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The Effects of an Online Training on Pre-Service Speech-Language Pathologists' Use of Family-Centered Skills

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## 24 Abstract

25 Purpose: Despite the recognition that family-centered services are best-practice in Augmentative  
26 and Alternative Communication services, many speech-language pathologists are lacking in their  
27 acquisition and implementation of family-centered skills. The purpose of this study was to  
28 evaluate the effects of online instruction in a family-centered, relational skills strategy on pre-  
29 service SLPs' use of family-centered skills.

30 Method: A switching-replications design was used to evaluate the effects of an online training on  
31 the use of family-centered behaviors by fifteen pre-service SLPs' who were randomly assigned  
32 to two groups. The online training taught the students a four-step relational skills strategy  
33 (summarized by the acronym, LAFF): (a) Listen, empathize, and communicate respect; (b) Ask  
34 questions; (c) Focus on the issues; and (d) Find a first step. Participants were videotaped during  
35 interactions with simulated parents before and after the training.

36 Results: After an average of 61 minutes of instruction via the online module, all of the pre-  
37 service SLPs significantly improved their demonstration of relational skills. Additionally, one  
38 parent of a child who used AAC viewed the video recordings and chose 14 of the 15 post-  
39 instruction role plays as more family-centered.

40 Conclusion: The findings from this study provide support for the use of an online environment to  
41 teach pre-service SLPs family-centered relational skills. In order to prepare future SLPs and  
42 ensure the delivery of family-centered services, future research is necessary, including  
43 investigations to determine whether other family-centered skills can be effectively taught  
44 through an online environment.

45

46 For a child with disabilities, his or her family is the constant or consistent factor. While  
47 professionals may come and go, the family grows with the child, sees the child in most settings,  
48 and knows the child's needs best. Considering the interdependence of the family and child, the  
49 way in which professionals support children with disabilities and their families has the potential  
50 to enhance or to hinder child and family outcomes (Dempsey & Keen, 2005).

51 Over the last few decades, growing recognition of the importance of family input and  
52 participation has led to a change in the expected model of service delivery. There is now  
53 acknowledgement that families are an essential part of service delivery and are key decision  
54 makers concerning their child's services (Dunst, Trivette, & Hamby, 2007). Professionals are  
55 now expected to deliver family-centered services which recognize that each member of the  
56 family is important and impacts the child's life. Arango (2011) describes family-centered  
57 practice as a partnership characterized by trust, respect, and open communication—where  
58 families and professionals work together to make decisions in the best interest of the child.

59 As part of this change from professionally-centered to family-centered services,  
60 professional organizations have transformed their philosophies and skill requirements in order to  
61 include families in service provision and develop professionals who can work effectively with  
62 them. For speech-language pathologists (SLPs), it is their role and responsibility to “recognize  
63 the essential role that families play in all aspects of service, from assessment through treatment,  
64 and the role that families and individuals play as key decision makers, recognized for their  
65 knowledge and skills” (American Speech-Language-Hearing Association, n.d.a).

66 Despite the push for family-centered service provision, evidence suggests that families do  
67 not always receive these services from their children's SLP (Mandak & Light, 2018a, Marshall  
68 & Goldbart, 2008). SLPs have reported their lack of training in family-centered services and the

69 challenges faced when working with families (Mandak & Light, 2018a, 2018b). To improve  
70 outcomes for children with disabilities and their families, it is necessary to identify effective  
71 ways to improve the family-centered skills of SLPs.

## 72 **Children who use AAC**

73       Although SLPs should provide family-centered services to all children and families,  
74 evidence suggests one group for whom family-centered services are especially vital, but  
75 critically lacking—children with complex communication needs (CCN) who may rely on  
76 augmentative and alternative communication (AAC) (Bailey, Parette, Stoner, Angell, & Carroll,  
77 2006; Mandak & Light, 2018a; McNaughton, Rackensperger, Benedek-Wood, Krezman,  
78 Williams, & Light, 2008). For children with CCN, it is well documented that positive AAC  
79 outcomes are dependent on the family’s involvement and the development of a successful  
80 family-professional partnership (Angelo, Jones, & Kokoska, 1995; Cress, 2004). Historically,  
81 families were not part of the AAC decision making process. The professional typically made  
82 treatment decisions, while families provided information (Parette & Angelo, 1996). Considering  
83 that family members are often the most significant and most frequent communication partners  
84 for children who use AAC, they must be involved in making decisions (Granlund, Björck-  
85 Akesson, Wilder, & Ylvén, 2008). Many families agree and express their desire to be key  
86 members of the AAC decision-making team (Calculator & Black, 2010; McNaughton et al.,  
87 2008). When family members are part of the team, and when their routines and patterns of life  
88 are considered, there is a greater likelihood that they will assume ownership of the planned  
89 interventions (Parette & Angelo, 1996). These factors all contribute to the growing recognition  
90 of the importance of family input and the acknowledgement that families are an integral part of  
91 the AAC decision-making process (Bailey et al., 2006; Cress, 2004).

92           Accordingly, it has been recognized as best practice to implement family-centered AAC  
93 services (Cress, 2004; Mandak, O'Neill, Light, & Fosco, 2017). Decades of research provide  
94 evidence of the benefits of family-centered services as they have been linked to many positive  
95 parent, family, and child outcomes (Dunst et al., 2007). A meta-analysis of nearly 50 studies  
96 showed that family-centered services resulted in greater family satisfaction with services;  
97 stronger self-efficacy beliefs within the family; greater family empowerment; improved family  
98 ratings of the helpfulness of supports and resources; improved parent judgements of child  
99 behavior, progress, and functioning; and increased family and individual well-being (Dunst et al.,  
100 2007). Despite the documented benefits, many SLPs still adhere to a professionally-centered  
101 mindset (Iacono & Cameron, 2009; Mandak & Light, 2018a, 2018b), in which professionals see  
102 themselves as experts, while families are seen as less capable in knowing what is in the best  
103 interest of the child (Dunst, Johanson, Trivette & Hamby, 1991). For families with children with  
104 CCN, a lack of family-centered services can result in the selection of inappropriate AAC  
105 systems, which can diminish the likelihood of positive AAC outcomes and lead to abandonment  
106 of AAC strategies (Parette & Angelo, 1996; McNaughton, Hamlin, McCarthy, Head-Reeves, &  
107 Schreiner, 2008).

### 108 **Family-centered Skill Sets**

109           In order for SLPs to deliver family-centered services, they must acquire specific skills to  
110 work effectively with children and their families. Over the years, Dunst and colleagues (1991,  
111 2002, 2007) have thoroughly investigated the implementation of family-centered services and the  
112 necessary skills to provide such services. They found a distinct subset of skills, called relational  
113 skills, to be vitally important to providing family-centered services. Relational skills include  
114 behaviors that are typically associated with effective clinical practice (i.e., active and reflective

115 listening, compassion, empathy, respect, and effective communication), as well as maintaining  
116 positive beliefs and attitudes toward families, especially those regarding parenting competencies  
117 and family strengths (Dunst et al., 2007).

118         Of the family-centered skill sets, many SLPs assume they are using relational skills  
119 adequately (Mandak & Light, 2018a). For example, Mandak and Light surveyed 211 SLPs who  
120 served children with autism spectrum disorder and CCN. A number of questions were aimed at  
121 relational skills such as treating families with respect and viewing families as competent and  
122 equal members of the team. They found that nearly all the SLPs perceived that they treated  
123 parents respectfully, helped parents feel competent, treated parents as individuals and equals, and  
124 ensured that parents had a chance to say what was important to them. Unfortunately, parent  
125 perspectives suggested otherwise. In the same study, some of the parents of children with CCN  
126 surveyed reported that their children's SLP did not help them feel competent as parents (57% of  
127 parents), did not treat them as equals (44%) or individuals (50%) and did not provide them  
128 enough time to talk during interactions (52%) (Mandak & Light, 2018a). Another study also  
129 found that families of children who use AAC reported that professionals lacked sensitivity and  
130 understanding of family demands (Marshall & Goldbart, 2008). If relational skills are indeed  
131 lacking in AAC service provision as the evidence suggests from parents' perspectives, it is  
132 unlikely that children and families will realize the benefits of family-centered services.

### 133 **Pre-service Training**

134         One of the key barriers to family-centered AAC services is the lack of pre-service  
135 training in family-centered services (i.e., training at the graduate level). Research suggests that  
136 many SLPs do not receive family-centered training in their pre-service programs. For example,  
137 Mandak and Light (2018a) found that more than half of the 211 SLPs reported that they received

138 no training in family-centered service provision during their graduate training program. Another  
139 group of SLPs who participated in an online focus group also shared their experiences related to  
140 pre-service training in family-centered services (Mandak & Light, 2018b). None of the SLPs  
141 reported graduate coursework specifically focused on family-centered services and all agreed  
142 that their graduate training could have been improved to better prepare them to more effectively  
143 work with families.

