“WHEN DO I GET TO SEE THE DOG?”: THE COMMUNICATIVE ENVIRONMENT DURING ANIMAL ASSISTED SPEECH THERAPY SESSIONS FOR ADULTS WITH ACQUIRED COGNITIVE-COMMUNICATIVE DISORDERS

BY

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DISSERTATION

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ABSTRACT

This is a mixed methods study of an established Therapy Dog Program in a sub-acute rehabilitation hospital that examined the communicative space created when a therapy dog is part of a Speech Therapy (ST) session for persons with acquired cognitive-communicative disorders. Grounded in the theoretical framework of *distributed communication* (Hengst, 2015) and supported by multi-disciplinary research on the impact of rich and complex communicative environments, this project was designed to study Animal-Assisted Therapy (AAT) as an activity that (while rarely used in the field of Communication Sciences and Disorders) is highly reflective of the responsibilities, preferences, and personal lives of patients (i.e. pet ownership and interaction with animals). This study draws on ethnographic methods of data collection (e.g., video-taped observations, interviews, collections of artifacts) and a participatory action research (PAR) component utilized to trace the process of program development to meet individual departmental and clinician-specific goals. Ten primary participants and fourteen secondary participants were recruited across 10 total weeks of data collection, and data sources included interviews, video-recorded observations of Animal-Assisted Speech Therapy sessions and Traditional Speech Therapy sessions, and clinical program planning sessions. This study has multiple goals: 1) to explore the institutional context of the Therapy Dog Program at Carle Foundation Hospital (CFH), 2) to describe the language resources used by all participants in an Animal-Assisted ST session and to compare those patterns to a Traditional ST session, and 3) to trace the process and progress made by SLPs towards increasing their personal goals of independence, skill, and productive use of AAT to meet varied cognitive-communicative goals. Results show that AAT sessions were complex, flexible, high quality communicative spaces in which varied resource use was employed by all group members to align to others in the communicative space and to contribute through multiple participation roles. Further discussion and exploration of AAT stands to contribute to the larger discussion of environmental enrichment and language interventions provided in rich communicative environments in the field of aphasiology, rehabilitation science, and adult-neurogenic communication disorders at large.

Dedication

For my husband Ben, who will always be the best thing I got out of graduate school.

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CHAPTER 1: INTRODUCTION

As a practicing Speech-Language Pathologist (SLP) I spent my career in adult/medical settings (e.g., acute care hospitals, sub-acute rehabilitation hospitals, skilled nursing facilities, home health care, and outpatient hospitals). In those settings I worked with patients with aphasia and other acquired cognitive-communicative disorders (e.g., motor speech, executive function deficits, etc.). In that capacity, my clinical role was to provide individualized and targeted therapeutic interventions for persons with communication-related impairments and disorders, and to educate and train family members on their current deficits and future needs. In general, the overall targeted goal of the services I provided was to help patients return as closely as possible to their prior level of function, which included access to, and use of, the complex, flexible, and efficient language skills of an adult who has spent a lifetime communicating in the world.

As I progressed through my career I found myself focusing particularly intently on exploring what it was that was therapeutic about the services I was providing for aphasia and acquired language disorders, including how to define or capture what "therapeutic" means across persons, deficits, and needs. Somewhat unknowingly, through this process I was beginning to question the theoretical and foundational concepts of current aphasia practices. I began to internally take note of the activities, contexts, techniques, and even individual patient treatment sessions in which I felt (or the patient reported) that a session had been particularly therapeutic or meaningful. One activity that continually re-surfaced as meaningful in both my observations and patient reports was the inclusion of animals (particularly therapy dogs) into speech and language treatment sessions. The practice of including animals into therapy sessions, or Animal Assisted Therapy (AAT) is widespread in medical settings, and I therefore had the opportunity to observe and incorporate it across multiple rehab sites and locations (e.g., rehab hospitals, home care, etc.) I began to attend to how frequently patients requested these visits, told their family members about them, and brought them up as topics in later sessions. I observed and noted how AAT sessions felt conversational, and participants regularly told stories and shared experiences without prompting. As I searched for information or guidance on what it was about these AAT sessions that my patients and I felt was impactful, I was faced with far more questions than answers about how to further both my own understanding of the complexities of animal

interactions in therapeutic settings as well as how to optimize those sessions to address complex speech and language deficits.

As will be discussed in detail, current rehabilitation and intervention-based literature across multiple applied healthcare disciplines (e.g., physical medicine, occupational, physical, and speech therapy, nursing) has acknowledged the depth of the relationship between animals and humans, and researchers have explored the inclusion of animals into rehabilitative and therapeutic sessions for adults with neurogenic disorders. These applied disciplines have explored a wide variety of activities and possible benefits of incorporating animals into rehabilitation spaces, specific to disciplinary goals and boundaries. The field of Communication Sciences and Disorders (CSD) has contributed only marginally to this area of research, and yet the questions I had about the inclusion of animals into therapeutic sessions were specific to language use in and beyond clinical settings. In my use of AAT, why did these sessions feel productive, social, and engaging for both the participants and myself? Why did I turn to volunteer handler/dog teams for help when I had a patient who was disinterested in therapy, or severely communicatively impaired? Why did my patients continually use the word "therapeutic" to describe these interactions with the animals? As I explored this topic and these ideas throughout the course of my doctoral program and throughout the completion of my early research project, this question of the why of AAT has brought me not to a specific task, but rather to an exploration of the communicative environment that is created during these sessions.

At the core of this study and this line of research is an exploration of complexity. As will be discussed further, I believe what is missing from the current literature on AAT in healthcare is a description or mapping of the richness of the communicative space and behaviors when an animal is a part of a therapeutic session. Drawing on my clinical experience with both AAT as well as traditional Speech Therapy sessions I believe that the reason for that is simple – we have not yet attended to the varied and multiple communicative resources at work in these spaces. While AAT is the focus of this particular study, I will argue that the theoretical foundations and principles of complexity it draws on are critical for exploring how to design clinical spaces for adults with acquired cognitive-communicative disorders across patient populations, deficits, and settings.

The theoretical framework for this work was drawn from Hengst's work on *distributed communication* (Hengst, 2003; Hengst, 2015), which provides the foundation for exploring the

dialogic nature of human experiences and life worlds, the activity-based nature of communication learning and use, and the multiple communicative resources used in everyday communication. This study, and the lines of research it draws on and will contribute to, seeks to understand the communicative environment created when an animal is a part of a rehabilitation setting, and how the affordances of that environment can be marshalled to target adult/acquired cognitive and communicative disorders.

The next chapter will introduce the theoretical framework of distributed communication upon which this study is grounded, as well as the topic of *rich communicative environments* (RCE) in both every day and clinical communicative spaces. Chapter two will conclude with a brief discussion of how the field of CSD has previously talked about communicative resources at work in multi-party verbal interactions, and what roles clinicians (SLPs) have traditionally held in interventions for persons with communication disorders. Chapter three will begin with an introduction to the Human-Animal Bond (HAB), which will be discussed as both a theoretical foundation for AAT and a background for the historical and current uses of animals in healthcare and educational practices. Chapter three will conclude with a review on the existing literature discussing AAT in the field of Speech-Pathology for adults with acquired cognitive-communicative disorders. Chapter four will discuss the methods for both the ethnographic data collection and the Participatory Action Research (PAR) component, and Chapter five will discuss all results in detail. This manuscript will conclude with a discussion of all results, as well as clinical implications for the field of CSD and future directions in this line of research.

CHAPTER 2: DISTRIBUTED COMMUNICATION AS A FRAMEWORK FOR COMMUNICATION INTERVENTIONS

Distributed communication (Hengst, 2003, 2015; Hengst & Duff, 2007) provides a theoretical foundation for describing the communicative interactions observed during AAT for adults with acquired cognitive-communicative disorders that is grounded in Vygotsky's social language theories as well as activity-based frameworks, such as Cultural-Historical Activity Theory (CHAT) (Cole, 1998; Engeström, Miettinen, & Punamäki, 1999; Engeström, 2000; Leont'ev, 1981) and distributed cognition (Hutchins, 1995). Drawing on sociocultural theories of communication, Hengst and colleagues (Hengst, 2001; Hengst, 2003, 2015; Hengst & Duff 2007) provide a system for exploring communication in the world through an individual and socially relevant lens. Distributed communication attends to both the contextual and textual aspects of communication by recognizing both resources (e.g., language, gestures, writing) and practices (the way these resources are used in interactions in the world) as elements of sociocultural activity (Hengst, 2015). Distributed communication recognizes the significance and dialogic impact of individuals' histories, memories, skills, values, and life experiences on every communicative interaction, and draws on Hutchins's (1995) work on *distributed cognition* to argue that these elements combine to form a "functional system" which is the "situated, emergent, and highly dynamic flow of alignments among people, objects, and environments as people act to achieve varied ends" (Hengst, 2015, pg. 18). The use of a functional systems approach allows researchers (and clinicians) to recognize the co-construction of language both in its use of resources and the space in which it is used in a way that recognizes the temporal, spatial, and social situatedness of the activity.

Language interventions that attend to the social and activity-driven nature of communication have long been supported by sound theoretical foundations in neuroscience (Luria, 1963, 1970, 1976), rehabilitation science (Ylvisaker & Feeney, 1998, 2000), and psychology (Vygotsky, 1978). Ylvisaker and Feeney argue that communicative and cognitive interventions should incorporate, and be provided in, social settings that focus on "everyday routines" that reflect the complexity and richness of communication and behavior in the world (1998, pg. 22). Theories of situated learning and patterns of participation (Lave & Wenger, 1991) and distributed cognition (Hutchins,1995; Luria, 1970; Leont'ev, 1981) all resonate with a

distributed approach to communication taken up by Hengst and Miller (1999), Hengst (2003, 2015) and Hengst and Duff (2007).

Hengst (2015) identifies three principles of distributed communication: first, the inherent, embedded nature of language in activity, second, the common ground created by participants through activity, and third, the need for the incorporation of all communicative resources available (Hengst, 2015, pg. 11).

> The core premise of distributed communication is that communicative resources (e.g., language, gestures, writing) and communicative practices (e.g., the variable ways resources are taken up, used, and transformed in interactions with the world and others) are not discrete phenomena, but must be examined as facets of sociocultural activity. (Hengst, 2015, pg. 18)

These principles will briefly be discussed individually, as they provide the framework for Hengst, Duff, and Jones's (2018) work on designing and constructing Rich Communicative Environments, and for the analysis of the data collected for this study.

Language and communicative resources embedded in activity. As discussed by Hengst (2015), distributed communication and the inextricable connection between language and activity is supported by Vygotsky's principles of development through social interaction. Vygotsky posits the function of speech as one that "guides, determines, and dominates the course of action" in any interpersonal activity (1986, pg. 28). At its core, Vygotsky's sociocultural theory of learning and development (Vygotsky, 1978; Vygotsky, 1980) is a constructivist theory that states that social interaction drives cognitive development in children and early learning. Vygotsky's theory specifies that social interaction (external) precedes cognitive development (internal), in direct contrast to Piagetian theories of language development (Wertsch, 1985, pg. 62-63). As will be discussed in greater detail below, AAT is a quasi-group intervention (multiple participants are present, number of patient-participants may vary) that typically involves interacting through play, seeking and giving of affection, and completing simple daily care tasks for a trained therapy animal. AAT is social (e.g., it involves multiple persons) and creates a situated environment in which interaction with and around the dog can function as the activity itself. From this, participants can shape, form, or adjust the activity of interacting with an animal and the historically informed/habituated communication patterns (e.g., register use, specific gestures) that come with years of experience interacting with animals.

Common ground. Common ground, or the "shared histories of participation in an activity" references the shared "knowledge, practices, and language" that developed among and within communities and allows activities to be recognizable and familiar to community members (Hengst, 2015, pg. 18). In Clark's (1992) model of evolving common ground he argues that these shared histories of participation are pervasive and continuous. Researchers have described these types of complex, flexible, and multi-layered experiences as being representative of *chronotopic lamination* (Bakhtin, 1981; Prior, 1998; Prior & Shipka, 2003), broadly used in this study to describe the embodiment of participants across space and time, bringing with them differing levels of expertise, experience, and histories with animals. The participants involved in AAT (as with any laminated and dynamic activity) bring with them their histories of a lifetime of interacting with animals. The experience of interacting with companion animals such as dogs and cats is a common human experience for many people, one that spans all stages of life and levels of personal importance.

Common ground can be viewed from both temporal and spatial domains that are fundamentally dialogic and laminated (Latour, 2005; Prior & Schaffner, 2011; Prior, 1998; Werstch, 1985). As discussed by Prior (1998), we can see this development of common ground across situations (microgenesis), activity systems (mesogenesis), and the history of sociocultural activity (phylogenesis) (pg. 99). In AAT we see the development of this common ground through analysis of in-the-moment interactions during individual sessions (microgenesis), development of relationships and behaviors across patients, dogs, and groups from session to session (mesogenesis), and across the sociocultural history of human interactions and activities with domesticated animals (phylogenesis). Participants in our first study (Sherrill & Hengst, 2016) could seamlessly call upon these lifelong histories of animal interactions to engage with the therapy dog in what was previously a sterile and strictly controlled hospital setting, as well as demonstrate the week-to-week recall of tricks or preferences specific to an individual therapy dog. These sessions were provided in groups that included multiple therapists and family members as well as the participant, and it quickly became clear that the animal was a full participant, with her own history of experiences with human interaction.

Language orchestrated with other communicative resources. In Vygotsky's work, language is a tool used in activity (along with artifacts), and it thereby serves to mediate social interaction and cognitive development. Holzman (2009) cautions against seeing Vygotsky's use

of language-as-tool as a split between objective/subjective (using tools to acquire knowledge), but rather a "theory of becoming" in which learning and language use is a continual process (pg. 17). Vygotsky argues that mediated activity is how social and natural environments are "mastered" and the process by which children develop the higher psychological functions of cognitive development (Vygotsky, 1978, pg. 55). These principles are further taken up by Luria (1976), who stressed that successful engagement, participation, and tool use (language) is distributed across people and situations. Researchers of Cultural Historical Activity Theory (CHAT) have expanded this work to clearly discuss how distributed engagement (cognition) can be used to successfully navigate complex functional systems as well as breakdowns in functional systems through distribution across people and activity systems (Hutchins, 1995; Leont'ev, 1981).

Distributed communication (Hengst, 2015) allows for the analysis of communicative resources used in the nameable and yet inherently flexible activity of interacting with an animal in a group. The incorporation of AAT into a clinical setting encourages patients to utilize any and all communicative resources at their disposal (e.g., gesture, positioning and body language, verbalizations, non-verbal attention-seeking vocalizations or sounds). The accepted use of multiple communicative resources in an activity like AAT (e.g., tapping of a leg, tongue clicking, whistling, etc.) to interact with the therapy dog may allow a patient with severe cognitive-linguistic deficits to interact fully in the activity and to communicate through the use of different modalities (e.g., gestures, non-verbal communication) with the dog as a partner.

Rich Communicative Environments

Utilizing the framework of distributed communication, Hengst and her colleagues (Hengst & Duff, 2007; Hengst, Duff, & Dettmer, 2010; Hengst, Duff, & Jones, 2018) argue that clinicians can create therapeutic spaces that attend to concepts of richness and complexity and design environments and interventions that capitalize on histories and individual experiences with everyday communicative practices. It is through a discussion of these spaces, or *rich communicative environments* (RCE) that we can explore the layered and dynamic activity of AAT in a clinical setting.

In a review article written as a response to a Clinical Aphasiology Conference (CAC) presentation, Hengst, Duff, and Jones (2018) review the current state of research on neuroplasticity and environmental enrichment as it has been studied in animal models and then

move to a discussion of distributed communication as the framework for a discussion of the translational potential of attending to environmental enrichment principles for persons with acquired cognitive-communicative disorders. Hengst et al. (2018) argue that communicative environments exist on a continuum from limited or restricted to rich and individualized, and the process of "environmental enrichment" is the method by which environments are "re-designed" to meet individual needs (pg. 9). Hengst et al. (2018) argue that this continuum includes variables of complexity, voluntariness, and quality, which gives a way to characterize and describe the environment, and identify activities or interventions in which particular features (e.g., complexity) are malleable. Rich communicative environments can then be broadly defined as complex, authentic, multi-party interactions and situations representative of patients' life worlds, histories, and preferences.

Rich communicative environments have been explored in neuroscience for decades, and multiple researchers have identified components as well as possible advantages of complex or enriched environments in animal models (Hebb, 1949; Dalqvist, Ronnback, Bergstrom, Soderstrom, & Olsson, 2004; Komitova, Zhao, Gido, Johansson, & Eriksson, 2005; Kleim & Jones, 2008; Van Praag, Kempermann, & Gage, 2000; Kempermann, Kuhn, & Gage, 1997). Hengst et al. (2018) argue that the field of CSD is poised to incorporate environmental enrichment principles into rehabilitation practices with immediate translational benefits, specifically to "marshal social learning to support ongoing reorganization of cognitive and communicative functioning," and that this re-organization has the potential to translate in immediate and meaningful ways outside of the clinical/service delivery setting (pg. 10). Hengst et al. (2018) argue that these richer and more complex environments have multiple components and utilize resources across multiple modalities (e.g., verbal language, gestures), which are again flexible and adaptable to individual needs and can shift and adjust between communicative roles and levels of expertise (pg. 13).

CSD is an applied field with its ultimate focus on the translational capabilities of interventions. To do this, our field will need to first recognize not only what rich communicative environments are, but also what they look like in the world. In a recent study exploring rich communicative environments in the world, Hengst, McCartin, Valentino, Devanga, and Sherrill (2016) utilized situated discourse analysis procedures to describe resource use and shifting

footings (Goffman, 1981)[1] in interactions between Augmentative and Alternative Communication (AAC) users, aides (caregivers), and community members across varied activities and settings on a university campus. This study aimed to contribute to both the theoretical and multi-disciplinary design of AAC by examining the devices used by persons with severe communication disorders as "mediators of activity" rather than "prosthetics" needed for clear production of speech, with an ultimate goal of designing AAC devices that function as "pseudo-intelligent mediators (PIMS)" rather than simply replacements for parts of the body that produced speech (Hengst et al., 2016, pg. 7). The theoretical foundation for this study drew heavily on CHAT perspectives and distributed communication, and detailed discourse analysis procedures were used to describe the functional system of the communicative exchanges, including the participation frameworks visible in social interactions across multiple university settings (e.g., a crowded lunchroom, a tech store on campus).

Hengst et al. (2016) identified, coded, and analyzed 5 different types of discourse (playful episodes, trouble sources, procedural discourse, conversational narratives, and conversational repetition), examined how the patterns of use of these discourse types changed across settings and activities, and described the mediational roles embodied by aides or partners when primary participants were communicating with unfamiliar partners (e.g., store clerk, cashier, passer-by). Their results indicate that future AAC design should incorporate awareness of shifting roles and frames of participants in communicative activities, and the tools and resources used in these different activities and spaces, rather than simply the physical disability or transmission capabilities of the users. Hengst et al. (2016) laid a critical theoretical and applied CSD foundation not only for attention to complexity in AAC use, but also for the mediational capabilities of non-human participants in communicative activities.

In this study, Hengst et al. (2016) provide a thick and detailed description of the communicative spaces and activities in these interactions, and they also describe the richness, complexity, and quality of the discourse patterns used in varied activities and settings. Hengst et al. (2016) discuss the roles occupied by all participants as well as the situated and distributed nature of the individual participants' experiences in everyday communication interactions. This

[1] Goffman (1981) defines changes in footings and alignments as "[…] the way we manage the production or reception of an utterance. A change in footing is another way of talking about a change in our frame for events" (pg. 128).

study provided support and guidance for how to describe the way in which environments are enriched and made more complex by attending to all available resources and participant roles afforded, and also has direct implications for a discussion of a therapy dog as a non-human mediational partner in an AAT session.

Resources at Work in Communicative Interactions

As a conclusion to the discussion of the aspects and variables at work in rich and complex communicative environments, I will briefly introduce some of the resources, behaviors, and participant roles previously identified in CSD literature in both everyday communication interactions and traditional clinical practice. Specifically, this will include an introduction to conversational balance (talk time), discourse resource types, and register use.

Attention to resource use in communicative interactions and settings includes an awareness of not only what is being said, but also who is doing the talking and how much of the talking time or space they control. A full discussion of conversational turn-taking is beyond the scope of this project given the complexity of the situated and contextual factors of conversation; however, I will refer briefly to a literature base in conversational analysis on the value given to speakers, specifically how the relative equality or asymmetry of the turn-taking roles they occupy is not only indicative of the speech act itself (e.g., podium speeches vs casual conversation), but also the perceived equality of the speakers themselves in the interaction (Sacks, Schegloff, & Jefferson, 1974). The field of CSD has devoted surprisingly little time to challenging clinicians to attend to the amount of talk they use in a clinical session, and how it impacts communicative balance or conversational partnership. In a published response to Aura Kagan's research on (and marketing of) "Supported Conversation" training, Holland (1998) states that we need to look beyond the field of CSD to examine our approach to balanced conversation in therapeutic spaces and our role in training clinicians to be equal communicative partners:

> To deal with talking, transacting, interacting - even just hanging out - we need models from other disciplines; for example sociolinguistics, social anthropology, small group, interpersonal and non-verbal communication. These models stress the notion of parity, in which speakers shift roles, disclose information about the self, and otherwise act as equals and as sequentially interdependent partners in the communicative or conversational enterprise. (Holland, 1998, pg. 846).

Leahy (2004), a researcher within the field of CSD and one of the primary voices on therapeutic discourse practices, further illustrates this point when specifically talking about "asymmetry" in client/clinician interactions given the overall purpose of communication interventions:

> Asymmetry is natural where levels of expertise differ, and where one is being consulted with regard to expertise. However, it is reasonable to question whether an asymmetrical relationship is the most conducive means of facilitating change, especially when, ultimately, communication competence is the goal of the interaction. (Leahy, 2004, pg. 71).

In a CSD study piloting a mediated discourse elicitation protocol designed to preserve interactional roles consistent with different discourse types (e.g., narratives, conversation, procedural discourse) Hengst and Duff (2007) draw attention to the balance of talk time across sessions and participants in their study. The primary focus of the study challenged the clinician to take up interactional roles as a partner rather than a clinician, which required her to critically evaluate patterns of clinical discourse and their impact on the interaction. While talk time was certainly not the focus of this study, Hengst and Duff (2007) report that in the second session of the project the clinician "worked" to limit her own talk time, and the client produced twice as many words (pg. 45). They identified the reason or purposes for extended talk time from the clinician (e.g., when extended directions or instructions were needed), as part of the analysis of the patterns of the interaction. Balance (or relative domination) of talk time can be seen as a resource used manage and display participant levels of expertise in a communicative interaction, and attention to its use can contribute to our understanding of how participants shift between roles in a given setting.

The use of placeholders and fillers (e.g., uhm, well, etc.) has also been extensively discussed as a communicative resource or "contribution" in typical speakers (Clark & Brennan, 1991) and as a highly common way to negotiate social roles in patients with non-fluent aphasia (Simmons-Mackie & Damico, 2013). While some researchers in CSD choose to categorize placeholders and fillers exclusively as "non-word" errors (Brookshire & Nicholas, 1995; Middleton & Schwartz, 2013; Schuchard, & Middleton, 2018), others have characterized them as flexible compensatory devices (or resources) used to communicate and maintain control and participation in interactional turns (Hengst, 2005; Ripich, Fritsch, Ziol, & Durand, 2000; Davis & Maclagan, 2010).

The field of CSD has also drawn on multi-disciplinary literature to identify several discourse resources types that align speakers to and around communication partners within and across exchanges. Hengst (Hengst, 2001, 2003; Hengst, 2006) refers to these robust and frequently occurring discourse types as *interactional discourse resources* (IDR), and has explored the use of these resources by persons with communication disorders and their partners. For the purposes of this project, the IDRs I will briefly discuss include conversational narratives, playful episodes, procedural discourse, a form of reported speech, and register use.

Narratives exemplify the dialogic nature of human communication (Bakhtin) and have been found to show promise as a communicative resource for clinical intervention in the treatment of aphasia (Hengst & Duff, 2007; Hengst, Duff, & Prior, 2008; Hengst, 2015). Holland and Nelson (2013) discuss the importance of the "illness narrative," or the ability for the patient with aphasia to tell their story in the aftermath of a diagnosis of aphasia (pg. 10). This process (telling the "story of their aphasia") is empowering for the patient as well as encouraging, as themes of progress and hope are important aspects of the illness narrative (Holland & Nelson, 2013, pg. 11). Personal narratives, or what Shadden and Hagstrom (2007) call "life stories," are essential for establishing identity, specifically an "enculturated organization structure for meaning making, in which people, places, objects, are joined by infused values and beliefs" (pg. 325). Murray (2003) argues that the everyday language used in narratives is fundamental for establishing their social nature, and the structure of narratives as part of a larger cultural practice (pg. 98). The ability to produce narratives at the conversational or complex sentence level is impaired in many patients with aphasia, and therefore the expression of identity and participation is often impacted as well.

The use of playful exchanges or episodes in conversation and communicative interaction has also been widely documented in the fields of sociolinguistics (Crystal, 1998; Sherzer, 2002), and CSD by researchers studying aphasia and cognitive disorders including amnesia and Alzheimer's disease (Hengst, 2006; Shune & Duff, 2012). Hengst (2006) studied "verbal play" and "linguistic mischief" present in a collaborative referencing intervention between familiar partners, and characterized both the function and type of playful interactions as resources put to use between, and by, all subjects of the study (pg. 314). Sherrill and Hengst (2016) expanded Hengst's (2006) classification of simple and extended playful episodes (e.g., jokes, playful stories, teasing, etc.) to include playful activities, particularly the games and activities specific to

the presence of the dog in the communicative space.

Procedural discourse involves language used to direct or guide another participant, or to establish a hierarchical relationship between speakers. Bloom, Obler, De Santi, and Ehrlich, (2013) define procedural discourse as discourse that "directs a listener how to do something in a series of chronological or conceptually related steps," differentiating it from expository discourse specifically due to the inclusion of a sequential theme (preface, pg. 10). Hengst, Duff, and Prior (2008) discuss the use of procedural discourse (either intentional or unaware on the part of the speaker) as a resource that establishes the therapist (or speaker) as the leader and expert in the activity or as the "clinician-in-charge (pg. 63). Given the therapeutic context of a rehabilitation or clinically-focused setting, attention to procedural discourse would be particularly helpful for describing when a novice-expert pattern is established.

Reported speech (e.g., quoting, rephrasing, repeating the words of another speaker who is or is not present) has been studied as an ubiquitous discourse phenomenon (Lucy, 1993; Myers, 1999; Tannen, 2007) as well as a conversational resource that remained accessible for, and widely used by, persons with a diagnosis of aphasia (Hengst, 2005). In Sherrill and Hengst (2016) we used this foundation of reported speech to discuss the concept of *envoicing* or giving voice to another. In this study, envoicing was discussed as a form of reported speech used to give a human voice to the therapy dog, to animate what they think the therapy dog's thoughts, feelings, or emotions may be during the AAT sessions. Envoicing was seen to be a ubiquitous resource used by all participants in that study, regardless of communication impairment. A discussion of envoicing particularly for an animal also brings to bear the complicated history of human-animal interaction and the complexity of our inter-species relationship, and can be seen as an act of reported speech via anthropomorphism, defined by McHugh (2004) as "the projection of ideas of the human into animal bodies" (pg. 11). Tannen (2004) specifically refers to envoicing (what she refers to as "*ventriloquizing"*) as a way of frame and footing shifting for all participants in a cross-species interaction (pg. 402).

Register use is a resource that spans multiple cross-disciplinary fields and includes the domains of: pitch, prosody, volume and tone (Attardo Pickering, & Baker, 2011); topical focus, intonation and pacing, specific or restricted lexicon, specialized linguistic usage patterns (Duranti & Goodwin, 1992, Mitchell & Edmonson 1999); social ranges and domains (values/personal associations, types of relationships); and semiotic ranges and modalities

(gestures, body language) (Agha, 2004; Saville-Troike, 2008). One of the most striking reported aspects of the human/animal relationships in both the clinical and community settings is the use of specific speech and paralinguistic patterns when speaking directly to or even about the dog. This current study draws on Sherrill and Hengst (2016) to classify these patterns as a register, specifically named *pet register*. The decision to label this register as pet register rather than adoption of *pet/dog directed speech* (Ben-Aderet, Gallego-Abenza, Reby, & Mathevon, 2017; Jeannin, Gilbert, & Leboucher, 2017) was based on the context and situation of the interaction and the importance of including the communicative function of specific physical gestures performed (e.g., leg tapping, snapping of fingers) as a component of the register. Both Tannen (1984) and Labov (1972) discuss register shifting within the context or distinction of style as part of a larger discussion of "style shifting." Tannen, in her work *Conversational Style: Analyzing talk among friends* (1984), discusses the style shifting potential of register in communicative interactions as a resource for building and solidifying relationships (both dyadic and community-based):

> The association of these various lexical choices with particular settings then yields the possibility of stylistic variation created by usage in other settings. The shared social knowledge of expectation of one register than another, in other words, makes it possible to signal metaphorical meaning about the relationship and the situation at hand. For example, the use of colloquial language in a public setting is associated with a particular style: it is a way of communicating the messages, 'I'm just folks,' and 'we're all equals.' (Tannen, 1984, pg. 13).

The theoretical framework of distributed communication and the focus on creating rich communicative environments that incorporate a diverse range of voluntary, complex, and diverse types of language use challenges clinicians to attend to the roles of all participants in a given activity. Given the target audience for this work, I would like to briefly and yet directly discuss the traditional role of the clinician in a therapeutic setting as it influenced both the design of this study, the participants involved, and the analysis of data collected.

Traditional Roles for Clinicians

The previous section defined and explored components of a RCE, and introduced some of the resources at work in conversational interactions. Traditional Speech Language-Pathology (SLP) sessions, however, are purposefully designed as simplified contexts to support clinician

directed tasks targeting measurable goals. The physical spaces of SLP sessions are designed to support one-on-one interactions, as they typically occur in a highly controlled environment (closed office or private room). Multiple repetitions of a given task (e.g., naming pictures, answering questions, etc.) are presented by the clinician, attempted by the client, and immediately evaluated by the clincian. This allows the clinician to collect large amounts of data in any given session, and to measure success by accuracy of performance on targeted activities. In a piece titled, "Constructing incompetence during group therapy with traumatically brain injured adults," Kovarsky, Kimbarow, and Kastner (1999) argue that traditional SLP sessions are so highly focused on error correction that conversation and even game-play in clinical spaces is de-contextualized in an effort to control the stimuli. This structure allows clinicians to "count" or evaluate correct responses in any and all exchanges, which subsequently suppresses the possibility of a balanced interaction and instead focuses on error identification: "Put another way, without errors to remediate, there would be no therapy" (Kovarsky et al., 1999, pg. 293).

Leahy (2004) describes the therapeutic relationship between client and clinician as "arguably the strongest element of the working relationship through which the therapeutic healing or restorative process occurs" (pg. 71). This relationship between client and clinician begins with an evaluation of the client's deficits and, thereby, is on very unequal footing. In an examination of the "negotiation" of the roles inhabited by clinicians and clients with aphasia, Simmons-Mackie and Damico (2013) title these established roles as *competent helper* (clinician) and *incompetent patient* (client) and discuss the assumptions created and propegated in this relationship:

> The goal of therapy is to build communicative competence, yet the assumptions required for treatment demand that the client be incompetent. That is, the therapist expects the client to demonstrate problems with communication. Thus, both parties act in acordance with a presupposition of deficit in the individual targeted for therapy (Simmons-Mackie & Damico, 2013, pg. 313).

Researchers in CSD have long questioned the contradiction of how a strictly controlled relationship could encourage the cooperative use of modalities between comunicative partners necessary for adults with acquired cognitive-communicative disorders, particularly if their struggle is with the loss of flexibility and use of multiple resources. Holland (1998) clearly discusses this contradiction in her aptly titled work "Why can't clinicians talk to aphasic adults"

when she states, “Most clinicians would agree that the fruits of their therapeutic labours should be found in aphasic patients improving their ability to engage in conversation. However, these same clinicians have difficulty considering that conversation itself can serve as a therapeutic medium” (pg. 845).

Holland (1998) argues that these attitudes are a direct result of the way that clinicians are trained to interact with their clients. Research on the training of student clinicians in the field of CSD primarily concerns the relationship between supervisor and student clinician and the types and levels of feedback provided (again from supervisor to student clinician) across different supervisory models (Anderson, 1988; Geller, 2002; McCrea & Brasseur, 2003; Ho & Whitehill, 2009). In the Anderson Continuum of Supervision (Anderson, 1988) cited by the American Speech-Language Hearing Association (ASHA) as the “most widely recognized supervisory model in speech-language pathology” (ASHA, 2008, pg. 2), the ultimate goal of clinicial instruction is independence, or self-supervision (Anderson, 1988), explicitly placing the clinician in the role of expert and authority. In the Anderson Continuum, consultations as means of self-reflective practice are recommended throughout the scope of a practictioner’s entire clinical career; however, consultations are with other clinicians only (Anderson, 1988).

Hengst and Duff (2007) discuss the within-discipline belief that some clinicians are simply “better communicators than others,” with a “natural gift” for communicating with patients (pg. 47). In this study, which again examines the role of clinician as communicative partner rather than instructor, Hengst and Duff (2007) discuss the logical fallacy that a field dedicated to addressing communication disorders assumes that effective communication is non-trainable or non-remediable in its own practitioners. Hengst and Duff (2007) reference the work of Norris and Jones (2005), Scollon (2001), and Wertsch (2008) on mediated action to propose that clinicians approach the clinical relationship and space as mediators rather than directors, with a focus on situated and distributed principles of language interaction (Hengst & Duff, 2007, pg. 38-39).

In an effort to contribute to this discussion of clinical relationships and participant roles, this study examined not only the communicative behaviors of participants, but also the personal attitudes and professional application of AAT from the perspective of the clinician through the inclusion of a Participatory Action Research (PAR) component. PAR is a process that aims to “bring together action and reflection, theory and practice, and participation with others, in the

pursuit of practical solutions to issues of pressing concern to people […]" (Reason & Bradbury, 2006, p. 4). As a method of inquiry, PAR identifies interventionists and administration (in this case the practicing SLPs, and administrators interested in advancing an AAT program) as active participants in the exploration (Walker, 1993; Fine, Torre, Boudin, Bowen, Clark, Hylton, Migdalia-Martinez, Roberts, Smart, & Upegui., 2003; Ozanne & Saatcioglu., 2008; Baldwin, 2012). PAR encourages "the building of alliances between researchers and participants in the planning, implementation, and dissemination of the research process" (McIntyre, 2007, pg. 1), and in the case of this study it allowed us to analyze and reflect on the clinician's experiences and observations while they were in the process of providing services. Put succinctly, PAR includes clinical practitioners as engaged participants in the process, allowing researchers and practitioners to develop knowledge and programs that can inform practice at any time (Heron & Reason, 2001).

In the case of this current study, this method allowed us to go beyond targeting the practitioners only through wrap-up or reflective interviews to including them in the planning process across the design, data collection, and analysis stages of the study. This process allowed us to mutually explore issues such as long-term feasibility, productivity and practical application, and expansion of CFH's current AAT program. It also allowed researchers and interventionists to collaborate utilizing the best practices currently available in the literature on AAT and to work with clinicians to maximize the flexible and situated nature of an AAT session that might otherwise take the previously discussed form of drill-based activities with an animal layered onto a pre-planned session.

