STATISTICAL KNOWLEDGE IN SECOND LANGUAGE ACQUISITION RESEARCH: A RESEARCHERS' PERSPECTIVE

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ABSTRACT

A methodological turn in applied linguistics has led to greater emphasis on improving quantitative practices in second language acquisition (SLA) research, in terms of both analyzing and reporting data. One area of interest has been the degree of statistical knowledge possessed by SLA researchers, which encompasses not only what SLA researchers are able to do when analyzing and interpreting data, but also how this knowledge develops. Previous studies have considered SLA researchers' (at both faculty and graduate levels) self-perceptions of statistical knowledge and training, as measured through questionnaires, and actual statistical knowledge, as measured through discipline-specific test items. The current study builds upon such inquiry by engaging directly with 12 SLA researchers through a series of semi-structured interviews, with an emphasis on both personal experiences with conducting quantitative analyses and general perceptions of historical and contemporary training practices in SLA. Interviewees' responses highlighted the use of collaboration in overcoming statistical difficulties, the complexities surrounding increased graduate training and the field-wide increase in advanced statistical techniques, and a wider need to consider methodological rigor from a more inclusive mixed-methods perspective.

The methodological turn in applied linguistics (Byrnes, 2013) has led to greater emphasis on methodological rigor in conducting empirical research. One specific sub-discipline of applied linguistics (see Hall et al., 2017) that has seen increased methodological scrutiny is that of second language acquisition (SLA; e.g., Norton & Ortega, 2000; Plonsky & Gass, 2011). Given the prevalence of quantitative methods in SLA research (Brown, 2004; Loewen & Gass, 2009), one highly relevant area of interest in this regard has been the existing statistical knowledge amongst SLA researchers. When referring to statistical knowledge here we draw upon both Gonulal (2020) and Loewen et al. (2019), whose own definitions drew from several earlier sources (e.g., Schield, 1999, 2004; Wallman, 1993). Specifically, Gonulal (2020) operationalized statistical knowledge as "the ability to a) choose correct statistical methods suitable for research questions, b) conduct statistical analyses properly, c) understand and interpret the results of statistical analyses, d) evaluate the soundness of statistical analyses, and e) report statistical results properly" (p. 5). In measuring SLA researchers' statistical knowledge, previous studies have relied primarily on self-report survey-based data (e.g., Lazarton et al., 1987; Loewen et al., 2014) and, most recently, a practice-oriented Statistical Knowledge Test (SKT; Loewen et al., 2019). Gonulal (2020) also investigated doctoral students' (i.e., researchers in training) statistical knowledge and satisfaction with their statistical training. The current study builds on this research by engaging directly with SLA researchers to understand how their personal experiences and practices might inform our overall understanding of SLA researchers' statistical knowledge, in terms of past, present, and future growth.

BACKGROUND

The strength of quantitative research is in the ability to yield generalizable and synthesizable findings that advance theory and inform practice (this, of course, assumes the additional presence of strong research design and informative reporting). Yet, inappropriate, misapplied, and/or misinterpreted statistical analyses can threaten the epistemological integrity of SLA research (Loewen et al., 2019). Thus, it is not surprising that we have seen increased emphasis on statistical practices in SLA, including full volumes overviewing statistical procedures (e.g., Larson-Hall, 2015; Plonsky, 2015) and article-based reviews of prior/current usage (e.g., Cunnings, 2012; Plonsky & Gonulal, 2015; Plonsky & Oswald, 2016). Research emphasizing the

usage of advanced statistical procedures has tended to overlook the degree of statistical knowledge possessed by SLA researchers, knowledge which is necessary if we are to see a reform in methodological practice across SLA, as called for in Plonsky (2014).