144         Given the importance of family-centered services and the lack of training and coursework  
145 for SLPs, it is urgently necessary to determine how to best teach SLPs the necessary knowledge  
146 and skills to deliver effective family-centered services. Targeting skills that extend across  
147 populations and contexts, such as relational skills, may be the most parsimonious way to  
148 integrate family-centeredness into graduate training (Brown & Woods, 2011; Dunst et al., 2007).

#### 149 **Evidence-based Relational Skills**

150         Two published reviews of evidence-based family-centered measures (Dunst, Trivette, &  
151 Hamby, 2006; Porter et al., 2012) showed four sets of relational skills necessary for family-  
152 centered service provision: a) Treating families with respect, as competent individuals and  
153 equals; b) Accepting families in an honest, caring, non-judgmental atmosphere; c) Actively  
154 listening to families' needs, concerns, and priorities; and d) Recognizing the families' strengths  
155 and moving forward based on the strengths and desires of the families. Though these practices  
156 are consistently cited as necessary for family-centered service provision, SLPs may need  
157 guidance as it can be difficult to operationalize these practices into concrete clinical skills (e.g.,  
158 how to demonstrate respect to a parent). There is also limited understanding of how to most  
159 effectively and efficiently teach individuals these skills.

160 In response to these challenges, researchers have sought to improve the use of specific  
161 relational skills by pre-service SLPs. Some have targeted one skill at a time (e.g., targeting  
162 “mindfulness” in Beck, Verticchio, Seeman, Milliken, & Schaab, 2017; Beck & Verticchio,  
163 2018), while others have attempted to teach multiple skills at once (e.g., Kadarevak, Laux, &  
164 Mills, 2004). For example, Kadarevak et al. (2004) implemented a counseling training module  
165 for 10 pre-service SLPs over the period of three class sessions (i.e., 8 hours of time). Each  
166 session was designated to teach a subset of relational skills (i.e., developing a therapeutic  
167 relationship through nonverbal behaviors, eye contact, and silence; asking open-ended questions;  
168 and paraphrasing and summarizing emotions and concerns). Pre-and post interviews were  
169 completed with students who played the roles of parents. Following the training module, the pre-  
170 service SLPs were perceived as demonstrating improved counseling skills by blind raters using  
171 The Counselor Rating Form (CRF). Despite the reported positive gains of this study, the findings  
172 should be interpreted with caution as there was no measure of the pre-service SLPs’ actual  
173 implementation of the targeted relational skills.

174 Another group of researchers developed a multi-skill strategy in order to improve the  
175 relational skills of students in the helping professions (McNaughton et al., 2008; Thistle &  
176 McNaughton, 2015; Vostal, McNaughton, Benedek-Wood, & Hoffman, 2015). Participants in  
177 these studies included pre-service SLPs (Thistle & McNaughton, 2015) and pre-service teachers  
178 (McNaughton et al., 2008; Vostal et al., 2015). Across the studies, a four-step strategy was  
179 taught, summarized by the acronym LAFF: (a) Listen, empathize, and communicate respect; (b)  
180 Ask questions; (c) Focus on the issues; and (d) Find a first step. Although the authors labeled  
181 their strategy as an “active listening” strategy, it also incorporates the other three highly cited



182 relational skills of providing a caring atmosphere, treating families with respect, and moving  
183 forward based on family desires.

184         Of particular interest to the present study are the findings from Thistle and McNaughton  
185 (2015), who used a pre-test post-test design to examine the effects of instruction. Before and  
186 after 90-minutes of in-person instruction in the LAFF strategy, 23 pre-service SLPs participated  
187 in simulated role plays. The simulated role plays were developed to simulate a parent meeting  
188 with the child's SLP and were based on common concerns expressed by parents of young  
189 children who use AAC. Role plays with simulated parents are helpful for pre-service  
190 professionals because it is often hard to predict when challenging parent interactions will occur.  
191 It is thus difficult to observe a challenging parent interaction during actual services and use the  
192 interaction for instructional purposes (Hill, Davidson, & Theodoros, 2010). Following  
193 instruction, all pre-service SLPs increased their implementation of the LAFF strategy in the  
194 simulated role plays. Seven parents of children who used AAC viewed pairs of simulated role  
195 plays and responded to forced choice questions regarding the simulated interactions (i.e., In  
196 which video did you think the SLP demonstrated stronger communication skills?) and open-  
197 ended questions (i.e., In the video you just indicated as demonstrating stronger communication  
198 skills, what were the positive communication behaviors exhibited by the SLP?). The parents  
199 chose the pre-service SLPs in the post-role plays as stronger communicators the majority of the  
200 time (i.e., 79%) suggesting that the pre-service SLPs benefited from the strategy instruction  
201 (Thistle & McNaughton, 2015).

202         In the other two studies (McNaughton et al., 2008; Vostal et al., 2015), the pre-service  
203 teachers were taught through in-person instruction and their use of the strategy was assessed in  
204 pre and post simulated interactions. Following instruction, all participants increased their

205 implementation of the LAFF strategy. Parents and teachers outside of the studies additionally  
206 described post-instruction interactions more positively than the pre-instruction interactions,  
207 suggesting that the pre-service teachers benefited from the instruction.

208         Given the research evidence, the LAFF strategy appears to be a promising method to  
209 improve the relational skill set of pre-service SLPs. All participants across the studies increased  
210 their implementation of the strategy during simulated scenarios following a relatively short  
211 period of direct instruction. Parents and teachers outside of the studies additionally described  
212 post-instruction interactions more positively, suggesting that the pre-service students benefited  
213 from the instruction. These findings suggest that the specific instructional procedures used were  
214 effective in teaching pre-service teachers and SLPs how to implement the multi-step LAFF  
215 strategy. Each of the investigations employed the same instructional sequence of procedures,  
216 which was drawn from research on strategy instruction (Kent-Walsh & McNaughton, 2005;  
217 Schumaker & Deshler, 2006).

### 218 **Strategy Instruction and Learning Environment**

219         When using a strategy instruction framework, the goal is for instructors to identify the  
220 component skills of a strategy and then teach learners to master, sequence, and demonstrate the  
221 strategy in an efficient manner (Kameenui & Simmons, 1990). In the LAFF studies, the  
222 instructional procedures were adapted from strategy instruction to include a pre-test, a  
223 description of the LAFF strategy steps, a model of the strategy, and the opportunity to practice  
224 the strategy. These findings suggest that strategy instruction is an effective technique to teach  
225 pre-service SLPs and teachers relational skills such as the LAFF strategy.

226         Previous research using LAFF, while encouraging, has limitations. To date, the LAFF  
227 strategy has only been taught through in-person instruction, which has a number of constraints.

228 For example, students must go at the pace of the instructor and learn and review the same content  
229 as others at the same time (Clark & Mayer, 2016). Additionally, students cannot pause, rewind,  
230 or maneuver throughout a lesson depending on their understanding of the material. Considering  
231 pre-service training programs, it may be particularly difficult to find extra time to provide  
232 instruction in relational skills since this content is often not part of the typical curriculum. In  
233 order to overcome some of these limitations, another delivery method may be beneficial for  
234 students such as the use of e-learning, or learning in an online environment.

235 E-learning is defined as instruction delivered on a digital device that is intended to  
236 support learning (Clark & Mayer, 2016). Although much of e-learning is designed to inform  
237 students (i.e., communicate information), there is evidence supporting the use of online  
238 environments designed to build specific skills (i.e., perform tasks) (Clark & Mayer, 2016). In  
239 these environments, the goal is to build skills and to teach learners how to adapt skills for real-  
240 world use, where each situation will vary. Given the importance of demonstrating relational  
241 skills in various settings, an online environment may be effective for teaching pre-service SLPs a  
242 strategy such as LAFF.

243 Despite the novelty of e-learning, it is important to note that it is not the online  
244 environment which makes instruction effective, but rather the instructional methods that are  
245 delivered through the online medium. In this study, principles of effective e-learning (Clark &  
246 Mayer, 2016) were paired with instructional procedures drawn from strategy instruction (Kent-  
247 Walsh & McNaughton, 2005) in order to teach relational skills to pre-service SLPs. Specifically,  
248 the instructional sequence outlined by Kent-Walsh and McNaughton (2005) was adapted for use  
249 in an online environment, and included the following stages: pretest and commitment to learning  
250 the strategy, description of strategy, demonstration of strategy, verbal practice of strategy steps,

251 controlled practice and feedback, advanced practice and feedback, post-test and commitment to  
252 implementing the strategy, generalization. Although strategy instruction has primarily been  
253 implemented and evaluated in traditional classroom learning environments (i.e., in-person  
254 instruction), there is some evidence of its effectiveness in an online environment (Douglas,  
255 McNaughton, & Light, 2013; Douglas, Kammes, & Nordquist, 2017).