No instance of PAR or collaborative research methods were identified during the AAT literature review for this project (across any/all topics), despite the explicit need for the involvement of discipline specific professionals in AAT services. Specific to this project, the PAR component allows us to explore how clinicians can create and support rich environments in a clinical space and describe the comfort level of these particular clinicians with regards to creating and marshalling communicative resources to support diverse patient populations.

In summary, the framework of distributed communicated serves as a framework for understanding the situated and distributed nature of communication in the world. The dimensions of a rich communication environment can not only be observed and attended to, but also directly targeted to maximize the complexity, voluntary nature, and quality of clinical

spaces. The following chapter will discuss the history and theoretical support for the inclusion of animals into clinical spaces, and discuss the current state of the research on animals in medical and healthcare interventions.

CHAPTER 3: ANIMALS IN CLINICAL SPACES

The final section of this background requires an in-depth discussion of the role of animals in clinical spaces and the recent history of Animal Assisted Activities (AAA) in healthcare settings. This chapter will briefly introduce the reader to current literature on the Human-Animal Bond (HAB), as well as existing research from multiple rehabilitation and healthcare fields who have explored the use of animals in clinical settings. As will be discussed below, the way in which current literature in clinical or healthcare spaces talks about animals is largely reflective of practical needs (e.g., training, certification, etc.); therefore, a more expansive, multi-disciplinary literature review is needed to establish the social/cultural impact and history of human-animal interactions.

The Human-Animal Bond

Human-animal co-presence and the domestication of animal species has a fascinating and complicated history, visible across the human transition from hunter-gatherers to farmers and later to an industrial society (Serpell, 1996). Today animals exist in complicated roles including both food-producers and companions, with several species capable of existing as both food and friend (e.g., pigs, farm birds, etc.). Humans who share their lives with companion animals may think of themselves as an owner, a guardian, or something in between, and for many people companion animals are full members of the family (Serpell, 1996; Beck & Katcher, 1996, 2003; Bonas, McNicholas, & Collis 2000; Carslile-Franke & Frank, 2006; Fine & Beiler, 2008; Beck, 2014; Amiot, 2015).

According to the most recent figures available from the American Veterinary Medical Association (AVMA) in the *U.S. Pet Ownership and Demographics Sourcebook, 2012*[2], there are over 70 million pet dogs and 74 million pet cats in the US alone. Of the owners surveyed for the AMVA publication, 63% considered their pet to be a member of their family (AMVA, 2012). In 2017 the North American Pet Health Insurance Association (NAPHIA) completed a survey of pet ownership in which they report higher pet ownership numbers than the AVMA (89.7 million pet dogs and 94.2 million pet cats) and also report that 2.1 million owners purchased pet

[2] The 2017 edition of the AVMA US pet ownership and demographics sourcebook has been completed but not yet released to the general public.

insurance designed to cover preventive and emergency medical treatment for companion animals in 2017 alone (NAPHIA, 2018).

While a full analysis of the relationship between humans and domesticated animals is beyond the scope of this document, it is critical to introduce it as a contributor to (and theoretical foundation for) the study of animals in clinical and rehabilitation settings. Specifically referred to as the Human-Animal Bond (HAB) (or alternately, the Human-Animal Relationship) (Beck & Katcher, 1996; Hosey & Melfi, 2014), this connection between animals and humans has been used as the foundation for work in healthcare fields aimed at understanding why people recovering from injury or illness respond to, and could potentially benefit physically or psychologically from, animals in a therapeutic setting. In 1998 the AVMA's Steering Committee on the HAB defined it as:

> [...] a mutually beneficial and dynamic relationship between people and other animals that is influenced by behaviors that are essential to the health and well-being of both. This includes, but is not limited to, emotional, psychological, and physical interactions of people, other animals, and the environment (Fine & Beck, 2015, pg. 5).

The psychological model for the HAB is variable across authors; however, current literature cites attachment and social support theories that begin early in life as the primary manifestations of the bond (Beck & Katcher, 2003; Esposito, McCune, Griffin, & Maholmes, 2011; Geist, 2011; Fine, 2015). This model was expanded by Enders-Slegers (2000) to encompass the entirety of the theory of "social provisions" (originally credited to Robert Weiss), the components of which include attachment, social integration, reassurance of worth, reliable alliance, guidance, and the opportunity for nurturance (pg. 194). See Table 3.1 for research exploring varied components of the HAB.

Table 3.1
Components of the Human-Animal Bond

Components of the Human-Animal Bond		

Evolutionary Factors	• Biophilia: The innate tendency to focus on life and lifelike processes, including emotional attachment to living things. (Wilson, 1984)
	  ○ Complicated nature of predator vs prey (from both animal / human POV)
		• Kellert & Wilson, 1993; Wilson, 1984; Beck & Katcher, 1996; Beck, 2014; Kahn, 1997
		  ○ Serpell, 1996; Arluke, 1996; Mills & Hall, 2014; Hosey & Melfi, 2014; Blazina, Boyra, & Shen-Miller, 2011

Developmental and Learning Processes	• Children learn about /interact with pets, which translates to views and ideals about all animals • Life-long feelings of attachment and mutual care-giving (people provide for needs, animals provide emotional reciprocation).	• Levinson, 1969; Melson 2001, 2008; Bizub, Joy, & Davidson, 2003; Friesen, 2010; Hall & Malpus, 2000; Martin & Farnum, 2002; Solomon, 2010
Modeling	• Parents / society teaches positive vs. negative ways to interact with animals	• McHugh, 2004; McCardle, 2011; Fine, 2000; Fick, 1993
Physiological health and well-being	• Blood pressure, stress, exercise, social interaction	• Cole et al., 2007; Friedman, Katcher, Thomas, Lynch, & Messent, 1983; Friedmann, Thomas, & Eddy 2000; Friedmann & Son, 2009; Geisler, 2004
Categories and descriptions adapted from Amiot et al., (2015), multiple additional / multi-disciplinary sources added.		

The HAB may best be described as the emotional and psychological connections between people and animals in community-based settings; however, what currently eludes the field of human-animal studies is an identifiable metric by which to measure the depth (and/or presence) of the HAB. When and under what circumstances does it exist? Why is it described as a "natural" experience for some people and not for others? These questions have direct implications to this study, particularly with regards to the feasibility of offering AAT programs to diverse patient populations (within and beyond the discipline of speech pathology) and to the understanding of the communicative interactions possible between humans and animals.

Animals in Healthcare

The origins of animals as therapeutic partners and contributors to healthcare has a long and well-documented history. As early as the 1860s, healthcare providers wrote of the positive impact of animals in healthcare and included recommendations for their use in training and educational resources. In her 1859 nursing educational manual *Notes on Nursing: What it is and what it is not*, Florence Nightingale stated that "A small pet animal is often an excellent companion for the sick, for long chronic cases especially" (1946 re-print of facsimile, pg. 58). The use of animals in hospital and medical settings was not accepted fully for several decades, with a noted increase in their use following WWII to aid the recovery of veterans in convalescent hospitals (Serpell, 2015; Hooker, Freeman, & Stewart, 2002).

Continued interest in the use of animals in healthcare was due to practitioners within the field of psychiatry, who have historically lead the way for both the implementation and research into incorporation of animals into medical and clinical spaces. Boris Levinson used his own companion dog "Jingles" as a participant in psychotherapy sessions with pediatrics, and was one of the first modern researchers to describe the facilitating role that animals embody in communicative interactions (Levinson, 1969). It was at this point in time (late 1960s-early 1970s) that calls for standardization, definition, and classification of animal assisted interventions and services were put forth by professionals in healthcare fields in an effort to both disseminate research on the topic and institute regulatory guidelines needed to protect the health and safety of all participants involved.

At this point in the discussion it is necessary to provide some definitions and descriptions of the different terminology and categories used by those practicing and utilizing animal assisted interventions in educational and medical settings, as the distinctions between uses will be critical for a later discussion of the details of data collection in this study, as well as for productivity and training needs. There is a significant lack of coherence in the description and discussion of interventions that utilize animals in the current literature, and in fact a doctoral dissertation by LaJoie (2003) cites as many as 20 different definitions of AAT alone, with little or no discernable difference between methods (e.g., Pet Therapy, Animal-Assisted Therapy, Pet-mediated Therapy, Animal co-Therapy, Pet Facilitated Therapy, and Pet oriented Therapy). The most important terminological distinctions to be made for this project involve the types of activities involving animals, levels of professional training, support, and multi-disciplinary

involvement that is required. See Table 3.2 below for a breakdown of the most current/agreed-upon terminology for activities, interventions, and services involving animals in healthcare.

Table 3.2
Current terminology for interventions and services involving animals in healthcare.

Interventions and Service Distinctions for Animals in Healthcare					
	Description	**Animal**	**Training**	**Professionals**	**Treatment Goals**
Animal Assisted Therapy (AAT)	Structured, goal oriented therapeutic intervention directed by healthcare professionals	Primarily dogs and horses (equine therapy).	AKC Good Citizenship certification, Therapy Dog Certification through AKC or local club.	Licensed / certified professionals acting within scope of practice (e.g., OT,PT, SLP, RT) Handler / animal team	Targeting measurable discipline-specific goals with documentation of purpose and progress
Animal Assisted Education (AAE)	Structured, goal-oriented educational intervention	Primarily companion animals	Site dependent – AKC Good Citizenship certification required for dogs	Academic or service professional Handler / animal team	Academic or educational goals (e.g., reading fluency)
Animal Assisted Activities or Interventions (AAA)/ (AAI)	Informal interactions or visitations	Primarily companion animals	Individual sites (e.g., a nursing home) may require proof of AKC Good Citizenship	Handler / animal team	No treatment goals – targeting motivation, education, or general recreation
Service Animals	Assistance for a single person with an identified medical or psychological need	Primarily dogs	Extensive training involved including individualized / person-specific needs	Service Animal and patient/client	Safety and well-being particular to individual needs
Emotional Support Animals	Animals designated to provide emotional / psychological support	Primarily dogs, however, category is unlimited	None required	Emotional support animal and client, possibly physician	Emotional well-being particular to individual needs
(Jeegatheesan, Jegatheesan, Beetz, Choi, Dudzik, Fine, Garcia, Johnson, Ormerod, Winkle, & Yamazaki, 2014; AVMA, 2018; Fine, 2015)					

Pet Partners, the largest non-profit organization for training and coordination of Animal Assisted Therapy (AAT) / Animal Assisted Activities (AAA) in the United States, began educating professionals and advocating for the use of animals in rehabilitation in the late 1960s. One of the founders of Pet Partners (Dr. Leo Bustad) is credited as one of the earliest users of the term "human-animal bond" (Fine, 2015, pg. 5). Pet Partners established a specialized "Therapy Animal Program" in 1990, with a goal of "establishing rigorous standards for both animals and their human handlers to ensure safe and effective therapy animal visits in the community" (Pet Partners – Our History, 2018). Pet Partners reports a membership roster of greater than 13,000 volunteers providing more than 3 million AAA visits across healthcare and educational settings each year (Pet Partners – in your facility, 2018). These visit numbers do not include home visits that utilize companion animals or animals trained and owned by individual therapists and therapy dog clubs not affiliated with Pet Partners.

Training and certification for the use of animals in AAA is not a standardized process at this time, and all states have different training and liability requirements. The American Kennel Club's (AKC) Canine Good Citizen (CGC) certification is a basic behavioral test that is considered a minimum entrance requirement to train as a therapy dog and consists of simple tasks such as "accepting strangers" and "sitting politely" as well as following simple commands (10 steps total) (AKC, 2018). The AKC does not train or certify therapy dogs; however, they do recognize them, and guide potential volunteers to organizations with national recognition (e.g., Pet Partners, Therapy Dogs International) (AKC, 2018). Therapy dog certification can be completed at any private training facility, and individualized therapy dog clubs can and often do require additional training and certifications as they and their visiting sites deem appropriate. Therapy dog certification programs expand upon basic obedience and command-following activities (e.g., recall, sit/stay, leave it, etc.) by introducing the dogs to common healthcare situations and equipment (e.g., walkers, crutches, etc.) (Therapy Dogs International, 2018).

AAT is widely practiced in a variety of residential and in-patient healthcare settings (e.g., in-patient rehabilitation, skilled nursing facilities) for adults with acquired cognitive-communicative disorders following neurological injury or illness (e.g., traumatic brain injury, stroke, Parkinson's Disease, and Dementia). While multiple rehabilitation and therapeutic disciplines use AAT (e.g., Occupational, Physical, or Recreational Therapy), they often do so for very different goals and outcome targets (Fick, 1993). For example, an AAT session with a

physical therapist may target standing balance while holding a hula hoop or throwing the ball to a therapy dog, and a session with an occupational therapist may include brushing a dog, petting a cat, or hold a bird on a finger to target fine motor control. The disciplines of physical and occupational therapy have utilized animals to target a variety of physical strength, balance, and movement goals (All & Loving, 1999), with very general stated theoretical foundations such as increased motivation and physical or kinesthetic feedback (Macauley & Gutierrez, 2004; Bizub, Joy, & Davidson, 2003) as well as improvements noted in "conditioning" for patients with severe physical weakness (All & Loving, 1999, pg. 52).

The mediational ability for the dog to exist in a role both therapeutic and yet non-dominant, leads to a less defined but heavily cited theory behind the success of AAT, the dog as arbitrator in a human-driven world. Regularly used in psychiatric studies of AAT and extended to many other disciplines (e.g., OT, Nursing), the idea of the animal as an empathetic, non-judgmental listener is essentially descriptive of a partner who unconditionally accepts the patient, client, or child at their current state, status, or skill level, despite the deficits and disabilities that the rest of the world focuses on so intently (Bardill & Hutchinson, 1997; Fine, 2008; Friesen, 2010; Mallon, 1994). Dogs in particular are reported by patients to be empathetic listeners who "just understand" and as such are the ideal confidant (Bardill & Hutchinson, 1997, pg. 21). Animals "cannot answer back, pass judgement, be influenced by what others say, or break confidence" (Bonas et al., 2000, pg. 211) and yet are capable of understanding communication in nuanced forms. The benefit of a relationship with no judgement or comparison to previous abilities cannot be overlooked, particularly for patients whose lives have been inexplicably and often permanently impacted by illness or injury.

Animals and Communicative Practices

Despite limited publications in communication sciences and disorders (CSD), multiple cross-disciplinary publication researchers have reported anecdotal observations for the potential for animals to be used in a therapeutic capacity to address speech and language goals, and have encouraged further study by professionals in CSD (Fine & Beiler, 2008; Fick, 1993). Review studies in Alzheimer's research (Bernabei, De Ronchi, La Ferla, Moretti, Tonelli, Ferrari, & Atti, 2013), Nursing (Jorgenson, 1997) Rehabilitation Science (Giaquinto & Valentini, 2009) and counseling studies (Bizub et al., 2003) report a consensus in the literature that supports increased verbalization across settings and situations when animals are present, specifically spontaneous

language attempts and conversations initiated by and between patients and staff. Quasi-experimental studies, including Berry, Borgi, Terranova, Chiarotti, Alleva, & Cirulli, (2012), Hall and Malpus (2000) and Richeson (2003), have studied the impact of AAT sessions on aspects of perceived motivation (apathy), agitation, and verbal and non-verbal social behaviors, and offer anecdotal reports of increased attempts to spontaneously interact with the dog (both verbal and non-verbal) and increases in communication-like behaviors from residents in a long-term hospital. These behaviors included greetings, requests for affection, and signs of anxiety displayed and understood by both humans and animals.

While limited ethnographic work has been completed on this topic, two multi-disciplinary studies with ethnographic components (e.g., observations and recorded field notes) have been completed (Bardill & Hutchinson, 1997; Fick, 1993). These studies analyzed social interaction behaviors following AAT visits in institutionalized adolescent and geriatric populations in the fields of nursing and occupational therapy. Bardill and Hutchinson (1997) report that the dog represented a listener who gave "empathetic, non-verbal feedback," increasing participants' attempts to spontaneously communicate with the dog (pg. 21), and Fick's (1993) results include increased spontaneous conversations and personal narratives about pets/pet ownership, as well as both verbal and non-verbal social interaction attempts increased with the dog present.

Communicative resources visible during AAT. Animals have long been found to elicit specific speech patterns from their human communicative partners, and these patterns have been discussed for their similarity to speech patterns used with infants. These patterns have been compared to patterns used by adults when teaching language to human infants, or what was originally (and commonly) termed "motherese," "parentese," or "baby talk" (Schilling-Estes, 1998; Sicoli, 2015; Hirsh-Pasek & Treiman, 1982; Snow, 1972; Jeannin et al., 2017). The patterns of modifying speech and pitch when adults speak to infants in the American English language learning phase, or *motherese*, was characterized by Snow (1972) as containing shorter, grammatically simpler speech with few errors, with more redundancy or repetition, and adaptations or continuation of use of the register dependent on the child's reaction (pg. 561). Hirsch-Pasek and Treiman (1982) were the first researchers of record to compare motherese to how people talk to dogs and referred to these patterns as *doggerel*. Drawing on the foundational observations of motherese, Hirsch-Pasek and Treiman (1982) examined four owner-dog dyads

completing various tasks in an effort to compare/contrast the features of motherese with those used when speaking to a dog. Their results indicated "striking similarities" between the speech from human to canine and previously described aspects of motherese, including decreased utterance length (MLU), sentence type (more imperatives than declaratives), increased use of present tense, increased repetition, simplified grammatical forms with few errors, and use of tag questions (Hirsch-Pasek & Treiman, 1982).

Multiple researchers have since discussed and identified specific elements of pet or animal directed speech that are similar to the way humans speak with infants or small children, including adjustments in pitch and prosody, use of diminutives and endearments, and repetitive patterns of speech (Mitchell & Edmonson, 1999; Mitchell, 2001; Burnham, Kitamura, & Vollmer-Conna, 2002; Ben-Aderet et al., 2017; Jeannin et al., 2017; Benjamin & Slocombe, 2018). Researchers in human-animal interaction and animal cognition have analyzed both the basic patterns of speech to domestic animals (dogs) (Mitchell, 2001) as well as the control and attention-getting function of the repetitive nature of talk to dogs (Mitchell & Edmonson, 1999). Mitchell and Edmonson's (1999) study also utilizes dyadic pairs of owner/companion animal (although data was collected on both familiar and unfamiliar dyad pairs), and they also suggest that short/repetitive speech to dogs indicates the use of a "conversational model" in which the dog can answer by action (pg. 59). In a later publication, Mitchell (2001) compared the speech patterns from the 1999 data set to previously published studies of motherese and found similarities primarily in patterns of prosody, lexical features, grammatical complexity, redundancy, and content (pg. 202). Current literature is now widely using the term Pet Directed Speech (PDS) and Infant or Adult-Directed (IDS vs. ADS) instead of doggerel or motherese to describe these patterns. As will be discussed below, for this project we will retain the use of "pet register" to capture the entirety of the aspects and components of a full register observed in our previous study (Sherrill & Hengst, 2016). Of added relevance for this project is that two recent publications have specifically analyzed and begun to describe the acoustic characteristics of pet directed speech with typical adult speakers (Jeannin et al., 2017; Ben-Aderdet et al., 2017) and have provided valuable information regarding the specific pitch changes/modulations seen with typical speakers using PDS.

The potential analysis of pet register as a resource that can be employed by all participants during an AAT session indicates potential to contribute to the discussion of a metric,

or a visible identifier of the HAB in action that can be defined and described. What our current line of research brings to the discussion of PDS is an argument for the recognition of PDS as a full register. A register is a complex system that involves multiple linguistic, non-verbal, and behavioral components including domains of pitch, prosody, volume and tone (Attardo et al., 2011), topical focus, intonation and pacing, specific or restricted lexicon, specialized linguistic usage patterns (Duranti & Goodwin, 1992, Mitchell, 1999), and social ranges and domains (values/personal associations, types of relationships) and semiotic ranges and modalities (gestures, body language) (Agha, 2004; Saville-Troike, 2008). The expansion of PDS to a register (pet register) allows researchers to recognize the specific and individualized features of communication with animals, as well as to explore how registers provide a common ground and connect individual speakers across histories and life experiences, and how their use contributes to the richness and complexity of the communicative environment. This is especially relevant in the study of people with communication disorders, particularly as our previous work has indicated that pet register was seemingly spared across all patients and diagnoses types observed with similar patterns as used by typical speakers, including extensive use of physical gestures and multiple modality attention-seeking communicative behaviors.

The current state of AAT in CSD. The field of CSD has entered the discussion of AAT in rehabilitative sessions; however, the contributions of our field are severely limited in scope and quantity. Only one study exploring the use of AAT for adults in healthcare settings is in a peer-reviewed discipline-specific journal (LaFrance, Garcia, & Labreche, 2007) and only five total studies explicitly discuss communication goals or observed outcomes during AAT sessions across the lifespan (Adams, 1997; Bass, Duchowny, & Llabre, 2009; LaFrance et al., 2007; Macauley & Gutierrez, 2004; Macauley, 2006). Only three of these earlier studies were both authored by professionals in the field of CSD and specifically discuss the use of AAT for adults with acquired cognitive-communicative disorders, and all were quasi-experimental case studies with 1-3 total primary participants (Adams, 1997; LaFrance et al., 2007; Macauley, 2006).

Adams (1997) authored the first of these three case studies: "Animal-assisted enhancement of speech therapy: a case study," published in *Anthrozoös,* an animal studies journal with a wide multi-disciplinary audience. Adams (1997) is a single subject case study of a 72 year-old female who received AAT with two therapy dogs as part of a rehabilitation program to address a diagnosis of apraxia of speech. The stated goal of the sessions is "appropriate and

correct word initiation," addressed through the use of simple questions and a picture identification activity from a standardized kit. The tasks attempted with the dog were highly discrete and capitalized on the presence of the dog as a target (e.g., "Where is his tail?"). The author reports that "variables of social behavior," such as smiling, looking, touching, and verbalizing, were measured through percentage of occurrence during the session (Adams, 2007, pg. 54). Results show improvement in these variables of social behavior and the accuracy of simple questions and picture naming; however, there is no discussion of how or when the dog contributed beyond fetching during simple repetition of the task. See below for a description of the events of the session, which indicate (through repetitive use of the term "required") that the interactions between the dog (Charlie) and the patient participant (WA) were directed by the clinician and focused around the naming of a picture card, and then scored for accuracy, presumably on the correct naming of the card.

> In one activity, Charlie was engaged in "retrieving" a dumbbell. WA had to identify the picture card, then maneuver the string around one end of the dumbbell and offer it to Charlie giving him the appropriate command of, "Charlie, take it." Charlie would then take the dumbbell to his trainer/caregiver some feet away. His trainer/caregiver would then verbally praise Charlie and reposition him for the return back to WA. WA was then required to direct Charlie back to her with the command of, "Charlie, come." When Charlie returned to WA, she was required to give him the command of, "Charlie, give," upon which he would release the dumbbell. This process was repeated for each of the 10 pictures to be identified. WA's responses were scored as either correct or incorrect (Adams, 1997, pg. 53).

Results showed no treatment effect on verbal language from the AAT sessions based on comparison of pre/post testing results from the *Boston Diagnostic Aphasia Evaluation* (BDAE, Goodglass & Kaplan, 1972).

Almost a full decade later, "Animal-assisted therapy for persons with aphasia: a pilot study" (Macauley, 2006), was published in *The Journal of Rehabilitation Research and Development*. Macauley has produced two of the four published studies on AAT in SLP, as she has also published on pediatric treatment utilizing hippotherapy. The research was guided by questions of whether or not AAT was effective treatment for aphasia, whether it was less, more, or equally as effective as traditional therapy, and patient-reported differences in motivation

between the two types of sessions (Macauley, 2006). The design included one semester of traditional speech therapy (ST) followed by one semester of AAT for three participants with aphasia. Macauley (2006) provided very few details about the treatment sessions, stating simply that both stages utilized "similar activities," and targeted "similar goals" (pg. 360). There is no specific discussion of the tasks or structure used beyond a link to a website that has been inaccessible for the last 4 years. Macauley (2006) used pre-post test results of the *Western Aphasia Battery* (WAB, Kertesz, 1982) and reported no significant change in scores for either AAT or traditional SLP sessions. This study included a social validity measure (questionnaire) regarding treatment satisfaction and goals, and all patients reported not only improvement and progress towards their goals, but also increased motivation for sessions that involved AAT. The conclusion reached by the author was that AAT is "at least as effective" as traditional therapy; however, due to the limited description of activities, goals, or treatment targets, the evidence put forth in this study supports neither traditional speech therapy treatment effects nor AAT (Macauley, 2006, pg. 363).

The third and final study specifically discussing communication disorders treatment and AAT in an adult population was written by LaFrance et al. (2007) and is the only of the three published in a peer-reviewed CSD journal (*Journal of Communication Disorders*). The study was modeled after a quasi-experimental ABCA reversal design study done in a psychiatric facility (Hall & Malpus, 2000) claiming that the presence of the dog (and not the human handlers) was the primary catalyst for increased social interaction. LaFrance et al. (2007) is a single case study of a patient with a diagnoses of aphasia residing in an in-patient rehabilitation facility. This study analyzed both verbal and non-verbal behaviors from the participant in the 3-5 minutes of transport back to his room following a weekly AAT ST session, under one of three conditions. The stated goal of this study was to "encourage patients in the AAT program to communicate" with all persons he encountered on the walk back to his room, with an ultimate goal of "transfer of therapeutic goals" (LaFrance et al., 2007, pg. 220). The design of this study allowed researchers to examine whether using the dog as part of the transport would increase the patient's verbalization beyond the therapy session. The AAT-ST session was the independent variable, but no details were provided about the structure or activities completed during these sessions, and the SLP acted as both the treating clinician and dog handler. In the first condition (no dog, no SLP), a porter would return the patient to his room with no dog or SLP present. In

the second condition (no dog, SLP) only the SLP returned the patient to his room, and in the third condition (dog and SLP) both the dog and the SLP were present for the walk back to his room. LaFrance et al. (2007) reported a small increase in verbal and non-verbal behaviors from the participant when the SLP-handler was introduced (second condition), and a "marked" increase in both verbal and non-verbal social behaviors from the patient in the third condition when the dog was present (pg. 222). The authors reported that staff and strangers stopped to initiate a conversation with the patient when the dog was present, which provided the opportunity for increased social interaction.

In contrast to these earlier studies, the goal of Sherrill and Hengst (2016) was to first explore and describe the communicative environment created when a dog is a part of a therapy session in a rehabilitation setting. In this study, thirty-four participants were enrolled in a six-week multi-species ethnographic study that included the observation of nine AAT sessions conducted at an inpatient sub-acute rehabilitation facility. Multi-species ethnography can briefly be defined as an approach to ethnographic research that acknowledges the interconnectedness of organisms (not limited to animals) to human life and widens the lens beyond the human experience alone (Kirksey & Helmreich, 2010). Sherrill and Hengst (2016) piloted specific dog-directed data collection measures that attempted to collect data from the viewpoint of the dog, her experiences, and her role in the group. A GoPro camera was mounted on a harness and worn by the dog capturing her movement in space, her patterns of interaction with participants, and her gaze and attention in relation to and on other group members.

Ethnographic methods of data collection and interpretive analysis in Sherrill and Hengst (2016) allowed for a careful description of the communicative patterns and the language resources naturally occurring in this space. As described by Damico, Simmons-Mackie, Oelschlaeger, Elman, and Armstrong (1999), the methods of qualitative inquiry used in this study allowed us to first take a "learning role," one in which we explored the phenomenon of communication with animals, rather than first attempting to test its effectiveness under controlled conditions (pg. 653). Findings of this study support the potential of AAT to stimulate multi-party interactions with and around the dog during AAT sessions, as well as sustained engagement of participants who anticipated and sought out opportunities to work with the AAT dog. Given that the interactions observed in Sherrill and Hengst (2016) involved only Occupational and Physical Therapy services, a significant amount of ethnographic work still

needed to be done in the field of CSD to describe the patterns of interactions with animals during speech pathology sessions in the clinical space.

Prior to Sherrill and Hengst (2016) the little that has been done in AAT within the field of CSD has not focused on the communicative practices within or around the AAT session itself, again simply viewing the dog as an adjunct, tool, or prop for previously determined activities. Recent research in the field of human-animal interactions cites the social and interactive nature of the relationship between animals and humans (Beck, 2014; Fine, 2015; Friedmann & Son, 2009; McCardle, 2011), and yet two of the three CSD studies prior to Sherrill and Hengst (2016) attempted a quasi-experimental design that essentially eliminated activity, social interaction, and community from the studies in an effort to achieve experimental control. At best, this use results in temporarily increased engagement or motivation of the patient for the task; at worst, it is simply a behavioristic reward for participation. Neither of these situations capture the potential of the animal in the room, and the understanding that the introduction of a therapy dog should fundamentally contribute to the complexity of the communicative environment and shift the discourse discussion from clinical to animal-bond. In Sherrill and Hengst (2016) we made the conscious choice to step back and describe this environment and the relationships, behaviors, and alignments that took place between all participants. From this data we were able to position our findings at the beginning of a promising line of research that has solid foundations and theoretical support from communication sciences and disorders as well as human-animal interactions.

The Current Study

This case study of an Animal Assisted Therapy (AAT) program in an inpatient sub-acute rehabilitation facility uses ethnographic methods of data collection and situated discourse analysis procedures for interpretation and analysis of data. A participatory action research (PAR) component was included to trace the progress towards administrative and SLP-specific goals of increasing therapist independence, skill, and productive use of AAT. This current study was designed as case study of another site (similar in design to our previous study (Sherrill & Hengst, 2016)) in that it seeks to further describe the communicative environment by mapping the discourse patterns of an AAT session. In contrast to our previous study, all sessions observed included a speech-language pathologist targeting discipline-specific goals.

Research questions:

1. What is the institutional context of CFH's Therapy Dog program, and how do the speech pathologists currently utilize it?
2. What is the communicative environment in an AAT-ST session, and how do different people participate? How do those patterns compare with Traditional ST sessions?
3. What are the institutional goals for using therapy dogs in the rehab program? How were these goals met (or changed) across this study?
4. How did the SLPs' reported expectations and comfort levels with utilizing animals in therapy change across the study?

This project is designed to study AAT as an activity that (while rarely used in the field of CSD) is highly reflective of the responsibilities, preferences, and personal lives of patients (i.e. pet ownership and interaction with animals). AAT was utilized to explore how rich communicative environments can be created and maintained by professionals in the clinical space to meet patient needs and directly address cognitive-linguistic goals for patients with acquired cognitive-communicative disorders.

CHAPTER 4: METHODS

This is a mixed methods study that draws on ethnographic methods of data collection (e.g., video-taped observations, interviews, collections of artifacts), situated discourse analysis of communicative interactions and behaviors, and a participatory action research (PAR) component utilized to trace the process of program development to meet departmental and clinician-specific goals for use and expansion of the research site's current Therapy Dog program. In this section I will focus first on describing the process of gaining access to the site and a description of the participants and recruitment methods used across all aspects of the study. I will then turn to a discussion of all sources and forms of data collected, and conclude with the methods used during data analysis (including both descriptive statistics and content analysis) to describe and compare patterns of participation across groups and individuals.

Gaining Access to the Site

Critical to any ethnographic study is gaining and negotiating access to the site. I began active exploration of possible sites for this study in early spring of 2016 with the intention of securing a site that provides rehabilitation services to adults with acquired cognitive-communicative disorders, preferably with a previously established AAT program. In Fall of 2016 I was invited to present at the CU Autism Network, and following that presentation I was approached by two Carle Foundation Hospital (CFH) SLPs (Jenny and a co-worker) with whom I had previous professional connections. Carle Foundation Hospital (CFH) is a large community hospital in Urbana, IL with a 20-bed dedicated inpatient rehabilitation floor providing therapy services (e.g., Occupational, Physical, and Speech) to patients following a variety of neurological, orthopedic, and general recovery needs. As we discussed my presentation, Jenny stated that while CFH did have an active "AAT" program, she felt like it was under-utilized, and that the speech therapy department (collectively) did not know how to actively target speech goals during AAT sessions. Following this conversation I turned my attention to CFH as the site for this study and began to hold exploratory and planning meetings with the DCSS, which lasted in various forms (e.g., group meetings with DCSS and Dr. Julie Hengst, phone conversations, emails, etc.) through December of 2016.

In the Fall of 2017 we moved from informal discussions and planning meetings to formal negotiation with Carle's Executive Liaison of Research Partnerships (Emily Wee) and IRB

specialists from both Carle and UIUC. During this time there were several decisions made behind the scenes in CFH's Research Liaison department that we were not privileged to, beyond an explanation that of the 19 projects had been proposed during the time of our proposal, we were the only project and team moving on to active IRB construction. Carle's Research Liaison reported that research at CFH is typically only accepted on a funded basis; however, we negotiated in-kind return of staff training and resources in exchange for access. Components of this in-kind return included presentations (ie., I developed and delivered a continuing education training course as part of the CFH Brain Injury Symposium and presented at CFH Volunteer Services and Therapy Dog Handler Meetings), and agreed to provide educational/research and training materials to the CFH rehabilitation department identifying discipline-specific goals and targets for multi-disciplinary AAT sessions. Planning meetings were concluded in 2017, and a cross-institutional IRB (#17CNI1672 (CFH) / 18622 (UIUC)) was approved in March of 2018. See Appendix A for the IRB approval documents for both CFH and UIUC.

Participants and Recruitment

We recruited both primary and secondary participants for this study. Primary participants were patients who had been admitted to the rehabilitation unit at CFH and had been offered the opportunity to receive Therapy Dog visits during their stay. CFH's protocol for their therapy dog program begins upon admission to the rehabilitation unit. The DCSS, medical social worker, or admitting nurse asks patients if they would like to receive Therapy Dog visits as part of their general admission check-list. If they do request dog visits the DCSS reviews their medical chart for allergies or highly communicable conditions that could be passed from patient to dog handler, as patients in isolation or those with highly communicable conditions are not (typically) permitted to receive therapy dog services. Potential primary participants were identified by the DCSS during the rehab unit's standard admission procedures, and we accepted the first 10 primary participants who met all study inclusion criteria with no preference or priority given to patients by diagnoses or type of communicative disorder. Inclusion criteria for Primary Participants were that they: 1) had been offered the opportunity to receive Therapy Dog services, 2) were a minimum age of 18 years of age, and 3) were receiving skilled speech therapy services during their inpatient rehabilitation stay. Recruitment was limited to 3 new primary participants each week due to the need to be cognizant of rapid discharge rates and scheduling of multiple sessions. The average length of stay is 10-14 days at CFH, and scheduling needs for all

3 sessions involved in data collection required a weekly limitation on participant enrollment to avoid attrition due only to discharge.

Secondary participants included Speech-Language Pathologists (SLP) providing services to primary participants, administrative personnel and Handler/Dog teams involved with the CFH Therapy Dog program, and family members of primary participants. Secondary participants were recruited by myself during on-site data collection or referred to me by primary participants (in the case of family members). CFH secondary participants were either already involved in the Therapy Dog program or were interested in learning more about its uses and implementation potential. In all video-recorded sessions the SLP and the participant had met and had at least one session together previously; however, it would be inaccurate to label any SLP as the primary therapist (or "lead") for any participant. CFH's rehab department utilizes blind scheduling, meaning that all therapists may (and do) see all patients based solely on daily schedule needs. This is reportedly due to the intense variability of therapist schedules (e.g., weekend coverage needs, part time employees, student supervision) and to encourage transparency in therapeutic practices. All primary participants received a minimum of an hour of speech therapy services every day, split into two half-hour sessions, and all primary participants regularly saw two different SLPs in one day. See Table 4.1 below for basic demographic information for primary participants and secondary participants present for video-recorded sessions.