Previous research measuring statistical knowledge among SLA researchers considered both SLA professors and graduate students (Gonulal, 2020; Gonulal et al., 2017; Lazarton et al., 1987; Loewen et al., 2014), with findings drawn primarily from self-report data. For example, Lazarton et al. surveyed 121 members of the Teaching of English to Speakers of Other Languages (TESOL) organization, while Loewen et al. surveyed 157 SLA professors and 158 SLA graduate students. Comparing Loewen et al.'s replication study to Lazarton et al.'s initial survey, professors and graduate students indicated increased confidence for many basic and some advanced statistical concepts. Participants in Loewen et al. (2014) also rated the adequacy of their statistical training slightly higher than those in Lazarton et al. (1987). However, in terms of the number of statistics courses taken (mean = 2.3) and overall low confidence in interpreting advanced statistical analyses, little appeared to have changed in the nearly 30 years between surveys.

More recently, Gonulal et al. (2017) investigated graduate students' perceptions of statistical knowledge development during semester-long, discipline-specific statistics courses. Their findings indicated perceived gains in knowledge regarding basic descriptive and common inferential statistics. However, participants reported limited gains in knowledge of advanced statistics. Gonulal (2020) also evaluated SLA doctoral students' statistical knowledge using a statistics survey and interviewed a subsample of participants about their experiences in preparing to use and interpret statistics in SLA research. He conducted semi-structured interviews to gain insights into participants' experience with statistics and their training in using statistical analyses. He found that interviewees were dissatisfied with their training in statistics because generally it was not discipline (i.e., SLA)-specific. They also reported that the training lacked opportunities to go beyond basic terminology and analyses and lacked opportunities for students to apply or practice reporting statistics. He reported that graduate students tended not to further their statistical knowledge using self-training. To summarize these inquiries, there appears to be limited confidence amongst SLA researchers and researchers-in-training in their ability to apply the advanced statistical procedures that are becoming more commonplace in SLA research (e.g.,

Plonsky 2015). However, as previously highlighted, these studies mainly relied on self-report data, and did not provide empirical measures of statistical knowledge.

Statistical Knowledge Test

To build upon the existing self-report data regarding SLA researchers'/graduate students' statistical knowledge, Loewen et al. (2019) developed the *Statistical Knowledge Test* (SKT). The SKT is a 26-item multiple choice survey comprised of SLA-specific material intended to measure SLA researchers' ability to understand basic statistical concepts and procedures, to select and interpret statistical analyses, and to critically evaluate statistical information and data-related claims. In total, 198 active SLA researchers from North America and Europe completed the SKT. Respondents averaged a score of 18/26 (or 69%; median = 77%), with questions related to identifying Type I/II errors, interpreting a box plot, and understanding the relationship between statistical coefficients, standard errors, and population parameters posing high difficulty. In survey responses, participants indicated a preference for internet-, textbook-, and colleague-based aid, as opposed to turning to statistical consultants or help centers. Respondents also reported a strong preference for conducting statistical analyses using SPSS (76%). Finally, respondents reported having taken, on average, 2.5 quantitative analysis or statistics courses.

These results are very comparable to those reported in Gonulal (2020), who evaluated doctoral students' statistical literacy using a similar instrument. His participants averaged a score of 16/28 (57%) on a test of statistical knowledge. Like the practicing researchers in Loewen et al. (2019), he found that the researchers in training turned to the internet, textbooks, and colleagues when they needed statistical assistance, and that the participants had taken approximately 2 (M = 2.19, SD = 1.56) statistics courses. Taken together, these two studies suggested that statistical training practices in the field of SLA/applied linguistics were similar at the time Gonulal (2020) conducted his study and when more advanced career researchers surveyed in Loewen et al. (2019) received their training.

THE CURRENT STUDY

While the outside measures of statistical knowledge reported in Loewen et al. (2019) and Gonulal (2020) built upon prior self-report findings, the current study builds upon the SKT

findings by engaging directly with 12 SLA researchers through a series of semi-structured interviews. In essence, our interviews allowed us to place an emphasis on both SLA researchers' personal experiences with conducting quantitative analyses and general perceptions of historical and contemporary training practices in the SLA field. Drawing on such experience allowed the interviewees to provide commentary on the current state of statistical knowledge likely not fully represented in the SKT, and also more in-depth than could be gleaned through self-report data. These interviews also allowed us to compare the perspectives of researchers who are currently practicing in applied linguistics with those of the doctoral students more recently enrolled in statistics courses that Gonulal (2020) interviewed. Our specific research questions were:

1. How do SLA researchers develop and maintain their statistical knowledge?
2. What are current researchers' views on the type of training and statistical support that are available to SLA researchers?
3. What changes do researchers perceive about the knowledge and use of statistics in our field?