### 256 **Research Aims and Questions**

257 The purpose of this study was to improve the relational skills of pre-service SLPs during  
258 interactions with simulated parents of children who use AAC. Specifically, this study aimed to  
259 add to the existing research by developing and evaluating an online training to teach the LAFF  
260 strategy to pre-service SLPs. Currently, it is unknown whether online instruction in the LAFF  
261 strategy will be more or less effective than in-person instruction. The following two research  
262 questions were proposed:

- 263 1. What are the effects of an online training in the LAFF strategy on pre-service SLPs' use of  
264 the strategy skills in role plays with simulated parents?
- 265 2. What are the effects of an online training in the LAFF strategy on a parent's perceptions of  
266 the pre-service SLPs' family-centered behaviors?

### 267 **Methods**

#### 268 **Research Design**

269 The current study employed a 2 (groups) x 3 (measurement times) switching replications  
270 experimental design (Salkind, 2010). In this study, two groups participated in pre-test simulation  
271 role plays (Time 1). The first group received training, and then participated in a second  
272 simulation role play. The second group completed a second role play without receiving the  
273 training (i.e., another "pre-test"). Following the second role play, the second group then received

274 the training. Both groups then participated in a third role play (See Figure 1). This design was  
275 chosen as it provided a control condition, replication of treatment effects, and a maintenance  
276 assessment in the group that received the training first (Cook, Campbell, & Peracchio, 1990).  
277 The switching replications design is considered one of the strongest and most effective  
278 experimental designs at controlling for threats to internal validity (Edmonds & Kennedy, 2016).  
279 It also eliminates the need to deny potentially beneficial treatment due to random assignment to  
280 the control group (i.e., Group 2).

281 INSERT FIGURE 1 HERE.

## 282 **Participants**

283 Ethics approval was obtained from the Pennsylvania State University Institutional  
284 Review Board prior to recruitment. Participants were recruited from a graduate course on  
285 Augmentative and Alternative Communication in a Department of Communication Sciences and  
286 Disorders in Central Pennsylvania. The following inclusion criteria were used for participation:  
287 (a) SLP master's students enrolled in a graduate level AAC course and (b) no prior exposure to  
288 the LAFF strategy. Of the 17 students in the course that met the inclusion criteria, 16 of the  
289 students provided consent to participate in the study. The 16 students were randomly assigned to  
290 Group 1 or Group 2 by a random number generator. Of these participants, 15 completed the  
291 study. One participant was unable to complete the study due to medical reasons and dropped out  
292 after the first role play. Although her demographic information is included in Table 1 (i.e., to  
293 demonstrate that the groups were similar on key features), data from the first role play are not  
294 included in the results.

295 Prior to the study, all participants provided demographic (i.e., age, gender, race, and  
296 ethnicity) and background information on their prior education, training, and experience working

297 with families and/or AAC (see Table 1). The participants consisted of 3 males and 13 females  
298 and ranged from 22 to 30 years of age. Fourteen of the participants identified their race and  
299 ethnicity as white and non-Hispanic. One participant identified as white and Hispanic, and  
300 another participant identified as more than one race, non-Hispanic. All participants reported a  
301 Bachelor's degree as their highest degree obtained.

302 Regarding prior training, none of the participants reported that they had ever been trained  
303 in family-centered services or how to effectively interact with families. Three of the participants  
304 reported training in counseling during an undergraduate course and eight of the participants  
305 reported prior coursework in AAC (i.e. excluding current enrollment in their graduate AAC  
306 course). Regarding prior experience working with families, ten reported experiences including  
307 positions at daycare centers, schools, camps, etc. Six of the participants reported personal  
308 experiences with families of children with disabilities and five reported having prior experience  
309 with AAC. Table 1 displays the demographic characteristics of the students by Group 1/Group 2.

310 As shown, the groups were relatively similar on most key features. One feature on which  
311 the two groups varied was whether or not they had previous AAC experience. No pre-service  
312 SLPs in Group 2 reported experience, while five pre-service SLPs in Group 1 reported previous  
313 experience. This was anticipated to not impact results since all pre-service SLPs were enrolled in  
314 an AAC course at the time of the study and had completed 12 weeks (75%) of the course.

315 INSERT TABLE 1 HERE.

### 316 **Materials**

317 This study involved two sets of materials: the online training and the simulated role  
318 plays, which were used to measure the demonstration of the LAFF skills by the participants.

#### 319 **Online training**

320 **Training content.** An online training was developed in order to teach pre-service SLPs  
321 how to actively listen and communicate effectively with parents of children with CCN. The pre-  
322 service SLPs were taught the 4-step LAFF strategy (McNaughton et al., 2008). Specifically, the  
323 pre-service SLPs were taught the 12 component *skills* within the 4-step strategy (See Figure 2).

324 INSERT FIGURE 2 HERE.

325 **Training format and environment.** The online training consisted of four sections (i.e.,  
326 introduction, LAFF strategy instruction, practice activities, and conclusion). Table 2 presents  
327 each of these sections, the strategy instruction stages in each section, the specific components of  
328 training used in each stage, and the estimated time for completion. The training was completely  
329 housed on Moodle, an e-learning platform which allows educators to create courses in a secure  
330 learning environment (“About Moodle”, 2017). All narrations in the training were provided by  
331 the first author.

332 INSERT TABLE 2 HERE.

333 **Simulated role plays.** Six simulated role plays were developed to simulate a parent’s  
334 meeting with the child’s SLP. Role plays were used in order to allow the pre-service SLPs to  
335 demonstrate their pre- and post-instruction skills in a supportive and low-risk environment.  
336 Following the recommendations of Dotgers and colleagues (2008) and Barrows (1987), the  
337 scenarios were based on actual concerns expressed by families of children with CCN (e.g.,  
338 Anderson, Balandin, & Stancliffe, 2014; 2015; Bailey, Parette, Stoner, Angell, & Carroll, 2006;  
339 Marshall & Goldbart, 2008; McNaughton et al., 2008; Mandak & Light, 2018a). Each of the  
340 scenarios included a script and a description of the problem to be discussed with the SLP. Each  
341 script specifically listed four statements to be used during the interaction. Once the scenarios  
342 were initially developed, they were reviewed by a mother of a child with CCN who was

343 currently receiving SLP services. The mother was recruited through an online social media group  
344 and was unknown to the authors. She reported that her child used word approximations and a  
345 speech-generating device (SGD) to communicate. The parent was asked for her opinion on the  
346 realism, importance, and wording of the scenarios. Of the six scenarios, the parent indicated that  
347 four of the scenarios were both realistic concerns and “very important” for SLPs to be able to  
348 handle. The following four scenarios were thus included in the simulated interactions: (a) Parents  
349 wanting a new AAC device; (b) Parents seeing no need for AAC, because of worries about the  
350 impact on spoken language; (c) Parents worrying about social isolation of their child because of  
351 AAC; and (d) Parents feeling overwhelmed with the programming demands of the AAC device.  
352 Each simulation was balanced across the three time points of the study, allowing each participant  
353 to be exposed to three of the four scenarios once. The scenarios were assigned to each participant  
354 to ensure that each group had an equal amount of exposure to each scenario at each time point.

355       *Training of simulated parents.* Four doctoral students studying speech-language  
356 pathology were recruited to play the role of parents of children with CCN (i.e., simulated  
357 parents). The doctoral students included three white women and one African-American man. The  
358 use of simulated parents follows a similar model to the use of simulated patients which  
359 originated in the medical field. Researchers in the field of teacher education crafted the pedagogy  
360 of simulated parents, specifically to prepare teacher candidates for parent-teacher conferences  
361 (Dotger, Dotger, & Maher, 2010; Dotger, Harris, & Hansel, 2008). Simulated parents have been  
362 used successfully in the postgraduate setting for the training of counseling skills (Farrell,  
363 Deuster, Donovan, & Christopher, 2008), communicating effectively (Thistle & McNaughton,  
364 2015), and breaking bad news to parents (Vaidya, Greenberg, Patel, Strauss, & Pollack, 1999).



365 Investigations have also reported that interactions with simulated parents are viewed as authentic  
366 and positive experiences for students (Dotger et al., 2008).