Table 4.1
Demographic information for all session participants

		Primary Participant Demographics and Session Participants					
Primary Participants		**Age**	**Race / Ethnicity**	**Occupation**	**Session Type**	**SLP**	**Other Secondary Participants**
P1	Ed	52	African American	Minister	Trad-ST	Jenny	
					AAT-ST	Jenny	Wendy & Mitzie
P2	Bill	74	Caucasian	Retired farmer	Trad-ST	Allison	
					AAT-ST	Jenny	Sarah & Trooper
P3	Henry	65	Caucasian	Writer	Trad-ST	Allison	
					AAT-ST	Allison	Sarah & Trooper
P4	Jack	64	African American	Retired factory worker	Trad-ST	Jenny	Jack's spouse and daughter
					AAT-ST	Allison	Sarah & Trooper
P5	Rick	69	Caucasian	Machinist	Trad-ST	Jenny	
					AAT-ST	Jenny	Carol & Pepper
P6	Ron	50	Native American	Unemployed	Trad-ST	Jenny	
					AAT-ST	Allison	Rich & Cubbie
P7	Jeff	66	Hispanic	Field laborer	Trad-ST	Allison	
					AAT-ST	Jenny	Sarah & Trooper
P8	Howard	84	Caucasian	Retired farmer	Trad-ST	Jenny	
					AAT-ST	Jenny	Carol & Pepper, Howard's spouse
P9	Tina	63	African American	Retired nurse	Trad-ST	Jenny	
					AAT-ST	Jenny	Rich & Cubbie
P10	Brad	18	Caucasian	Student	Trad-ST	Allison	
					AAT-ST	Allison	Rich & Cubbie

I had originally planned to recruit patients for both an opted-in group (those who elected to receive Therapy Dog visits) and an opted-out group (those who declined Therapy Dog visits). By the end of the six weeks of approved on-site data collection only two patients had both

declined therapy dog visitations and met study criteria for inclusion in the opted-out group (i.e., were over 18 years of age and receiving ST services). Both patients declined participation in the study, citing concerns about video-recording of their therapy sessions. Therefore, all ten primary participants recruited were included in the AAT / opted-in group, and all participants received AAT services. Primary participants ranged in age from 18-84, with a variety of cognitive-communicative disorders and goals targeted during ST sessions. Secondary participants included 2 treating SLPs, 3 family members, 2 administrative staff members (DCSS and rehab physiatrist/rehab medical director), and 4 dog/handler teams (1 dog and 1 handler per team). The DCSS also occupied the role of one of the therapy dog handlers in this study. All dog/handler teams were current/active volunteers at CFH and had been providing volunteer visits through the Therapy Dog program for over 2 years. CFH requires that all dog and handler teams be vetted as volunteers (simple background checks and a basic hospital safety/training program is completed), and all handler/dog teams must demonstrate proof of AKC Canine Good Citizenship and Alliance Therapy Dog certification prior to applying to the therapy dog program. Dog/handler teams must then undergo several supervised assessments and visits prior to being admitted into the program, and must track and document all visits completed. See Appendix B for a copy of both primary and secondary participant consent forms.

Data Collection

Data collection included audio recordings, video recordings, and a researcher's log with detailed notes of interviews, logistical needs, session observations, and collection of artifacts. Sources included structured as well as spontaneous or unplanned interviews, program planning sessions, and video recorded observations of Animal Assisted Therapy Speech Therapy sessions (AAT-ST) and Traditional Speech Therapy sessions (Trad-ST). I completed between 3-4 data collection sessions with each primary participant and 1-4 data collection sessions with each secondary participant depending on their role in the study. On-site data collection began in the spring of 2018 and was concluded by early summer. Follow-up interviews continued until mid-summer of 2018. I was responsible for and completed all data collection (both on-site and follow-up interviews) as CFH approved only one on-site researcher.

Interviews. Primary Participant initial interviews were the first step in data collection for all primary participants. Interviews took place in the patient's room and were audio recorded only due to risk of capturing participants' roommates or other personnel not involved in the study on

camera. I began these interviews with a review of the Participant Consent form and answered any and all questions regarding the sequence or components of the study, as well as confirmed understanding that subsequent sessions would be video recorded. Participants were assigned a number during initial data collection (P1-P10) reflecting their recruitment order and a pseudonym during data analysis. No secondary participants were present for any primary participant's initial interview, as they were all scheduled and took place between breaks from other therapy appointments (e.g., PT, OT, ST).

Questions for the primary participant initial interview were constructed specifically for this project as well as some adapted questions from *The Lexington Attachment to Pets Scale* (LAPS) (Johnson, Garrity, & Stallones, 1992) and the *Communication Confidence Rating Scale for Aphasia* (CCRSA) (Babbitt & Cherney, 2010). These scales were utilized as content or topical examples only, as all responses to interview questions were analyzed through content analysis procedures to be discussed later in this chapter. Responses were not assigned a rating, or analyzed per the LAPS or CCRSA scales. I asked participants about their history and experiences with animals, their current and past pet ownership status, and any relevant experiences they had with animals. This interview also included questions about their current and past medical status, including reason for admission to the rehab unit and current ST / cognitive-communicative goals (e.g., "Why are you here at CFH?" and "What are you working on in therapy?"). A total of 2 hours and 28 minutes of audio recorded data was collected across the 10 primary participant initial interviews, supported by 27 pages of detailed notes in the researcher's log.

I attempted follow-up interviews with all primary participants approximately 2-3 weeks following their discharge from CFH. Questions for the follow-up interview were constructed specifically for this project and included basic recall questions (recall of the AAT sessions, details about the dog, etc.) and impressions about the impact of AAT services on their rehab stay. All follow-up interviews were completed by phone and were not audio recorded. A total of 6 follow-up interviews were completed, with one participant's number disconnected, 2 un-returned messages left, and one interview not completed as due to patient re-locating. A total of 16 pages of researcher's log notes were collected across 6 follow-up interviews.

Interviews also took place throughout data collection with secondary participants including dog handlers (both those who directly participated in sessions and those who were

members of the CFH Therapy Dog program) administrative staff (e.g., DCSS and rehab physiatrist), and the two SLPs involved in primary data collection (Jenny and Allison). Interviews with Jenny and Allison were completed immediately prior to their first program planning sessions and were recorded as part of their planning sessions. None of the other secondary participant interviews were video or audio recorded due to patient privacy concerns given the locations of the interviews (e.g., nurse's station, hallways, shared offices). A total of 10 secondary participant interviews were completed and 31 pages of detailed researcher's notes were collected. See Appendix C for all interview templates.

Animal assisted therapy (AAT-ST) sessions. While there was no attempt made to schedule these sessions in a particular order, 9/10 participants received their AAT-ST sessions first (following the initial interview) and their Traditional ST (Trad-ST) sessions second. All AAT-ST sessions were video recorded from 4 camera angles placed in different positions in a large conference room. Camera angles (see below) were designed to maximize recording of activities across the larger communicative space and all participants.

- Camera 1: Camera 1 was a standing tripod-mounted camera placed in the corner of the room approximately 6 feet away from the primary participant.
- Camera 2: Camera 2 was a table-top tripod-mounted camera placed on the large table in the center of the room approximately 3-4 feet from the primary participant.
- FlipCam: The flipcam was placed on either a back shelf or a side computer cabinet approximately 3-5 feet from the primary participant. This camera was frequently adjusted as activities changed in the room, and was also occasionally placed on the floor to capture the dogs' behaviors during floor tricks.
- GoPro: The GoPro was attached to a harness and worn by all therapy dogs, designed to capture the dogs' viewpoint and actions or activities that captured his or her interest.

AAT-ST sessions took placed in a closed/private conference room for all participants in an effort to decrease the risk of capturing incidental participants on video. I was present for all sessions in the role of both observer and data collector and was responsible for placing and adjusting all cameras. Both primary and secondary participants routinely directed questions and comments my way before and during the session, and the therapy dog interacted with me on multiple occasions. AAT-ST sessions were scheduled for between 30-45 minutes; however, as is typical with rehabilitation settings the actual recorded times differed depending on time taken to

transfer the patient as needed (e.g., out of bed into a wheelchair) and transport them to the conference room. A total of 4 hours and 27 minutes of AAT-ST sessions were video recorded with an average of 26 minutes and 42 seconds per session, supported by session observation notes taken in the researcher's log. See Figure 4.1 below for the layout of camera placement during AAT-ST sessions and Figures 4.2 through 4.5 for footage from all 4 camera angles at the same moment in time (minute 18:02) from Tina's AAT-ST session.

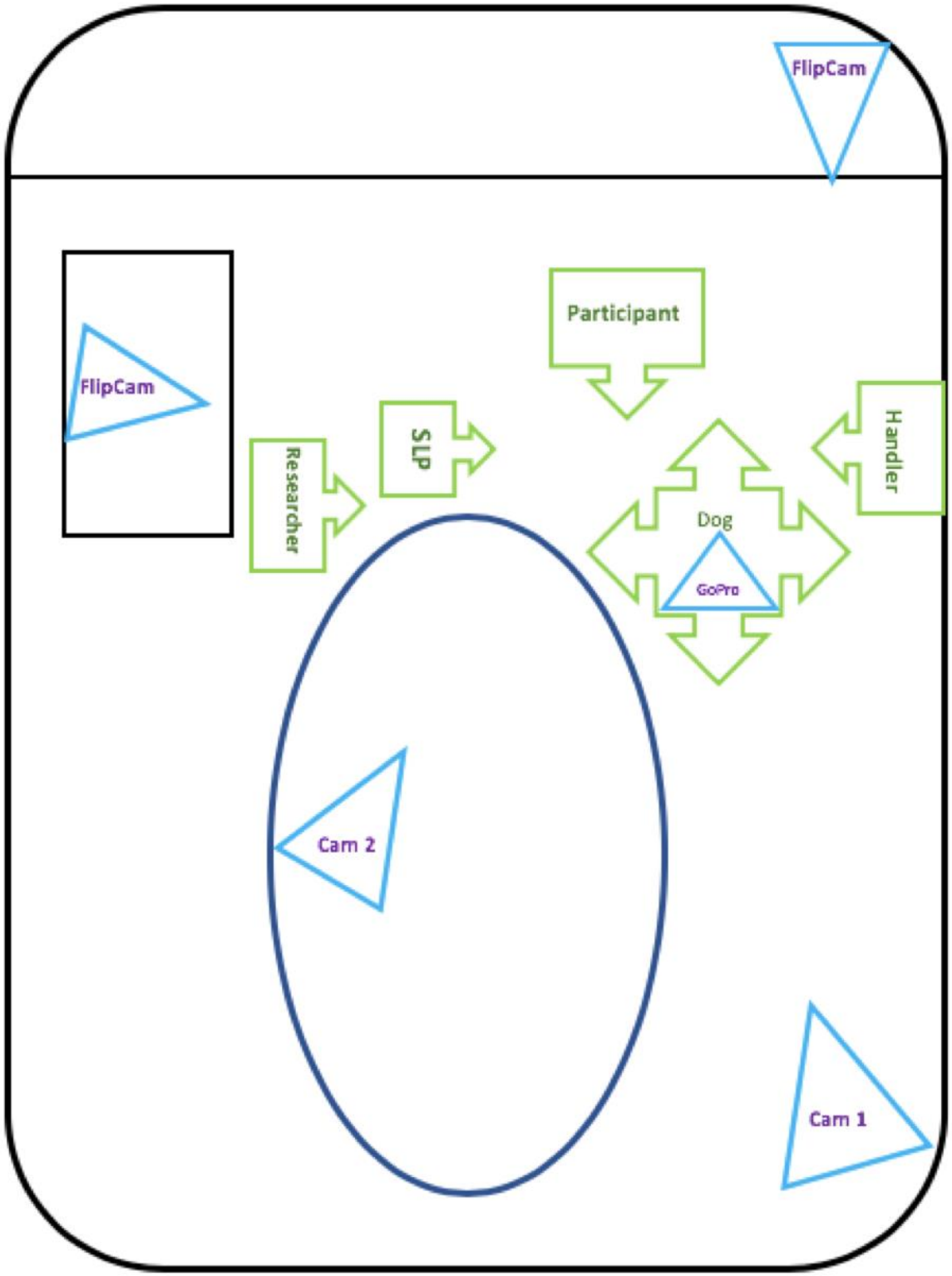


Figure 4.1. Camera layout for AAT-ST sessions in the rehabilitation unit conference room.

Figure 4.2. Camera 1 (AAT-ST session)

Figure 4.3. Camera 2 (AAT-ST session)

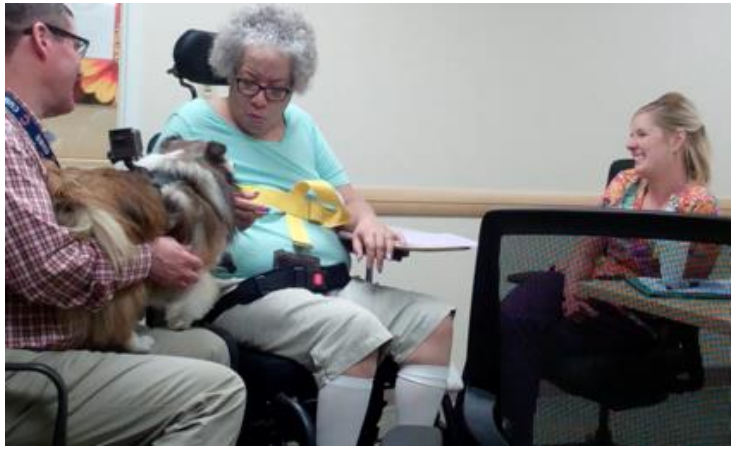


Figure 4.4. FlipCam (AAT-ST session)

Figure 4.5. GoPro Camera (AAT-ST session)

Traditional speech therapy (Trad-ST) sessions. Trad-ST sessions were video-recorded in either the same conference space utilized for the AAT-ST sessions, the SLP's private office, or participant's private room. All sessions were video-recorded from two camera angles, both within 5 feet of the participants. Camera placement for Trad-ST sessions varied slightly based on the setting, with a minimum of one camera directly facing each participant for all sessions and both cameras capturing audio for both the participant and the SLP. See Figures 4.6 and 4.7 for clips from two camera angles at the same moment (4:03) from Ron's Trad-ST session.

Figure 4.6. Camera 1 (Trad-ST session)

Figure 4.7. Camera 2 (Trad-ST session)

I was present for and observed all Trad-ST sessions as well; however, very limited interaction occurred between myself and other members (i.e., the SLP and Primary Participant) during these sessions. These sessions included tasks/activities designed to target patients' individual ST goals. Most activities had a directional or question/answer format to them, and conversational interaction was largely limited to greetings and goodbyes. A total of 4 hours and 32 minutes of Trad-ST session data was video recorded with an average of 27 minutes and 15 seconds per session, supported by session observation notes taken in the researcher's log.

Across all data collection sessions I kept detailed records of incidental discussions and interactions that took place between myself and any subjects involved in the study that were not captured on videotape. Incidental discussions included moments in which family members were present/greeted outside of video-recorded AAT-ST or Trad-ST sessions, or when questions about the research study lead to expanded discussion of patient status or opinions about their current therapy program. I also collected general field notes and session observations that included patient reports or direct quotations during transfers to and from the therapy room, my own personal observations during sessions, listing or questions about specific tasks or activities completed in sessions, and any materials used during sessions. A total of 26 pages of researcher's log notes were constructed from incidental discussions, interactions, and session observation notes (both AAT-ST and Trad-ST sessions). An additional 12 pages of researcher's log notes were collected regarding scheduling and logistical needs for AAT-ST and Trad-ST sessions.

Program planning sessions. Program planning sessions were completed with the DCSS and the treating SLPs (SLP planning sessions). Planning and logistical meetings between the DCSS and myself took place immediate prior to, during, and following on-site data collection. The first of these sessions was audio-recorded, and subsequent sessions were not recordable due to shared office space with the Medical Social Worker (MSW) in which sensitive patient information (e.g., names, birthdays) were regularly communicated over phone conversations audible in the background. The first session was both a logistical and planning meeting and also included the secondary participant interview for the DCSS. The second and third meetings were collaborative and flexible, allowing both the DCSS and myself to ask questions and confirm logistics as needed. During the final meeting I completed training on the AAA/AAT scheduling calendar as a part of the last/wrap-up session. A total of 4 DCSS planning sessions were

completed with 25 minutes of audio-recorded data collected supported by 12 pages of researcher log notes. An additional 12 pages of artifacts were collected during these sessions, including printed/distributed information on pet therapy provided in the patient handbook and CFH website upon admission, training materials previously provided to the CFH therapy staff by the DCSS concerning recommended goals and areas that could be targeted through AAT use, and handler education and certification documentation required by CFH.

SLP planning sessions were completed with both treating SLPs throughout the on-site data collection period. These sessions were audio-recorded when possible (3 total); however, several sessions were not recordable due to shared office space similar to that of the DCSS in which private patient information was audible from an office mate or colleague. SLP planning sessions were held as closely as possible to the beginning of the week (Monday or Tuesday) depending on SLPs' work schedule. The structure of the weekly program planning sessions was collaborative, as a combination consultation / interview which allowed for flexible discussions as needed; however, they always included the following topics:

- ST diagnoses and current goals for that week's participants
- SLPs' current confidence level regarding planning for that week's AAT-ST sessions (Likert scale)
- Time spent planning for AAT-ST sessions that week (productivity questions)
- Mutual planning / discussion of possible AAT-ST activities/tasks that would specifically target participants' individual goals (e.g., consultation)

I collected case data notes during these sessions that also included primary participants' previous medical history, current course of treatment, initial ST diagnostic procedures and testing, multi-disciplinary disposition recommendations and expected length of stay, and current progress towards ST goals. During these SLP program planning sessions, participants were placed by the treating SLPs into four groupings for the purposes of our discussions only. These groupings were labeled 1) the Aphasia Grouping, 2) The Cognitive Impairment Grouping, 3) The Mixed Diagnoses Grouping, and 4) The Dysarthria and Speech Impairment Grouping. These groupings will be discussed in greater detail in the data analysis and results section, as they did not impact data collection in any way. Program planning sessions were held with both SLPs individually with a total of 8 sessions across the span of on-site data collection (4 per SLP), and a total of 38 minutes of audio-recorded data supported by 32 pages of detailed researcher's log

notes. Follow up sessions with both SLPs were completed by phone 2-3 weeks after the conclusion of onsite data collection. See Appendix D for SLP program planning session questions and visual support used (Likert scale). See Tables 4.2 and 4.3 below for audio and video-recorded data and researcher log totals.

Table 4.2
Categories and totals of audio and video-recorded data collected

AUDIO AND VIDEO-RECORDED DATA					
		Initial Interviews & Planning Sessions (Audio)	AAT – ST Sessions (Video)	Trad-ST Sessions (Video)	Total Time Recorded
P1	Ed	20:18	32:49	22:21	1:15:28
P2	Bill	16:44	35:02	43:51	1:35:37
P3	Henry	19:43	28:20	17:58	1:06:01
P4	Jack	6:35	23:06	20:49	0:50:30
P5	Rick	13:19	20:40	27:27	1:01:26
P6	Ron	11:31	25:42	29:24	1:06:37
P7	Jeff	14:58	22:47	25:48	1:03:33
P8	Howard	10:53	27:08	23:36	1:01:37
P9	Tina	18:35	31:33	24:51	1:14:59
P10	Brad	16:15	19:57	36:29	1:12:41
DCSS PLANNING SESSIONS		25:35			
SLP PLANNING SESSIONS		38:04			
TOTAL:		3:32:30	4:27:04	4:32:34	12:32:08
KEY: ALL TIMES SHOWN IN HOURS:MINUTES:SECONDS					

Table 4.3
Categories and totals of all researcher log pages

RESEARCHER'S LOG	
SECTION	*Pages*
INTERVIEW NOTES	
PRIMARY PARTICIPANT INITIAL	27
PRIMARY PARTICIPANT FOLLOW-UP	16
SECONDARY PARTICIPANTS	31
SCHEDULING/ LOGISTICS NOTES	12
SESSION OBSERVATION NOTES	26
DCSS PLANNING NOTES	12
SLP PLANNING NOTES	32
ARTIFACTS COLLECTED	12
TOTAL PAGES:	168

In summary, I collected a total of 12 hours and 32 minutes of audio and video-recorded data across 10 primary participant interviews, 10 AAT-ST sessions, 10 Trad-ST sessions, and 4 program planning sessions. A total of 168 pages of detailed researcher log notes were collected across the span of data collection, including 26 interviews and 12 total program planning sessions.

Data Analysis

Discussion of data analysis procedures will be organized broadly around research questions as different types of data (i.e., audio and video-recorded data, detailed notes from the researcher's log, and artifacts collected) and sources of data (i.e., interviews, AAT-ST sessions, Trad-ST sessions, and program planning sessions) informed research questions to a greater or lesser degree. Methods used for data analysis procedures across research questions includes discourse analysis of communication observed in the communicative sessions (AAT-ST and Trad-ST) as well as content analysis of interviews and artifacts.

Describing the Communicative Environment of AAT-ST and Trad-ST Sessions

To analyze the communicative environment and patterns of participation in both AAT-ST and Trad-ST sessions I drew primarily on video-recorded session data. All video-recorded data was transcribed using a consensus transcription process, and finalized transcripts were utilized to quantify the amount of talk in all session (i.e. total word counts, words per minute, and mean length of turn). Transcripts were also used to code all forms of discourse and communicative interactions as videos were analyzed, and the interpretation of what was said (stories) was supported by field notes. To sample the communicative patterns needed to discuss the complexity and quality of discourse, I turned to the use of Interactional Discourse Resources (IDRs).

Transcription and coding procedures. Transcription procedures adapted from Hengst (2001, 2003) allowed for a real-time, visual representation of all communicative patterns by all participants, including gestures/non-verbal communication from all participants, participant sounds (e.g., laughing, whining from the dog) as well as activities that impact or affected the environment (e.g., ambient sounds, participants entering/leaving). All transcripts were completed across a three stage or "pass" process, which involved particular attention to specific components (e.g., audio, gestures, alignments) on successive passes. Pass one was primarily an audio pass in which all verbalizations and audible sounds were recorded. Pass two focused on inclusion of

gestures for all participants and identification of pet register. The third full transcription pass was a consensus pass in which the lead researcher and a trained lab assistant identified and corrected any remaining errors. See Appendix E for transcription protocols, pass-by-pass requirements and transcription keys/codes used.

An additional component of these transcription procedures not used in our previous AAT study (Sherrill & Hengst, 2016) was the use of a specific code designed to capture the complexity and immediate reactiveness of the dogs' alignments to and around group members. Examples of categories and specific elements of this code includes: approaching or moving towards a group member in greeting (Apprs →B); social or play-based behaviors (ears perked facing a participant or object: ⩚⩚→Je, tail wagging: ⇆⇉, front legs out/down in an anticipatory bow posture: ⤶→T); physical contact made by the dog with the participants (licking (⌥:Je R Hand); and attention and interest level (e.g., head tilt ◂▸). Coders were also instructed to attend closely to signs of discomfort or stress on the part of the dog (e.g., tail tucked: ⇊, retreating or backing away, pulling at leash, etc.) and to thoroughly describe behaviors that were not represented by the dog code. General categories of canine behavior listed above and specific behaviors represented by the dog code were guided by research on canine behavior and socialization (Aloff, 2005; Bekoff, 1974; Bradshaw & Nott, 1995; Miklósi, Polgárdi, Topál, & Csányi, 2000; Serpell, 2016). See Appendix E for the dog code (included in the transcription conventions key).

All coding was completed using final transcripts and videos to ensure accurate coding beyond the text of a transcript (e.g., interpretation of pet register, etc.). There were three passes included in this coding process: 1) a first or initial pass by the primary researcher, 2) a second pass completed by a trained lab assistant, and 3) a third / consensus agreement pass completed between the primary researcher and the coder of the second pass to discuss and resolve differences as needed (see Bradley, Curry, & Devers, 2007). All three coding passes were completed twice for each transcript, with word/turn counts identified and counted first and IDRs counted second. The average percentage of disagreement following the second pass (prior to the third consensus meeting) was 6% or less for word count and interactional turn count (range of 94% to 97% agreement across individual sessions), and 4% or less for IDRs (range of 96% to 97% agreement across individual sessions). Areas of disagreement were primarily additions (e.g., identification of an IDR that the lead researcher had missed or overlooked). Final numbers

utilized for reported counts were agreed upon by both coders during the third consensus pass. See Appendix E for the operational definitions provided to all coders during the training process.

Operational definitions. The definition of *words* was adapted from Hengst (2005) and includes "neologisms, false starts, and placeholders (e.g., um, well, and okay) as well as well-formed words" (pg. 142-143). See Table 4.4 for examples categories and total counts assigned.

Table 4.4

Examples of word categories and associated count totals

Word Category	Example	Word Count
Fully formed words (1 each)	Apple	1
Neologisms (1 each)	I went to wist – wasta - Walmart.	6
False starts (1 each)	S-s-sip	3
Placeholders – both real and filler words (uhm, well, okay, mhmm) (1 each)	I uhm, went to go to the store.	8
Words spelled out intentionally (1 per letter)	T-R-E-A-T	5
Part-word repetitions (1 each)	Pi-pi-pick	3

Five different Interactional Discourse Resource types (IDRs) (Hengst, 2001, 2003, 2006) were individually coded, including Conversational Narratives (CN), Playful Episodes (PE) Procedural Discourse (PD), Envoicing (EV), and Pet Register. IDRs were coded both individually (e.g., a single participant conversational narrative) and across groups (e.g., multiple participants all engaging in a playful activity). See Table 4.5 below for brief IDR descriptions and examples and Appendix E for full operational definitions provided to all coders during the training and analysis process.

Table 4.5
Descriptions and examples for all identified and coded IDRs

Examples of Identified and Coded IDRs	
Conversational Narrative: Re-telling of an event / story	• "I had small dog. Ten – five years." • Extended telling of participation in a dog championship lasting >3 minutes.
Playful Episode: Playful activities, utterances or responses. Includes teasing and joke telling	• "Meanie." (in response to SLP request to focus on task) • SLP2: [laughs] <u>*snausages* [laughing]</u> P4: Snausages. [laughs] H2: I pay him in treats [laughs]. Oh my god that's right! [laughs]
Procedural Discourse: Verbal interaction through which novice-expert pattern is established	• "Can you read that again?" • "Say it louder – I didn't understand you."
Envoicing: Speaking for the dog	• "She's thinking - protect, protect." • "I know you brought the chicken flavored ones. You can't fool me."
Pet Register: Speech directed at the dog using prosodic changes, redundancy, or endearments	• Good girl! *You're such a good girl.* • You're my sweetie pie. Yes, yes you are.

The amount of active talk time in both AAT-ST and Trad-ST sessions was calculated by determining the Words Per Minute (WPM) across all participants. WPM was calculated by dividing total words for per session by the session length in minutes and seconds. To establish an operational definition for the number of WPM in an active conversational environment, we referenced Correia, Brookshire, and Nicholas (1990) who identified mean WPM rate for an elicited picture description task as 123.9 for non-aphasic adults and 80.9 for aphasic adults. For the purposes of this analysis, we defined sessions with greater than 100 WPM as talk active communicative environment, and sessions with less than 100 WPM as talk quiet environments. Talk time was also calculated as a percentage for each participant in all sessions by dividing each participant's total word count by the total word count for all participants.

Interactional turns included both verbal (formed utterance or response of any length) and nonverbal interactions (e.g., nodding, laughing, and sighing) from all participants. Turns were counted separately if they overlapped/occurred at the same time as another participant's turn, and

laugher was only counted as an individual turn if it occurred in isolation of other words. Mean length of turn (MLT) was calculated by dividing the total word count for each participant by their total interactional turn count to arrive at the number of words on average for each interactional turn. For example, a single utterance of "I have two dogs" would result in a MLT of 4. IDRs were counted both as a total per session (e.g., 8 total conversational narratives in Ed's Trad-ST session) and were also counted by which participant initiated them (e.g., Ed initiated 6 out of 8 conversational narratives in his Trad-ST session). Pet register was counted and calculated as a percentage of total talk time per session (words spoken in pet register/total word count for session).

Non-verbal communication and gestures were coded and counted individually across all video-recorded sessions (both AAT-ST and Trad-ST). For the purpose of analysis, gestures were divided into three categories: 1) audible (e.g., whining, kissing noises, tongue clicking), 2) physical seeking or interactive (e.g., attempts to call or contact another participant or contact between two participants such as petting, touching a hand in sympathy, etc.), and 3) general communicative gestures (e.g., raising hand in a "stop" motion, tracing or drawing in the air, pointing, etc.). Transcribers were instructed to identify and mark all visible gestures and use of audible vocal (non-verbal) communication from all participants during pass two, and gestures were counted both individually (per participant) and across the entire session.

Descriptive statistics (e.g., frequency distribution) will be used to display results from all metrics and to discuss patterns across the larger group of all 10 participants, results within the four diagnostic groups (i.e., the Aphasia, Cognitive Impairment, Mixed Diagnoses, and Speech and Dysarthria Groupings), and individual profiles. A comparison of these descriptive statistics will be utilized to discuss the differences in the communicative patterns between the AAT-ST and Trad-ST sessions for all participant groupings.

Analyzing the Program Planning Sessions, Interviews, and Artifacts

Content analysis procedures were utilized for and across all interviews, researcher log notes, and artifacts to draw out and describe the narrative history of the program at CFH and to trace and track the evolution and progression of the program to its current state. Content analysis procedures were also utilized within and across program planning sessions to assess the response of both the DCSS and the SLPs to the changes in their program across the length of the study.

All audio tapes collected during program planning sessions and interviews were transcribed using the same procedures discussed above (without the addition of gestures), and researcher's log notes were typed and complied. Interviews and program planning sessions were conducted in a very conversational manner; however, I planned and arranged questions and prompts around content areas (Graneheim & Lundman, 2003) to allow for categorical analysis by topic guided by previously stated research questions. Content analysis was conducted utilizing word and search functions across sessions and completing detailed analysis of any trends or comments recorded by transcribers and coders during the analysis process.

To answer questions about the institutional context, the research site, the roles of administrative and therapy staff, and the day-to-day operation of the CFH Therapy Dog program, I drew on heavily on interview data from secondary participants with a previous history of participation in the program and scheduling and logistical artifacts. For example, the DCSS, both SLPs, and all 4 Handlers were asked to physically "walk me through" the process of scheduling an AAT visit for a particular patient, requiring them to both demonstrate and describe the role they would take in arranging that visit and the protocols currently in place. Interview data and notes from DCSS planning sessions were also used heavily during analysis for the description of the institutional context and history of the program, and artifacts provided during DCSS planning sessions were used to discuss program specific training and educational protocols currently in place.

Content analysis procedures were also used to better understand how AAT impacted treatment for particular clients and how the SLPs developed their ability to utilize AAT. Utilizing a combination of interview data (both from the primary participants and the SLPs during planning sessions) and situated discourse analysis of transcribed sessions, I constructed individual case reports for each of the 10 primary participants with attention to the following categories or topics: 1) current and relevant recent medical history, including admitting medical diagnoses and ST/treatment diagnoses, 2) history with animals and stated reason for requesting AAT services 3) current ST goals and targeted areas of intervention, and 4) individual results of situated discourse analysis across coded/counted measures (e.g., word count, IDR use) as compared to both the total 10 participant group and within his or her assigned/smaller diagnostic group (e.g., The Aphasia Group, the Cognitive Impairments Group).

Data gathered during program planning sessions with the SLP (PAR data) was used to explore the SLPs patterns of use, comfort level, and progression of independence with incorporating animals into skilled sessions. Interviews and researcher's notes collected during these planning sessions were also analyzed for content categorically / by topic, including: 1) primary participant diagnoses and ST goals, particularly as they impacted treatment planning, 2) productivity / planning needs reported that week, 3) questions or SLP requests to discuss or co-plan activities to target specific goals, and 4) SLP confidence / independence with planning for and utilizing AAT. Descriptive statistics were also used to analyze PAR/program planning data for range of reported time spent by the SLPs on planning for AAT sessions and confidence levels with AAT services.

In summary, this study was designed as a mixed methods study utilizing ethnographic methods of data collection (e.g., video-taped observations, interviews, collections of artifacts), situated discourse analysis procedures, and a participatory action research (PAR) component. This study aims to describe the communicative environment created during an AAT-ST session, to describe the quality and nature of talk during these sessions, and to look at how these patterns are the same or different in a traditional SLP (Trad-ST) session. This study also aims to trace the process by which SLPs developed their ability to utilize AAT to address targeted, discipline specific goals. The next chapter presents the results from all data collected across this design.

CHAPTER 5: RESULTS

This study included data collection for 10 primary participants with adult-acquired cognitive-linguistic deficits and 14 secondary participants. Data collection lasted approximately 10 weeks, with 6 weeks of on-site data collection for primary participants at CFH and 4 weeks of follow-up interviews. All participants participated fully across all sessions with no attrition; however, follow-up interviews were not possible with 4 participants whose circumstances changed following their inpatient stay. This chapter presents results from data collected through ethnographic methods, situated discourse analysis results of communicative patterns and measures identified and coded, and results from the PAR / program planning sessions, again generally organized by research question. I will begin with a description of the history and institutional context of the Therapy Dog program at CFH, including program and study participants. I will then discuss the communicative patterns observed in AAT-ST sessions and compare these patterns to results observed in Trad-ST sessions. This section will conclude with results of the PAR section of data collection, specifically the process of marshalling AAT sessions for targeted and goal-directed SLP interventions.

The History of the Therapy Dog Program at CFH

Carle's Therapy Dog Program was started in 2002, and at that time it was fully managed through the Volunteer Services Department and Coordinator. As with most (if not all) AAT programs, all dog and handler teams are (and always have been) volunteers with no paid training or reimbursement for certifications. According to the acting DCSS, when the Therapy Dog program at CFH was first created it was managed by Volunteer Services, and it "waxed and waned, ebbed and flowed," depending on the enthusiasm and support of specific coordinators and volunteers. Approximately 5 years ago the DCSS became interested in training her own therapy dog and began to request that the rehabilitation unit receive more visits from the Therapy Dog program. The DCSS's involvement with the Therapy Dog program has increased every year, and 3 weeks prior to the start of data collection she "absorbed" all responsibility for management and implementation of the Therapy Dog program (across all units and areas of the hospital) from Volunteer Services as part of her additional role as the Director of Patient Support Services. The DCSS reported that she felt that AAT was a "calling" and "passion" and,

therefore, had put forth a great deal of time and effort to educate herself on the use of animals in healthcare and reported she was very happy to take on this role.

CFH's Therapy Dog program provides animal visitation services across the entire hospital, including visits to the Medical/Surgical floors, the Inpatient Cancer Center Unit, and Pediatrics. In the last several years the dog visitation program has expanded its services to the Mills Breast Cancer Institute, which offers outpatient services on a variety of levels. The therapy dog/handler teams regularly visit Mills to meet and greet patients waiting in the lobby, provide individual visits to patients while they wait for treatments, give comfort to grieving family members, and visit the CFH nursing staff. Scheduling of visits on the rehab unit is done through internal emails in which handlers will alert The DCSS of times/days during the week they are able to provide services. The DCSS also regularly contacts the handlers for "special requests," which involve emergency visitation needs for patients, family members, or staff. At the time of this study there were 6 dog and handler teams who regularly provided services and 3 who were in training and evaluation stages and not completing visits.

CFH administration is (and has historically been) highly supportive of the Therapy Dog program and is eager to capitalize on the marketing and public relations opportunities it provides. For example, a printed copy of a local news story on the CFH therapy dog program is posted in 3 places in the Mills Cancer Center, and "Therapy Dog Services" are advertised in the rehab unit handbook provided to all patients upon admission. Prior to data collection the DCSS was working with a local dog trainer to implement specific requirements for dogs completing rehab unit visits (e.g., demonstrations of wheelchair and rehab equipment safety beyond basic certification standards), and she was recognized for this work with a CFH "Star" award. Despite the obvious institutional benefits from this program (e.g., public relations), the DCSS reported that significant work and effort put towards the Therapy Dog program took place outside of her scheduled work time, and as discussed above, no monetary support whatsoever is given for certification, training, or hourly payment to dog and handler teams.