METHODOLOGY

Participants

Twelve researchers working at research institutions participated in interviews. Three participants self-identified as primarily qualitative researchers, and nine self-identified as primarily quantitative researchers. In general, interviewees can be considered to be relatively senior members of the field (10/12 held a rank of either associate or full professor), and represented a range of SLA interests. We provide demographic information for the participants in Table 1.

Interview Protocols

We collected data through a series of semi-structured interviews. Two sets of interview questions were developed (and piloted) to elicit researchers' opinions on the field's current state of statistical knowledge: 11 questions targeted researchers who conducted primarily quantitative research (see Appendix A), and a modified set of 11 questions was developed for those who

engaged primarily in qualitative research (see Appendix B). Examples of interview questions included *Can you describe your personal development as a statistician within SLA research?*, *When facing statistical difficulties, what are some of the resources that you have relied upon for assistance?*, and *Could you walk us through the different types of training you have received on how to perform statistical analyses*? These two sets served as a guide, with interviewers given the freedom to allow the interviews to develop organically (i.e., asking follow-up questions when necessary; allowing interviewees the freedom to provide additional insight when relevant).

Procedure

Three members of the research team scheduled and conducted 20-minute, one-on-one interviews with participants either in-person or via videoconferencing platforms. Each interviewer audio-recorded and transcribed their interviews. A second member of the research team verified the transcription of each interview.

Table 1
Demographic Information for Interview Participants

Category	N	%
Gender		
Female	9	75
Male	3	25
Academic Position		
Assistant Professor	1	8.3
Associate Professor	6	50
Professor	4	33.3
Other[a]	1	8.3
Major Field of Study		
SLA	5	50
Psycholinguistics	3	25
Education	2	16.7
Other[b]	2	16.7
Research Focus		
Quantitative	9	75
Qualitative	3	25

Notes. [a] Program director, non-profit research institution; [b] Identity and language learning, language testing.

Data Analysis

We analyzed interview transcripts using thematic analysis, where we identified themes that best exemplified patterns observed across interviews (Boyatzis, 1998). We specifically followed a dialogic perspective, where meaning was considered as co-constructed between interviewer and interviewee (Wortham, 2001). We then compared themes with findings from the SKT (Loewen et al., 2019) to better inform our interpretation of the results. All interviewees were provided an opportunity to review their comments for accuracy and anonymity.

FINDINGS

We now draw upon the insight of our 12 interviewees, with a range of 4-20 years at their current institutions ($M = 12.13$, $SD = 4.83$), and who have been active within the field of SLA for a substantial period of time. We present excerpts of interviews across three key interrelated themes: quantity of training, sources of knowledge, and field progression. To promote conciseness, ellipses (…) have been included in excerpts to remove repetitive or unrelated information.

Quantity of Training

Reflecting upon their experiences, the majority of the interviewees described their own statistical training as limited (as shown in Excerpts 1 and 2).

> *Excerpt 1*
> In my PhD program we did have one course on statistics. It was using a book though that did not use SPSS, it used some off-software that no one used outside of the statistics class. So I didn't find that very helpful either, although we learned some of the concepts. (Interviewee 1, associate professor, quantitative research orientation)

> *Excerpt 2*
> I took one statistics course through the … college of education, and I did really well on that course, but then it was another year after that when I actually started

analyzing my data … I didn't really remember any of the details about how to carry out these statistical tests. (Interviewee 5, professor, quantitative research orientation)

Maybe most telling is that multiple interviewees referred to the limitations of their statistical training leading to a sense of "flying/going by the seat of my pants" (Interviewee 4, Interviewee 7).