367         Simulated parents are trained in a standardized and scripted way to present specific  
368 behaviors, statements, concerns, etc. Accordingly, the four doctoral students were required to  
369 attend a training on portraying a parent, which was given by the first author and lasted  
370 approximately 90 minutes. Each was given their script (i.e., four statements) and a specific  
371 profile with a description of the parent he or she would portray including informational content  
372 such as employment, marital status, and living arrangements (Dotger et al., 2008; see  
373 Supplemental materials). The simulated parents were first instructed to enter the room in which  
374 the pre-service SLP was waiting, and to sit in the chair closest to the door. The simulated parents  
375 were then instructed to use statement #1 near the beginning of the conversation, statements #2  
376 and #3 during the conversation, and statement #4 if the pre-service SLP asked for additional  
377 thoughts or questions. The simulated parents were required to use statements #1-3, and had the  
378 option to use statement #4. If the pre-service SLP offered a solution or a plan for the next steps,  
379 the simulated parent was trained to end the interaction by agreeing with the proposed solution  
380 (e.g., “That sounds good. We can give that a try.”)

381         During the training, the simulated parents had the opportunity to practice their scenarios  
382 and ask any questions. During a final practice scenario, the first author observed the simulated  
383 parents and completed a checklist of the required statements. The simulated parents needed to  
384 demonstrate 100% of the target parent statements in order to complete the training. All simulated  
385 parents were blind to the conditions of the study and to the group assignment of the pre-service  
386 SLPs. The simulated parents were also not aware of the design of the study.

387           ***Procedural integrity.*** The procedural integrity of the simulated role plays was  
388 independently assessed by a graduate student in Special Education following the last role play.  
389 The graduate student was blind to both the conditions and goals of the study. Six videos of each  
390 simulated parent were randomly chosen, resulting in 24 total videos (53%). For each video, the  
391 graduate student identified whether each of the required statements was stated by the simulated  
392 parent. In all videos, the simulated parents used their required statements with 100% accuracy.

393           ***Social validity of the simulated role plays.*** The authenticity of the simulated parents was  
394 measured following the participants' completion of their last role play. In response to, "The  
395 simulated parents were effective in portraying real parents," seven (44%) of the pre-service SLPs  
396 strongly agreed with this statement, eight (50%) agreed, and one (6%) disagreed.

## 397 **Procedures**

398           **Simulated role plays.** The pre-service SLPs participated in three video-taped role plays,  
399 one at each time point (i.e., Time 1, Time 2, and Time 3), with two days separating each  
400 interaction. The role play interactions were balanced so the pre-service SLPs interacted with a  
401 different simulated parent at each of the three time points and each scenario was used a similar  
402 number of times across Time 1, Time 2, and Time 3. At each time point, the pre-service SLPs  
403 completed the same procedures:

- 404       1. The pre-service SLPs were told that they would be meeting with an individual playing the  
405       role of a parent of a child with CCN. The parent would have a specific concern and the pre-  
406       service SLPs were told to play the role of the child's SLP.
- 407       2. The pre-service SLPs received a short summary of a scenario which described a child on his  
408       or her caseload. Each pre-service SLP had 10 minutes to review the scenario.

- 409 3. After 10 minutes of review, the pre-service SLPs were taken to a room by a researcher. Each  
410 room included a rectangular table with three chairs. Two of the chairs were across from each  
411 other on the long sides of the table, and the other chair was on a short end of the table.
- 412 4. The pre-service SLPs were told that the parent would knock on the door, come into the  
413 room, and sit in the chair on the long side of the table closest to the door. Once these  
414 instructions were given, the researcher started video recording and exited the room.
- 415 5. The simulated parent entered the room and sat in the chair closest to the door. He or she  
416 then responded to the pre-service SLPs according to his or her scenario script.

417 **Access to online training.** Following the first simulated role play for Group 1 (i.e., Time  
418 1) and the second role play for Group 2 (i.e., Time 2), each pre-service SLP was given  
419 instructions to access and complete the online training on their personal computers before their  
420 next scheduled role play. Once they accessed the training, they were told the following: “In this  
421 training, you will learn a strategy to effectively interact and develop positive relationships with  
422 parents. Once you learn the strategy, you will have the opportunity to practice recognizing and  
423 using the strategy during SLP-parent interactions in an online environment. The training can be  
424 completed independently and does not need to be completed in one sitting. Learners must  
425 successfully complete all activities in order to complete the training. The training will take  
426 approximately 75-90 minutes.” Once granted access, there was no limit to how many times the  
427 participants could log-in to the training. Despite this, all pre-service SLPs only accessed the  
428 training once.

## 429 **Measures**

430 **LAFF Scoring Rubric.** In order to measure the participants’ use of the component skills  
431 in each strategy step, a scoring rubric was used which was adapted from past research

432 investigating the LAFF strategy (McNaughton et al., 2008; Thistle & McNaughton, 2014). Each  
433 of the 12 component skills of LAFF were included in the rubric. The score was determined by  
434 calculating the presence or absence of each skill. The dependent variable was the total score for  
435 all skills with a maximum score of 12 (i.e., 5 skills for the “L” step, 2 skills for the “A” step, 3  
436 skills for the first “F” step, and 2 skills for the last “F” step). A coding manual was developed,  
437 which included the operational definitions for each of the 12 skills in the LAFF strategy. For  
438 each component skill, a definition was provided, as well as example statements, and exclusionary  
439 information, if appropriate (e.g., Do not count open-ended questions that are not aimed at getting  
440 more information; “Tell me when would be best to meet.”)

441       *Coding procedures.* A graduate student in Special Education completed the LAFF  
442 coding. The coder was trained by watching a 30-minute instructional video which described how  
443 to access, view, and code the simulated role play videos. The coder then viewed and coded 6  
444 practice videos of students interacting with simulated parents. For each video, the coder was told  
445 to watch the entire video to obtain an initial impression of the interaction, and then score the  
446 presence of behaviors during a second viewing. Each of the 12 component LAFF skills were  
447 included in the rubric and were scored a 1 (or 0) depending on the presence (or absence) of the  
448 behaviors during the simulated interactions. The coder was 100% accurate in identifying the  
449 presence and absence of behaviors in the practice videos. Once training was complete, the coder  
450 was granted access to the role play videos in a balanced order. Each group of 15 videos included  
451 a similar number of role plays from each group of participants and from pre- or post-training.

452       In order to ensure reliable scoring, a second coder was also trained in the same coding  
453 procedures. This coder was also a graduate student in Special Education, blind to the conditions  
454 of the videos. The second coder scored 33% (n=15) of the videos. The reliability videos were

455 selected so the coder saw one video of each participant (n=15) at varying time points. The  
456 rubrics from each coder were compared for the 15 videos. Agreement was calculated by  
457 comparing each coder's rating for each individual skill for a total agreement score out of 12. For  
458 example, if the two coders both agreed that a pre-service SLP used 7 out of the 12 LAFF skills  
459 and did not use 5 of the skills, and they agreed on the presence or absence of the same skills,  
460 their agreement was 12 out of 12 (i.e., 100%). The rubrics from each coder were compared,  
461 resulting in an agreement of 92% across sessions.

462 **Data Analysis.** Due to the small sample size and the likelihood of a violation of the  
463 assumptions of normality and homogeneity of variance, the data were analyzed using  
464 nonparametric methods (Maxwell & Satake, 2006). In order to determine the effects of the online  
465 training, a Mann-Whitney test was used to compare the gain in LAFF scores of Group 1 between  
466 Time 1 and Time 2 and the gain in LAFF scores of Group 2 between Time 1 and Time 2. It was  
467 hypothesized that the gain from Time 1 to Time 2 would be greater for Group 1, since they  
468 received training during this time. A Wilcoxon Signed Ranks test was also conducted to compare  
469 the gain in LAFF scores of Group 2 between Time 1 and Time 2 to their gain in LAFF scores  
470 between Time 2 and Time 3. It was hypothesized that Group 2 would demonstrate greater gains  
471 from Time 2 to Time 3, since they received training during this time.

472 **Forced Choice.** In addition to the LAFF scoring rubric, the simulated role plays for each  
473 pre-service SLP were assessed by a parent of child who used AAC by completing a forced  
474 choice question. Criteria for inclusion was to "be a parent of a child with complex  
475 communication needs (i.e., child is unable to use natural speech to meet his or her daily  
476 communication needs)." The parent was a 40-year old mother whose daughter used a tablet with  
477 an AAC app. She was recruited online through a private social media group, designated for

478 professionals who work with children who use AAC and parents of children who use AAC. The  
479 parent was blind to the conditions and procedures of the study. The parent viewed videos of the  
480 pre- and post-instruction role plays for each pre- service SLP, and answered the questions:

- 481 1. If you were the parent in these videos, which interaction would you consider most effective  
482 and successful?
- 483 2. In the video, what was the most effective behavior exhibited by the SLP?