It is also important to note at this time that prior to the planning and beginning of data collection for this study, the Therapy Dog program at CFH (across all units and floors) was not, in practice, an AAT program. All handlers and dogs are certified as therapy dog providers/teams; however, per the definitions provided by the International Association of Human-Animal Interactions Organization (IAHIO) and the American Veterinary Medical

Association (AMVA) (Jegatheesan, Beetz, Choi, Dudzik, Fine, Garcia, Johnson, Ormerod, Winkle, & Yamazaki, 2014; AMVA, 2018), the program at CFH prior to and outside the bounds of this study was providing AAA / Animal Visitation services (refer again to Table 3.2 on page 22 for classification of AAA vs AAT services). Prior to the initiation of this study, therapy dog visits were primarily conducted in common areas or patient rooms outside of scheduled therapy sessions and included the patient, any family members present, and the handler/dog team only. Therapists did not document if their patients had received dog visits, and did not suggest discipline specific goals that could be addressed during visits. Therapy dogs did occasionally attend therapy sessions (e.g., a Therapy Dog visit folded into the last 10 minutes of a Physical Therapy session while the patient was resting); however, regular incorporation of the therapy dogs into goal-directed sessions with an Occupational, Physical, or Speech Therapist was a rare occurrence prior to this study. Therapists were not informed of scheduled Therapy Dog/handler visit times, did not have access to their schedules, and were not able to directly schedule visits with them. If a patient specifically requested a visit or a therapist or staff member thought that they would particularly benefit from a visit a request was passed on to the DCSS and a dog visit would be scheduled outside of therapy appointment times/sessions. This current study was designed to observe two separate SLP sessions, one in which the SLP provided individual services with no changes or adaptations requested by the researcher (Trad-ST) and one AAT-ST session in which the Therapy Dog handler team was required to be present. This study, in its application, created an AAT program at CFH for the six weeks of data collection that was used exclusively by the ST department.

Program planning sessions between myself and the DCSS were held throughout the data collection process, and in these sessions we discussed both the current state of the CFH Therapy Dog program as well as the institutional (CFH) and department specific (Rehabilitation Unit) goals for the program going forward. At this first planning session the DCSS showed me her current Therapy Dog handbook, which consisted of 2 pages of ideas for therapists to target functional cognitive, language, and physical (both gross motor and fine motor) goals. The DCSS expressed concern that this handbook was written very generally and did not include documentation examples or specific patient/diagnostic indicators to guide therapists in any way; however, it represented the sum total of the educational materials she had been given when she assumed leadership of the Therapy Dog program. In this session, and several that followed, the

DCSS expressed serious concern that therapy staff (across disciplines) had difficulty learning new techniques and creatively planning for therapy (incidentally, a concern also shared by the rehab coordinator in Sherrill & Hengst, 2016). She reported that she thinks that Evidence Based Practice is used as an "excuse" to utilize programs or techniques that require little planning or preparation, and that therapists report "stress" when asked to incorporate new techniques and activities, which is both unethical and limiting to their growth as professionals.

Therapist training and education was a re-occurring theme in these meetings as the DCSS had previously attempted with little success to find training or education materials to pass on to her therapy staff who were interested in utilizing AAT. The DCSS also reported during these planning meetings that she hoped seeing and incorporating AAT into therapy sessions through this study would encourage therapists to get out of their "therapy rut" and consider ways in which they could incorporate treatments that were in the early stages of research. The DCSS cited the merger between CFH and the UIUC medical school as a hopeful catalyst that would encourage researchers and clinicians to work together, and would challenge both therapists and researchers.

The DCSS was highly focused on moving forward, and advancing the Therapy Dog program at CFH. The DCSS reported that marketing had thus far been on a "feel good" level, with several news stories and social media postings about the therapeutic impact of the dogs' visits to the Mills Cancer Center. One of her primary goals was to develop a way to track, measure, and report the number and type of Therapy Dog visits (AAT vs AAA/room visits) as well as the impact of the program on patient satisfaction. She also expressed interest in adding patients to a master list so that they could be flagged upon return to the hospital (e.g., re-admission, exacerbation of chronic or degenerative conditions) in an effort to proactively offer visits to patients who might forget the Therapy Dog services were available or be unable to request them themselves. I worked with the DCSS during the final planning session to develop a basic tracking system (logging AAA room visits and AAT rehab visits) through a group calendar and appointment planner, which is currently being used only for the purposes of quantifying the amount and location of visits (e.g., 10 AAA visits per week medical floor, 2 AAT visits on rehab). Patient satisfaction measures specific to AAT/AAA visits are still very much in the early stages, as patient satisfaction measures are sent out institutionally through The Carle Foundation (owner of CFH, all associated medical clinics, and Health Alliance Medical Plans), and,

therefore, any changes or additions to patient satisfaction questionnaires or measures must be institutionally approved. At our last meeting the DCSS was looking to develop a rehab-specific patient questionnaire to be filled out in-house with the final discharge paperwork, and again administrative approval is needed and the process is very much just beginning.

By the end of data collection I had presented a therapist-targeted continuing education presentation to CFH therapy staff and rehab unit employees that included a comprehensive listing (and classification by discipline) of current evidence-based practice research and training materials (as part of in-kind site negotiation). I also constructed an AAT "handbook" that is currently in the final stages of production (awaiting materials specific to CFH Handler scheduling) that includes examples of activities and goals that can be targeted during AAT sessions, documentation examples, and program-specific instructions for arranging AAT visits and working individually with handlers. At the final planning session, the DCSS was excited about new ideas and directions for the Therapy Dog program. She demonstrated several "enrichment activity" tools that she had purchased (e.g., busy mats, toys, obstacle course items, etc.) and reported that she was in the process of arranging a dedicated space in the rehab gym for AAT in effort to decrease the "stress" therapists may feel when planning and organizing activities and materials for AAT sessions.

Three months after the conclusion of data collection, I contacted the DCSS to discuss the final details of the AAT handbook and was told at that time that she would be leaving her position at CFH. The DCSS reported that there was no permanent replacement secured, and it was highly unlikely that the next DCSS would be willing to take on the additional / unpaid role of managing the Therapy Dog program. As of our last discussion, the AAT program in the rehabilitation unit at CFH was on hiatus until further notice. Therapy Dog visitations were still ongoing at Mills Cancer Center and medical floors of CFH; however, the Volunteer Services department was unwilling to resume responsibility for ongoing development of the AAT program in the rehabilitation unit. The path and trajectory of the CFH Therapy Dog program observed in this study is fundamentally representative of the fragility of all AAT programs. Given that they are driven by the time and good intentions of volunteers only, it is not surprising that they "ebb and flow" in and out of existence. In summary, the administration was happy to benefit from the Therapy Dog program and the services it provided, but as of this current time is

unwilling to support it with dedicated staff or funding. The future of the CFH Therapy Dog program is currently very uncertain, regardless of the perceived benefits from patients and staff.

The Participants and Therapy Dog Team

Primary participants and family. Ten primary participants were recruited for this study, all receiving inpatient rehabilitation services following neurological disorder or injury. Participants were overwhelmingly male (90%); however, this was representative of the unit's census/demographics during data collection (census averaged >80% male for all 6 weeks of on-site data collection), and participants ranged in age from 18 to 84. Cerebral Vascular Accident (CVA) was the most common acute medical diagnosis (80% of participants), and 60% of all participants had experienced a previous CVA. All participants were receiving Physical, Occupational, and Speech Therapy services (PT, OT, ST) as well as Medical Social Work (MSW) consultations as needed in cases of disposition, counseling, or family support. See Table 5.1 for participant's medical/diagnostic data obtained through PAR/ program planning sessions and patient interviews.

Table 5.1
Recent medical diagnoses / history and services received at CFH for all primary participants

Participants		**Medical Diagnoses**	**Recent Medical History**	**Rehab services at CFH**
P1	Ed	L CVA	4 prior CVAs	PT/OT/ST
P2	Bill	R CVA during bypass	Multiple cardiac issues, recent decline in cognition	PT/OT/ST
P3	Henry	R CVA	Pulmonary issues (e.g., COPD, asthma) w/anoxic brain injury	PT/OT/ST
P4	Jack	R CVA	Previous CVA	PT/OT/ST
P5	Rick	L CVA	Previous CVA	PT/OT/ST
P6	Ron	Oral CA - active sub-lingual tumor	Previous brain injury / trauma	PT/OT/ST/MSW
P7	Jeff	L CVA	CVA, PNA, Visual Impairment	PT/OT/ST/MSW
P8	Howard	CVA	CVA	PT/OT/ST/MSW
P9	Tina	Brainstem CVA	CVA	PT/OT/ST
P10	Brad	TBI	Artic, ADHD, concussions	PT/OT/ST/MSW

As is visible above, every primary participant had been diagnosed with a significant neurological medical history prior to their current/admitting diagnoses. Of the 8 primary participants with admitting diagnoses of CVA, 6 of them had a medical history of at least one previous CVA. Other pre-existing or concomitant diagnoses included traumatic and non-

traumatic brain injury, as well as one primary participant who reported that both he and his wife had noted decline in his cognitive abilities in the last several months. In reference to both my own clinical practice experiences and reports of the treating SLPs in this study, this is highly representative of a typical inpatient rehabilitation caseload in which participants with a single, new-onset / acute diagnosis are the rare exceptions and not the rule.

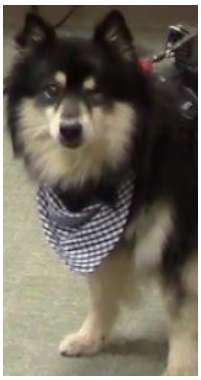
During the first two months of the study the rehabilitation unit was close to full, with an average census of 18.3 and 18.4 patients per month (out of 20 possible). In week 1 of the study 15 patients requested Therapy Dog visits and 3 were accepted into the study. In week 2, 13 patients requested Therapy Dog visits and 3 were accepted into the study. In week 3, 15 patients requested Therapy Dog visits and 3 were accepted into the study. In week 4, 17 patients requested Therapy Dog visits and 1 was accepted into the study (10 participant limit reached). All participants who agreed to participate in the study stated that they wanted to be in the AAT group as a condition of participation, and made clear to The DCSS that they had requested Therapy Dog visits.

Participants' family members were very limited in this study in comparison to our previous study, with a total involvement of 3 family members only. While family members are not discouraged from attending daily rehabilitation sessions at CFH they often waited to visit until therapy visits were completed, or were not available to visit until early evening. One family member (Howard's wife) was present for her spouse's AAT-ST session and participated as a full member in the session until she was called out by the staff social worker. The two other family members were present Jack's Trad-ST session (his daughter and spouse) and participated in presence only (did not contribute verbally to the session).

The Therapy Dog Team. Ten members of the Therapy Dog Program directly participated in this study as secondary participants. Both treating SLPs involved (Jenny and Allison) were experienced SLPs who specialized in medical settings and had requested to be involved in this study due to an interest in advancing their skills and their "flexibility" (Jenny) with using AAT in patient care. Both SLPs are certified Brain Injury Specialists (CFH certification) with more than 5 years' experience. Four handler/dog teams participated in this study. All handlers and dogs had previous experience with AAT, either through participation in CFH's Therapy Dog program or outside therapy dog visitation programs, and two handlers reported that they had received AAT services themselves or known family members who

received AAT services (Wendy and Rich). See Table 5.2 for details regarding years of experience for the dog/handler teams and breed specific information provided by the handlers for canine secondary participants (note: dog breed names provided by dog handlers).

Table 5.2
Handler and dog team participants and AAT experience

Handler and Dog Teams	
Wendy and Mitzie	Sarah and Trooper
• 5 years as an AAT team • Mitzie – 8 year old Pomeranian 	• 2 years as an AAT team • Trooper - 13 year old Shephard/ Collie Mix 
Carol and Pepper	Rich and Cubbie
• 5 years as an AAT team • Pepper – 6 year old Bichon Frise 	• < 2 years as an AAT team • Cubbie – 7 year old Mini Sheltie 

All four handlers reported that they came back week after week to volunteer due to the incredible response they got from patients and a feeling that they too would be "lost," (Wendy) "hopeless," (Sarah) or "depressed" (Rich) without their own animals should they ever be

hospitalized. Three out of the four handlers participated in more than one session (Rich, Sarah, and Carol), and all 4 handlers involved initially reported initial concern regarding their "role" in the AAT-ST sessions as they were primarily used to completing visits outside of therapy sessions and not during them. All four handlers later reported that they felt comfortable after only a few minutes in a therapy-focused session and were quick to point out tricks, behaviors, or techniques their individual dogs were capable of that might "come in handy" for future sessions.

Comparing the Communicative Environment in AAT and Traditional SLP Sessions

Analysis methods allowed us to characterize the complexity, voluntariness, and quality of communicative patterns in both AAT-ST and Trad-ST sessions. In this section I will look at these dimensions through measures of talk time and turns, participant involvement, and both diversity and initiation of IDRs. I will begin by discussing the group data, which includes all participants (10 primary participants and all secondary participants involved in AAT-ST and/or Trad-ST sessions) before moving to a discussion of individual diagnostic groups.

Talk time. Results from the analysis of talk time across both AAT-ST and Trad-ST sessions indicate variability across participants and session types; however, findings showed that all 10 AAT-ST sessions and 8/10 Trad-ST sessions can be characterized as talk active communicative environments, defined previously as sessions with greater than 100 words per minute (WPM). WPM range for the AAT-ST sessions was 122.2 to 165.0, and for the Trad-ST sessions WPM range was from 74.4 to 138.2. Average WPM was 142.7 for AAT-ST sessions and 114.8 for Trad-ST sessions. See Figure 5.1 for WPM totals across all sessions. In the Trad-ST sessions the SLP was always the dominant speaker in terms of percentage of talk time with a talk time range of 52.2% to 78.1%, for SLPs and an average of 67%. Primary participants demonstrated between 17.6% and 47.8% of all calculated talk time, with an average of 33% across all participants. In the AAT-ST sessions, however, higher talk time percentages were observed for primary participants. During AAT-ST sessions primary participants were responsible for a range of 24.5% to 65.1% of all talk time, with an average of 40.9%. For 80% of primary participants, their percentage of talk time during the AAT-ST session was greater than their percentage of talk time in their Trad-ST session, even with an additional participant present in the AAT-ST session, representing a higher percentage of talk time in a 3-4 percent group than a 2 person dyad. There was noticeably lower talk time observed for SLPs in the AAT-ST sessions, with a range from 14.3% to 48.1%, and an average talk time of 32.7%. Talk

time for handlers in the AAT-ST sessions was similar to the SLPs, with a range from 16.9% to 32.3% and an average of 24.3%.

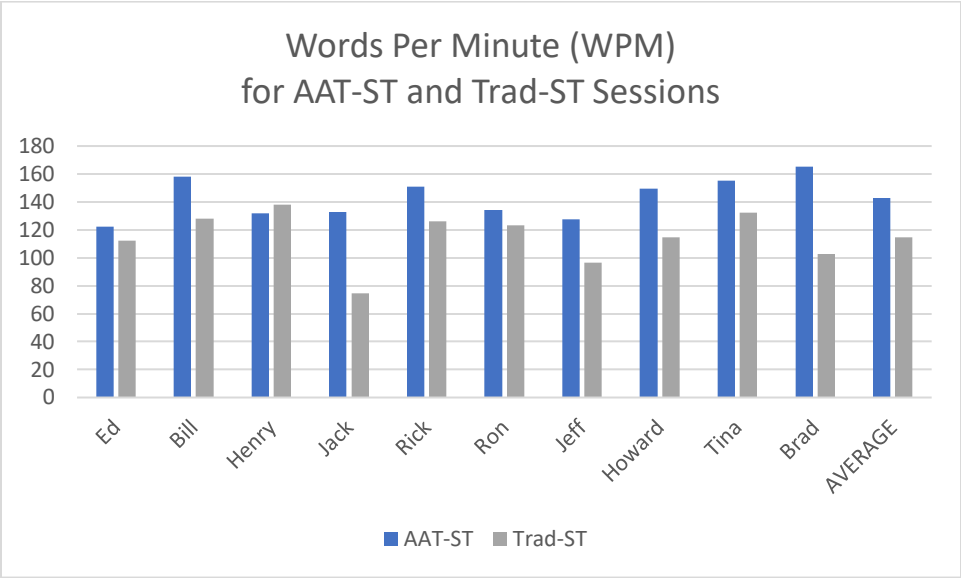


Figure 5.1: Words Per Minute (WPM) for both AAT-ST and Trad-ST sessions

Mean length of turn. As observed with talk time, findings also consistently show that in the Trad-ST sessions the SLP demonstrated notably higher MLT, or words per turn. MLT in Trad-ST sessions was calculated for SLPs at a range of 6.7 to 15.2, with an average of 11.8 words per turn, and primary participants ranged from 3.6 words per turn to 10.5 with an average of 6.0. For AAT-ST sessions, SLPs' MLT range was between 3.4 and 9.9 with an average of 6.5, primary participants' range was between 4.3 and 13.0 with an average of 8.2, and handlers' range was between 4.4 and 11.3 with an average of 6.7 words per turn. In the Trad-ST sessions, SLPs demonstrated a MLT that was roughly twice that of participants (49% difference). See Figure 5.2 for MLT average across participants in both Trad-ST and AAT-ST sessions.

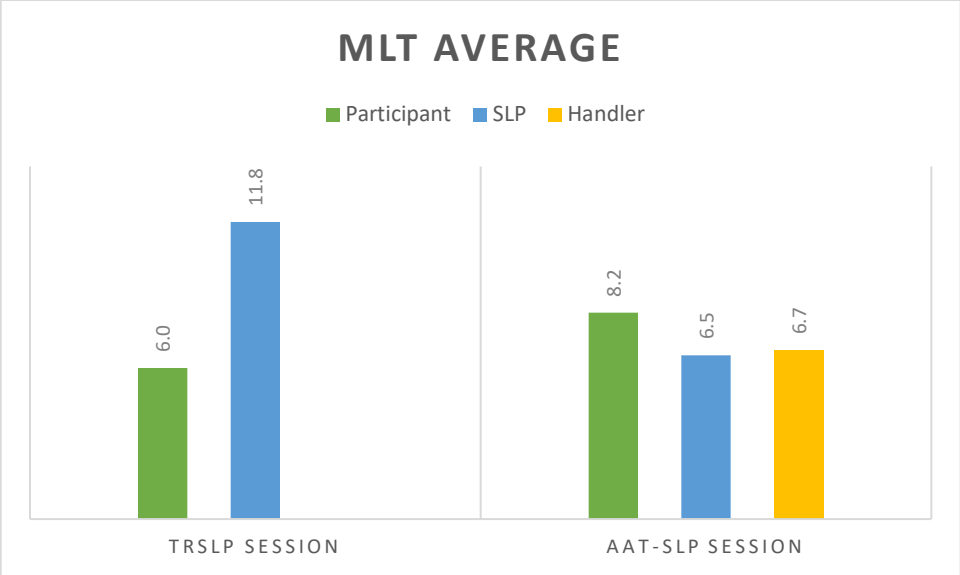


Figure 5.2. Mean Length of Turn (MLT) averages for all participants in both Trad-ST sessions and AAT-ST sessions.

As was seen with talk time, primary participants' MLT was noticeably higher in the AAT-ST sessions than the Trad-ST sessions, even with the addition of another participant/speaker. Nine out of ten primary participants demonstrated a higher MLT in the AAT-ST session than in the Trad-ST session, with a range of difference between -2.5% and 57.9% and an average of 23.9% higher MLT in the AAT-ST sessions. In 50% of AAT-ST sessions the primary participant demonstrated a higher MLT than any other participant. In all 10 sessions (across both SLPs) SLP MLT was lower in the AAT-ST sessions than in the Trad-ST sessions, with a range between 4.1% and 76.9% lower and an average range of 40.7% lower. See Figures 5.3 and 5.4 for MLT by participant in AAT-ST and Trad-ST sessions.

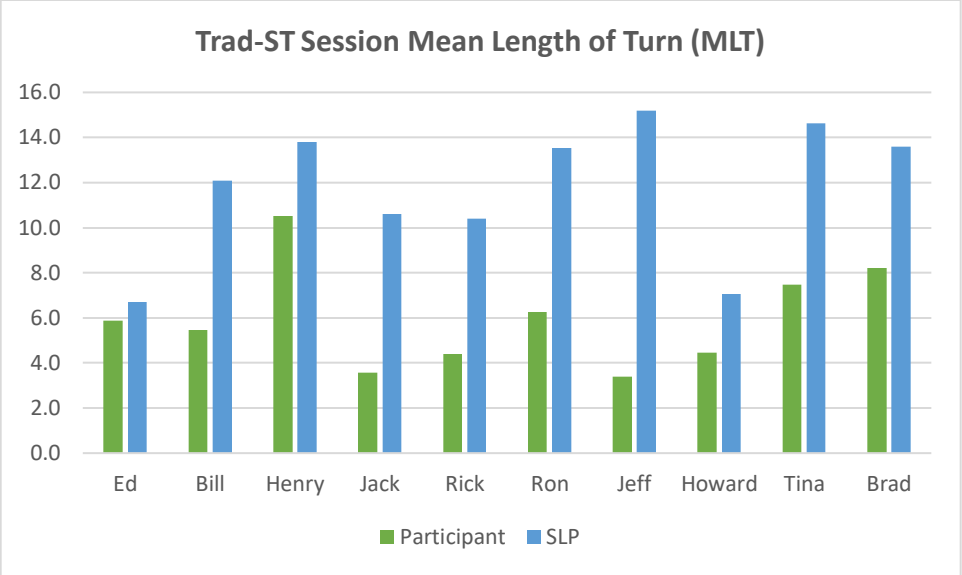


Figure 5.3. Mean Length of Turn (MLT) for individual participants in Trad-ST sessions.

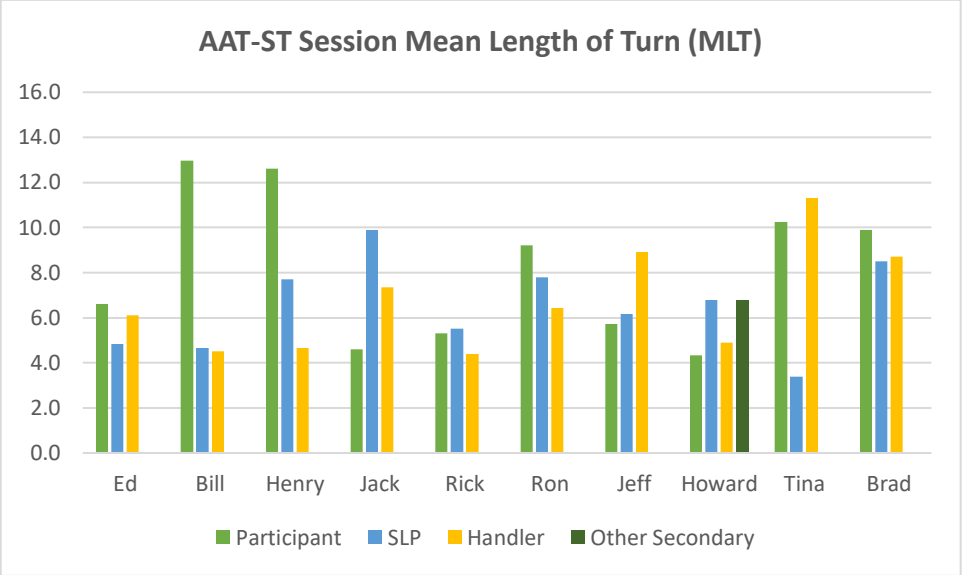


Figure 5.4. Mean Length of Turn (MLT) for individual participants in AAT-ST sessions.

Interactional discourse resources (IDRs). Our operational definition for IDRs allowed us to reliably code for highly marked cases of IDRs across sessions, to count IDRs both within and across sessions, and then to look at who was involved in the use of those resources. Similar to the analysis of talk time and turn time, IDR use was dominated by SLPs in the Trad-ST sessions, and by primary participants in the AAT-ST sessions. Results showed first that IDRs

occurred with just over twice the overall frequency in AAT-ST sessions as in Trad-ST sessions. Across all 10 Trad-ST sessions there were 639 total IDRs identified (across all participants), including 91 conversational narratives, 467 instances of procedural discourse, and 81 playful episodes. Envoicing was not identified in any Trad-ST session. Across all 10 AAT-ST sessions there were a total of 1,290 IDRs identified (across all participants), including 306 conversational narratives, 415 instances of procedural discourse, 524 playful episodes, and 45 instances of envoicing. The type of IDR used most consistently in Trad-ST sessions was procedural discourse, representing 73% of all / total IDR use. Procedural discourse was used at a rate more than five times of the next highest IDR in Trad-ST sessions. In comparison, IDR use in AAT-ST sessions was dominated by primary participants, who demonstrated high frequency use of multiple IDRs, including conversational narratives, procedural discourse, and playful episodes. Playful episodes were the most frequent IDR observed during AAT-ST sessions; in addition, procedural discourse and conversational narratives were also observed in high frequency. See Table 5.3 and Figures 5.5 and 5.6 below for a display of conversational narratives, procedural discourse, playful episodes, and envoicing by type of session including range and average for each IDR across all 10 participants.

Table 5.3

Total, range, and average of all IDRs identified across all video-recorded sessions

IDR Totals for all Sessions and Participants										
	Trad-ST Sessions					AAT-ST Sessions				
	CN	PD	PE	EV		CN	PD	PE	EV	
Range	0-37	23-108	3-19	0		13-48	7-120	24-82	1-10	
Total	91	467	81	0	**639**	306	415	524	45	**1,290**
Average	9.1	46.7	8.1	0		30.6	41.5	52.4	4.5	
	Key: CN = Conversational Narrative, PD = Procedural Discourse, PE = Playful Episode, EV = Envoicing, P = Primary Participant, SLP = Speech-Language Pathologist, H = Handler									

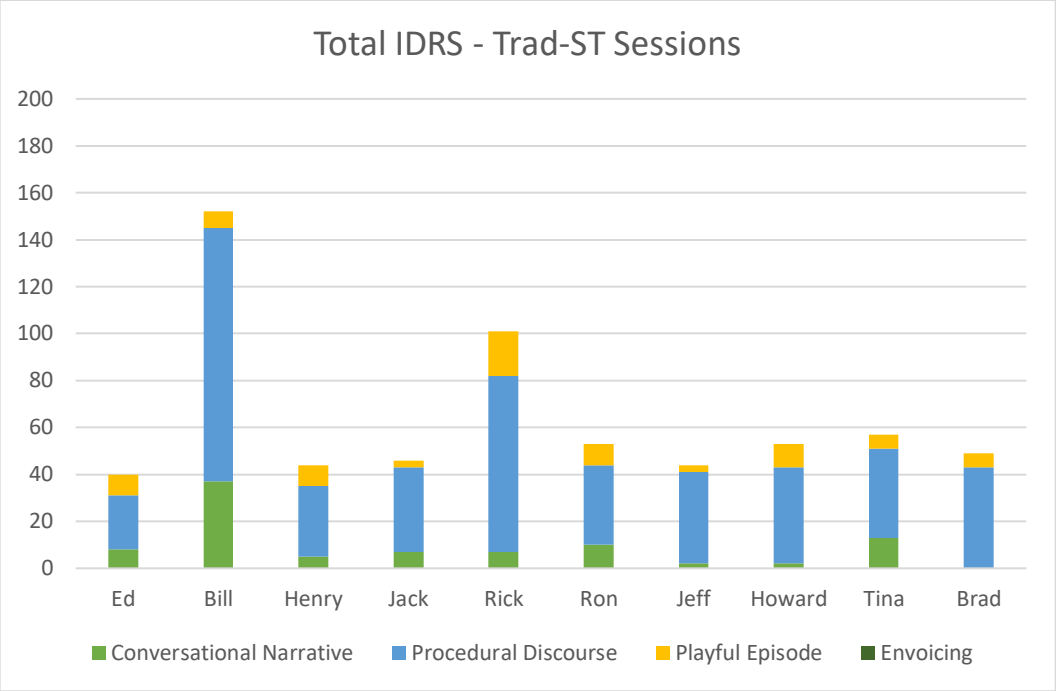


Figure 5.5. Total IDRs for all participants in Trad-ST sessions.

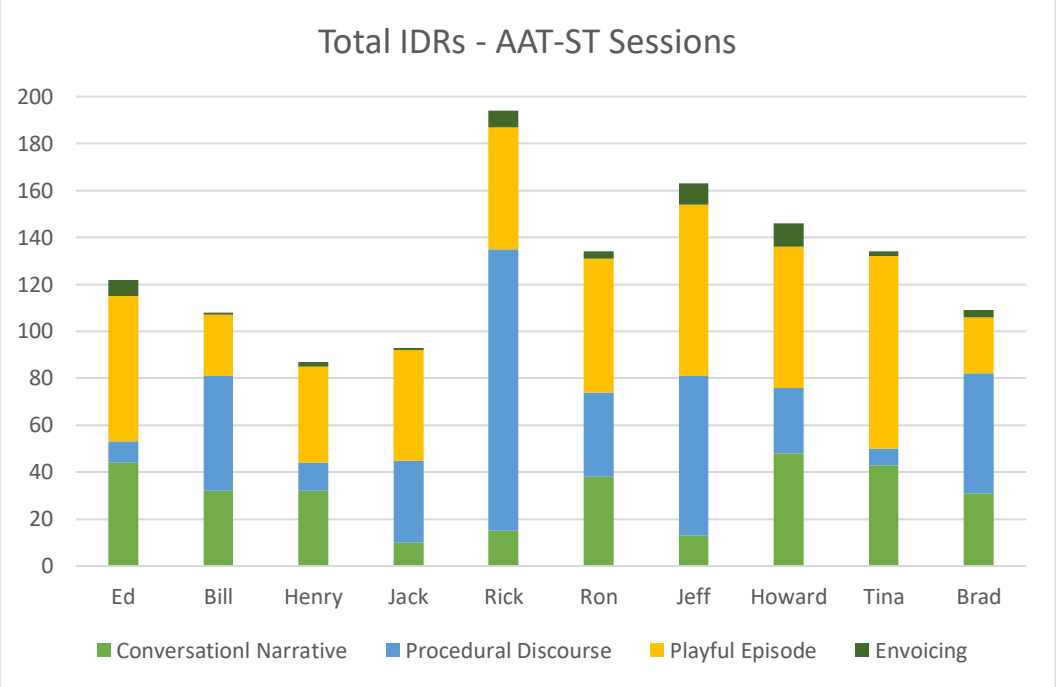


Figure 5.6. Total IDRs for all participants in AAT-ST sessions

The initiator of each IDR was also identified in every instance of its use. Multiple participants could be involved in playful episodes (e.g., laughing in response to a joke), and even

conversational narratives (e.g., one participant building on a story of another or contributing a relevant detail); however, individual IDR totals were calculated based on the initiator of the IDR only. Initiation of IDRs across participants and sessions again showed patterns in which the SLPs dominated Trad-ST sessions, particularly in initiation of procedural discourse. In the Trad-ST sessions, SLPs initiated an average of 4.4 conversational narratives, 44.9 instances of procedural discourse, and 3.8 playful episodes per session. In comparison, primary participants initiated an average of 4.7 conversational narratives, 1.8 instances of procedural discourse, and 4.3 playful episodes.

In the AAT-ST sessions primary participants again showed higher patterns of initiation and contribution to the session, as they initiated an average of 17.9 conversational narratives, 1.2 episodes of envoicing, 15.5 episodes of procedural discourse, and 25.3 playful episodes per session. SLP's in the AAT-ST sessions initiated an average of 6.1 conversational narratives, 2.3 episodes of envoicing, 14.5 episodes of procedural discourse, and 11 playful episodes per session. Rounding out the AAT-ST sessions, handlers initiated an average of 6.1 conversational narratives, 1 episode of envoicing, 11.5 instances of procedural discourse, and 13.9 playful episodes per session, and the dog was identified as having initiated an average of 2.2 playful episodes per session. See Table 5.4 for a breakdown of IDRs calculated per session, per participant. These results are displayed below in a data table (Table 5.4) as well as in both histogram and scatter-plot form (Figures 5.7 - 5.10), which are utilized to show the density of IDR use across participants and sessions.

Table 5.4
IDRs identified by initiator for all video-recorded sessions

	Individual Interactional Discourse Resources (IDRs) - All Participants in All Sessions																		
	Trad-ST SESSION						AAT-ST SESSION												
	Participant			*SLP*			*Participant*				*SLP*				*Handler*				*Dogs*
	CN	PD	PE	CN	PD	PE	CN	EV	PD	PE	CN	EV	PD	PE	CN	EV	PD	PE	PE
(P1) Ed	6	0	4	2	23	5	36	1	4	34	4	3	3	13	4	3	2	15	0
(P2) Bill	11	5	5	26	103	2	22	0	29	7	4	0	8	8	6	1	12	10	1
(P3) Henry	4	2	6	1	28	3	24	0	4	26	5	2	6	6	3	0	2	8	1
(P4) Jack	4	1	2	3	35	1	4	0	3	16	6	0	29	15	0	1	3	14	2
(P5) Rick	3	3	11	4	72	8	6	3	53	23	4	2	28	14	5	2	39	9	6
(P6) Ron	8	0	3	2	34	6	14	0	1	23	8	3	27	11	16	0	8	23	0
(P7) Jeff	1	0	1	1	39	2	10	5	34	34	2	2	13	11	1	2	21	24	4
(P8) Howard	0	0	5	2	41	5	23	1	9	26	18	9	5	22	7	0	14	9	3
(P9) Tina	10	2	4	3	36	2	29	0	1	54	5	1	1	6	9	1	5	19	3
(P10) Brad	0	5	2	0	38	4	11	2	17	10	5	1	25	4	15	0	9	8	2
Totals	47	18	43	44	449	38	179	12	155	253	61	23	145	110	66	10	115	139	22
Key: CN = conversational narrative, PD = procedural discourse, PE = playful episode, EV = envoicing																			

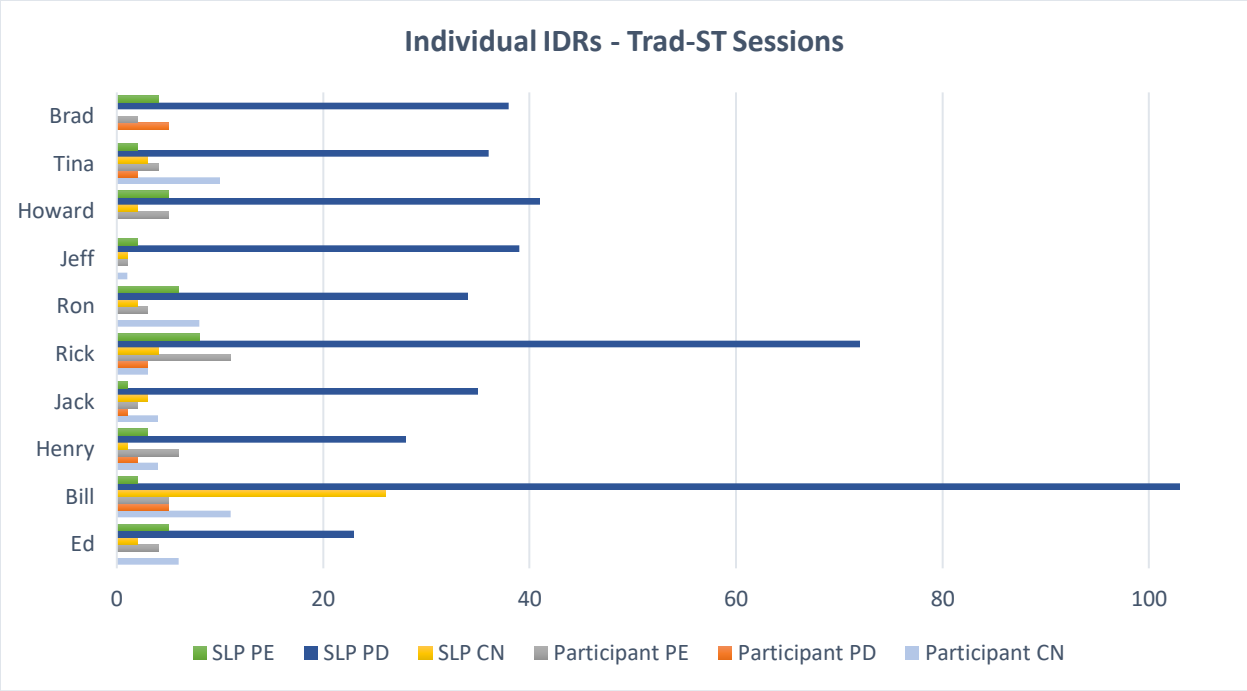


Figure 5.7. IDRs for all participants in Trad-ST sessions – organized within each session by initiator of IDR.

