2015). Third, the RM-ANOVAs were conducted with the outcomes as multivariate responses using the same complete case dataset used in the first analysis. In these analyses, the assumption of sphericity was explicitly tested using Mauchly's test. If Mauchly's test was significant ( $p < .05$ ), the test for the effect of time was adjusted using the Huynh-Feldt correction.

The experiment-wise Type-I error rate was controlled in two ways. First, the overall test of effect of time was controlled using the false discovery rate (FDR) adjustment (Benjamini & Hochberg, 1995). Second, all paired comparison tests were adjusted using the FDR adjustment as well. These two sources of significance tests could be tested simultaneously because we used the results of the overall test of the effect of time to determine which primary outcome(s) to investigate using pair comparisons.

In order to investigate the effects of missing data handling on the results, multiple methods of analysis were pursued, including mean imputation, median imputation, an alternative autoregressive model, and full information maximum likelihood (FIML). Across each of these efforts, the same substantive conclusions were reached and the most conservative results are reported below. Although there is substantial missingness present in the dataset, analysis of data with missingness present depends greatly on the procedures used to address the missingness and checking the robustness of the conclusions—not necessarily the amount of data that is missing. Because the same conclusions were reached when using multiple different methods of missing data analysis, there can be greater confidence that the results reported below reflect the full theoretical dataset with some margin of error.

## Results

Because attrition is common in longitudinal research, participation rates at each time point are reported in Table 1. Participation ranged from 38.23% to 64.70% of the total possible sample ( $N = 34$ ) and 41.94% to 70.96% of the obtained sample ( $N = 31$ ) with the lowest participation observed for the third timepoint. This is likely due to the structure of the summer terms, which necessitated that the survey be sent to participants during the final week of the first summer session when they were busy completing exams and finalizing documentation for their clinical practicum. Participants were, however, allowed to open the survey and complete it at a later time in order to increase the response rate by accommodating their busy schedules. The median amount of time participants spent on the survey across all time points ranged between only 6.64 and 9.45 minutes, suggesting a minimal time commitment for participation.

**Table 1**  
*Participation Rates by Timepoint*

Timepoint	Participants	Sample Represented ( $N = 31$ )	Population Represented ( $N = 34$ )
Fall	22	70.96%	64.70%
Spring	20	64.52%	58.82%
Summer 1	15	48.39%	44.11%
Summer 2	13	41.94%	38.23%
Fall	17	54.84%	50.00%



Individual participants had between 0.3% and 94.0% missing responses with an average of 49.2% across all timepoints—that is, individual participants ranged widely in their individual nonresponse across the course of the study. The percent missing of each primary outcome by timepoint are reported in Table 2. Although there was substantial missingness present in the data, as indicated in Table 2, the procedures used to address this missingness and answer the research questions in the present study are designed to address the missingness in a principled and rigorous manner. As mentioned above, multiple methods of addressing the missingness in the present dataset resulted in the same substantive conclusions being drawn, which should increase the confidence in the outcomes discussed within this manuscript.

**Table 2**

*Summary of Observed Data by Timepoint Prior to Multiple Imputation*

Measure		Timepoint				
		0 (Fall)	1 (Spring)	2 (Summer 1)	3 (Summer 2)	4 (Fall)
Needs						
Total Score	<i>M (SD)</i>	84.4 (10.0)	75.5 (11.1)	72.9 (14.3)	75.7 (8.0)	75.5 (10.4)
	% Missing	32.3	54.8	58.1	67.7	54.8
Supervisor Controlled	<i>M (SD)</i>	34.0 (4.4)	31.2 (4.7)	29.1 (6.4)	31.3 (4.9)	30.7 (4.1)
	% Missing	32.3	54.8	57.7	64.5	54.8
Supervisee Focused	<i>M (SD)</i>	34.2 (4.1)	34.1 (5.9)	29.8 (3.6)	32.9 (4.6)	32.1 (4.4)
	% Missing	29.0	48.4	64.5	67.7	54.8
Expectations						
Total Score	<i>M (SD)</i>	84.2 (10.7)	81.6 (12.0)	73.7 (7.4)	77.2 (7.0)	76.3 (9.0)
	% Missing	35.5	48.4	64.5	76.7	58.1
Supervisor Controlled	<i>M (SD)</i>	18.8 (2.8)	16.5 (2.5)	15.2 (3.4)	14.5 (2.3)	14.8 (2.5)
	% Missing	29.0	48.4	58.1	64.5	54.8
Supervisee Focused	<i>M (SD)</i>	18.8 (3.3)	18.0 (2.7)	16.6 (2.5)	16.3 (2.1)	16.4 (3.1)
	% Missing	32.3	48.4	64.5	64.5	54.8