#### 484 **Social validity**

485 Following the last simulated role play, all of the participating pre-service SLPs were  
486 asked a set of questions aimed at assessing the social validity of the training content and the  
487 training offered through an online platform. The questions specifically evaluated: (a) the  
488 perceived usefulness of the relational strategies targeted, (b) the practicality of offering the  
489 training online, and (c) the usefulness of the various components of the online training.

### 490 **Results**

#### 491 **LAFF Scores**

492 Table 3 lists the individual LAFF scores for each participant at each time point. The  
493 medians and ranges were calculated for both groups at each time point. No statistically  
494 significant difference was observed between the groups at Time 1, indicating that their initial  
495 behaviors were similar ( $p > .05$ ). The medians for Group 1 were 3.5 at Time 1 (range 3-5), 10.5  
496 at Time 2 (range 4-11), and 9.5 at Time 3 (range 6-12) (see Figure 3). The medians for Group 2  
497 were 5.0 at Time 1 (range 2-6), 4.0 at Time 2 (range 3-7), and 10.0 at Time 3 (range 9-12).

498 INSERT TABLE 3 HERE.

499 INSERT FIGURE 3 HERE.

500 The question of interest was whether the training resulted in improvements in the LAFF  
501 scores. Accordingly, the gain scores for each group were calculated between Time 1 and Time 2,  
502 and between Time 2 and Time 3. The gain from Time 1 to Time 2 for Group 1 demonstrated the  
503 effects of the training as did the gain from Time 2 to Time 3 for Group 2. The change from Time  
504 2 to Time 3 for Group 1 represented a measure of maintenance of training effects.

505 A Mann-Whitney test was completed in order to compare the gains in LAFF scores for  
506 each group from Time 1 to Time 2. It was hypothesized that Group 1 would demonstrate greater  
507 gains since they completed the training between Time 1 and Time 2. Results showed that Group  
508 1 had statistically significant greater gains ( $Mdn = 5.50$ ) from Time 1 to Time 2 compared to the  
509 gains made by Group 2 ( $Mdn = -1.00$ ),  $U = 1.00$ ,  $p = .002$ , suggesting that the training was  
510 effective in increasing Group 1's use of the LAFF strategy in the role plays.

511 A Wilcoxon Signed Ranks test was completed in order to compare the gains in LAFF  
512 scores for Group 2 from Time 1 to Time 2 (i.e., pre-training) to their gains from Time 2 to Time  
513 3 (i.e., post-training). It was hypothesized that Group 2 would demonstrate greater gains between  
514 Time 2 and Time 3, since they completed the training during this time. It was determined that  
515 Group 2 had statistically significant greater gains from Time 2 to Time 3 ( $Mdn = 7.00$ ) compared  
516 to their gains from Time 1 to Time 2 ( $Mdn = -1.00$ ),  $Z = -2.384$ ,  $p = .017$ , suggesting that the  
517 training was effective in increasing Group 2's use of the LAFF strategy in the role plays.

### 518 **Online Training Completion**

519 The pre-service SLPs varied in the amount of time spent accessing the online instruction  
520 (range: 29 to 101 minutes; average: 61 minutes), as well as the number of completed training  
521 components. Group 1 spent an average of 56 minutes accessing the training, while Group 2 spent  
522 an average of 66 minutes. Eight of the pre-service SLPs completed all training components, 5

523 completed all components except one application exercise, and two completed all training  
524 components except the two application exercises.

### 525 **Forced Choice**

526 In addition to the LAFF scoring rubric, the role plays were assessed by a parent of child  
527 who used AAC by completing a forced choice question. In response to, “If you were the parent  
528 in these videos, which interaction would you consider most effective and successful?” the parent  
529 selected the post-test video as more effective and successful for 14 of the 15 pre-service SLPs.

530 In response to, “What was the most effective behavior exhibited by the SLP?” the parent  
531 identified the following behaviors as “most effective”, (a) asking open-ended questions and  
532 taking time to ensure that the parent’s concern is fully understood (identified 9 times), (b)  
533 keeping the conversation focused on the concern and addressing it directly, without getting too  
534 carried away with suggestions and information (identified 4 times); and (c) showing empathy  
535 and understanding, and acknowledging the parent’s concern as valid (identified 2 times).

### 536 **Social Validity**

537 In response to the social validity questions, 100% of the participants stated that they  
538 would recommend that others learn the LAFF strategy. Six simply stated “Yes”, while others  
539 provided additional thoughts. Two reported that they were more confident after the training, five  
540 reported that the LAFF strategy provided scaffolding support, and two reported that the LAFF  
541 strategy was important to learn and that it would be a good addition to the graduate curriculum.

542 The pre-service SLPs additionally offered many benefits to using the LAFF strategy.  
543 Seven (47%) of the pre-service SLPs reported that the strategy provided a step-by-step process  
544 and a helpful framework to use during the interactions. One stated that the strategy was easy to



545 remember and included intuitive steps. Another reported that when using the strategy, the  
546 conversation flowed better since she knew what to say.

547 In addition to benefits of using the LAFF strategy, the pre-service SLPs were asked about  
548 disadvantages of strategy use. Three (20%) of the pre-service SLPs reported that there were no  
549 disadvantages to using the LAFF strategy. Twelve (80%) of the pre-service SLPs reported that  
550 using the strategy could be viewed as scripted and unnatural. Two (13%) of the pre-service SLPs  
551 also stated that the strategy may not be appropriate for all situations.

552 The participants additionally shared their opinions regarding the online training  
553 environment with 88% of the pre-service SLPs agreeing or strongly agreeing that “An online  
554 environment was effective for teaching the LAFF strategy.”

## 555 **Discussion**

556 The goal of this study was to develop and evaluate an online training to teach pre-service  
557 SLPs a relational skills strategy designed to increase their demonstration of family-centered  
558 behaviors during interactions with parents of children with CCN. Overall, the training appeared  
559 to provide an effective, efficient, and socially valid means of teaching pre-service SLPs how to  
560 implement the LAFF strategy. All participants increased their use of the LAFF strategy  
561 following the completion of the online training. Almost all of the participants also improved in  
562 their demonstration of family-centered behaviors, as measured by the perceptions of a parent of a  
563 child use used AAC.

## 564 **Effectiveness of Intervention**

565 This is the first study to investigate the effectiveness of teaching the LAFF strategy in an  
566 online environment. As hypothesized, the online training resulted in an increase in the  
567 implementation of the LAFF strategy skills during post-training interactions for Group 1 and

568 Group 2. After a relatively short period of instruction (i.e., average of 61 minutes), Group 1  
569 improved from demonstrating a median of 3.5 skills pre-training to a median of 10.5 skills post-  
570 training and Group 2 improved from a median of 4.0 skills to a median of 10.0 skills.

571 Although direct comparisons cannot be made to previous investigations of the LAFF  
572 strategy due to varying methods of measurement (i.e., different scoring rubrics), similar  
573 improvements were observed in the present study compared to the previous LAFF investigations.  
574 For example, the first LAFF study (McNaughton et al., 2008) used a pre-post design and a  
575 scoring rubric to investigate the effects of an in-person LAFF training for pre-service teachers.  
576 After 120 minutes of in-class instruction in the LAFF strategy and 30 minutes of outside class  
577 activities, the pre-service teachers improved from a score of 4 to 16 (medians) out of 20 (60%  
578 increase). A later LAFF investigation (Thistle & McNaughton, 2015) also used a pre-post design  
579 and a scoring rubric out of 20, but with pre-service SLPs. After 90 minutes of in-class  
580 instruction, the pre-service SLPs improved from an average score of 4.17 to 17.43 (66%  
581 increase). In the same year, Vostal et al. (2015) evaluated pre-service teachers' use of the LAFF  
582 strategy before and after 150 minutes of in-person training using a scoring rubric out of 17. Mean  
583 scores improved from 3.6 at pre-test to 15.8 at post-test (72% increase). Thus, despite the switch  
584 to the online environment in the current study, the pre-service SLPs were able to make gains in  
585 their implementation of the LAFF strategy. Considering the various components of the online  
586 training, the effectiveness of the instruction across studies could be attributed to the use of the  
587 strategy instruction model, the use of the online environment, or a combination of the two.