Sources of Knowledge

Since few interviewees had taken more than one or two statistical courses during their studies, much of their knowledge was self-developed through a number of different avenues (Excerpts 3 and 4).

Excerpt 3

Their stats PhD students had a requirement of sitting at this help desk for many hours every week and I met a student who was a dual degree in linguistics and statistics…So I sat with him for three hours a week and he would give me an assignment and I would go to the SPSS help desk and figure out how to carry out my assignment…I would bring the results back and he would teach me how to read them. (Interviewee 6, professor, quantitative research orientation)

Excerpt 4

I think you learn by doing in this field. People will tackle *t*-tests because they're using them. You have that overview class where you learn like *t*-tests, ANOVAs, correlations but you don't really learn it till you use it…I found my statistics knowledge lacking when I became a professor so I've gone to many workshops that are on a specific statistic that I want to use. (Interviewee 1, associate professor, quantitative research orientation)

Despite shortcomings in classroom-based training, it is clear that options are available to overcome limitations in statistical knowledge. While the above excerpts promoted methods of

continued knowledge growth by seeking one-on-one help or training in workshops, the interviewees also indicated preferred strategies when they encountered a statistical challenge. While the SKT indicated researchers tended to prioritize internet sources and textbooks, the interviewees were strong proponents of the use of statistical help centers and statisticians. (Excerpts 5 and 6).

Excerpt 5

I learned from courses but I have to say that I probably learned a lot more from working with statistical consultants through those years on specific projects. (Interviewee 3, associate professor, quantitative research orientation)

Excerpt 6

And I still do that with students here when I have like an MA thesis and they're using something and I'm not quite sure if we did it right, we'll make an appointment [with a statistical consultant] and go over our data, how we did it, and how we wrote it up and check with someone. (Interviewee 1, associate professor, quantitative research orientation)

Participants similarly indicated a reliance on colleagues when they encountered a difficult statistical question (Excerpt 7).

Excerpt 7

I guess I have colleagues, right, who I can bounce ideas off of. Less so here at the university than colleagues who are at other places, you know, I went to grad school with. (Interviewee 7, associate professor, quantitative research orientation)

In addition to the SKT indicating that researchers prioritized web- and text-based aid, the interviewees' responses appeared to strongly emphasize a collaborative approach towards statistical analysis: interviewees described collaborating and consulting with colleagues, graduate students, statisticians, and attending workshops.

Field Progression

Regarding improvements in statistical knowledge in SLA over time, the interviewees appeared conflicted. As seen in excerpts 8 and 9, some perceived that there had been substantial growth both amongst researchers and training programs.

> *Excerpt 8*
>
> I think people are getting better at stats. Especially the PhD programs now are requiring more statistical coursework, the textbooks are better. (Interviewee 1, associate professor, quantitative research orientation)

> *Excerpt 9*
>
> I have to say that I'm really impressed with the younger generation. They come out knowing all kinds of stuff that, you know, sends my head spinning. (Interviewee 5, professor, quantitative research orientation)

In contrast, while recognizing an increase in training, there was a question of how beneficial such training had been (Excerpt 10).

> *Excerpt 10*
>
> I wish I could say students had more knowledge now...I think students would get it [a stats course], and in the end they might not know they should be thankful for it, but they would really benefit from it, So I don't know. Yeah, I think it's still an issue. (Interviewee 7, associate professor, quantitative research orientation)

A particular concern raised by several interviewees is the pace at which statistical advancements are being made and whether a proper understanding of the basics of statistical knowledge was being lost in the field's haste for greater implementation of more sophisticated techniques (Excerpt 11).

Excerpt 11

I think we're starting to run into the problem that in order to be a sophisticated consumer of some of the newer techniques…you need to understand the older techniques. So in essence we've increased the amount of information they need to learn and at the same time a lot of places are trying to shorten the time to degree. (Interviewee 12, associate professor, quantitative research orientation)

Additionally, interviewees raised the issue of disciplinary differences within SLA itself, with different theoretical foci leading to differences in statistical knowledge (Excerpts 12-13).