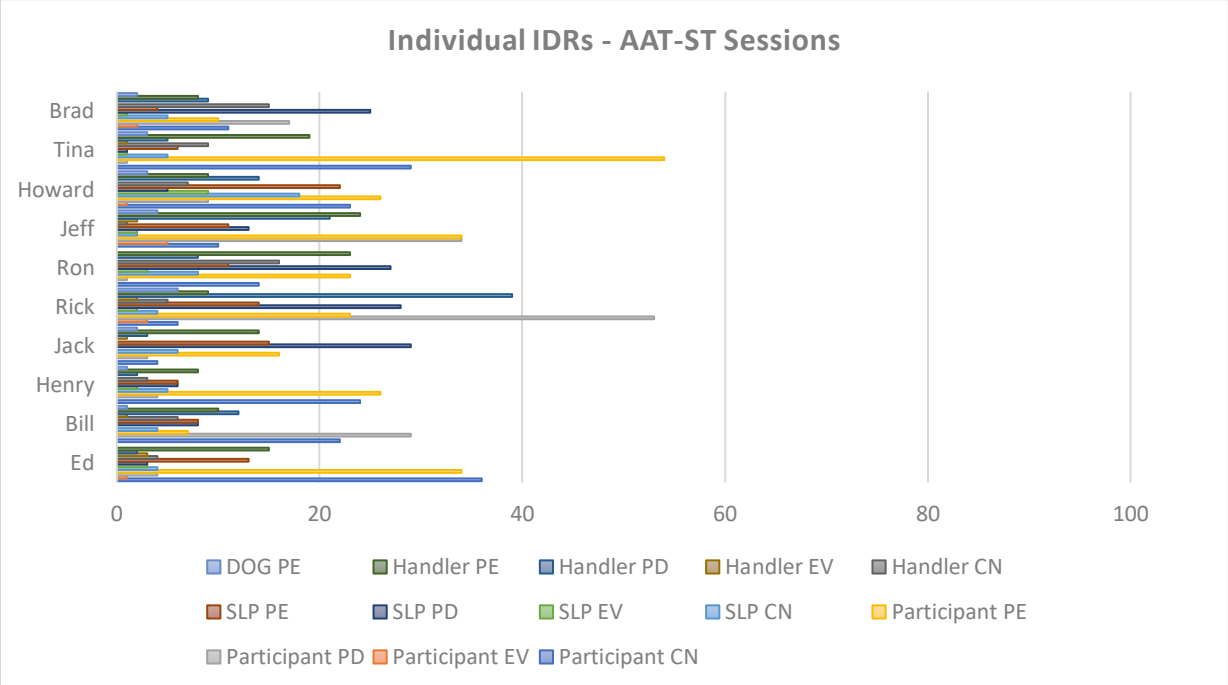


Figure 5.8. IDRs for all participants in AAT-ST sessions – organized within each session by initiator of IDR.

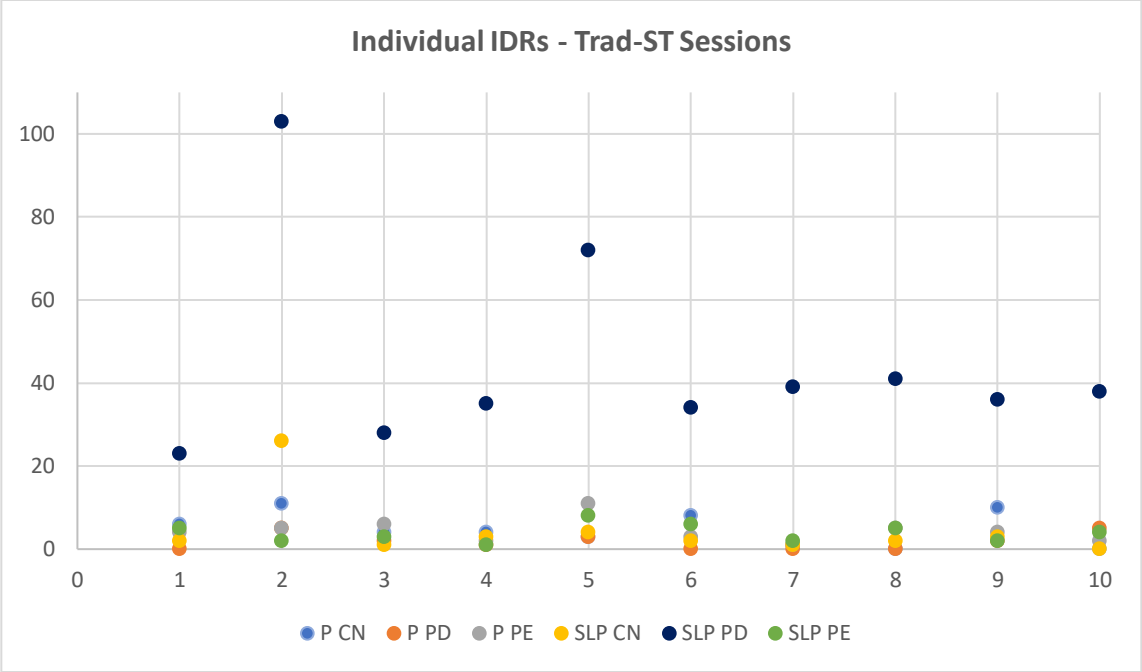


Figure 5.9. IDRs for all participants in Trad-ST sessions – organized within each session by initiator of IDR.

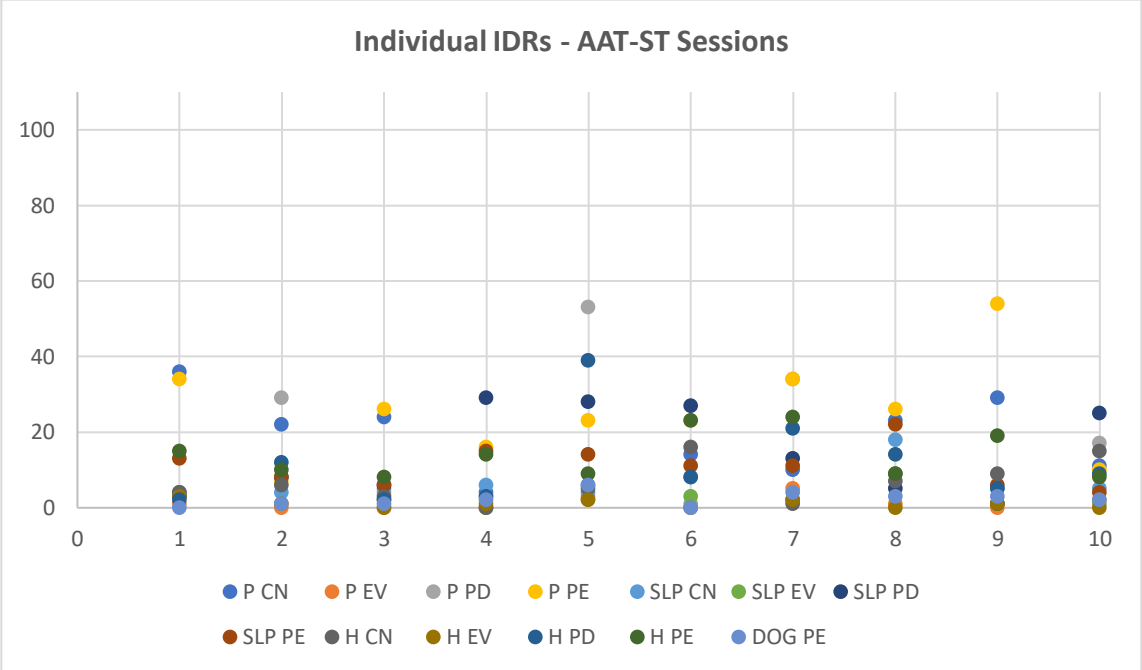


Figure 5.10. IDRs for all participants in AAT-ST sessions – organized within each session by initiator of IDR.

The development and use of the "dog code" to capture and describe the complexity and immediate reactiveness of the dog's alignments and physical gestures was critical in identifying the dog's participation and initiation of IDRs, and subsequently in attending to their role as a partner and full group member in the AAT-ST sessions. There were multiple situations (across dogs, participants, and sessions) in which the dog's alignments and behaviors triggered or initiated playful episodes that were recognized and contributed to by all group members. The dog was given a line in the transcript equal to all other participants, and the dog code was used / entered in that line concurrently with vocalizations (e.g., whines, sneezes, panting) audible from the dog. See Figure 5.11 below for a transcript excerpt from Brad's AAT-ST session of a playful episode that was initiated by the therapy dog (Cubbie), and was contributed to by all other group members. The playful episode begins with Cubbie moving from across the room to approach Brad's foot (encased in a cast) and beginning to lick his toes.

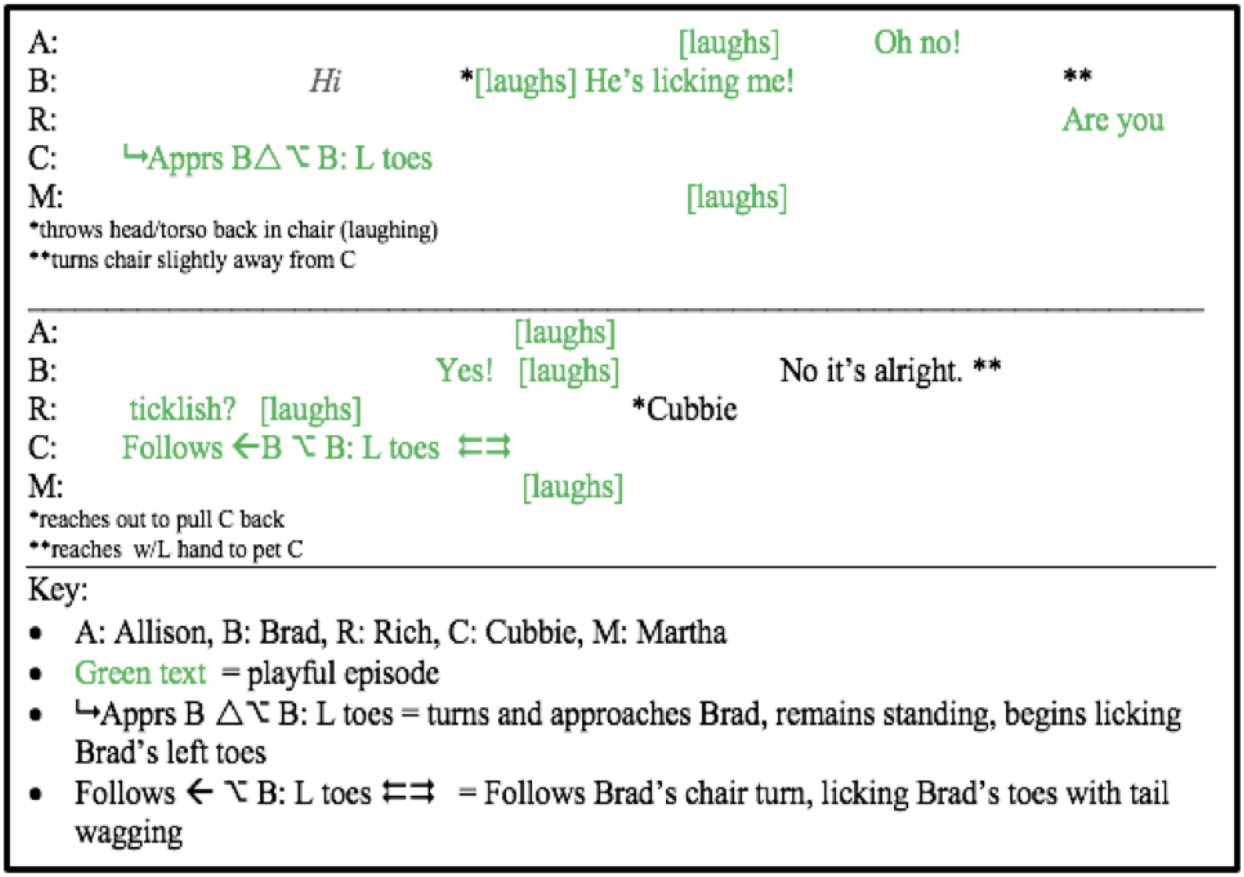


Figure 5.11. Section of coded transcript from Brad's AAT-ST session.

During both transcript consensus meetings and coding passes, all researchers were instructed to identify and indicate use of any "registers" observed (e.g., sports register, medical register, etc.) and particular attention was paid to the identification of register in consensus IDR passes. No presence of other register use was identified in either AAT-ST or Trad-ST sessions; however, an argument could be made for a "clinical register" composed primarily of directions given in multiple forms (e.g., direct, display, question-based) from clinician to participant in Trad-ST sessions. Pet Register was identified and counted in AAT-ST sessions only. Pet register use was highly variable; however, primary participants demonstrated a higher use of pet register than any other participants. Pet register was identified between 2% to 56% for primary participants, 2% to 13% for SLPs, 2% to 22% for handlers, and 11% for other participants. Average use of pet register across sessions was 15% for primary participants, 4.7% for SLPs, and 9.5% for handlers. See Figure 5.12 for pet register ranges depicted across all sessions and participants.

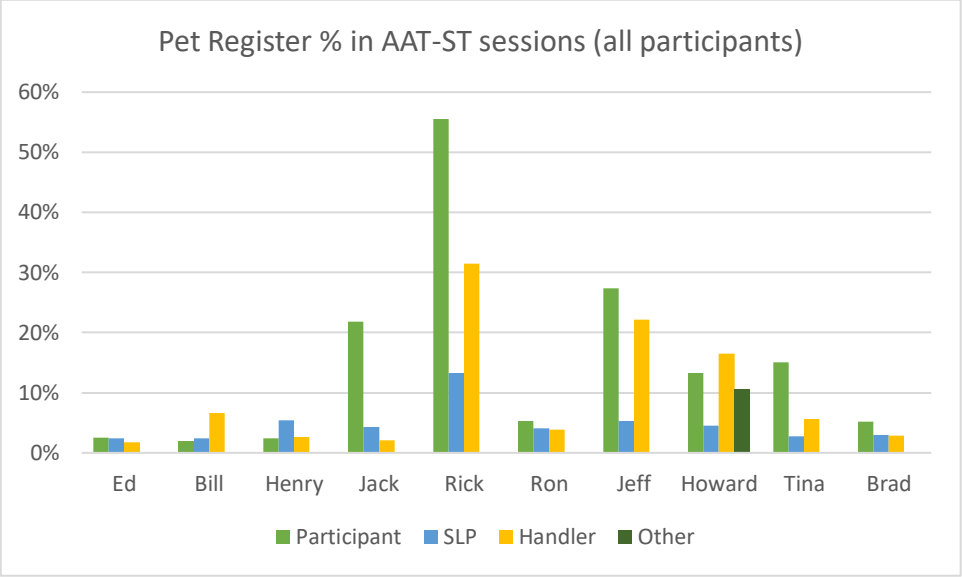


Figure 5.12. Percentage of pet register (across total word count) used by individual participants in AAT-ST sessions.

Non-verbal (vocal) communication and the use of gesture was counted for all participants in both Trad-ST and AAT-ST sessions. Participants in the Trad-ST sessions demonstrated an average of 22.7 uses of audible, physical, or generally communicative resources and gestures used, with a range from 10 to 36 total non-verbal resources and gestures counted per session for

all participants. Primary participants and SLPs displayed roughly equal amounts of non-verbal communication and gestures in Trad-ST sessions, with 11.6 counted on average for primary participants and 11.1 on average for SLPs. In the AAT-ST sessions, however, the total count/use of non-verbal communication and gestures was higher in all sessions, and primary participants more non-verbals/gestures per session. AAT-ST sessions had an average of 74.6 non-verbals/gestures used per session (range from 52 to 89), with a primary participant average of 39.9. SLPs averaged 13.5 gestures per session, handlers 16.8, and dogs 4.4 in AAT-ST sessions. See Figures 5.13 and 5.14 for representation of non-verbal communication and gesture use counted across all sessions.

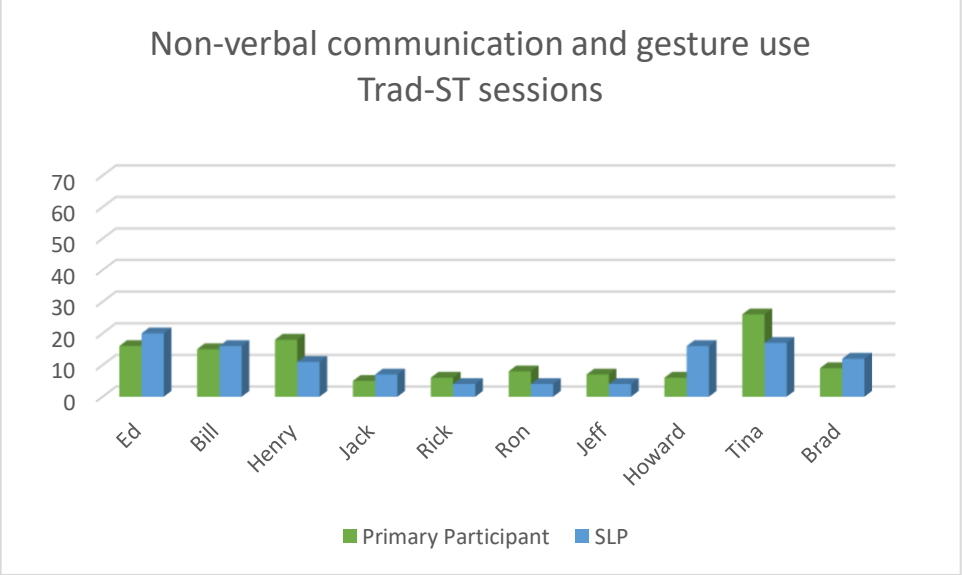


Figure 5.13. Non-verbal communication and gesture use in Trad-ST sessions for all participants

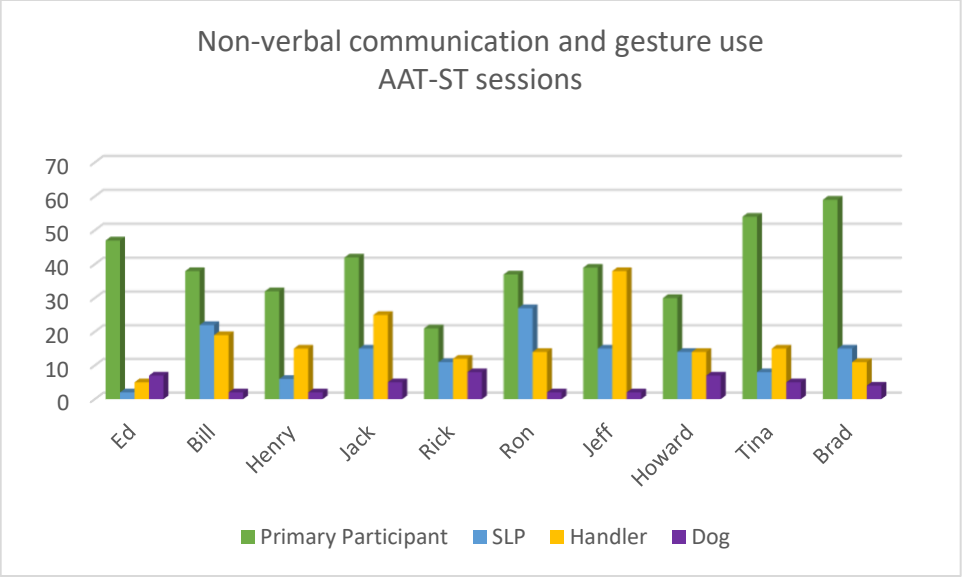


Figure 5.14. Non-verbal communication and gesture use in AAT-ST sessions for all participants.

In summary, the results presented above show that while 8/10 Trad-ST sessions can be classified as talk-active environments, talk time and procedural discourse use was largely dominated by SLPs during Trad-ST sessions. AAT-ST sessions were observed to all be talk-active environments with more equal distribution of talk time across participants, more participants involved, increased turns/words per turn used by participants, and a greater variety and initiation of discourse types and resources used by primary participants. AAT-ST sessions were also voluntary, in that participants were not only able to choose to participant in the sessions but they were also able to lead and direct activities. Signs of affective engagement were observed through gesture use and requests from participants to repeat the activity, also not seen during Trad-ST sessions.

Marshalling AAT Sessions for SLP Interventions

This section will discuss results from the SLP planning sessions, used to trace the process of incorporating AAT services into the SLP program and department. Results from PAR data indicate that both treating SLPs were quickly and efficiently able to plan AAT-ST sessions that directly targeted functional goals across varied diagnoses and disorders.

At the first SLP planning session both Jenny and Allison reported that they had previously used the therapy dogs for "morale boosters" (Jenny) and "mood lifters" (Allison), yet they rarely incorporated them into a goal-directed, targeted sessions. Allison in fact reported that the only time she had recently used the dogs "in therapy" was as a bribe to get a patient to leave their

room for therapy. Both Jenny and Allison reported personal goals prior to the start of data collection that included being able to use the dogs "naturally" in sessions (Jenny), increasing confidence that they were targeting goals effectively, and increasing experience with documenting activity-based tasks. Both Jenny and Allison also reported a desire to explore the "full potential" of AAT activities, and increase their own personal repertoires as therapists with regards to activity-based interventions.

All SLP planning sessions began with a discussion of participants' current ST diagnoses and goals. It is important to note at this time (given the larger comparison of Trad-ST and AAT-ST sessions) that all ST diagnoses and goals are determined by the SLP only during the evaluation process. Primary participants in this study had no direct input in goal construction for their ST/rehab plan of care, and not a single primary participant could list a specific goal they were targeting in PT, OT, or ST. Prior to the start of data collection, Jenny reported that she was concerned about planning activities for AAT-ST sessions, stating that "I've always been taught that structure equals skill. I'm nervous about adapting and responding as the patient and the dog needs. You can't use a worksheet as a backup." Both Jenny and Allison reported that this issue of "what do I do," or how to design activities that would allow them to conduct a goal directed, targeted session was the primary issue impacting confidence with incorporating AAT into a goal-directed session. See Table 5.5 below for a description of the ST diagnoses and goals determined by evaluating therapists to be targeted during both Trad-ST and AAT-ST sessions.

Table 5.5

Speech therapy diagnoses and goals for all primary participants

Participant		ST Diagnoses	ST goals
P1	Ed	Expressive aphasia, apraxia of speech	1) abstract and divergent naming 2) moderate level definitions 3) complex expression in response to ?s. 4) Imitation of multi-syllabic words. 5) Use of word finding strategies to decrease errors
P2	Bill	Cognition (memory) and executive function (problem solving, attention)	1) Working memory for daily events 2) Sustained and alternating attention tasks 3) Verbal sequencing and problem solving 4) Complex expression (sentence level and above)
P3	Henry	Cognition (memory) and executive function (attention)	1) Sustained and alternating attention tasks 2) High-level problem solving 3) Complex organization tasks
P4	Jack	Aphasia, cognition (memory), executive function (problem solving)	1) Functional reading/writing tasks at the sentence level. 2) Immediate and working memory tasks for daily events. 3) Divergent naming 4) Left sided and alternating attention
P5	Rick	Expressive and receptive aphasia	1) Reading comprehension at the sentence level 2) Word-finding tasks (convergent / divergent naming, categorical item naming) 3) Sentence-level auditory comprehension tasks 4) Use of word-finding strategies to decrease anomic blocks
P6	Ron	Speech intelligibility	1) Use of intelligibility strategies to maximize functional communication (basic dysarthria-type strategies): a) slow rate, b) over-articulation, c) audible volume 2) Identify need to use multi-modalities (paper/pen) to maximize communication effectiveness.
P7	Jeff	Expressive and receptive aphasia	1) Convergent and divergent naming tasks at the single word level (e.g., categorical item naming) 2) Simple level definitions 3) Functional memory strategies (due to visual impairment)
P8	Howard	Expressive and receptive aphasia and executive function	1) Complex verbal reasoning 2) Divergent and convergent naming (e.g., categorical item naming) 3) Working/delayed memory using spaced retrieval and chunking strategies
P9	Tina	Dysarthria, dysphagia	1) Breath support strategies at the sentence level 2) Fluency strategies at the sentence level 3) Completion of oral motor and pharyngeal strength and clearance exercises 4) Trial feeds of HTL/Puree with SLP.
P10	Brad	Cognition (memory) and executive function	1) STM / WM tasks 2) Complex organizational tasks 3) Verbal deductive reasoning (problem solving)

Across the course of the SLP planning meetings I encouraged both Jenny and Allison to think about and try to plan activities around and within the activity of interacting with a dog, rather than trying to adapt or interject text or paper-based activities into the AAT session. I provided them with general activity suggestions gathered from observations, my personal experiences with AAT, our previous study (Sherrill & Hengst, 2016), as well as existing literature on therapy dog training / certification. Both Jenny and Allison are long-time pet owners (both have dogs), and we also discussed at length the importance of bringing their own pet ownership expertise and histories with animals into their session planning. Refer again to Appendix D for examples of materials provided to both Jenny and Allison during planning sessions. Examples of these activities included an information/interview sheet, simple recall activities, sequencing tasks, commonly discussed topics, and tricks/directions the dogs were likely to be able to follow. See Table 5.6 below for a breakdown of activities planned per week by treating SLPs.

Table 5.6
Activities planned for weekly AAT-ST sessions and SLP reflections on previous sessions

Week	**SLP**	**Activities planned / materials prepared for session**	**Reflections on last week's activities/session (beginning Week 2)**
1	Jenny	Lists / categories for divergent naming, "info sheet" for details about the dog, "conversation starter" prompt sheet, semantic feature map for description of dog.	N/A
	Allison	Interview Questions	N/A
2	Jenny	Dog trick training instructions	"I so over-planned – it happened so naturally!"
	Allison	Visual attention tasks (petting/grooming), interview questions	"He (the patient) was in charge of the session. He loved that part."
3	Jenny	List of tricks (discussed with handler), info sheet	"It's taking me no time to plan now – I feel more comfortable being flexible."
	Allison	Speech strategy handout (planning conversation targeting use of dysarthria strategies)	"I'm using the same activities with different patients – totally different results."
4	Jenny	Info sheet/questions, research done (by patient) on therapy dogs	"I like putting them in charge."
	Allison	Interview Questions, research on dog-related careers	"This was the best way to show his family his memory deficits – this will be huge."
Follow-up	Jenny	Interview questions, trick training	"I've done it twice in the last week – I can't wait to teach my student."
	Allison	Research on certification for therapy dogs	"Great student-teaching tool."

By the end of data collection both Jenny and Allison were fully independent with planning activities for AAT-ST sessions, and reported that they had "recycled" activities discussed during planning through both AAT-ST sessions and Trad-ST sessions, including the "info sheet" and "interview" activity. Both Jenny and Allison reported that these recycled tasks had been used effectively across sessions with participants with different diagnoses and deficits, yet resulted in what they felt was consistently high levels of verbal interaction, sustained attention, and ability for the patient to lead/direct the session. Both Jenny and Allison started these program planning sessions (Week 1) with self-reported confidence ratings in the low-medium range of a 5 point Likert scale (1 = no confidence, 2 = some/little confidence, 3 = moderate confidence, 4 = high/significant confidence, 5 = complete confidence / independence). By the end of week 4, both Jenny and Allison had increased their reported confidence to a

high/significant confidence level (4 on a 5-point Likert scale), and both came to the final AAT-ST meeting with activities they had independently designed.

Productivity was another often discussed and highly relevant issue during the planning sessions, as both Jenny and Allison carried caseloads of between 6-12 patients per day, with a departmental productivity expectation of 85% for all therapists in the rehab unit. A productivity target of 85% means that for a typical shift of 8 hours, a minimum of 6 hours and 48 minutes of those were required to be patient-contact, billable hours. That also means that for this same typical 8 hour shift, all session planning, chart review, student supervision/training, and documentation (for the entire caseload) should be completed in the remaining 1 hour and 12 minutes. Clearly the productivity time needed to prepare for AAT-ST sessions could be a concern for implementation or widespread use of AAT, therefore productivity time was tracked across data collection. Planning/productivity time was reported and calculated as it related to 15 minute "units," which are the standard units of measurement in in-patient rehab for both billable patient contact time and non-billable planning or documentation time. As noted in Figure 5.16, 15 minutes = 1 unit, 30 minutes = 2 units, and so on. Both Jenny and Allison reported high planning time required for / prior to the first AAT-ST session, with Jenny reporting that she needed an hour to plan (4 units) and Allison reporting a half an hour (2 units). By the end of on-site data collection both Jenny and Allison reported that they needed approximately a third of 1 unit (5 minutes) and they both felt comfortable adapting activities they already knew and had previously used (both in AAT-ST sessions and in traditional SLP sessions). See Figure 5.15 below for a combined week by week progression of reported confidence levels (reported via the Likert 1-5 scale) and reported productivity demands (in 15 minute units/increments).

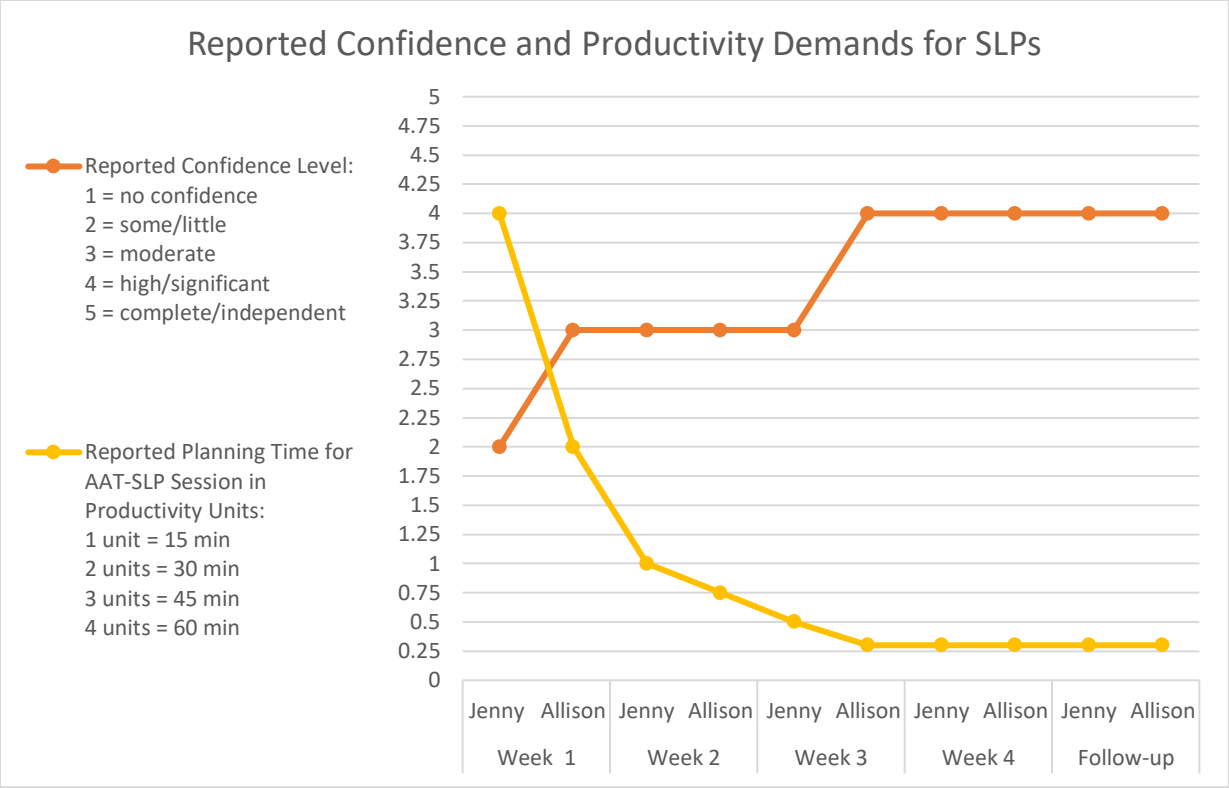


Figure 5.15. Combined graph including reported levels of confidence (on 5 point Likert scale) and time taken to plan for AAT-ST sessions (by 15 minute units) for both SLPs.

The final topic of supervision and clinical education was one that came up often during program planning sessions, as both Jenny and Allison were current supervisors of both graduate student interns and newly hired Clinical Fellows (CF)s (who work under provisional licenses for the first year of practice). Both SLPs stressed goals of increasing their confidence and experience with teaching CFs and graduate student interns how to incorporate flexible and patient-centered tasks and interactions into sessions. Again with reference to "structure," Jenny reported that she felt that students and beginning clinicians (CFs) are reluctant to utilize activities or interventions that they feel are "open" or "un-structured," particularly activities in which they cannot predict the outcome (e.g., starting a conversation on a topic unfamiliar to the clinician). Allison reported that she was (at the time of data collection) pursuing a full-time clinical supervisor role at the university level and reported that teaching "adaptive and flexible" therapy approaches was her greatest area of concern as an instructor. She referenced students who had recently attempted to document casual conversation as an "attempts to distract the therapist" and "confabulation," and as well as patients who had reported students who were "like drill

sergeants." By the end of data collection, both SLPs reported that they felt "very confident" in their ability to translate what they had learned to clinical supervision, and that they believed AAT would be the "perfect" (Jenny) or "ideal" (Allison) way to teach students how to stimulate conversation-level language, attend to patient preferences, and show "respect" (Jenny) for patient expertise and experiences in therapy sessions. By the last follow-up meeting (completed 2-3 weeks after on-site data collection was completed) both SLPs reported that they had included their students in two to three AAT-ST sessions each for current rehab patients. Jenny reported that she was "thrilled," and Allison reported she was "astonished" with the results of these recent sessions and their students' performance.

In summary, by the end of data collection both treating SLPs (Jenny and Allison) reported that they had met all of their own goals with regards to increasing confidence, efficiency, and flexibility with implementation of AAT into skilled ST sessions. Both SLPs reported eagerness to continue to incorporate AAT into treatment and utilize it as a teaching tool for student clinicians. Particularly notable to me, as a clinician who has struggled at times with building rapport and trust with patients in a medical setting, both SLPs directly stated to primary participants that "I learned more about you in this session than the entire time you've been here." The ability of this activity to build rapport and a shared history between therapist and patient was not fully explored by any means in this study, but the potential value and quality of an activity that creates a shared history between participants cannot be overlooked.