588 **Strategy Instruction.** There is much evidence that use of the strategy instruction model  
589 leads to positive outcomes for individuals learning a wide range of skills (e.g., Kent-Walsh et al.,  
590 2015), including pre-service professionals learning the LAFF strategy (McNaughton et al., 2008;

591 Thistle & McNaughton, 2015; Vostal et al., 2015). Per the strategy instruction framework, the  
592 training included a pre-test, a description of the LAFF strategy skills, a model of the strategy,  
593 and the opportunity to practice the strategy. The components of the training and the stages of  
594 strategy instruction were designed to promote active learning. If information is simply  
595 transmitted to passive learners, the learners will be limited in their ability to recall the content or  
596 transfer the learning to other situations (Darling-Hammond, 1995). Students learn by doing,  
597 through direct experiences with the content. For these reasons, the pre-service SLPs were not  
598 only provided with information regarding the LAFF strategy, but with opportunities to use and  
599 experience the strategy. The findings of this study add support to previous evidence  
600 demonstrating the effectiveness of the strategy instruction model when teaching adults without  
601 disabilities (e.g., Binger et al., 2010; Thistle & McNaughton, 2015).

602         Although all stages of strategy instruction were incorporated into the online training, it  
603 must be noted that some of the pre-service SLPs did not complete all components of  
604 instruction—specifically, some did not complete the “application” activities. The goal of the two  
605 application activities was to learn how to apply the target strategy to meet the demands typically  
606 found in the natural environment and to start to build fluency doing so. It is likely that the lack of  
607 completing these activities may have impacted the performance of these pre-service SLPs with  
608 the strategy post-training. For example, of the four pre-service SLPs who demonstrated the  
609 fewest number of strategy skills post-training, three did not complete the generalization activity.  
610 The lack of completion by some pre-service SLPs may be one limitation of e-learning. If the  
611 LAFF strategy was taught in a face-to-face setting, instructors would be able to monitor and  
612 ensure completion of all activities. Future research should investigate how to ensure completion  
613 of all instructional components in an online environment in order to promote mastery.

614           Despite this limitation of the online learning environment, overall the findings show that  
615 the strategy instruction procedures were successfully incorporated into an online environment,  
616 indicating benefits of online learning. The majority (88%) of the participants reported that the  
617 online environment was effective for teaching the LAFF strategy. There are many reasons why  
618 the online environment may have promoted the learning of the LAFF strategy.

619           **Online learning.** First, the pre-service SLPs were able to maneuver throughout the online  
620 training at their desired pace. Additionally, they were able to pause, rewind, or review content as  
621 necessary. These are advantages compared to face-to-face instruction, where students must learn  
622 and review the same content as others at the same time (Clark, 2016). The online setting  
623 additionally allowed the presentation of various types of media (e.g., text, graphics, audio, etc.),  
624 which have been shown to draw attention to relevant content and improve engagement (Mayer,  
625 2009).

626           One of the biggest advantages of the online setting may be exposure to step-by-step  
627 demonstrations and multiple example scenarios. For novice learners without knowledge of the  
628 strategy, examples are especially important (Clark, 2014). Evidence has shown that the most  
629 effective learning of strategy steps results from two or more examples that reflect the same  
630 guidelines but vary on their surface features (Clark, 2014). In this study, four example scenarios  
631 were included which illustrated four SLPs using LAFF with four different parents and concerns.

632           Considering that the impact of the online training appeared relatively similar to the  
633 impact of in-class training in prior LAFF investigations, the efficiency of the training should be  
634 considered. The online training in the current study took participants an average of 61 minutes to  
635 complete (range: 29 to 101 minutes), which was less instructional time compared to previous

636 investigations of LAFF. In this study, the efficiency of learning may point to potential benefits of  
637 the online environment and the potential accelerated pace of learning the LAFF strategy.

### 638 **Component Skills of LAFF**

639 Although the participants in the present study showed overall improvement in their  
640 implementation of the LAFF strategy, there were some strategy skills that were demonstrated  
641 less frequently than others. The one component skill that was demonstrated the least during the  
642 post-training role plays was asking open-ended questions. Eight (53%) of the participants did not  
643 demonstrate an adequate number (i.e., 2 or more) of relevant open-ended questions during the  
644 post-training role plays. In order to receive credit for the demonstration of this skill, SLPs had to  
645 “ask 2 or more relevant open-ended questions to get more information about the problem.” In the  
646 role plays immediately following training, only 7 (47%) of the SLPs demonstrated this skill.

647 Most of the pre-service SLPs asked questions aimed at acquiring specific information,  
648 rather than open-ended questions that could promote discussion. These types of questions are  
649 sometimes referred to as “data questions”, as they gather facts about the individual or context  
650 (AbuSabha, 2013). These types of questions gather information, but do not move a discussion  
651 forward or spark the conversation. Considering these questions’ potential for acquiring facts  
652 about the parent’s concern, it may not be surprising that the novice SLPs resorted to their use.  
653 Some examples of these types of questions from the pre-service SLPs included (a) Have you  
654 tried modeling speech? (b) Have you done any hearing or visual assessments? (c) Is he using it at  
655 home? and (d) Do you think it’s a well-suited device? These questions only require a short  
656 answer from the parent, often in the form of a one-word response.

657 It seems that the training did not adequately prepare the pre-service SLPs to ask open-  
658 ended questions. The skill was taught in a similar way to all other LAFF skills. It was first

659 described, then demonstrated. During the strategy skill description, the pre-service SLPs were  
660 presented with four open-ended questions that could be applied to most scenarios (i.e., the same  
661 questions that were taught to the pre-service SLPs in Thistle & McNaughton (2015)): 1) What  
662 would I see if I was there? 2) Tell me about a time when this was not a problem; 3) What do you  
663 see as the ideal solution; and 4) Tell me who else you have spoken with regarding your concern.  
664 While practicing in the online environment, the pre-service SLPs may have relied on the four  
665 questions without adequately learning how to ask open-ended questions. Contrary to a real  
666 interaction, the pre-service SLPs were able to take their time when responding to the video  
667 prompts during the practice exercises. When faced with a real parent concern during the role  
668 plays, the pre-service SLPs may not have been prepared to generate relevant open-ended  
669 questions and adapt in real-time, in response to the parent.

670         The observed lack of open-ended questions demonstrated by the pre-service SLPs may  
671 indicate an important avenue for future training development, including increased emphasis on  
672 building rapport with parents, generating relevant open-ended questions based on parent  
673 concerns, providing more opportunities to practice the skill of asking open-ended questions, and  
674 recognizing and addressing parents' emotions during interactions (Luterman, 2020).

### 675 **Parent Perspective**

676         Another goal of this study was to investigate the effects of the online training in the  
677 LAFF strategy on a parent's perceptions of the pre-service SLPs' family-centered behaviors  
678 before and after the training. The parent perceived the post-training interactions as more family-  
679 centered than the pre-training interactions for 14 out of the 15 pre-service SLPs.

680         The parent was also asked to identify the most effective behaviors exhibited by the SLPs  
681 in each simulated role play interaction. The behaviors identified as most effective by the parent

682 were asking open-ended questions and taking time to ensure that the parent's concern was fully  
683 understood.

684 It is likely that the LAFF strategy contributed to the pre-service SLPs' demonstration of  
685 these specific behaviors. For example, specific component skills could have impacted the way  
686 the SLPs were perceived as taking their time. In the L-step, the pre-service SLPs were taught to  
687 "give the parent the floor" and show that they were there to listen and fully understand the  
688 concern. They were taught that they could not provide assistance until they fully understood the  
689 concern as perceived by the parent (McNaughton et al., 2008).

690 In the A-step, the students were taught the importance of allowing silence during an  
691 interaction. They were taught to take notes, which potentially allowed periods of silence while  
692 they were writing. Although the SLPs' use of silence was not measured, they were taught that the  
693 positive benefits included "allowing the parent to process information, maintaining a family-  
694 centered focus, and providing an open invitation to the parent to talk." If the SLPs permitted  
695 silence, they were most likely observed as not rushing through the interaction.

696 The first F-step likely contributed to the parent's identified behaviors as well. The  
697 students were taught to "check for accuracy" (e.g., "Do I have everything right?") which was to  
698 ensure that both parties had a clear understanding of the concern before proceeding. This skill  
699 provided evidence that the pre-service SLP was actively listening and was working to understand  
700 the issues from the parent's perspective. By checking for accuracy, the pre-service SLP may  
701 additionally have provided the parent an opportunity to clarify or provide more information.

## 702 **Clinical Implications**

703 The findings from this study suggest important clinical implications for training pre-  
704 service SLPs to become family-centered clinicians. First, many of the pre-service SLPs were

705 lacking in relational behaviors during the role plays prior to training. These findings highlight the  
706 importance of graduate programs including family-centered content early in the curricula, as well  
707 as the development of effective interactional skills. As one participant stated, “A counseling  
708 course that incorporates LAFF could be an excellent addition to our school’s curriculum.” For  
709 novice clinicians, strategies such as LAFF, can provide support, scaffolding, and improved  
710 confidence, as expressed by many of the students post-training.