Excerpt 12

I think in certain areas they do [possess greater statistical literacy], you know, especially students who are working, you know, they're doing psycholinguistics and they're working with psychologists. (Interviewee 7, associate professor, quantitative research orientation)

Excerpt 13

I'm starting to wonder if our field isn't starting to be driven too much by statistical innovations...we're trained as linguists which means that we're trained in qualitative analysis of how language works, right? (Interviewee 5, professor, quantitative research orientation)

Interviewee 5 (Excerpt 13) referenced the potential qualitative nature of SLA, which echoed certain commentary from the three qualitatively-orientated interviewees. Their responses underscored the importance of statistical literacy in order to fully engage with the range of scholarly work published within SLA (Excerpt 14).

Excerpt 14

I feel like I can't really evaluate if I'm reading something where they're providing the numbers, I can't evaluate if they've done it well or not. (Interviewee 12, associate professor, quantitative research orientation)

The importance of possessing statistical knowledge is maybe best exemplified in Excerpt 15.

Excerpt 15

I also have the really hands on training as well that alerted me to some of the limitations of the statistical world. (Interviewee 9, professor, qualitative research orientation)

This researcher described how having received both quantitative and qualitative training, along with hands-on experience, informed their choice to primarily pursue qualitative approaches, while not disregarding the information that could be gleaned from a statistical approach. As shown in Excerpt 16, Interviewee 9 stressed the importance of understanding both strands.

Excerpt 16

Quantitative, qualitative, mixed methods and so forth of course even if you don't use statistics in your own work, I mean you want to be able to understand, and you wanna cooperate in your studies where it makes sense right, where there's a certain logic … of course it depends on what your interests are. (Interviewee 9, associate professor, quantitative research orientation)

In concert with Interviewee 9's perspective, Interviewee 2 argued in Excerpt 17 that the necessity for greater statistical knowledge amongst qualitative researchers should be balanced with the need for qualitative literacy for quantitative researchers as well.

Excerpt 17

I don't think that it's just that the qual people are missing this quantitative advantage, I also think that the quantitative people could really stand to learn something from us and I think that too frequently there's a misbalance between- an overemphasis on quant. (Interviewee 2, program director, qualitative research orientation)

Taken together, these final excerpts highlighted the need for appropriate training in both quantitative and qualitative research methods in order to be informed consumers of research in the diverse field of SLA.

DISCUSSION

We posed three research questions at the outset of our study:

1. How do SLA researchers develop and maintain their statistical knowledge?
2. What are current researchers' views on the type of training and statistical support that are available to SLA researchers?
3. What changes do researchers perceive about the knowledge of statistics in our field?

In regards to developing and maintaining their statistical knowledge, interviewees viewed their statistical training as limited. This is in line with the findings of the SKT in Loewen et al. (2019), where 55% of respondents felt their training to be inadequate (only 11% felt their statistical training was adequate). One primary reason for this perceived inadequacy might be the general lack of statistical courses available (~2-3 courses; Loewen et al., 2019; Gonulal, 2020; Lazarton et al., 1987; Loewen et al., 2014), but two additional concerns were raised by the interviewees. First, interviewees raised concerns regarding the applicability of statistics courses to SLA research practice, specifically in regards to interacting with actual SLA data and using common programs such as SPSS. This same concern was echoed by participants interviewed by Gonulal (2020): one participant shared that there was a significant mismatch between the content of their statistics classes and their own research, and suggested that "SLA faculty need to offer more discipline-specific quantitative research methods courses to move the field forward" (p. 14). Promisingly, more recent SLA-oriented statistical volumes/textbooks have tended to include SLA data (Larson-Hall, 2015; Plonsky, 2015), with walkthrough guidelines often provided for both the commonly used SPSS and the increasingly used R programs. Another important consideration touched upon in this regard is the practicality of working directly with students' own data when completing statistical courses. Of course, such alignment would require careful planning from program curriculum designers, but the ability to limit the time between training

and practical application would likely greatly benefit field-wide development in statistical knowledge (or help avoid the 'by the seat of my pants' feeling described by both Interviewees 4 and 7).