Diagnostic groups. The practice of Speech-Language Pathology in adult medical or healthcare settings includes the treatment of a wide variety of complex neurological (both acquired and/or degenerative) and structural (e.g., functional/physiological or trauma-based) disorders and conditions. For example, in a single day in a typical inpatient rehabilitation unit, Jenny's caseload may include patients with language impairments affecting the ability to either express or understand verbal communication (aphasia), swallowing disorders that impact oral intake of food/liquids (dysphagia), cognitive disorders impacting memory and problem solving (e.g., chronic dementia, acute traumatic brain injury), and patients with complex motor speech production disorders (e.g., intelligibility deficits as a result of dysarthria or apraxia of speech).

One of the most interesting results of the planning meetings (to me), was the immediate and implicit way in which Jenny, Allison, and myself quickly organized our discussions about the ten primary participants around their communication diagnoses, and specifically into four ST

diagnostically-related groupings. Again, primary participants for this study were not recruited by diagnosis (e.g., a diagnosis of aphasia was not required), and inclusion criteria simply required that they be receiving ST services for something. Beginning in week 2, Jenny, Allison, and I began to discuss how primary participants were alike or different. The three of us (across separate meetings) began to discuss participants as members of ST diagnostic groups that would be highly recognizable or characteristic of a Speech Therapy caseload. This initial grouping of participants was led by Jenny and Allison, and became highly visible during discussions of possible activities for different participants. For example, when planning possible activities for Henry, Jenny and I discussed the activities used during Bill's recent AAT-ST session, as both Bill and Henry had similar ST diagnoses (cognitive/executive function deficits) and associated treatment goals (e.g., attention and complex problem solving). By week 3, this topic of discussion had led us to overtly establish four different groups simply for the purpose of organizing and discussing potential activities that were reflective of primary participants' ST diagnosis. These groups included: 1) The Aphasia Grouping 2) The Cognitive Impairment Grouping, 3) The Mixed Diagnoses Grouping, and 4) The Dysarthria and Speech Impairment Grouping. These groupings did not impact data collection, scheduling, or services in any way, they were simply used to organize and conceptualize AAT planning. In this section, I will discuss the results of primary participants within these diagnostic categories in relationship to the larger / 10 participant group, as well as group themes and individual experiences highlighting the impact of AAT-ST sessions on participants' rehab stay.

***The aphasia grouping*.** Ed, Rick, and Jeff were primary participants who all had an admitting medical diagnoses of a Left CVA (stroke), a previous medical history that included a prior CVA, and an ST diagnoses of aphasia. Aphasia can be defined as an acquired loss of language that impacts auditory comprehension (understanding language), spoken language (finding the word you want to say, grammar), reading comprehension, and writing (impaired grammar and/or content) to various degrees and severity levels (McNeil & Pratt, 2001). All three of these participants had ST goals targeting both auditory comprehension and spoken language use. These goals targeted language use at the word level (e.g., naming pictures, naming items in a category), the sentence level (e.g., simple definitions and descriptions of an object's function), and use of strategies to prevent word-finding blocks such as describing, gesturing, or writing when they were unable to name or label something. Word-level goals may give the

impression that these participants had severe communication difficulties; however, all three were able to participate in conversations and complete the interview with me without any aids to spoken language needed (e.g., communication devices, pictures, writing tools, etc.).

Despite all having aphasia, the most visible/common theme across these participants was their spontaneous use of narrative. Ed, Rick, and Jeff all told stories in the interview and told/re-told those same stories in their individual AAT-ST sessions. Rick told over twice as many narratives or stories during his AAT-ST session as he did his Trad-ST session, Ed told over 5 times as many, and Jeff over 6 times as many. See below for examples of narratives from all three of these participants, with similar topics including grief over a pet (Figure 5.16), loss of a pet (Figure 5.17), and a sad story with a thankfully happy ending for a pet (Figure 5.18). Jeff (Figure 5.18) demonstrated the lowest percentage of talk time of all 10 primary participants during his Trad-ST session; however, in his AAT-ST session he told several extended stories that were well formed and easy to follow.

Ed: AAT-SLP Session

E:	when w-w-when we had to put M-Moe down I cried w- worse than my di-daughter and			
J:		aw		
W:	m hm			
M:		*		→J: ↗E

*squirms/re-adjusts

E:	my wife*	was…and the vet said it's hard…I never see a man cry like that	[laughs]	
J:			aw	
W:	m hm			
M:				

*looking down at / softly petting M

Key: E = Ed, J = Jenny, W = Wendy, M = Mitzie.

Figure 5.16. Section of transcript from Ed's AAT-ST session illustrating conversational narrative use.

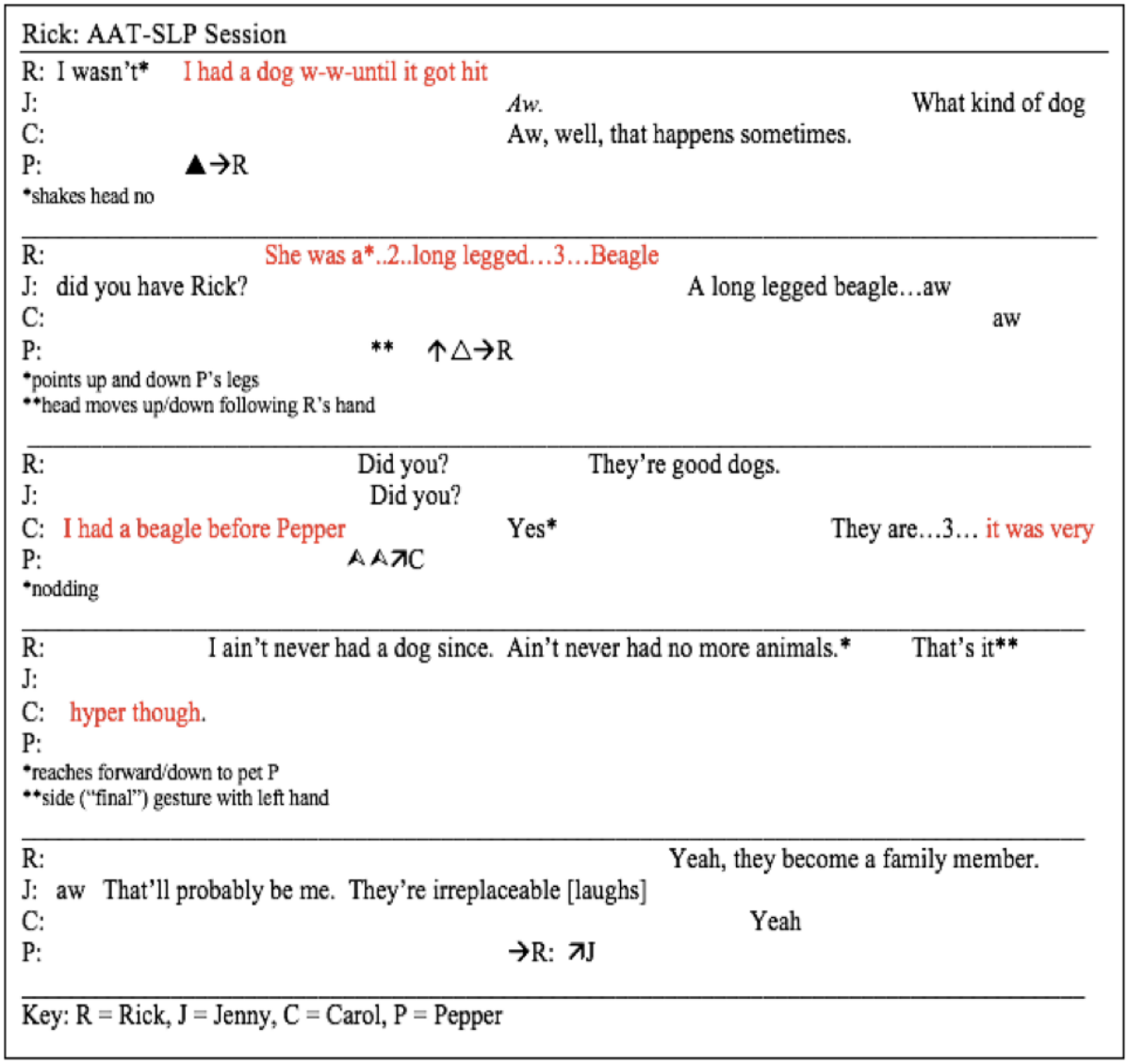


Figure 5.17. Section of transcript from Rick's AAT-ST session illustrating conversational narrative use.

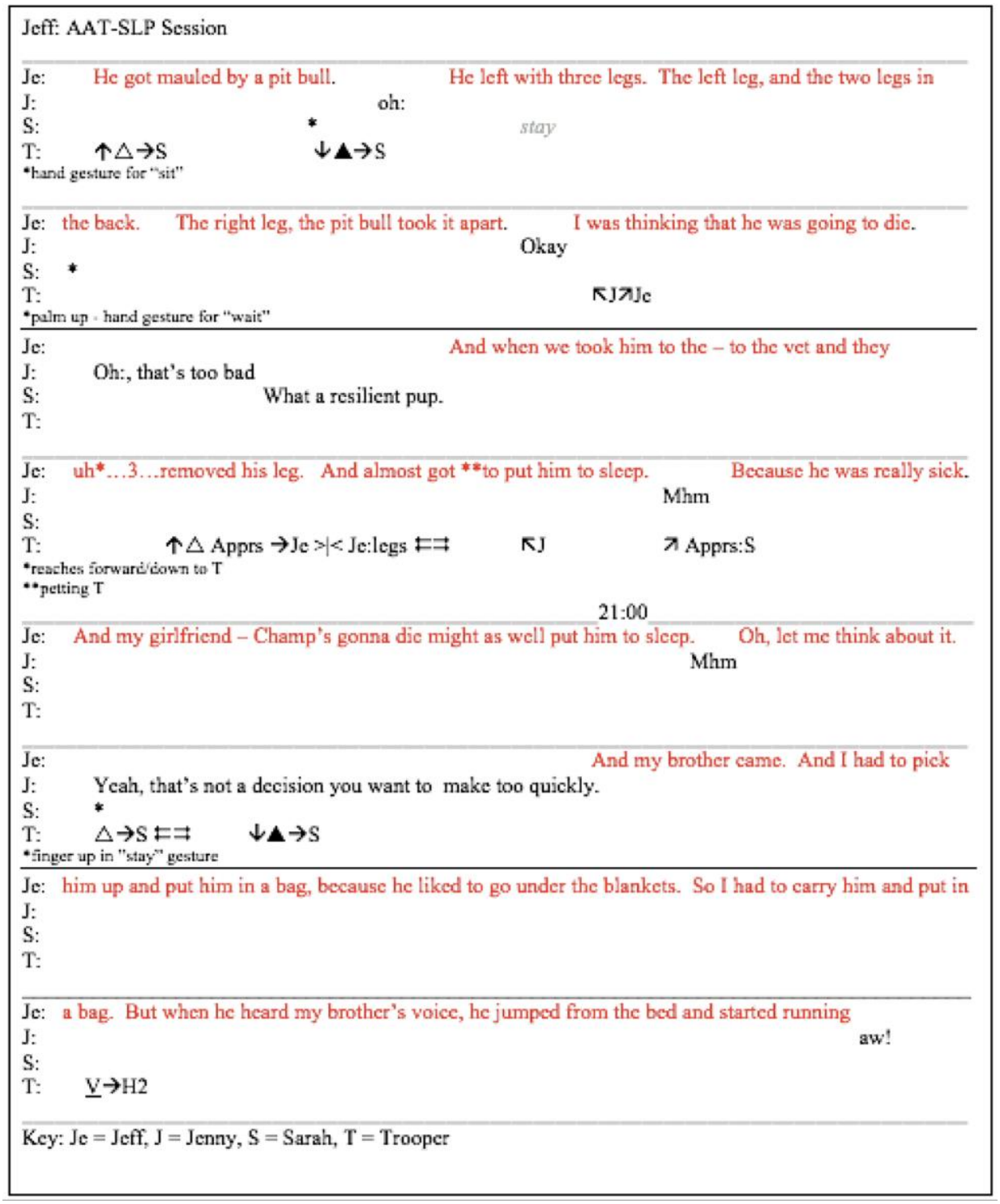


Figure 5.18. Section of transcript from Jeff's AAT-ST session illustrating conversational narrative use.

Patterns of talk time for Ed, Rick, and Jeff generally fit the patterns exhibited by the larger (10 participant) group, in that the AAT-ST sessions for all three of these participants can be described as talk active spaces (range of 122.28 to 150.82 WPM). Jeff's Trad-ST session, however, was one out of two sessions that was classified as talk quiet (96.40 WPM). Jeff demonstrated the lowest talk time of any primary participant in the Trad-ST sessions, with a percentage of talk time of 17.6% and a MLT of 3.4. Jeff had a 47% difference in talk time between the Trad-ST session and the AAT-ST session, the latter of which he participated in equally with other group members (3 members), occupying 33.5% of the talk time. It is also interesting to note that the SLPs in these sessions demonstrating notably less talk time in their AAT-ST sessions than in their Trad-ST sessions. The SLP in Ed's session dropped from 54% of total talk time to 30%, in Rick's session the SLP dropped from 69% to 41%, and in Jeff's session the SLP's talk time dropped from 82% to 38%.

Ed, Rick, and Jeff's use of IDRs also followed a similar pattern to what was exhibited in the larger (10 participant) group, in that during Trad-ST sessions SLP-initiated procedural discourse was used at more than 4 times the rate of any other IDR, while playful episodes, procedural discourse, and conversational narratives initiated by primary participants were all frequently occurring in the AAT-ST sessions. See Figures 5.19 and 5.20 for IDR use for these three participants in both Trad-ST and AAT-ST sessions.

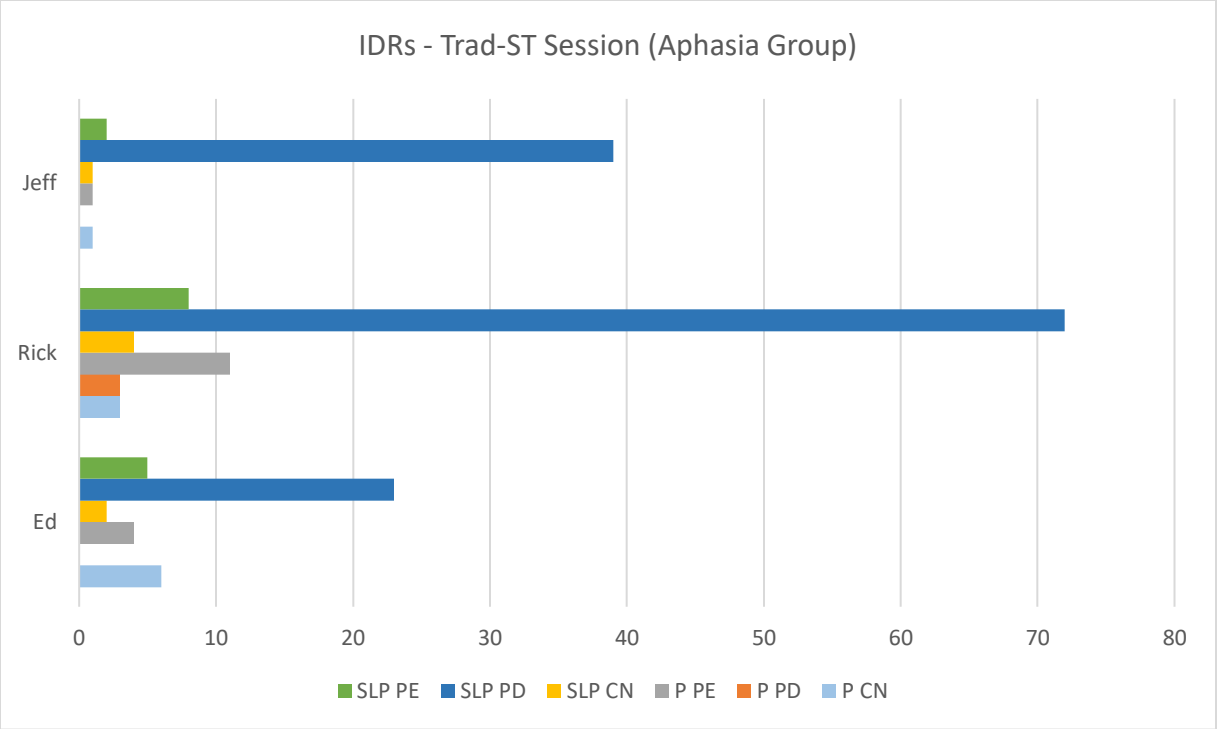


Figure 5.19. IDRs for all participants in Ed, Rick, and Jeff's Trad-ST sessions – organized within each session by initiator of IDR.

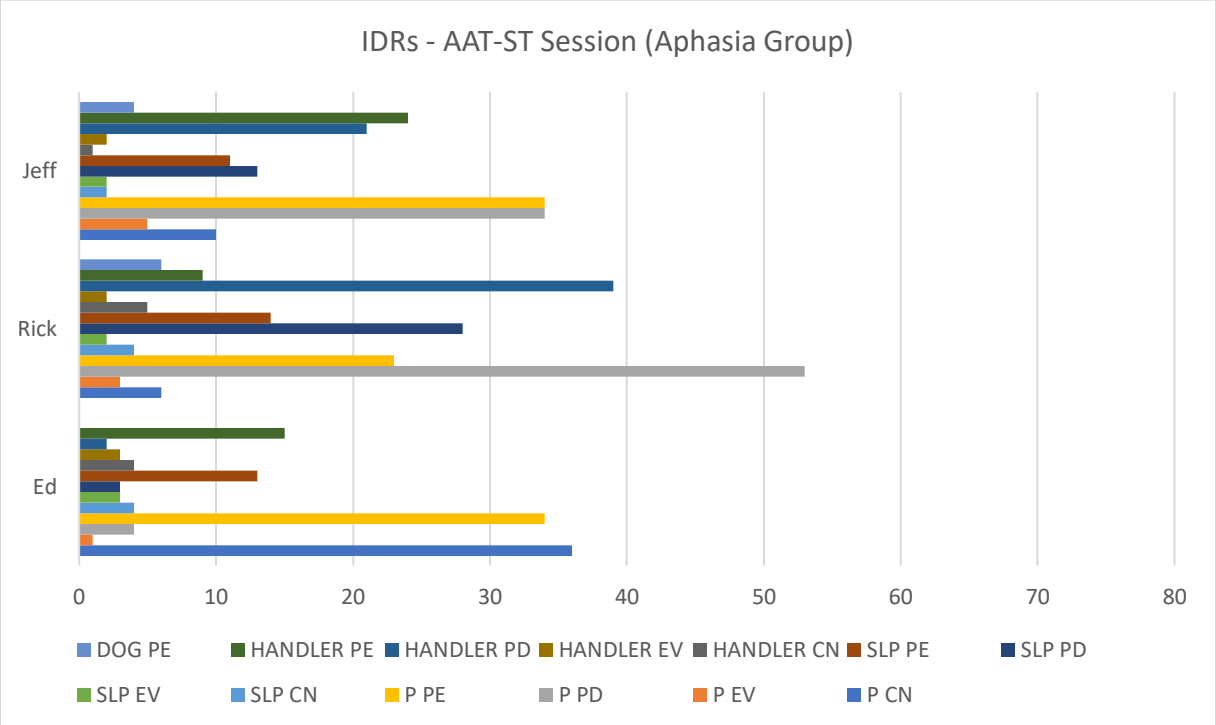


Figure 5.20. IDRs for all participants in Ed, Rick, and Jeff's AAT-ST sessions – organized within each session by initiator of IDR.

The cognitive impairment grouping. Disorders of cognition are highly common in rehabilitation facilities, and can manifest across or in conjunction with multiple diagnoses or events. The participants Jenny and Allison identified for this grouping had medical diagnoses of Right CVA (stroke), Traumatic Brain Injury (TBI), and per one patient's own report (Bill) had experienced recent decline in memory and reasoning skills. Memory problems are likely the most recognizable or visible of the issues impacting persons with cognitive disorders given the cultural awareness of diseases such as Alzheimer's and other Dementias. Symptoms of cognitive disorders also include difficulties with problem solving, reasoning, attention (both divided and sustained), and sequencing, often grouped together as disorders of *executive function* (Miller & Wallis, 2009). Bill, Henry, and Brad all had ST diagnoses of both memory and executive function impairments, and all had goals targeting delayed recall of new information, problem solving, attention, and sequencing.

These participants were at different stages of both their personal and professional lives, yet they all reported that their personal rehabilitation goal was to return to a prior level of function and independence. Bill was 74 years old and had been retired for "as long as I can remember." Bill stated multiple times during the interview that he was afraid his family would "use this" to prevent him from driving, the one activity that he wanted to return to more than anything. Henry (65 years old) was semi-retired from a professional writing career, and stated that prior to his stroke he thought he had found the "perfect balance" of semi-retirement. He expressed concern that he would "lose ground," and not be able to return to the schedule and intensity of writing he was capable of before his hospitalization. Brad (18 years old) also spoke of a desire to return to a path or trajectory, only his was towards finding his first meaningful and fulfilling career. Brad stated that he was "just starting to get things going," and he was worried he wouldn't be able to "get back to the progress I was on" at the time of his accident.

Brad was the only participant whose Trad-ST session occurred before the AAT-ST session, and in fact both occurred in the same day, as Brad and his family were requesting an earlier discharge home (by the next day) than had been originally planned. At the end of the AAT-ST session when repeat/follow-up Therapy Dog visits were being planned with Rich and Cubbie, Allison reminded Brad that his family had requested that Rich and Cubbie visit Brad's family in his room. We all accompanied Brad back to his room, where he introduced Rich and Cubbie to his family. Brad's mother gently reminded him that he had seen Rich and Cubbie two

days ago for an extended in-room visit. Brad had no recollection whatsoever of this visit, and in fact demanded that his mother show him "proof" (pictures taken on her camera). Brad's mother stated "If he doesn't remember seeing the dog – that's a big problem," and Brad was visibly upset as well. Allison later described this incident as "pivotal," as the rehab staff had been trying (unsuccessfully, per her report) to educate Brad and his family on the significance of his memory and cognitive deficits following his traumatic brain injury, and the need for close supervision when he returned home. This incident led to a care-team meeting that afternoon with the medical social worker (MSW), rehab physiatrist, and therapists to recommend an additional week of services/rehab prior to Brad's discharge home.

Percentage of talk time demonstrated by Bill, Henry, and Brad followed the larger (10 participant) group patterns in that both the all AAT-ST and Trad-ST sessions for all three of these participants were talk active communicative spaces, with a range from 132.02 to 165.09 for AAT-ST sessions and a range of 102.52 to 138.25 for Trad-ST sessions. Bill and Henry also demonstrated notably higher talk time during AAT-ST sessions than other session participants (up to 65.1%). Higher talk times and more talk active communicative spaces are not surprising in this group (given the lack of diagnosed language disorder), however what is notable is the way the AAT-ST activities and group members aligned to Bill and Henry's strengths, and did not attempt to limit their verbal contribution to the session. As with the Aphasia group, the SLPs aligned to the greater talk time demonstrated by primary participants by lowering their own. The SLP in Bill's sessions went from 72% of talk time in the Trad-ST session to 18% in the AAT-ST session, in Henry's sessions the SLP went from 52% in the Trad-ST session to 16.9% in the Trad-ST session, and in Brad's sessions the SLP went from 63% in the Trad-ST session to 32% in the AAT-ST sessions.

The IDRs used in Bill, Henry, and Brad's sessions (both AAT-ST and Trad-ST sessions) also followed the larger group pattern. Procedural discourse dominated IDR use in the Trad-ST sessions for all three of these participants, and occurred at a rate of more than 4 times any other IDR used. Again, as with the larger group results, IDRs used during AAT-ST sessions for Bill, Henry, and Brad included high numbers of playful episodes, conversational narratives, and procedural discourse. See Figures 5.21 and 5.22 for a breakdown of IDR use in both sessions for Bill, Henry, and Brad.

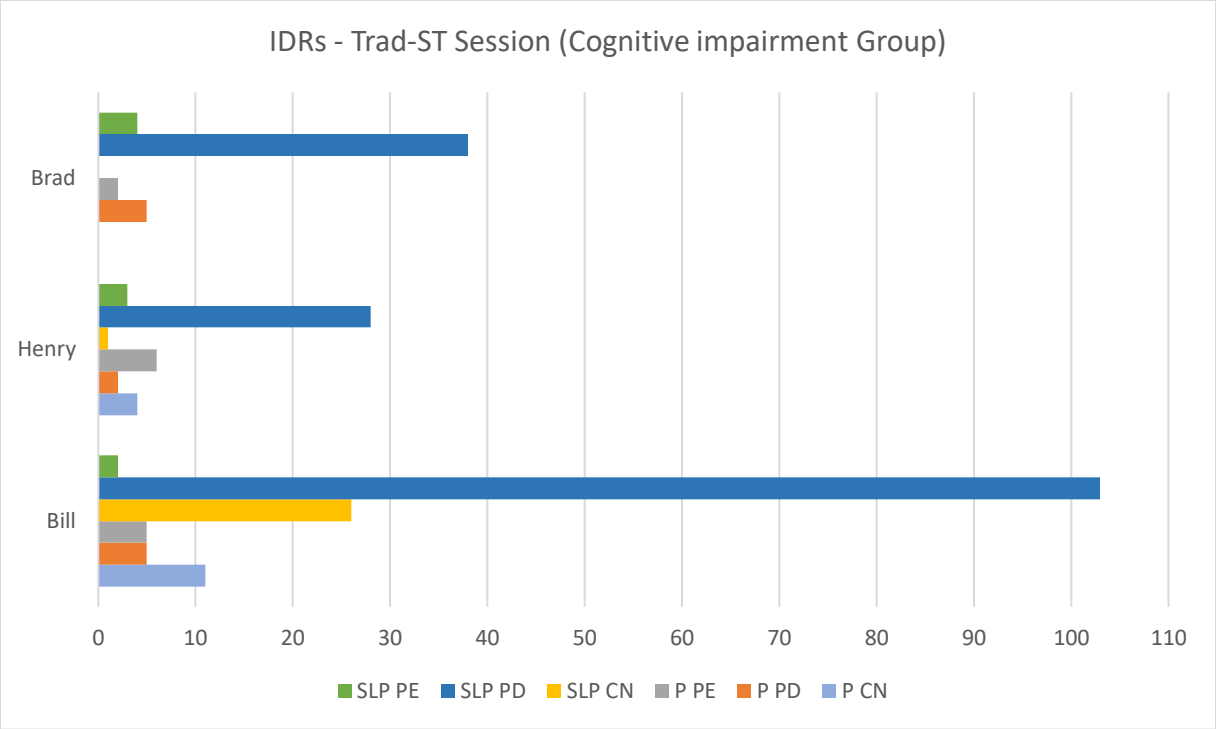


Figure 5.21. IDRs for all participants in Bill, Henry, and Brad's Trad-ST sessions organized within each session by initiator of IDR.

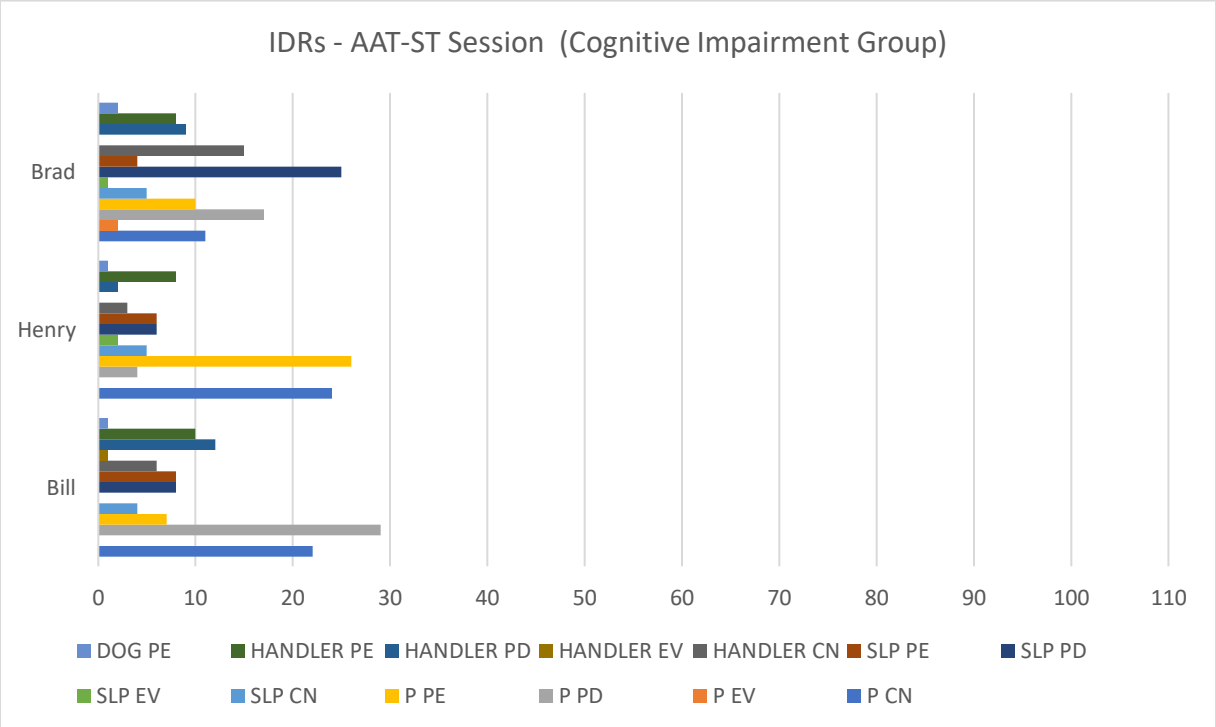


Figure 5.22. IDRs for all participants in Bill, Henry, and Brad's AAT-ST sessions organized within each session by initiator of IDR.

The mixed diagnoses grouping. Both Jack and Howard were familiar with CFH inpatient rehabilitation, as they had both received services there at least 1 additional time. Both Jack and Howard had difficulty recalling details about their previous medical history and diagnoses; however, both reported that they had experienced previous strokes. Jack stated he had experienced "at least one" previous stroke and Howard stated "maybe 2 or three – I can't remember." This complex medical history led Jenny and Allison to create a mixed diagnoses group, as both Jack and Howard had ST diagnoses of both aphasia and cognitive impairments. Unless a patient's current deficits are undeniably at the baseline level (e.g., if a patient with long-standing dementia is admitted for a hip replacement and all family members state that their cognitive status is baseline and unchanged) they are treated for all observed deficits and ST diagnoses. On initial evaluation, both Jack and Howard demonstrated difficulty with word-finding (anomia), complex spoken language use, verbal problem solving, working and delayed memory, and sequencing of information, and the specific site of lesion / medical diagnoses that caused those deficits was not an issue of debate.

The common theme (beyond diagnostics) linking Jack with Howard was a mutual discussion of "dependence," something both men brought up in the interview, in their AAT-ST sessions, and in their follow-up interviews at home. Both Jack and Howard reported concern that their current deficits would impact their ability to be home alone, and both reported fear that their family members would find their care needs to be too burdensome. During his Trad-ST session Jack's wife and daughter were present, and he addressed several defensive comments directly to them following a correction or re-direction from Jenny. For example, prior to beginning a worksheet task Jenny was arranging items on Jack's bedside table to make room for the therapy materials. Jenny cued Jack to look left to move the phone, and he immediately turned to his wife and daughter, stating "you know I don't have a table like this at home – I have more room and I'd be able to see the phone." Howard also stated multiple times in the interview that he was worried about returning home, stating that "I feel lost sometimes – I need my wife to remember way too much." Howard turned to his wife for support and assistance answering questions during the AAT-ST session, then later chastised himself on the way back to his room ("I should have done more of that myself").

As with the first two groups discussed in this section, Jack and Howard displayed similar patterns to the larger (10 participant) group with regards to talk time in Trad-ST and AAT-ST

sessions. The communicative environment in both Jack and Howard's sessions can be characterized as talk active (range from 132.60 WPM to 149.43 WPM). Jack's Trad-ST session was the second session (out of two) classified as talk quiet (74.44 WPM), and he was personally responsible for only 21.9% of total words used in the session. Both Jack and Howard demonstrated increased talk time relative to the number of participants in their AAT-ST sessions, and Jack demonstrated a higher percentage of talk time even with the addition of a group member (Sarah) in the AAT-ST session. Noticeable again in this group is the decrease in talk time demonstrated by the SLPs. The SLP in Jack's Trad-ST session is responsible for 78% of talk time in that session, and only 45% in the AAT-ST session. In Howard's sessions the SLP drops from 66% of talk time in the Trad-ST session to 44% in the AAT-ST session.

IDRs for Jack and Howard also followed the larger group patterns discussed above, with procedural discourse occurring at almost 5.9 times the rate of the next highest IDR on average in their Trad-ST sessions (77 total instances of procedural discourse, 13 playful episodes). In these Trad-ST sessions, Jack demonstrated only 1 use of procedural discourse, and Howard demonstrated none. In the AAT-ST sessions for these participants, playful episodes were the highest demonstrated IDR (107 total), with procedural discourse and conversational narrative coming in second and third (63 and 58 instances respectively). See Figures 5.23 and 5.24 for IDRs individual IDRs for members of the Mixed group.

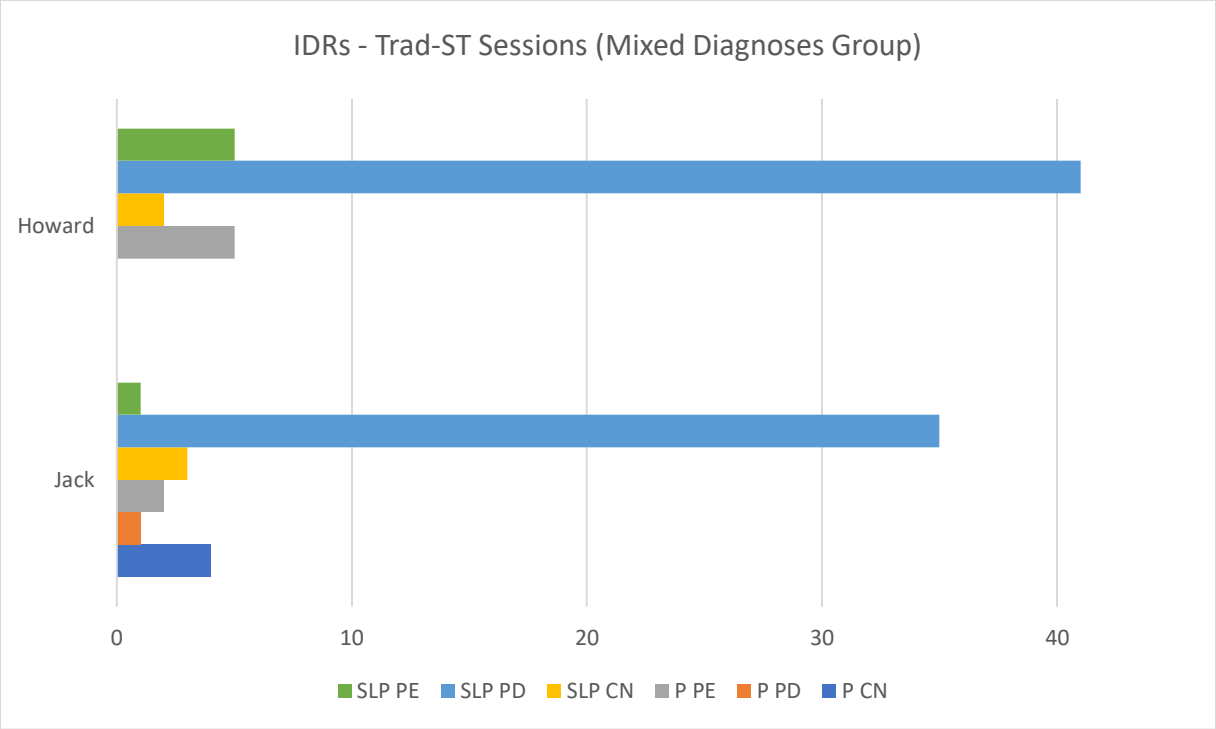


Figure 5.23. IDRs for all participants in Jack and Howard's Trad-ST sessions – organized within each session by initiator of IDR.