711         Second, the findings indicate that pre-service SLPs can be taught how to demonstrate the  
712 skills targeted in the LAFF strategy during interactions with simulated parents after a relatively  
713 short-period of online instruction. With an average of just 61 minutes of online training, all of the  
714 participants improved their implementation of the LAFF strategy. Despite the advantages of e-  
715 learning, to date there has been limited research examining the effectiveness of asynchronous  
716 online learning for pre-service SLPs. Two studies have examined pre-service SLPs’ perceptions  
717 of online learning modules in Communication Science and Disorders, but reported no learning  
718 outcomes (Ginsberg, 2008; Tattersall; 2015). Another study reported positive learning outcomes  
719 for students learning anatomy and physiology, but the instruction was presented in a hybrid  
720 design (i.e., online and in-person instruction; Lemoncello; 2015). There only appears to be one  
721 study to date which examined an asynchronous online learning module on pre-service SLPs  
722 phonetic transcription knowledge and skills (Krimm, Schuele, & Brame, 2017). After 1-3 hours  
723 of engagement with the online module, all students demonstrated improvements in phonetic  
724 transcription knowledge and skill. The findings of the present study add to this evidence as they  
725 highlight the effectiveness and efficiency of an online environment for pre-service training. They  
726 additionally show the potential for teaching clinical skills in a non-traditional format, especially  
727 if no one on faculty has expertise in a specific but essential area such as family-centered services.



## 728 **Limitations and Future Research**

729           Despite the contribution of this study to enhancing our understanding of pre-service  
730 training of SLPs in family-centered services, there are limitations to consider and important  
731 directions for future research. First, there were only 15 pre-service SLPs from one graduate  
732 program who participated in the training. With a sample size this small, it is difficult to extend  
733 the findings to the wider population. It is necessary to investigate the effects of the training with  
734 larger groups of pre-service SLPs from a range of programs and geographical locations. In  
735 addition to pre-service SLPs, the effectiveness of online training in family-centered skill sets  
736 should be investigated with SLPs who are already working, as in- service SLPs have reported  
737 challenges to providing effective family-centered services (Mandak & Light, 2018).

738           An additional limitation is the sole focus on the LAFF strategy and implementation of  
739 LAFF during AAC services. Although LAFF encompassed many evidence-based relational skills  
740 found in the literature, there may be other relational skills that play an important role in family-  
741 centered AAC services. LAFF is also potentially limiting in that it is too scripted. Considering  
742 that 80% of the pre-service SLPs reported that the strategy could be viewed as unnatural, LAFF  
743 may need improvements in order to adequately prepare students to provide individualized  
744 family-centered services. Future research is required to determine which relational skills are  
745 critical to the delivery of family-centered services and how to prepare pre-service SLPs. It is also  
746 necessary for pre-service SLPs to consider providing family-centered services to families and  
747 children who do not require AAC. Although all scenarios included in the training were based on  
748 real concerns of parents of children who use AAC, it is vital that pre-service SLPs are prepared  
749 to handle unique concerns from parents of children with a range of speech, language, and hearing  
750 impairments. Future research is necessary to identify which relational skills are most effective

751 during interactions with parents of children who use AAC, as well as to determine if the  
752 relational skills of LAFF or others are effective when interacting with parents of children with  
753 other communication impairments.

754 Another limitation is related to the sole use of simulated role plays and a lack of assessing  
755 generalization to actual parents of children with CCN. By using simulated role plays, the pre-  
756 service SLPs' use of the LAFF strategy was measured during one, brief moment in time. The  
757 short interaction may not have provided an accurate demonstration of the pre-service SLPs'  
758 relational skills. When working with actual families, relationships build over time and the use of  
759 relational skills may improve as the relationship grows. Future research should evaluate how pre-  
760 service SLPs' use of relational skills with parents changes over extended periods of time, and  
761 whether parents' perceptions change as a result of relational skill growth.

762 It is also possible that the pre-service SLPs would have demonstrated different behaviors  
763 when interacting with real parents. Despite the majority of the students reporting that the  
764 simulated parents were effective in portraying real parents, it is necessary to assess the  
765 implementation of the LAFF strategy with real parents in future LAFF investigations.

766 The focus on improving only the relational skills of the pre-service SLPs is also a  
767 limitation. Considering that there are other skills necessary to provide family-centered services  
768 (i.e., participatory skills; Dunst et al., 2007), future research should investigate whether these  
769 skills can be taught effectively and efficiently in an online environment as well.

## 770 **Conclusion**

771 Although family-centered AAC services are recognized as best practice, evidence  
772 suggests that families do not always receive these services from their child's SLP (Iacono &  
773 Cameron, 2009; Mandak & Light, 2018a, 2018b). One avenue for improving the family-centered

774 skill set of SLPs is through improvements to their pre-service training. Findings from this study  
775 suggest that an online training, that targets an evidence-based strategy and incorporates  
776 principles of effective e-learning and research on effective instruction, was effective in teaching  
777 pre-service SLPs how to demonstrate a relational skills strategy during interactions with  
778 simulated parents. Following approximately 60 minutes of training, all pre-service SLPs  
779 improved in their implementation of the strategy and reported that they would recommend the  
780 use of the strategy to others. In addition to strategy use, many of the participants were perceived  
781 as more family-centered by a parent of a child who used AAC, post-training.

782         Although relational skills are just one set of skills that contribute to a family-centered  
783 approach, they are vital when providing services to families with children with CCN. It is crucial  
784 that SLPs demonstrate relational skills when interacting with parents, as research suggests that  
785 this will lead to greater family satisfaction and family well-being (Dunst et al., 2007). If families  
786 are satisfied, there is a higher likelihood of developing a successful and collaborative partnership  
787 among families and SLPs, leading to improved AAC outcomes. In order to improve pre-service  
788 training and ensure increased delivery of family-centered services, future research is necessary.  
789 Future studies should investigate the effects of online family-centered trainings on larger groups  
790 of students and whether other family-centered skill sets can be effectively taught through an  
791 online environment.

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Figure Caption Sheet

956 *Figure 1:* Timeline of study procedures.

957 *Figure 2:* The 12 component skills of the LAFF strategy with example statements.

958 *Figure 3:* Median LAFF scores out of 12 for the Group 1 and Group 2 at each time point.

959

960 Table 1

961 *Characteristics of participants at Time 1*

Characteristic	Group 1		Group 2	
	N	%	N	%
<b>Gender</b>				
Female	7	87.5	6	75.0
Male	1	12.5	2	25.0
<b>Race</b>				
Caucasian	8	100.0	7	87.5
More than one race	0	.0	1	12.5
<b>Ethnicity</b>				
Hispanic or Latino	8	100.0	7	87.5
Non-Hispanic or Latino	0	.0	1	12.5
<b>Bachelor's Degree</b>				
CSD major	6	75.0	5	62.5
Non-CSD major	2	25.0	3	37.5
<b>Previous training in interaction/counseling strategies</b>				
Yes	3	37.5	1	12.5
No	5	62.5	7	87.5
<b>Previous AAC coursework (excluding current enrollment)</b>				
Yes	5	62.5	3	37.5
No	3	37.5	5	62.5
<b>Previous experience working with parent or family members professionally?</b>				
Yes	4	50.0	2	25.0
No	4	50.0	6	75.0
<b>Previous <i>personal</i> experience with family of children with disabilities?</b>				
Yes	3	37.5	3	37.5
No	5	62.5	5	62.5
<b>Previous experience with AAC? (professionally or personally)</b>				
Yes	5	62.5	0	.0
No	3	37.5	8	100.0

962 Table 2

963 *Online training format and content*

	Strategy Instruction Stages	Components of the Online Training	Approximate Time for Completion
Introduction	① <b>Pre-test and make commitment</b>	<ul style="list-style-type: none"> <li>• Video demonstrations of successful and unsuccessful parent-professional interactions</li> </ul>	12 minutes
LAFF Strategy	② <b>Description of strategy</b>	<ul style="list-style-type: none"> <li>• Text/audio description of the strategy skills</li> </ul>	12 minutes
	③ <b>Demonstration of strategy</b>	<ul style="list-style-type: none"> <li>• Video model of the strategy skills</li> </ul>	12 minutes
	④ <b>Verbal practice of strategy steps</b>	<ul style="list-style-type: none"> <li>• Point-form open ended question to recall the strategy steps</li> </ul>	3 minutes
Practice Activities	⑤ <b>Controlled practice and feedback</b>	<ul style="list-style-type: none"> <li>• Recognition exercise: Video scenario with questions to assess recognition of the strategy skills (i.e., “For each component of LAFF, you will select 'Present' or 'Not present.’”)</li> </ul>	6 minutes
	⑥ <b>Advanced practice and feedback</b>	<ul style="list-style-type: none"> <li>• Application exercise: Video scenario with pauses and prompts to demonstrate strategy skills (i.e., “What would you do/say next?”)                             <ul style="list-style-type: none"> <li>○ Completed with the use of the LAFF checklist</li> </ul> </li> </ul>	15 minutes
Conclusion	⑦ <b>Post-test and commitments</b> ⑧ <b>Generalization</b>	<ul style="list-style-type: none"> <li>• Final application exercise: Video scenario with pauses and prompts to demonstrate strategy steps (i.e., “What would you do/say next?”)                             <ul style="list-style-type: none"> <li>○ Completed without the use of the LAFF checklist</li> </ul> </li> </ul>	15 minutes