The second concern raised, and directly related to research question 3, is that the continued push towards more advanced analytical techniques (e.g., Plonsky, 2015) may in turn be creating greater limitations in the development of statistical knowledge. Given that the participants in the current study had the same mean number of statistics courses as more recent SLA graduate students (Gonulal, 2020), and that researchers are observing the use of more advanced statistical analyses, the burden of knowledge becomes even more intense. The concern is that rather than gaining a strong underlying knowledge of basic statistical procedures (e.g., ANOVA, correlations, t-tests), many of which underlie the processes of more advanced approaches (e.g., factor analysis, Loewen & Gonulal, 2015; structural equation modeling, Winke, 2014), students are learning how to run these more advanced procedures without the proper underlying knowledge to ensure that they are making appropriate decisions at each step of the analysis process. One promising note in this regard is that the current population of SLA researchers have at least shown a willingness to pursue statistical guidance from a range of resources. Respondents to the SKT in Loewen et al. (2019) and in Gonulal (2020) indicated a strong preference for internet- and textbook-based references, whereas the SLA researchers surveyed here indicated a willingness to gain advice from both their colleagues and statistical consultants. While the former indicates a degree of self-regulation in continued development in statistical knowledge, the latter shows a willingness to admit to shortcomings in statistical knowledge and take appropriate steps to address these shortcomings.

Though only touched upon briefly, it is important to note the insight provided by the three qualitatively-oriented researchers interviewed. When discussing a methodological turn, there is no reason that our emphasis should only be on quantitative practices. One of the participants shared that they felt underprepared to adequately evaluate quantitative studies, which is a concern echoed by one of the qualitatively-oriented doctoral students in Gonulal (2020): "I didn't understand what their shortcomings were" (p. 15). However, another qualitative researcher in the current study had strong training in both quantitative and qualitative methods, which she said allowed her to better understand the limitations of quantitative research and take a more qualitative approach that can incorporate quantitative methods, if needed. Indeed, we have seen a

significant increase in mixed-methods approaches in applied linguistics research (Khany & Tazik, 2019; King & Mackey, 2016), with SLA-specific guidebooks now available (Brown 2014; Riazi, 2017). SLA research has seen little review of qualitative practices compared to the emphasis on quantitative practices (though many SLA journals have begun to include more diverse research guidelines; e.g., Mahboob et al., 2016). However, if the trend in the field is towards more mixed-methods usage, then it becomes imperative that we consider knowledge of both quantitative and qualitative methods and procedures, which encompasses making appropriate methodological decisions as well as ensuring appropriate reporting and interpretation of a wider range of data sources.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The current study aimed to extend previous SLA research into field-wide statistical knowledge beyond self-report and practice-oriented methods by considering the personal experiences and reflections of active SLA researchers. While highly informative, we note here the limitations of our inquiry. Specifically, we employed a purposive sampling that included primarily senior researchers working within the North American region. While such a sample provides important insight, it must be noted that important SLA research has been produced by researchers beyond this specific region. Much like Loewen et al. (2019) included SKT responses from European-based researchers, the personal reflections of researchers beyond North America must be considered in future research to gain a fully formed understanding of statistical knowledge in the field of SLA, as well as changes in graduate training practices across different regions. A final consideration is that since our purposive sample featured senior researchers, it can only provide an outside perspective on how statistical training at the graduate level has changed. As seen in Gonulal et al. (2017), graduate students report increased statistical knowledge in some domains more than others. More direct contact with graduate students, as well as recent graduates, would shed more light on both advancements in and limitations to statistical training at the graduate level.