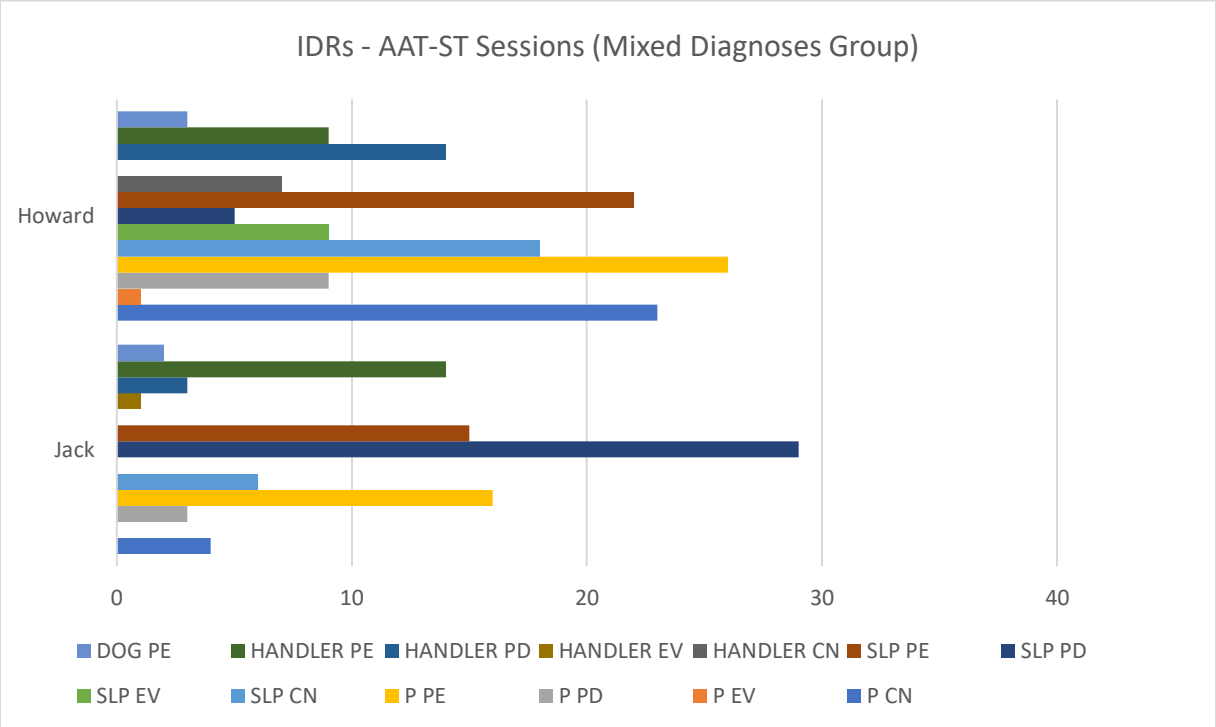


Figure 5.24. IDRs for all participants in Jack and Howard's AAT-ST sessions – organized within each session by initiator of IDR.

The dysarthria and speech impairment grouping. The last group to be discussed here includes two participants: Ron and Tina. Ron and Tina were brought to CFH rehab under very different circumstances; however, both were receiving ST services to address speech production and intelligibility deficits impacting their ability to communicate effectively and efficiently with their caregivers. Ron's intelligibility deficits were caused by a medical diagnoses of a malignant sub-lingual tumor that severely impacted intelligibility. His language and cognitive skills were thought to be intact (as reported by both Jenny and Allison), but he had difficulty utilizing speech strategies or self-monitoring his intelligibility deficits, meaning that frequent requests for repetition and clarification were needed by those engaging with him in conversation or therapeutic tasks. See Figure 5.25 below for a transcript example from Ron's Trad-ST session in which Jenny asks for repetition, and given the limited nature of her response (e.g., she doesn't expand, or ask additional questions) she appears not to understand the majority of Ron's utterance. Transcript conventions require that unintelligible sequences are marked with "XXX," and it should be noted that this amount of unintelligible sequences persisted following 6 transcription passes (3 more than required for other participants), all done by a licensed clinician (myself).

Ron – TrSLP Session

R: As long as you XXX XXX close to their mouth XXX XXX XXX XXX XXX. XXX.
J:

R: XXX you could get bit possibly, but I mean, the bottom line is uhm animals
J: What could happen?

R: XXX XXX XXX close, XXX XXX a good massage. XXX
J: Can you say that part one more time, I had

R: XXX a XXX XXX XXX XXX dog, XXX XXX massage
J: a hard time understanding you.

R: XXX XXX XXX XXX dog. XXX XXX
J: Mhm Ah.

Key: R = Ron, J = Jenny

Figure 5.25. Section of transcript from Ron's Trad-ST session illustrating intelligibility issues.

Tina also struggled with intelligibility; however, her medical diagnoses was a CVA, and her ST diagnoses was dysarthria, a neurogenic motor speech disorder causing weakness, impreciseness, and incoordination of the speech musculature (Darley et al., 1969). Dysarthria is not a language disorder, and therefore patients with dysarthria (and no concomitant aphasia or other language-based disorder) have difficulty producing clear and understandable speech, not finding the words to say. Tina's intelligibility was impacted by breathiness and hypernasality, impacting her ability to produce sentence-length utterances, to raise her volume, and to control and coordinate breath support with speech attempts. Both Tina and Ron expressed severe concern about the impact their intelligibility deficits would have on their current and upcoming medical issues. Ron was facing extended radiation and chemo treatments, as well as multiple reconstructive surgeries. Tina also faced severe dysphagia, and was in the midst of discussing alternative nutrition options with her physician and her family. Both Tina and Ron were scheduled to discharge to a skilled nursing facility after discharge from CFH, and directly stated that they worried that they would be unable to communicate with the staff at the new facility and fully participate in their upcoming care needs and decisions.

Given the severity of Ron and Tina's speech deficits it may be expected that the talk time or words per minute of their session would be adversely impacted, at least the SLPs would demonstrate a dominance of talk time to a greater extent than participants like Bill and Henry (who presented with cognitive deficits only). Results from talk time analysis indicate, however, that both Ron and Tina demonstrated similar talk time patterns as the larger (10 participant) group. Both their AAT-ST and Trad-ST sessions were classified as talk-active sessions with a range of 134.32-155.25 WPM for AAT-ST sessions and 123.03 to 132.56 WPM for Trad-ST sessions. Both Ron and Tina occupied approximately 1/3 of the talk time during Trad-ST two-person sessions (33.5% for Ron, 35.1% for Tina), however Tina occupied almost half of the total talk time during the AAT-ST session (47.9%) with three participants in the session. As with all of the other groups discussed above, the SLPs aligned to higher primary participant and handler talk time by decreasing their own talk time. The SLP in Ron's session went from 66% talk time in his Trad-ST session to 38.8 in his AAT-ST session, and in Tina's session the SLP went from a talk time of 64.9% in the Trad-ST session to 19.8 in the AAT-ST session.

As with all of the individual diagnostic groups discussed above, in both Ron and Tina's Trad-ST sessions, the SLP (Jenny for both sessions) demonstrated high relative incidence of

procedural discourse, occurring at more than 3 times the rate of the next highest IDR (72 instances of procedural discourse, 23 conversational narratives in total). Of the 72 instances of procedural discourse identified in Ron and Tina's SLP sessions, only 2 total were initiated by the participants. In the AAT-ST sessions, the combined total of playful episodes for this group (139) occurred at close to twice the frequency of the next highest IDR (81 conversational narratives), with procedural discourse ranking third in frequency (43). Ron and Tina initiated over half of the playful episodes in their 3-member AAT-ST sessions, and over half of the conversational narratives as well. See Figures 5.26 and 5.27 for individual participant display of IDRs for both Ron and Tina's Trad-ST and AAT-ST sessions.

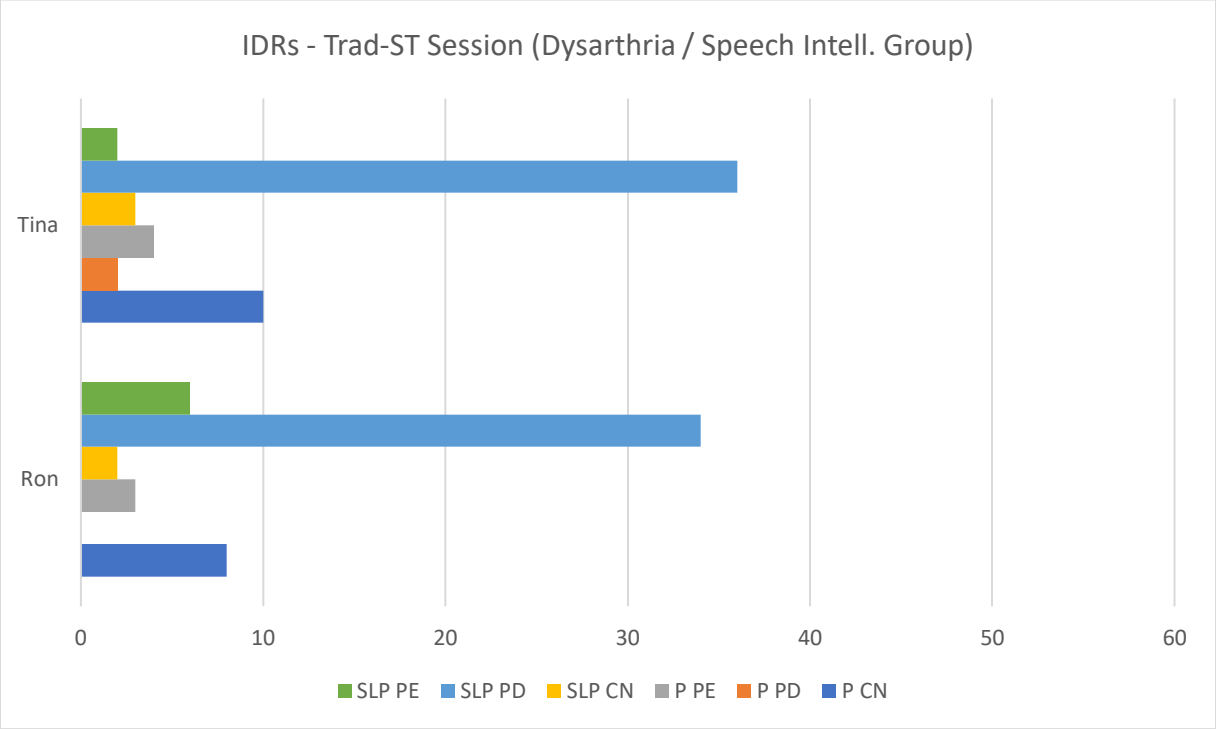


Figure 5.26. IDRs for all participants in Ron and Tina's AAT-ST sessions – organized within each session by initiator of IDR.

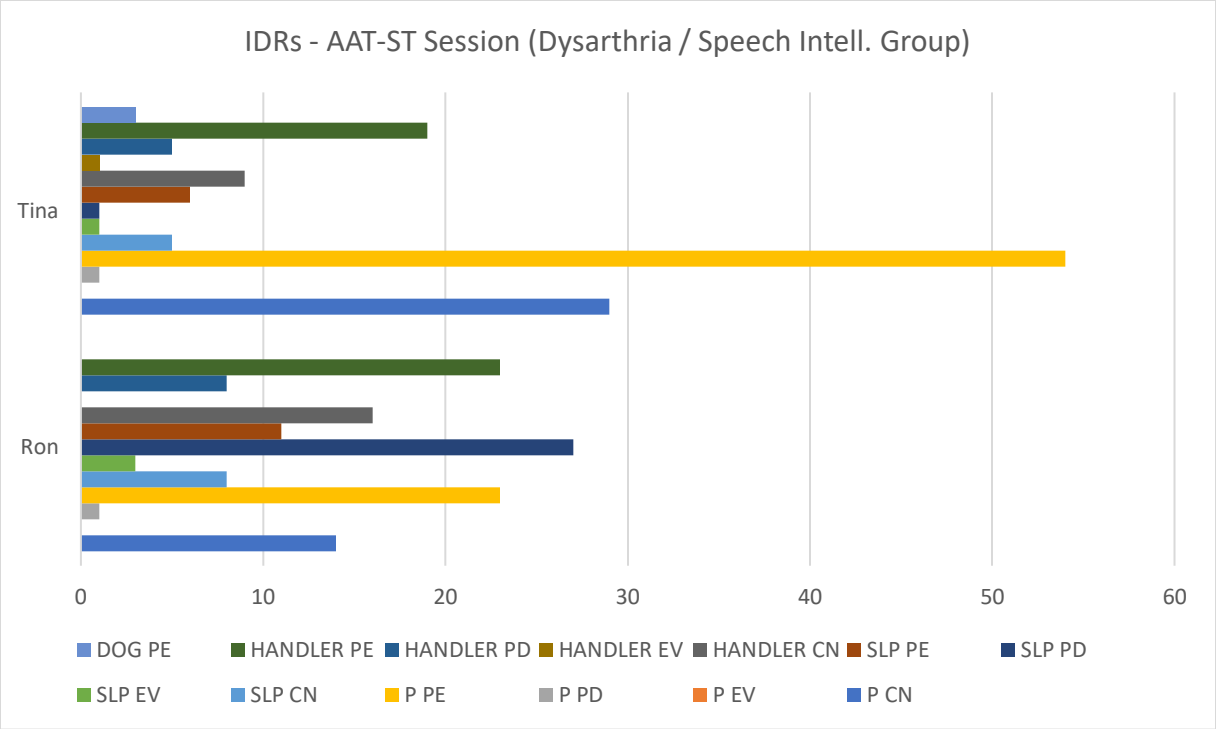


Figure 5.27. IDRs for all participants in Ron and Tina's AAT-ST sessions – organized within each session by initiator of IDR.

In summary, results from each of the individual participants, the diagnostic groups, and the larger/10 participant groups contributed to both the description of the communicative space created during an AAT-ST session, and how the communicative patterns observed in that space differed from those seen in a Trad-ST session. For a more detailed look at individual primary participants including a discussion of their history with animals and how their ST goals were targeted through specific activities in both AAT-ST and Trad-ST sessions, turn to Appendix F for condensed versions of the individual participant profiles created for each primary participant. The results of the situated discourse analysis portion of this study indicate significant differences between the AAT-SLP and SLP sessions in this study with regards to the types and variability of participation roles taken up by participants across sessions. Using Goffman's (1981) concepts of *gatherings*, *participation roles*, and *alignments* as a framework for understanding these participant interactions, we observed different levels of complexity, flexibility, and variation in participation roles and alignments in AAT-ST sessions versus those in Trad-ST sessions.

In this analysis, IDRs were used as proxies for both complex communicative patterns and speaker roles. By attending to the IDRs that are highly pervasive or robust in the across sessions,

we can examine the type of gathering that is taking place, and the roles of the participants. IDRs can be seen as framing events in both types of sessions (AAT-SLP and SLP), and as familiar frames that are weaved into conversation and understood by all participants. The patterns of IDR use, therefore, are reflective of how participants understand the structure of the session, their respective roles in the gathering, and the activity itself. For all primary participants and both SLPs involved in the study it was highly visible that during SLP sessions Jenny and Allison (the SLPs) took on the role of "director" or leader through repeated and pervasive use of procedural discourse (average of 44.9 instances of procedural discourse for SLPs per session). The structure of a traditional (drill-based or otherwise) SLP session establishes the SLP as the expert and the patient as the novice, and the primary participants visibly aligned to this structure by telling fewer stories, initiating fewer playful episodes, and producing very little procedural discourse of their own (average of 1.8 instances of procedural discourse for primary participants per session).

While timing or scheduling of AAT-SLP and SLP-only sessions was not manipulated in any way, it is striking to note that for 9/10 participants, the AAT-SLP session occurred first (before the SLP session). Lower frequency of IDRs, lower MLT, lower percentage of talk time, and less talk-active sessions occurred after patient/clinician rapport had been established, and after clinicians had the opportunity to observe the patterns produced by primary participants in the AAT-SLP sessions. These results indicate the power of the dog in the clinical space as a not only a partner but also as a communication broker, in a way that showed how the dog fundamentally and instantly disrupted the sociocultural space.

By the time the study was initiated, all of the primary participants had received a visit from one of the CFH Therapy Dogs at least once. The AAT-ST session in fact only marked the middle (#2) out of at least 3 Therapy Dog visits during their rehab stay. The histories and experiences created through this repeated contact allowed for complex, multi-layered interactions or *chronotopic lamination* (Prior & Shipka, 2003), in which all participants were able to draw on histories of interactions and activities not only with domesticated animals, but with specific therapy dogs as well. The laminated nature of interaction with animals connected individual participants within and across gatherings through these sociocultural histories and shared life experiences. No one had to be taught how to hold a leash, throw a ball, or pet the dog. All therapy dogs came to the sessions with an understanding of how sessions had occurred in the past, and which activities required what level of training or cooperation on their part. All

participants (canine and human alike) came to the AAT-ST sessions with an understanding of how to interact with each other.

At the conclusion of the AAT-ST session, each and every participant specifically arranged a follow-up "visit" with the therapy dog, and personally chose specific dates and times with the handler present. Two different handlers in two different sessions (Rich and Carol) hadn't planned on making return visits within the week, yet agreed to return within 48 hours for additional visits with primary participants who would be discharging soon. In 8/10 instances it was the primary participants who spontaneously initiated these request for a follow-up visit, and 6/10 primary participants made a joke to the SLP about how much "better" therapy was with a dog in the room. As observed in Sherrill and Hengst (2016), there is value of seeing the dog a second, and even a third time, particularly in that again it adds to, and continues this history of experiences and interactions.

Prior to beginning the individual interviews with primary participants, I spent a few minutes in the primary participants' rooms preparing the audio recording equipment and settling papers and consent forms. During this time, all ten primary participants had different questions about the sequence of events and purpose of the study. One question, however, was asked by every single participant during these first few moments of logistical housekeeping: "When do I get to see the dog?" Clearly, the dog's presence, role, and the power of the human-animal bond brings affordances and components to AAT that simply adding another group member does not, and the sociocultural impact of a lifetime spent with animals cannot be underestimated when discussing the role of animals in therapy.

CHAPTER 6: DISCUSSION

This study aimed to describe the communicative environment displayed during AAT-ST sessions, and to look at how these patterns are the same or different in a Traditional SLP (Trad-ST) session. I also aimed to trace the progress towards meeting departmental and clinician-specific goals for use and advancement of the Therapy Dog program in the rehabilitation unit at CFH. This research design allowed us to develop rich, detailed descriptions of the communicative environments in AAT-ST and Trad-ST sessions for 10 patients with two different clinicians while simultaneously observing the process of both departmental and institutional program development. This chapter will discuss the contributions of this study to conversations in the field of CSD through a description of the individual and group patterns of participation observed in both session types, the distributed nature of communication visible in AAT-ST sessions, and the process by which SLPs were able to adapt and adjust to the affordances of an AAT-ST session to target complex communicative goals.

AAT as a Rich Communicative Environment

I believe that the biggest take-away from this is study is the ability to characterize AAT-ST sessions as rich communicative environments. These sessions were complex interactions that drew on relationships with animals to reflect participants life worlds, histories, and preferences through the human animal bond and a history of interacting with animals. The measures of talk time and IDR use allowed us to speak to the dimension of complexity, with AAT-ST sessions all showing more talk time, more people, and more diversity of IDR use and initiation. AAT sessions are voluntary by definition, and in contrast to ST sessions, participants were able to lead and direct activities in AAT sessions. The dimension of quality was interpreted through signs of affective engagement and requests from participants to repeat the activity, again something not seen during traditional ST sessions. During and through the activity of AAT, the clinical space itself was re-configured as a rich communicative environment. The components of a rich communicative environment described by Hengst et al. (2018) includes variables of complexity, voluntariness, and quality, all of which are flexible, pliable, and highly stimulable in an activity such as AAT that uses multiple modalities, is specifically chosen by participants, and incorporates personal histories and life experiences.

Distributed communication (Hengst, 2003 & 2015) can be used as a foundation for communication interventions that recognize the connections and histories of language across a larger sociocultural scale. In the case of this study, attention to both individual and group histories of participation in the activity (interacting with a dog) is critical to understanding AAT. Using distributed communication to explore communication in the world through an individual and socially relevant lens, we can see how the rich cultural history of human interactions with animals (i.e., the human-animal bond) makes these highly familiar cultural spaces, filled with familiar communicative practices and routines. These principles allow us to explore how tightly controlled clinical spaces can be re-configured as individualized and personally relevant rich communicative environments.

The impact, contribution, and presence of the dog is critical for an understanding of how Hengst's (2015) framework of Distributed Communication makes visible the common ground contributing to the activity of AAT. The history of the human-animal bond and the patterns of interactions all participants brought to the AAT-ST sessions are based on a lifetime of learning, growing, and experiencing animal interactions through both companion animals and animals in the world. In every AAT-ST session we saw the human animal bond visible through the personal and physical stances and alignments between human and animal that drew on histories both in individual sessions and across sessions, and the communal sense of what we know about domesticated dogs and how to interact with them.

Patterns of Communication in AAT-ST and Trad-ST Sessions

One of the main aims of this study was to describe and compare the communicative environment in these two types of ST sessions. Results showed that regardless of patient diagnoses or SLP involved, every participant demonstrated more complex language use, more initiation and diversity of resource use, and more engagement in AAT-ST sessions. Analysis of WPM showed that 8/10 Trad-ST sessions were talk-active environments, with SLPs averaging greater than 2/3 of all talk time for all sessions. In Trad-ST sessions SLPs demonstrated twice the average length of turn as primary participants, and dominated resource use through procedural or directive discourse. This is not surprising, as Trad-ST sessions are designed to limit complexity, increase control, and make it easier for clinicians to document change on specific tasks or targeted skills. Primary participants visibly aligned to this structure by telling fewer stories, initiating fewer playful episodes, and producing very little procedural discourse of

their own. While it could be argued that this structure of expert/novice is to be expected in a therapeutic session in which a professional is targeting specific goals and advancement of discrete skills, it is nonetheless difficult to see how limited variability or complexity of verbal participation from a patient in a therapeutic session leads to flexible communication in the world, or translation of complex communication goals and skills to less structured social settings.

In AAT-ST sessions, however, all AAT-ST sessions (10/10) were talk-active environments in which primary participants used more and varied discourse resource types, used them more frequently, and initiated the use of resources such as narrative use and giving directions more frequently in the AAT-ST sessions than in the Trad-ST sessions. Results show that AAT displayed a complex, flexible, high quality environment in which both robustness and variety of resource use was employed by all group members to align to others in the communicative space, and to contribute through various participation roles. SLPs in particular aligned to and around group members more noticeably in AAT-ST sessions by speaking and directing less. AAT-ST sessions were social situations in which all members of the gathering (including the dog) occupied varied participant roles (e.g., narrator of a story, recipient or listener, initiator of a joke or playful episode, director, reporter or speaker for the dog), and shifted frames to align with and around other group members as they occupied varied roles. In the AAT-ST sessions patients' previous histories and life experiences allowed them to tell personal stories and give directions to the dog as an expert or group leader, a role highly uncommon for patients in a clinical space.

Primary participants were not the only group members to align and contribute more socially during AAT-SLP sessions, as SLPs not only occupied less overall talk time, but they also demonstrated fewer uses of procedural discourse, and also more frequently took up the role of narrator and contributor to playful exchanges. Group members aligned to and around each other, and patients' previous histories and life experiences even allowed for the use of multi-species changes in footings through the use of envoicing. These gatherings were laminated, flexible, and dynamic, and made visible a functional system that responded to individual interactions and group needs or affordances. This complexity was visible for participants across all diagnostic categories (e.g., aphasia, cognitive impairments, dysarthria), and therefore should be examined further for patients with mixed or concomitant disorders. The methods of data collection utilized in this study allowed us to observe and describe the specific tasks and

activities used by SLPs during both Trad-ST and AAT-ST sessions. I have found no similar evidence in AAT literature of this type of description and connection to goals, which is what will allow us to talk about the activity as interaction with and around the dog, not the dog interjected into the same activities completed in the traditional ST sessions, and will lend credibility to the claim that STs were targeting specific goals.

The addition of a gesture code for the dog in this study was the first step in this line of research for recognizing and drawing attention the individual dog's contributions, personalities, roles, and alignments visible in AAT-ST sessions. Prior to the use of this code (in Sherrill and Hengst, 2016) we identified the dog's large gestures or movements and his or her audible sounds, and they were identified and coded below the visible line of talk for other participants. Upon extended reflection, I believe this choice, and this privileging of the human experience had to do with how I see the role of the dog, as more of a therapist than participant. This leads me to background their participation as a representation of "their job," as a communication broker and a partner capable of bringing the variables of a rich communicative environment into any space they occupy. The use of the dog code developed for this project, however, required all transcribers, coders, and data handlers to specifically attend to the alignments and initiations of the dog, and the role they played as a participant capable of utilizing and employing communicative resources (e.g., initiating or participating in a playful episode, initiating a gesture). This code was constructed based on research from decades of study of canine behavior, but it was also instantly recognizable by research assistants familiar with their own pets' behaviors. Transcribers and coders very quickly caught onto identifying attention-seeking gestures and movements from the dog, and describing changes in alignments and participant roles based on their own histories of interaction with animals. Attention to, and representation of, the dogs' role in these sessions will require continued attention and multi-disciplinary collaboration as I move forward with this research line.

Clinician-Specific Goals and Clinical Implications

One of the primary aims of this study was to trace and observe the process of using AAT to target discipline-specific goals in a department (ST) that rarely used their Therapy Dog program but was interested in capitalizing on its potential. Despite their initial concerns, both of the SLPs in this study embraced the complexity of interactions with the therapy dog, expressed no concerns about it, and did not appear to try to control it during AAT-ST sessions. Both of the

SLPs in this study were able to seamlessly target specific cognitive-communicative goals during AAT-ST sessions very early on in the process of data collection. Both SLPs were able to align and adjust to shifting participation roles, and were able to comfortably take a less directive role in AAT-ST sessions. Traditional therapy practices attempt to limit or control complexity; however, in this study the SLPs demonstrated the ability to marshal complexity to meet a wide variety of patient needs and goals. Again, if the over-arching, ultimate goal of SLP intervention is to help patients use language in flexible and highly complex ways in everyday social situations, AAT-ST sessions were better representations of rich and complex communicative environments. It is possible that the effect of the dog as a communication broker altered the SLPs clinical practices, and encouraged them to participate more as partners rather than directors or leaders.

Despite the increased confidence success noted and reported by both SLPs, it is interesting to note that while timing or scheduling of AAT-ST and Trad-ST sessions was not manipulated in any way, for 9/10 participants, the AAT-ST session occurred first (before the Trad-ST session). Lower frequency and diversity of IDR use, lower MLT, and lower percentage of talk time for primary participants during their Trad-ST sessions therefore occurred after this patient/clinician rapport had been established, and after clinicians had the opportunity to observe the patterns and communicative behaviors of primary participants in the AAT-ST sessions. The field of CSD has a long road ahead in training clinicians to attend to patterns of complexity, and our role in enriching communicative spaces as an aspect of clinical practice.

At this point I must return to the fragility of this program, illustrated so poignantly by the fact that the AAT program at the core of this study is no longer in full operation. These programs run on the passion of volunteers, and in the case of this particular AAT program, sometimes they run primarily on the commitment of just one individual. It is clear that to be sustainable AAT programs will require not only the well-wishes of institutional administration and the appreciation of the clinicians, but also an awareness of the value of the program to the larger institution demonstrated through the allotment of financial and staff support. Consumer satisfaction with healthcare services drives care more now than it ever has before, and programs such as AAT have clear potential for impacting patients' experiences and provider choices.

This leads to the final point in this argument, that if the ultimate goal of intervention is to maximize communicative flexibility in the world, then as a discipline we should be looking at

integration of activities into clinical spaces rather than translation of tasks to the outside world. AAT is an example of an activity that, through a focus on integrating or bringing the world into clinical practice rather than translating or directing out, allows both participants and clinicians to draw upon the complexity and recognition of participant histories needed for successful social communication.

Future Directions

The primary focus of the discussion was the potential for AAT to reconfigure the clinical space as a rich communicative environment (Hengst et al., 2018) for all participants involved. It is important to stress the "all participants involved" portion, because an unexpected but noted result of the PAR component was documentation of repeated statements from the SLPs that they not only got to know their patients better, but enjoyed and highly valued the opportunity for their patients to take the lead at various times of the AAT-ST sessions. As this line of research moves forward, plans include replication studies utilizing ethnographic data collection methods and PAR components to further study the advancement of AAA programs into AAT programs that can be utilized directly during SLP sessions. Plans also include seeking out the places and programs that are already incorporating principles of rich communicative environments, and examining the situations and structures in place. In both Sherrill and Hengst (2016) and in this current study, all administrators reported that a crucial component of any complex or individualized treatment is "buy-in" from therapists, and given the noted fragility of this program, further exploration of the institutional support needs will be an important area of examination.

This study has noted implications for the current clinical training and education practices in the field of CSD, and has the potential to provide a reflexive opportunity to examine the types of goals being set for adults with acquired disorders, and the ways we approach functional or everyday communicative interventions. The dog was a single variable that disrupted the environment for all participants and fundamentally changed the sociocultural space. The ability to describe the complexity, voluntariness, and quality of activities will also provide insight into how to attend to those dimensions across populations and rehabilitation settings. It will also be valuable in the future to examine instances of push-back from therapists who don't know how to or are not interested in incorporating components of rich communicative environments into their treatment plans, particularly as the evidence base grows for implementation of complex and

socially relevant treatments. The only constant in the field of healthcare is the rapidity with which it changes, and the process of designing clinical spaces that maximize both the relevance and the opportunities for patients should be a perpetual focus of our field.

REFERENCES

Adams, D. (1997). Animal-assisted enhancement of speech therapy: A case study. *Anthrozoös* 10(1): 53-56.

Agha, A. (2004). Registers of language. In A. Duranti (Ed.), *A companion to linguistic anthropology* (pp. 23-45). Oxford: Blackwell.

American Kennel Club (AKC). (2018, August). AKC recognized therapy dog organizations. Retrieved from: https://petpartners.org/about-us/petpartners-story/.

All, A., & Loving, G. (1999). Animals, horseback riding, and implications for rehabilitation therapy. *Journal of Rehabilitation, 65*(3), 49-57.

Aloff, B. (2005). *Canine body language: a photographic guide*. Wenatchee, WA: Dogwise Publishing.

American Speech-Language-Hearing Association. (2008). *Clinical supervision in speech-language pathology* [Technical Report]. Retrieved from: https://www.asha.org/policy/tr2008-00296/.

American Speech-language Hearing Association (2017, December). Evidence based practice (EBP). Retrieved from: http://www.asha.org/Research/EBP/.

American Veterinary Medical Association (2012). *U.S pet ownership and demographics sourcebook.* Retrieved (2017) from: https://www.avma.org/KB/Resources/Statistics/Pages/Market-research-statistics-US-Pet-Ownership-Demographics-Sourcebook.aspx.

Amiot, C., & Bastian, B. (2015). Toward a psychology of human–animal relations. *Psychological Bulletin, 141*(1), 6.

Amiot, C., Bastian, B., & Martens, P. (2016). People and companion animals: It takes two to tango. *BioScience*, *66*(7), 552–560.

Anderson, J. (1988). *The supervisory process in speech language pathology and audiology*. Austin, TX: Pro-Ed.

Arluke, A. (1996). *Regarding animals*. Philadelphia, PA: Temple University Press.

Aten, J., Caligiuri, M., & Holland, A. (1982). The efficacy of functional communication therapy for chronic aphasic patients. *Journal of Speech and Hearing Disorders, 47*(1), 93-96.

Attardo, S., Pickering, L., & Baker, A. (2011). Prosodic and multimodal markers of humor in conversation. *Pragmatics & Cognition, 19*(2), 224-247.

Bakhtin, M. (1981). *The dialogic imagination: Four essays by M. M. Bakhtin*. C. Emerson & M. Holquist (Eds.). Austin, TX: University of Texas Press.

Baldwin, M. (2012). Participatory action research. In M. Gray, J. Midgley, & S. Webb. (Eds.). *The SAGE handbook of social work*. Thousand Oaks, CA: Sage.

Bardill, N., & Hutchinson, S. (1997). Animal-assisted therapy with hospitalized adolescents. *Journal of Child Adolescent Psychiatric Nursing, 10*(1), 17-24.

Bass, M., Duchowny, C., & Llabre, M. (2009). The effect of therapeutic horseback riding on social functioning in children with autism. *Journal of Autism and Developmental Disorders, 39*(9), 1261-1267.

Beck, A, & Katcher, A. (1996). *Between pets and people : the importance of animal companionship*. West Lafayette, IN: Purdue University Press.

Beck, A., & Katcher, A. (2003). Future directions in human-animal bond research. *American Behavioral Scientist, 47*(1), 79-93.

Beck, A. (2014). The biology of the human–animal bond. *Animal Frontiers*, *4*(3), 32-36.

Bekoff, M. (1974). Social play and play-soliciting by infant canids. *American Zoologist*, *14*(1), 323-340.

Ben-Aderet, T., Gallego-Abenza, M., Reby, D., & Mathevon, N. (2017). Dog-directed speech: Why do we use it and do dogs pay attention to it? *Proceedings of the Royal Society B: Biological Sciences*, *284*(1846).

Benjamin, A., & Slocombe, K. (2018). 'Who's a good boy?!': Dogs prefer naturalistic dog-directed speech. *Animal Cognition*, *21*(3), 353-364.

Bernabei, V., De Ronchi, D., La Ferla, T., Moretti, F., Tonelli, L., Ferrari, B., Atti, A. (2013). Animal-assisted interventions for elderly patients affected by dementia or psychiatric disorders: a review. *Journal of Psychiatric Research, 47*(6), 762-773.

Berry, A., Borgi, M., Terranova, L., Chiarotti, F., Alleva, E., & Cirulli, F. (2012). Developing effective animal-assisted intervention programs involving visiting dogs for institutionalized geriatric patients: A pilot study. *Psychogeriatrics*, *12*(3), 143-150.

Bizub, A., Joy, A., & Davidson, L. (2003). "It's like being in another world": Demonstrating the benefits of therapeutic horseback riding for individuals with psychiatric disability. *Psychiatric Rehabilitation Journal, 26*(4), 377-384.

Blazina, C., Boyra, G., & Shen-Miller, D. (2011). *The psychology of the human-animal bond*. New York, NY: Springer.

Bloom, R. L., Obler, L. K., De Santi, S., & Ehrlich, J. S. (2013). *Discourse analysis and applications: Studies in adult clinical populations*. New York, NY: Psychology Press.

Brookshire, R. & Nicholas, L. (1995). Performance deviations in the connected speech of adults with no brain damage and adults with aphasia. *American Journal of Speech Language Pathology, 4*(4), 118-123.