*Note.* Total  $N = 31$ . Mean ( $SD$ ) prior to multiple imputation.

Tests of missingness completely at random (MCAR) failed due to computational issues. Inspection of missing data patterns revealed that most variables had missingness patterns that were likely attributed to missing not at random (MNAR); however, baseline data were less obviously impacted by missingness. The higher levels of response at baseline and lack of evidence to the contrary suggest that data missing at the start of the study were missing at random. The high rates of nonresponse at the end of the study is likely problematic and results should be interpreted with some caution relative to the mechanism of missingness. As discussed in the methods above, missingness was addressed in three ways. All three methods resulted in approximately the same substantive interpretation of the change in the primary outcomes over time. In reviewing the discrepancies in outcomes between methods, we elected to report the most conservative results identified using the multiple imputation procedure described above.

In the RM-ANOVAs, we found significant decreases in the total scores of both Needs ( $F(4, 603) = 3.85$ ,  $p_{FDR} = .017$ ,  $\eta^2 = 0.16$ ) and Expectations ( $F(4, 587) = 2.76$ ,  $p_{FDR} =$

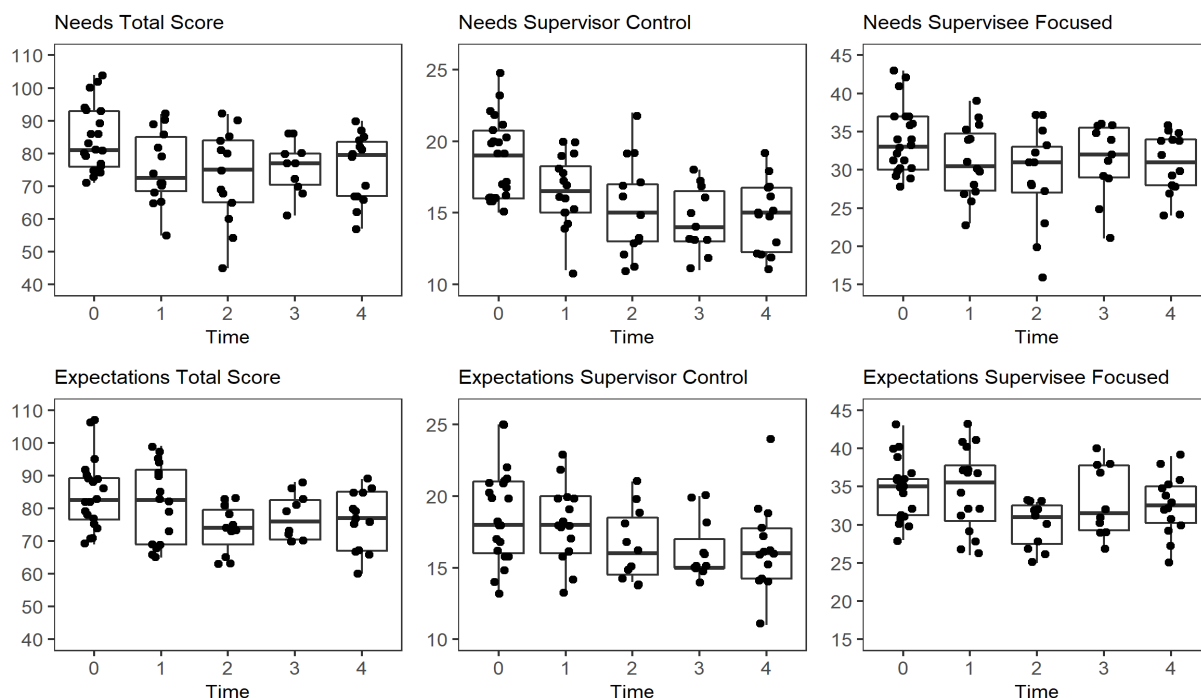
.043,  $\eta^2 = 0.12$ ) over time. For the Needs subscales, we again observed significant decreases across both Supervisee-focused ( $F(4, 460) = 2.96, p_{FDR} = .041, \eta^2 = 0.14$ ) and Supervisor-controlled items ( $F(4, 338) = 7.07, p_{FDR} < .001, \eta^2 = 0.28$ ). For the Expectations subscales, however, we observed significant decreases in Supervisee-focused items ( $F(4, 744) = 2.93, p_{FDR} = .041, \eta^2 = 0.12$ ), but found inconclusive results regarding Supervisor-controlled items ( $F(4, 437) = 1.97, p_{FDR} = .131, \eta^2 = 0.10$ ).