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966 Table 3

967

968 *Individual LAFF scores out of 12 and medians for Group 1 and Group 2 at each time point.*

969

	LAFF Score		
	Time 1	Time 2	Time 3
<b>Group 1</b>			
<b>1</b>	3	8	7
<b>2</b>	5	11	10
<b>3</b>	4	11	12
<b>4</b>	3	4	6
<b>5</b>	3	11	9
<b>6</b>	5	11	11
<b>7</b>	4	6	9
<b>8</b>	3	10	11
<b>Median</b>	3.5	10.5	9.5
<b>Group 2</b>			
<b>9</b>	5	4	12
<b>10</b>	6	4	9
<b>11</b>	4	3	10
<b>12</b>	5	4	10
<b>14</b>	2	3	10
<b>15</b>	3	3	10
<b>16</b>	6	7	10
<b>Median</b>	5.0	4.0	10.0

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**Figure 1**

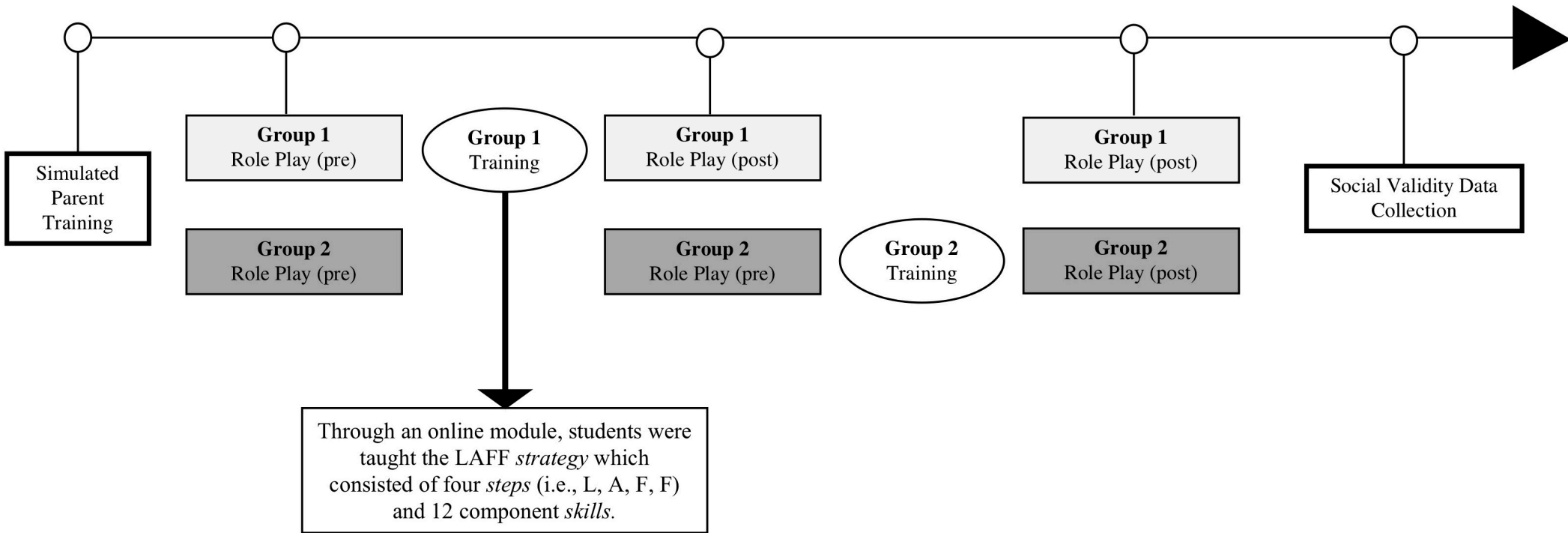




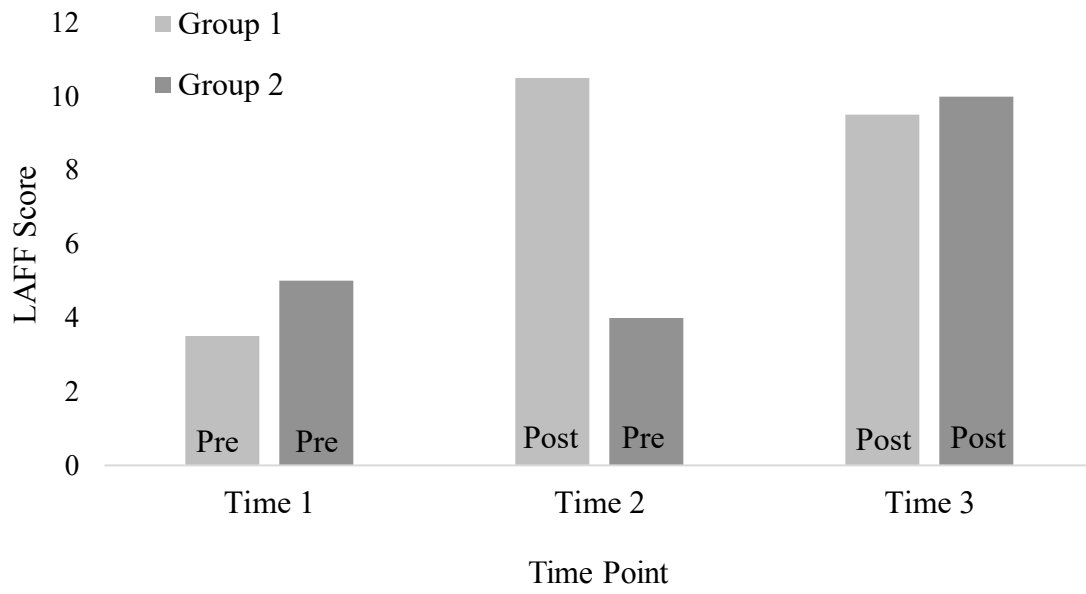
Figure 2

### LAFF CHECKLIST

Step	<input checked="" type="checkbox"/> SLP behaviors	Examples
<b>L LISTEN</b> and show interest	<input type="checkbox"/> Greet the parent, and offer some small chit chat	<i>“Hi, thanks for coming in today...”</i>
	<input type="checkbox"/> Ask about the reason for meeting	<i>“What would you like to talk about today?”</i>
	Empathize <input type="checkbox"/> Make a statement of empathy and understanding	<i>“I can understand why you are concerned; this is a serious problem”</i>
	Communicate <input type="checkbox"/> Thank the parent for coming to meet you <input type="checkbox"/> Show appropriate body language	<i>“I appreciate that you came to talk with me.”</i>
Goal of this step: To communicate that the SLP is doing his or her best to understand the parent’s thoughts and feelings (empathy) and that how the parent is feeling is important to the SLP (respect).		
<b>A ASK</b> questions	<input type="checkbox"/> Ask the parent for permission to take notes.	<i>“Do you mind if I take some notes while we talk?”</i>
	<input type="checkbox"/> Ask relevant open-ended questions	<i>“What would I see if I was there?”</i>
Goal of this step: To ask good questions that will gather information on how the parent sees the problem, while communicating respect for the parent’s point of view.		
<b>F FOCUS</b> on the issues	<input type="checkbox"/> Summarize the parent’s concerns	<i>“I’d like to review what we have talked about”</i>
	<input type="checkbox"/> Check for accuracy	<i>“Do I have everything right?”</i>
	<input type="checkbox"/> Ask if the parent would like to add anything	<i>“Is there anything else you’d like to add?”</i>
Goal of this step: To make sure that there is a clear understanding of the issues before moving ahead.		
<b>F Find a FIRST</b> step	<input type="checkbox"/> Consider the information provided and identify a plan	<i>“I think the first step is to get more information and then we will start to think about possible solutions together.”</i>
	<input type="checkbox"/> Plan a follow-up meeting	<i>“I will be back in touch by Friday.”</i>
Goal of this step: To consider the information obtained up to that point and think about next steps.		

**Figure 3**

1



2