CONCLUSION

Building on prior self-report data (Gonulal et al., 2017; Lazarton et al., 1987; Loewen et al., 2015) and Loewen et al's (2019) SKT, we drew upon the personal experiences and reflections of experienced SLA researchers to extend the current understanding of statistical knowledge within the field of SLA. While acknowledging that some programs do indeed appear to provide adequate or improved training, there is still a need for many programs to reevaluate their approach towards increasing graduate students' statistical knowledge. In this light, we make the following two recommendations for increasing statistical knowledge among SLA researchers. First, whenever possible, graduate students should receive statistical training within SLA-specific courses that allows them to engage with data relevant to SLA research. Ideally, this might include the opportunity for students to analyze their own second language data during a research methods or statistics course. Second, given the increased usage of advanced statistical techniques, the ~2.5 stats courses reported across studies may not be enough for students to acquire knowledge in both the core and advanced techniques needed to conduct and consume SLA research. Providing additional courses (or some degree of additional support) is highly encouraged. Our final recommendation is relevant to not only graduate student training, but also to experienced SLA researchers. We would suggest that both populations be made aware of and encouraged to take advantage of alternative methods of gaining statistical knowledge. Such methods include on/off campus resources (e.g., statistical consultation centers, websites, and forums), and also the increased statistical presence at SLA conferences (whether through pre/post-conference workshops or paper presentations). Of course, staying abreast of SLA-specific statistical literature (e.g., Plonsky, 2015) is a must, the increasing presence of which reinforces the field-wide importance of statistical knowledge within SLA research.

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APPENDIX A

List of 11 Guiding Quantitative Interview Questions

1. Can you describe your personal development as a statistician within SLA research?

2. What is different about you as a researcher (in regards to statistics) now versus when you first started?

3. Could you walk us through the different types of training you have received on how to perform statistical analysis? (*this question likely depends on the depth provided in #2*)

4. Could you share some of the difficulties you have faced while performing statistical analyses? This may include pre-analysis planning, data analyses and/or interpretation, reporting.

5. Could you share some of the experiences that you have had in grappling with difficult data and the how these situations were resolved, if indeed they were?

6. What have been some of the major accomplishments in your career in regards to statistics?

7. When facing difficulties, what are some of the resources that you have relied upon for assistance?

8. Could you share a little about your most recent statistical conundrum?

9. Could you describe some of the situations where you adopted new or less-familiar statistical analysis procedures in your research?

10. When you collaborate on a paper with colleagues or students, how do you go about negotiating what statistical procedure will be used, who will run the analyses, report the results, and conduct the interpretation?

11. What is your overall impression of the statistical knowledge of SLA researchers in general? What about specifically those who have entered the field as professors in the past five years?

APPENDIX B

List of 11 Guiding Qualitative Interview Questions

1. As someone that does not primarily use quantitative statistics in your research, could you share some of your background with statistics and SLA? (Training, experience working with others, perceptions, etc.)

2. What kinds of changes have you noticed between now and when you first began your career in SLA with regards to how researchers have adopted/utilized statistics in research?

3. Could you walk us through the different types of training you have received on how to perform statistical analysis?

4. How much of your work would you say is informed by research using quantitative/advanced statistical analysis?

5. How have you used statistics in your research?

6. Could you share anything about your habits with regards to consuming research that utilizes more quantitative methodologies? Specifically, with regard to statistics and their interpretation.

7. In the future, what do you see the relationship being between your work and quantitative statistics?

8. What are your thoughts on the level of training that Apprentice SLA researchers are receiving/receive in their programs? How or Where could it improve?

    a. What about the field of SLA as a whole?

9. In Hulstijn et al. 2014, Steven Talmy and Richard Young bring up the concept of 'methodolatry' or this seeming tendency to cling to one particular methodology in exclusion of other possibilities. The rest of the writers in the forum contend that collaboration is what is required to "bridge the gap" (if there is one) between cognitive and social approaches to SLA. Do you see this today? What are your thoughts?

10. In this same forum, Nick Ellis stated "Distrust any theory that claims that you can comprehensively study a component in isolation: syntax separate from lexis or semantics, form from function, representation from processing, diachronic from synchronic, knowledge from experience, behavior from brain, competence from usage, and so on (Ellis & Larsen-Freeman, 2006). Especially pertinent here is the social-cognitive gap. Such partitioning leads

to theoretical, ontological, and social isolation; self-aggrandizement; and autistic hostility. Diversity is powerfully creative if there is chance of interaction." What are your thoughts? What are your thoughts on mixed methods research?