Because we observed significant decreases in both total scores and all subscales with the exception of supervisor-controlled expectations, pairwise comparisons were conducted for all but supervisor-controlled expectations. The pairwise comparison results are shown in Table 3 where the mean difference and standard error are reported for each comparison. Additionally, raw scores for all outcomes across time are presented in Figure 1. For Needs, the total score decreased significantly from baseline (Fall) starting with participants' scores reported during Summer 1. Supervisor-controlled and Supervisee-focused needs subscale scores exhibited a similar pattern to the total scores in that significant decreases from baseline were observed beginning with Summer 1 scores. For expectations related items, the total score significantly decreased from baseline (Fall) from Summer 1 onward. The decrease was also significant between Spring and Summer 1. Supervisor-controlled items were not found to significantly change over time and therefore no paired comparisons were conducted. For the Supervisee-focused items, the only significantly lower scores occurred between Fall and Summer 1 and also Spring and Summer 1; such observations indicate that the only significant decrease in Supervisee-focused items occurred during the initial Summer reporting period. Comparisons of change over time were only significant relative to initial performance in the Fall term (i.e., baseline) not between each term.

**Table 3***Pairwise Comparisons of Scores Over Time*

Needs					Expectations				
Total Score					Total Score				
	0	1	2	3		0	1	2	3
1	-7.9 (2.9)				1	-3.0 (2.5)			
2	-11.1 (3.3)*	-3.2 (3.5)			2	-8.6 (2.7)*	-5.6 (2.8)*		
3	-10.2 (3.0)*	-2.3 (3.1)	0.9 (3.3)		3	-5.9 (2.6)*	-2.9 (2.8)	2.7 (2.8)	
4	-9.7 (2.8)*	-1.8 (3.1)	1.4 (3.1)	0.5 (2.9)	4	-7.2 (2.8)*	-4.2 (2.6)	1.4 (2.7)	-1.3 (2.6)
Supervisor Controlled					Supervisor Controlled <sup>1</sup>				
	0	1	2	3		0	1	2	3
1	-2.2 (0.8)								
2	-3.3 (0.8)*	-1.1 (0.9)							
3	-3.9 (0.8)*	-1.7 (0.8)	-0.6 (0.9)						
4	-4.1 (0.8)*	-1.9 (0.8)	-0.8 (0.8)	-0.2 (0.8)					
Supervisee Focused					Supervisee Focused				
	0	1	2	3		0	1	2	3
1	-2.6 (1.3)				1	-0.9 (1.2)			
2	-4.9 (1.5)*	-2.3 (1.5)*			2	-4.1 (1.2)*	-3.2 (1.3)*		
3	-3.1 (1.5)*	-0.5 (1.5)	1.8 (1.6)		3	-2.3 (1.3)	-1.4 (1.4)	1.8 (1.4)	
4	-3.8 (1.3)*	-1.2 (1.4)	1.1 (1.5)	-0.6 (1.4)	4	-2.9 (1.2)	-2.0 (1.2)	1.2 (1.3)	-0.6 (1.4)

Note. <sup>1</sup>Supervisor controlled behavior was not found to statistically change over time ( $F(4, 437) = 1.97, p_{FDR} = .131, \eta^2 = 0.10$ ). \*p-value < .05 after adjusted for multiple comparisons with FDR correction.

**Figure 1***Distribution of Scores Over Time*

## Discussion

We investigated the supervisory needs and expectations of a single cohort of graduate students during the course of their master's program to identify whether there were significant changes in either construct over time. Although there was substantial missingness present in the dataset, the results of the present study are likely representative of the total sample from which responses were solicited with some margin of error based on the procedures used to address missingness discussed above. The generalizability of these results to the broader graduate student population, however, should be tested through replication using additional samples of students from different universities. In the present sample, both students' supervisory needs and expectations were observed to decrease significantly over time, suggesting that these participants were increasing in their independence over the course of their graduate training. It is interesting to note, however, that supervisor-controlled expectations specifically did not change significantly over time. For reference, this constellation of items includes behaviors such as supervisor use of conference time, supervisor serving as a teacher, supervisor serving as the superior in the professional relationship, etc. As such, it is understandable that the very structure of graduate training programs would cause students to expect such consistency throughout their course of study. It is encouraging, however, that graduate students reported that they needed less of these behaviors over time even if they expected them to occur.

The results of the present study are consistent with those of Plexico et al. (2017) but also serve as an extension given their small sample size ( $N = 7$ ). While Plexico and colleagues (2017) did not report the number of students from which their sample was drawn, the present study's larger sample and additional use of multiple imputation procedures should enable clinical educators to have more confidence in the findings that are consistent across both studies. Our study confirms Plexico et al.'s (2017) finding that students' supervisory expectations are consistently higher than their supervisory needs, even if students in the present sample reported lower overall values for both relative to previous work. While there is a decrease in overall supervisory needs and expectations over time, it is also clear that there is substantial variability between students to be considered; this was also unsurprisingly consistent between our work and that previously reported by Plexico and colleagues (2017).

Because the present study and previous research indicate that graduate students tend to self-report lower supervisory needs and expectations over time, clinical educators might consider pairing measures such as that developed by Larson (1981) and used here with measures of observable clinical behaviors to guide the structure and support offered through formal supervision. If clinical educators combine their observational data of student performance with graduate students' self-reported needs and expectations, it should be possible to tailor supervisory experiences to maximize student growth while simultaneously reducing the resources necessary to provide effective supervision. Future research should investigate the concordance between students' self-reported supervisory needs and expectations and supervisors' ratings of students' clinical independence to determine how reliable such data are in guiding the supervisory process. When clinical educators draw attention to the process of supervision as opposed to merely its product, they are facilitating the long-term professional development of their students by giving them a framework for supervision to use later in their professional careers. Furthermore, data-driven

supervision practices should be helpful to graduate training programs in objectively identifying students who are struggling to develop necessary clinical skills. Difficult conversations such as the need for remediation can be made easier for clinical educators when both parties have contributed data to the discussion—especially if there is a way to reference an individual’s performance with respect to group-level data.

While the present study does provide clinical educators in the field of speech-language pathology with data supporting the increasing independence of graduate student clinicians, it’s also possible that they are unreliable narrators whose self-reports need external validation (Woolhouse, 2002). A consideration for future research would be to simultaneously investigate graduate student self-reports of their supervisory needs and expectations and supervisory reports of their clinical abilities or a similar construct. Even though the methods used here to address missingness are considered to be generally robust, it must be acknowledged that a limitation of the present research is the variability in response rates over time. For reference, however, Baruch & Holtom (2008) reported that organizational survey research generally results in an average response rate of 52.7% with a standard deviation of 20.4; our results at each time point fall well within that range. While higher response rates are obviously desirable, the results of the present study conform with the outcomes of the broader literature regarding the responsiveness of individuals to completing survey research. Future studies should attempt to solicit responses from a variety of graduate programs and increase the number (and retention) of respondents.

## Disclosures

The first and second authors have no relevant financial or non-financial disclosures related to this research. The third author is the clinical coordinator for the graduate training program discussed in this manuscript but has no relevant non-financial disclosures.

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