Bonas, S., McNicholas, J., & Collis, G. (2000). Pets in the network of family relationships: An empirical study. In A. Podberscek, E. Paul, & J. Serpell (Eds.), *Companion animals and us: Exploring the relationships between people and pets* (pp. 209-236). Cambridge, UK: Cambridge University Press.

Bradley, E., Curry, L., & Devers, K. (2007). Qualitative data analysis for health services research: developing taxonomy, themes, and theory. *Health Services Research, 42*(4), 1758-1772.

Bradshaw, J., & Nott, H. (1995). Social and communication behaviour of companion dogs. In J. Serpell (Ed.) *The domestic dog: Its evolution, behaviour and interactions with people* (pp.115-130). Cambridge, UK: Cambridge University Press.

Burnham, D., Kitamura, C., & Vollmer-Conna, U. (2002). What's new, pussycat? On talking to babies and animals. *Science, 296*(5572), 1435-1435.

Carslisle-Frank, P., & Frank, J. (2006). Owners, guardians, and owner-guardians: Differing relationships with pets, *Anthrozoös, 19*(3), 225-242.

Chapey, R., Duchan, R., Elman, R., Garcia, L., Kagan, A., Lyon, J., & Simmons-Mackie, N. (2008). Life participation approach to aphasia: A statement of values for the future. In R. Chapey (Ed.), *Language intervention strategies in aphasia and related neurogenic communication disorders* (5th ed., pp. 279-289). Philadelphia, PA: Lippincott, Williams, & Wilkins.

Clark, H., & Brennan, S. (1991). Grounding in communication. *Perspectives on Socially Shared Cognition*, *13*(1991), 127-149.

Cole, K., Gawlinski, A., Steers, N., & Kotlerman, J. (2007). Animal-assisted therapy in patients hospitalized with heart failure. *American Journal of Critical Care, 16*(6), 575-585.

Cole, M. (1998). *Cultural psychology: A once and future discipline*. Cambridge, MA: Harvard University Press.

Correia, L., Brookshire, R., & Nicholas, L. (1990). Aphasic and non-brain-damaged adults' descriptions of aphasia test pictures and gender-biased pictures. *Journal of Speech and Hearing Disorders, 55*(4), 713-720.

Crooke, P. & Olswang, L. (2015). Practice-based research: Another pathway for closing the research–practice gap. *Journal of Speech, Language, and Hearing Research, 58*(6), S1871-S1882.

Crystal D. (1998). *Language play*. Chicago, IL: University of Chicago Press.

Dahlqvist, P., Ronnback, A., Bergstrom, S., Soderstrom, I., & Olsson, T. (2004). Environmental enrichment reverses learning impairment in the Morris water maze after focal cerebral ischemia in rats. *European Journal of Neurosciences*, 19, 2288–2298.

Damico, J., Simmons-Mackie, N., & Schweitzer, L. (1995). Addressing the third law of gardening: Methodological alternatives in aphasiology. *Clinical Aphasiology,* 23, 83-93.

Damico, J., Simmons-Mackie, N., Oelschlaeger, M., Elman, R., & Armstrong, E. (1999). Qualitative methods in aphasia research: Basic issues. *Aphasiology, 13*(9-11), 651-665.

Damschroder, L., Aron, D., Keith, R., Kirsh, S., Alexander, J., & Lowery, J. (2009). Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science. *Implementation Science, 4*(1), 50.

Darley, F., Aronson, A., & Brown, J. (1969). Differential diagnostic patterns of dysarthria. *Journal of Speech, Language, and Hearing Research, 12*(2), 246-269.

Davis, B., & Maclagan, M. (2010). Pauses, fillers, placeholders and formulaicity in Alzheimer's discourse. In N. Amiridze, B. Davis, & M. Maclagan (Eds.), *Fillers, pauses and placeholders* (pp. 189-215). Philadelphia, PA: John Benjamins.

Duranti, A., & Goodwin, C. (1992). *Rethinking context: Language as an interactive phenomenon*. Cambridge, UK: Cambridge University Press.

Elman, R. J., & Bernstein-Ellis, E. (1999). The efficacy of group communication treatment in adults with chronic aphasia. *Journal of Speech, Language and Hearing Research, 42*(2), 411-419.

Enders-Slegers, M. (2000). The meaning of companion animals: Qualitative analysis of the life histories of elderly cat and dog owners. In A. Podberseck, E. Paul, & J. Serpell (Eds.), *Companion animals and us: Exploring the relationships between people and pets* (pp. 237-256). New York, NY: Cambridge University Press.

Engeström, Y., Miettinen, R., & Punamäki, R. (1999). *Perspectives on activity theory*. New York, NY: Cambridge University Press.

Engeström, Y. (2000). Activity theory as a framework for analyzing and redesigning work. *Ergonomics,* 43(7), 960-974.

Esposito, L., McCune, S., Griffin, J., & Maholmes, V. (2011). Directions in human–animal interaction research: Child development, health, and therapeutic interventions. *Child Development Perspectives, 5*(3), 205-211.

Fick, K. (1993). The influence of an animal on social interactions of nursing home residents in a group setting. *The American Journal of Occupational Therapy, 47*(6), 529-534.

Fine, M., Torre, M., Boudin, K., Bowen, I., Clark, J., Hylton, D., Migdalia Martinez, M., Roberts, R., Smart, P., & Upegui., D. (2003). Participatory action research: from within and beyond prison bars. In P. Camic, J. Rhodes, & L. Yardley (Eds.), *Qualitative research in psychology: xpanding perspectives in methodology and design* (pp. 95-120). Washington, D.C: American Psychological Association.

Fine, A., & Beiler, P. (2008). Therapists and animals: Demystifying AAT. In A. Strozier, & J. Carpenter (Eds.), *Introduction to alternative and complimentary therapies*. New York: The Hawthorne Press.

Fine, A. H. (Ed.). (2015). *Handbook on animal-assisted therapy: Foundations and guidelines for animal-assisted interventions (*4th ed.). Cambridge, MA: Academic Press.

Fine, A. H., & Beck, A. M. (2015). Understanding our kinship with animals: Input for health care professionals interested in the human–animal bond. In A. Fine (Ed.), *Handbook on animal-assisted therapy: Foundations and guidelines for animal-assisted interventions (*4th ed., pp. 3-10). Cambridge, MA: Academic Press.

Friedmann, E., Katcher, A., Thomas, S., Lynch, J., & Messent, P. (1983). Social interaction and blood pressure. Influence of animal companions. *Journal of Nervous and Mental Disease, 171*(8), 461-465.

Friedmann, E., Thomas, S., & Eddy, T. (2000). Companion animals and human health: Physical and cardiovascular influences. In A. Podberscek, E. Paul, & J. Serpell, (Eds.), *Companion animals and us: Exploring the relationships between people and pets* (pp. 125-142). Cambridge, NY: Cambridge University Press.

Friedmann, E., & Son, H. (2009). The human–companion animal bond: how humans benefit. *Veterinary Clinics of North America: Small Animal Practice, 39*(2), 293-326.

Friesen, L. (2010). Exploring animal-assisted programs with children in school and therapeutic contexts. *Early Childhood Education Journal, 37*(4), 261-267.

Geist, T. (2011). Conceptual framework for animal assisted therapy. *Child and Adolescent Social Work Journal, 28*(3), 243-256.

Geisler, A. M. (2004). Companion animals in palliative care: Stories from the bedside. *American Journal of Hospice and Palliative Medicine, 21*(4), 285-288.

Geller, E. (2002). A reflective model of supervision in speech-language pathology: Process and practice. *The Clinical Supervisor*, *20*(2), 191-200.

Giaquinto, S., & Valentini, F. (2009). Is there a scientific basis for pet therapy? *Disability and Rehabilitation*, *31*(7), 595-598.

Goffman, E. (1981). *Forms of talk*. Philadelphia, PA: University of Pennsylvania Press.

Goodglass, H., & Kaplan, E. (1972). *Boston Diagnostic Aphasia Examination (BDAE)*. Philadelphia, PA: Lea & Febiger.

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today*, *24*(2), 105-112.

Greene, J. C. (2007). *Mixed methods in social inquiry* (Vol. 9). John Wiley & Sons.

Hall, P., & Malpus, Z. (2000). Pets as therapy: effects on social interaction in long-stay psychiatry. *British Journal of Nursing*, *9*(21), 2220-2225.

Hebb, D.O. (1949) *The organization of behavior: a neuropsychological theory*. New York,NY: Wiley.

Helm-Estabrooks, N., & Albert, M. (1991). *Manual of aphasia therapy*. Austin, TX: Pro Ed.

Hengst, J. (2001). *Collaborating on reference: A study of discourse and aphasia* (Unpublished doctoral dissertation). University of Illinois at Urbana-Champaign, Champaign, IL.

Hengst, J. (2003). Collaborative referencing between individuals with aphasia and routine communication partners. *Journal of Speech, Language and Hearing Research, 46*, 831-848.

Hengst, J. (2006). "That mea::n dog": Linguistic mischief and verbal play as a communicative resource in aphasia. *Aphasiology*, *20*(2-4), 312-326.

Hengst, J. (2010). Semiotic remediation, conversational narratives and aphasia. In P. Prior & J. Hengst (Eds.), *Exploring semiotic remediation as discourse practice* (pp. 107-138). New York, NY: Palgrave MacMillan.

Hengst, J. (2015). Distributed communication: Implications of cultural-historical activity theory (CHAT) for communication disorders. *Journal of Communication Disorders*, *57*, 16-28.

Hengst, J., & Duff, M. (2007). Clinicians as communication partners: Developing a mediated discourse elicitation protocol. *Topics in Language Disorders, 27*(1), 37.

Hengst, J., Duff, M., & Jones, T. (2018). Enriching communicative environments: Leveraging advances in neuroplasticity for improving outcomes in neurogenic communication

disorders. *American Journal of Speech Language Pathology*, [Advance online publication], 1-14.

Hengst, J., Duff, M., & Dettmer, A. (2010). Rethinking repetition in therapy: Repeated engagement as the social ground of learning. *Aphasiology, 24*(6-8), 887-901.

Hengst, J., Duff, M., & Prior, P. (2008). Multiple voices in clinical discourse and as clinical intervention. *International Journal of Language and Communication Disorders, 43*(sup1), 58-68.

Hengst, J., Frame, S., Neuman-Stritzel, T., & Gannaway, R. (2005). Using others' words: Conversational use of reported speech by individuals with aphasia and their communication partners. *Journal of Speech, Language, and Hearing Research, 48*(1), 137-156.

Hengst, J., & Miller, P. (1999). The heterogeneity of discourse genres: Implications for development. *World Englishes, 18*(3), 325-342.

Hengst, J., McCartin, M., Valentino, H., Devanga, S., & Sherrill, M. (2016). Mapping communicative activity: A chat approach to design of pseudo-intelligent mediators for augmentative and alternative communication (AAC). *Outlines. Critical Practice Studies, 17*(1), 05-38.

Heron, J., & Reason, P. (2001). The practice of co- operative inquiry: Research 'with' rather than 'on' people. In P. Reason & P. Bradbury (Eds), *Handbook of action research: Participative inquiry and practice*. London, UK: Sage.

Hirsh-Pasek, K., & Treiman, R. (1982). Doggerel: motherese in a new context. *Journal of Child Language, 9*(01), 229-237.

Ho, D., & Whitehill, T. (2009). Clinical supervision of speech-language pathology students: Comparison of two models of feedback. *International Journal of Speech-Language Pathology, 11*(3), 244-255

Holland, A. (1998). Why can't clinicians talk to aphasic adults? Comments on supported conversation for adults with aphasia: Methods and resources for training conversational partners. *Aphasiology, 12*(9), 844-847.

Holland, A. (2007). *Counseling in communication disorders*: San Diego, CA: Plural Publishing.

Holland, A., & Nelson, R. (2013). *Counseling in communication disorders: A wellness perspective*. San Diego, CA: Plural Publishing.

Hooker, S. D., Freeman, L. H., & Stewart, P. (2002). Pet therapy research: A historical review. *Holistic Nursing Practice, 17*(1), 17-23.

Holzman, L. (2009). *Vygotsky at work and play.* London, UK: Routledge.

Hosey, G., & Melfi, V. (2014). Human-animal interactions, relationships and bonds: a review and analysis of the literature. *International Journal of Comparative Psychology, 27*(1).

Howe, T., Worrall, L., & Hickson, L. (2004). What is an aphasia-friendly environment? *Aphasiology, 18*(11), 1015-1037.

Howe, T., Worrall, L., & Hickson, L. (2008). Interviews with people with aphasia: Environmental factors that influence their community participation. *Aphasiology, 22*(10), 1092-1120.

Hutchins, E. (1995). *Cognition in the wild*: Cambridge, MA: MIT press.

Jalongo, M., Astorino, T., & Bomboy, N. (2004). Canine Visitors: The influence of therapy dogs on young children's learning and well-being in classrooms and hospitals. *Early Childhood Education Journal, 32*(1), 9-16.

Journal of the American Veterinary Medical Association (JAMA) (1998). Statement from the committee on the human-animal bond. *Journal of the American Veterinary Medical Association, 212*(11), 1675.

Jeannin, S., Gilbert, C., & Leboucher, G. (2017). Effect of interaction type on the characteristics of pet-directed speech in female dog owners. *Animal Cognition, 20*(3), 499-509.

Jegatheesan, B., Beetz, A., Choi, G., Dudzik, C., Fine, A., Garcia, R, Johnson, R., Ormerod, E., Winkle, M., & Yamazaki, K. (2014). *The IAHAIO definitions for animal assisted intervention and animal assisted activity and guidelines for wellness of animals involved.* Paper presented at the IAHAIO Annual Symposium and AGM. Amsterdam, Netherlands.

Johnson, T., Garrity, T., & Stallones, L. (1992). Psychometric evaluation of the Lexington attachment to pets scale (LAPS). *Anthrozoös, 5*(3), 160-175.

Jorgenson, J. (1997). Therapeutic use of companion animals in health care. *Image: the Journal of Nursing Scholarship, 29*(3), 249-254.

Kagan, A. (1998). Supported conversation for adults with aphasia: Methods and resources for training conversation partners. *Aphasiology, 12*(9), 816-830.

Kahn, P. (1997). Developmental psychology and the biophilia hypothesis: Children's affiliation with nature. *Developmental Review*, 17, 1–61.

Kellert, S., & Wilson, E. (Eds.). (1993). *The biophilia hypothesis*. Washington, DC: Island Press.

Kempermann, G., Kuhn, H., & Gage, F. (1997). More hippocampal neurons in adult mice living in an enriched environment. *Nature, 386*(6624), 493.

Kirksey, S., & Helmreich, S. (2010). The emergence of multispecies ethnography. *Cultural Anthropology*, *25*(4), 545-576.

Kendon, A. (2004). *Gesture: Visible action as utterance*. Cambridge, UK: Cambridge University Press.

Kertesz, Andrew. (1982). *The western aphasia battery.* New York, NY: Grune & Stratton.

Kleim, J., & Jones, T. (2008). Principles of experience-dependent neural plasticity: Implications for rehabilitation after brain damage. *Journal of Speech, Language, and Hearing Research, 51*(1), S225-S239.

Komitova, M., Zhao, L., Gido, G., Johansson, B., & Eriksson, P. (2005). Postischemic exercise attenuates whereas enriched environment has certain enhancing effects on lesion-induced subventricular zone activation in the adult rat. *European Journal of Neuroscience*, 21, 2397–2405.

Kovarsky, D., Kimbarow, M., & Kastner. (1999). The construction of incompetence during group treatment with traumatically brain injured adults. In D. Kovarsky, J. Duchan, & M. Maxwell, M. (Eds.), *Constructing (in)competence: Disabling evaluations in clinical and social interaction* (pp. 291–311). Mahwah, NJ: Erlbaum.

Kruger, K., & Serpell, J. (2000) Animal-assisted interventions in mental health: definitions and theoretical foundations. In A. Fine (Ed), *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice* (pp. 33-48). San Diego, CA: Academic.

Labov, W. (1972). *Sociolinguistic patterns*. Philadelphia, PA: University of Pennsylvania Press.

LaFrance, C., Garcia, L., & Labreche, J. (2007). The effect of a therapy dog on the communication skills of an adult with aphasia. *Journal of Communication Disorders, 40*(3), 215-224.

LaJoie, K. (2003). An evaluation of the effectiveness of using animals in therapy. (Unpublished doctoral dissertation, University Microfilms No. 3077675). Spalding University, Louisville, KY.

Latour, B. (2005). *Reassembling the social: An introduction to actor-network-theory*. New York, NY: Oxford University Press.

Lave, J., Wenger, E., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, MA: Cambridge University Press.

Leahy, M. M. (2004). Therapy talk: Analyzing therapeutic discourse. *Language, speech, and hearing services in schools*, *35*(1), 70-81.

Leont'ev, A. N. (1981). *Problems of the development of the mind*. Moscow: Progress Publishers.

Levinson, B. M. (1969). *Pet-oriented child psychotherapy.* Springfield, IL: Charles C. Thomas.

Linacre, J., Heinemann, A., Wright, B., Granger, C., & Hamilton, B. (1994). The structure and stability of the Functional Independence Measure (FIM). *Archives of Physical Medicine and Rehabilitation*, 75(2), 127-132.

Lucy, J., & Lucy, L. (Eds.). (1993). *Reflexive language: Reported speech and metapragmatics*. Cambridge, UK: Cambridge University Press.

Luria, A. (1963). Restoration of function after brain injury. Oxford, UK: Pergamon Press.

Luria, A. (1970). The functional organization of the brain. *Scientific American*, *222*(3), 66-79.

Luria, A. (1976). *The working brain: An introduction to neuropsychology*. New York, NY: Basic Books.

Macauley, B. (2006). Animal-assisted therapy for persons with aphasia: A pilot study. *Journal of Rehabilitation Research and Development, 43*(3), 357-365.

Macauley, B. L., & Gutierrez, K. M. (2004). The effectiveness of hippotherapy for children with language-learning disabilities. Communication Disorders Quarterly, 25(4), 205-217.

Mallon, G. (1994). Some of our best therapists are dogs. *Child and Youth Care Forum, 23*, 89-101.

Martin, F., & Farnum, J. (2002). Animal-assisted therapy for children with pervasive developmental disorders. *Western Journal of Nursing Research*, *24*(6), 657-670.

McCardle, P. (Ed.). (2011). *Animals in our lives: Human-animal interaction in family, community, and therapeutic settings*. Baltimore, MD: Paul H. Brookes.

McCrea, E., & Brasseur, J. (2003). *The supervisory process in speech-language pathology and audiology*. Boston, MA: Allyn and Bacon.

McHugh, S. (2004). *Dog*. London, UK: Reaktion Books.

McIntyre, A. (2007). *Participatory action research* (Vol. 52). Thousand Oaks, CA: Sage Publications.

McNeil, M. R., & Pratt, S. R. (2001). Defining aphasia: Some theoretical and clinical implications of operating from a formal definition. *Aphasiology*, *15*(10-11), 901-911.

McNeill, D. (1992). *Hand and mind: What gestures reveal about thought*. Chicago, IL: University of Chicago press.

Melson, G. (2001). *Why the wild things are: Animals in the lives of children*. Cambridge, MA: Harvard University Press.

Melson, G. (2008). Children in the living world: Why animals matter for children's development. In A. Fogel, B. King, & S. Shanker (Eds.), *Human development in the twenty-first century: Visionary ideas from systems scientists* (pp. 147–154). New York, NY: Cambridge University Press.

Middleton, E. & Schwartz, M. (2013). Learning to fail in aphasia: An investigation of error learning in naming. *Journal of Speech Language Hearing Research,* 56(4), 1287-1297.

Miklósi, A., Polgárdi, R., Topál, J., & Csányi, V. (2000) Intentional behavior in dog-human communication: an experimental analysis of "showing" behavior in the dog. *Animal Cognition* (3), 159–166.

Mills, D., & Hall, S. (2014). Animal-assisted interventions: making better use of the human-animal bond. *Veterinary Record, 174*(11), 269-273.

Miller, E., & Wallis, J. (2009). Executive function and higher-order cognition: Definition and neural substrates. *Encyclopedia of Neuroscience*, *4*(99-104).

Miller, P., Hengst, J., & Wang, S. (2003). Ethnographic methods: Applications from developmental cultural psychology. In P. Camic, J. Rhodes, & L. Yardley (Eds.), *Qualitative research in psychology: Expanding perspectives in methodology and design.* Washington, D.C, US: American Psychological Association.

Mitchell, R. (2001). Americans' talk to dogs: Similarities and differences with talk to infants. *Research on Language and Social Interaction, 34*(2), 183-210.

Mitchell, R., & Edmonson, E. (1999). Functions of repetitive talk to dogs during play: Control, conversation, or planning? *Society and Animals, 7*(1), 55.

Mittman, B. (2014). *Developing an integrated implementation research agenda: Guidance from prevailing frameworks* [PowerPoint Slides and Transcript]. Retrieved from https://cred.pubs.asha.org/article.aspx?articleid=2239573.

Murray, M. (2003). Narrative psychology and narrative analysis. In P. Camic, J. Rhodes, & L. Yardley (Eds.). *Qualitative research in psychology: Expanding perspectives in methodology and design* (pp. 95-111). Washington, D.C, USA: American Psychological Association.

Murrey, G. J. (2006). *Alternate therapies in the treatment of brain injury and neurobehavioral disorders: A practical guide.* New York, NY: Routledge.

Myers, G. (1999). Functions of reported speech in group discussions. *Applied Linguistics*, *20*(3), 376-401.

Nightingale, F. (1946). Notes on nursing: What it is, and what it is not. Philadelphia: J.B. Lippincott Co.

Norris, S., & Jones, R. (Eds.). (2005). *Discourse in action: Introducing mediated discourse analysis*. London, UK: Routledge.

Olswang, L., & Prelock, P. (2015). Bridging the gap between research and practice: Implementation science. *Journal of Speech, Language, and Hearing Research, 58*(6), S1818-S1826.

Ozanne, J., & Saatcioglu, B. (2008). Participatory action research. *Journal of Consumer Research, 35*(3), 423-439.

Pet partners (2018, August). Our history - the pet partners story. Retrieved from https://petpartners.org/about-us/petpartners-story/.

Pet Partners, (2018, August). Pet partners at your facility. Retrieved from https://petpartners.org/learn/pet-partners-at-your-facility/.

Prior, P. (1998). *Writing/disciplinarity: A sociohistoric account of literate activity in the academy*. Mahweh, NY: Lawrence Erlbaum.

Prior, P., & Schaffner, S. (2011). Bird identification as a family of activities: Motives, mediating artifacts, and laminated assemblages. *Ethos, 39*(1), 51-70.

Prior, P., & Shipka, J. (2003). Chronotopic lamination: Tracing the contours of literate activity. *Writing selves, writing societies: Research from activity perspectives*, 180-238.

Raymer, A., Beeson, P., Holland, A., Kendall, D., Maher, L., Martin, N., Murray, L., Rose, M., Thompson, C., Turkstra, L., Altman, L., Boyle, M., Conway, T., Hula, W., Kearns, K., Rapp, R., Simmons-Mackie, N., & Gonzalez Rothi, L. (2008). Translational research in aphasia: From neuroscience to neurorehabilitation. *Journal of Speech Language Hearing Research, 51*(1), S259-275.

Reason, P., and Bradbury, H. (Eds.). (2006). *Handbook of action research*. London, UK: Sage.

Redefer, L., & Goodman, J. (1989). Brief report: Pet-facilitated therapy with autistic children. *Journal of Autism and Developmental Disorders, 19*(3), 461-467.

Richeson, N. (2003). Effects of animal-assisted therapy on agitated behaviors and social interactions of older adults with dementia. *American Journal of Alzheimer's Disease & Other Dementias, 18*(6), 353-358.

Ripich, D., Fritsch, T., Ziol, E., & Durand, E. (2000). Compensatory strategies in picture description across severity levels in Alzheimer's disease: A longitudinal study. *American Journal of Alzheimer's Disease, 15*(4), 217-228.

Robey, R. (2004). A five-phase model for clinical-outcome research. *Journal of Communication Disorders, 37*(5), 401-411.

Sacks, H., Schegloff, E. A., & Jefferson, G. (1974). A simplest systematics for the organization of turn taking for conversation. *Language: Journal of the Linguistic Society of America, 50*(4), 696-735.

Sams, M., Fortney, E., & Willenbring, S. (2006). Occupational therapy incorporating animals for children with autism: A pilot investigation. *American Journal of Occupational Therapy, 60*(3), 268-274.

Sandberg, C. (2017). Hypoconnectivity of resting-state networks in persons with aphasia compared with healthy age-matched adults. *Frontiers in Human Neuroscience, 11*(91).

Saville-Troike, M. (2008). *The ethnography of communication: An introduction* (Vol. 14). Oxford, UK: Blackwell Publishing.

Scollon, R. (2001). *Mediated discourse [The nexus of practice]*. London, UK: Routledge.

Serpell, J. (1996). *In the company of animals: A study of human-animal relationships*. Cambridge, MA: Cambridge University Press.

Serpell, J. (2015). Animal-assisted interventions in historical perspective. In A. Fine (Ed.), *Handbook on animal-assisted therapy: Foundations and guidelines for animal assisted interventions (*4th ed., pp. 11-19). Cambridge, MA: Academic Press.

Serpell, J. (2016). *The domestic dog*. Cambridge, UK: Cambridge University Press.

Schilling-Estes, N. (1998). Investigating "self-conscious" speech: The performance register in Ocracoke English. *Language in Society. 27*(01), 53-83.

Schuchard, J. & Middleton, E. (2018). The roles of retrieval practice versus errorless learning in strengthening lexical access in aphasia. *Journal of Speech Language Hearing Research, 61*(7), 1700-1717.

Schuell, H., Carroll, V., & Street, B. (1955). Clinical treatment of aphasia. *Journal of Speech and Hearing Disorders, 20*(1), 43-53.

Schuell, H. M., Jenkins, J. J., & Jiminez-Pabon, E. (1964). Aphasia in adults. New York: Harper and Row.

Shadden, B., & Hagstrom, F. (2007). The role of narrative in the life participation approach to aphasia. *Topics in Language Disorders, 27*(4), 324-338.

Sherrill, M., & Hengst, J. (2016). Situated communication across species: A case study of animals in therapy. *Archives of Physical Medicine and Rehabilitation*, *97*(10), e79.

Sherzer J. (2002). *Speech play and verbal art*. Austin, TX: University of Texas Press.

Shewan, C., & Bandur, D. (1986). *Treatment of aphasia: A language-oriented approach*. San Diego, CA: College-Hill Press.

Shune, S., & Duff, M. C. (2012). Verbal play as an interactional discourse resource in early stage Alzheimer's disease. *Aphasiology*, *26*(6), 811-825.

Sicoli, M. (2015). 5 Voice Registers. In D. Tannen, H. Hamilton, & D. Schiffrin (Eds.), *The handbook of discourse analysis* (2nd ed., pp. 105-126). Hoboken, NJ: John Wiley & Sons.

Simmons-Mackie, N. (2008). Social approaches to aphasia intervention. In R. Chapey (Ed.), *Language intervention strategies in aphasia and related neurogenic communication disorders* (5th ed., pp. 290-317). Philadelphia, PA: Lippincott, Williams, & Wilkins.

Simmons-Mackie, N. & Damico, J. (2013). Social role negotiation in aphasia therapy: Competence. In D. Kovarsky, J. Duchan, & M. Maxwell (Eds.), *Constructing (in) competence: Disabling evaluations in clinical and social interaction* (pp. 313-342). Mahwah, NJ: Erlbaum.

Simmons-Mackie, N., King, J., & Beukelman, D. (Eds.). (2013). *Supporting communication for adults with acute and chronic aphasia*. Baltimore, MD: Paul H. Brookes.

Simmons-Mackie, N., Threats, T., & Kagan, A. (2005). Outcome assessment in aphasia: A survey. *Journal of Communication Disorders*, 38(1), 1-27.

Snow, C. (1972). Mothers speech to children learning language. *Child Development, 43*(2), 549-565.

Solomon, O. (2010). What a dog can do: children with autism and therapy dogs in social interaction. *Journal of the Society for Psychological Anthropology, 38*(1), 143-166.

Tannen, D. (1984). *Conversational style: Analyzing talk among friends*. Norwood, NJ: Ablex Publishing Corporation.

Tannen, D. (2004). Talking the dog: Framing pets as interactional resources in family discourse. *Research on Language and Social Interaction*, *37*(4), 399-420.

Tannen, D. (2007). *Talking voices: Repetition, dialogue, and imagery in conversational discourse*. Cambridge: Cambridge University Press.

Van Praag, H., Kempermann, G., & Gage, F. H. (2000). Neural consequences of environmental enrichment. *Nature Reviews Neuroscience, 1*(3), 191-198.

Vygotsky, L. (1978). *Mind in society: The development of higher mental process*. Cambridge, MA: Harvard University Press

Vygotsky, L. (1980). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Vygotsky, L. (1986). *Thought and language* (Revised Edition): Cambridge, MA: MIT Press.

Walker, M. (1993). Participatory action research. *Rehabilitation Counseling Bulletin, 37*, 2-2.

Wertsch, J. (1985). *Vygotsky and the social formation of mind*. Cambridge, MA: Harvard University Press.

Wertsch, J., Del Rio, P., & Alvarez, A. (Eds.). (1995). *Sociocultural studies of mind*. Cambridge: Cambridge University Press.

Wheeldon, J., & Ahlberg, M. (2011). *Visualizing social science research: Maps, methods, & meaning*. Los Angeles, CA: Sage.

Wilson, E. (1984). *Biophilia*. Cambridge, MA: Harvard University Press.

Ylvisaker, M., & Feeney, T. (1998). Collaborative brain injury intervention: Positive everyday routines. San Diego, CA: Singular Publishing Group.

Ylvisaker, M., & Feeney, T. (2000). Reflections on dobermans, poodles, and social rehabilitation for difficult-to-serve individuals with traumatic brain injury. *Aphasiology, 14*(4), 407-431.

APPENDIX A: INSTITUTIONAL REVIEW BOARD APPROVALS

Carle Foundation Hospital Institutional Review Board

PROJECT TITLE: Transforming Clinical Spaces through Animal Assisted Therapy: exploring the human-animal bond and the impact on cognitive-communicative disorders.

IRB NO: 17CNI1672
SUBMISSION TYPE: ACTION:
APPROVAL DATE: **EXPIRATION DATE:** RISK DETERMINATION: REVIEW TYPE:

March 28, 2018 Julie Hengst, PhD

Molly Caldwell, MSW, Manager, Human Subject Protection On behalf of the Carle IRB

Initial Review
Approved
March 28, 2018
March 27, 2019
No More than Minimal Risk Expedited Review

Thank you for submitting the above study for initial review. The Carle Institutional Review Board has approved the submission per the regulatory guidelines stated in 45 CFR 46.110 categories 5, 6, and 7, and 45 CFR 46.111, for a period of one year. The following study documents are now approved for use:

- Protocol,v.03/18/2018
- Informed Consent Forms (Primary and Secondary),v.01/15/2018
- HIPAA Authorization, v. 02/08/2018
- PrimaryPatientInitialInterview(ATTandNon-AATgroups),received03/16/2018
- SecondaryParticipantInterview,received02/08/2018
- SLPWeeklyPlanningInterview,received02/08/2018
- AppendixK:Co-InvestigatorsandKeyResearchPersonnel,dated02/08/2018

Consent: Per 45 CFR 46.116 and 45 CFR 46.117, original signed copies of the consent form approved with this submission, **which has been stamped with an approval expiration date,** should be kept with your study records, and a copy given to the subject. If the study is treatment related, a copy should go in the medical chart.

HIPAA: Original signed copies of HIPAA Authorizations, **with approval date stamp,** should be kept with the study records, with copies to the subject and the medical chart. If HIPAA tracking is required please submit the electronic Accounting Disclosure Tracking form to Health Information Management (HIM) when appropriate. This form can be found on IRBNet.

Study Amendments: Any changes to study materials and processes must be approved by the Carle IRB prior to implementation, except when necessary to eliminate apparent immediate hazards to subjects. Please refer to Carle IRB Policy 403 (Modifications to Previously Approved Research) for information about how to submit such amendments to the Carle IRB for review.

Unanticipated problems: All unanticipated problems involving risks to subjects or others must be reported to the Carle Institutional Review Board in accordance with Carle IRB Policy 801. All FDA and sponsor

reporting requirements should also be followed. Note that materials submitted to the Carle Institutional Review Board should not contain subject names, medical record numbers, or other individual identifiers.

Prisoners: If a subject becomes incarcerated during the course of the study, contact the Carle IRB within 10 (ten) working days of becoming aware of the incarceration. We are required to conduct IRB review with a prisoner representative present before that subject may continue in the research.

Closure/ Re-approval: Until analysis of identifiable research data is complete, this study must be given annual continuing review by the Carle IRB. Please check the IRB submission deadlines online and file for continuing review in a timely fashion based on the expiration date stated in this letter.

Carle Foundation Hospital Institutional Review Board

If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact the Human Subject Protection Office. Include the study title and Carle study number with your correspondence.

Note: This letter has been electronically signed in accordance with applicable federal regulations and institutional policies. A copy is retained within the Carle IRB's records.

mlp

telephone (217) 383 4366 • *fax* (217) 383-3993 • *e-mail* irb@carle.com • www.carleconnect.com/irb

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of the Vice Chancellor for Research

Office for the Protection of Research Subjects 805 West Pennsylvania Avenue
Urbana, IL 61801

March 28, 2018

Julie Hengst
Speech and Hearing Science 901 South Sixth Street Champaign, IL 61820

RE: Transforming Clinical Spaces through Animal Assisted Therapy: Exploring the human-animal bond and impact on cognitive-communicative disorders
IRB Protocol Number: Carle #17CNI1672; UIUC #18622

Dear Dr. Hengst:

The University of Illinois at Urbana-Champaign (UIUC) IRB recognizes Carle IRB as the IRB of Record for this research. This was determined based on the Memorandum of Understanding in place between the Carle IRB and the UIUC IRB.

Sincerely,

Michelle Lore, MS
Human Subjects Research Specialist
Office for the Protection of Research Subjects

c: Carle IRB
Carle Regulatory

APPENDIX B: INFORMED CONSENT FORMS

Carle Study ID #: 17CNI1672 Informed Consent Version: 1.0 Primary Participant
Institutional Review Board
FWA 00002292

INFORMED CONSENT FOR PARTICIPATION IN A RESEARCH STUDY

Study Title: Transforming Clinical Spaces through Animal Assisted Therapy.

Principal Investigator: Dr. Julie A. Hengst, PhD.CCC-SLP
Department and Institution: Department of Speech and Hearing Science
University of Illinois at Urbana Champaign
Address: 901 S. Sixth Street, Champaign IL
Contact Information: 217-333-2230

You are being asked to participate in a research study. Your participation in this research study is voluntary. This form contains information that will help you decide whether to take part.

KEY INFORMATION

PURPOSE: The purpose of this research study is to look at how language is used during Animal Assisted Therapy sessions at Carle Hospital. We are asking you to participate in this study because you are currently a patient in the rehab unit and receiving Speech Therapy services. We are recruiting some patients who will be receiving Animal Assisted Therapy and some who will not. It is your choice to receive Animal Assisted Therapy services or not. You will not be placed in either group for research purposes. By doing this study we hope to learn more about how to use programs like Animal Assisted Therapy in hospital settings to meet Speech Therapy goals.

PROCEDURES: We will be gathering data that includes videos of therapy sessions and interviews. You will be asked complete a short interview and allow us to observe and record two therapy sessions.

RISKS: The risks involved in this project are minimal. We will be video recording these sessions, so there is the chance that someone will recognize you from the video recording. If any of the interview questions make you feel uncomfortable you do not have to answer them. A risk of this research is loss of confidentiality. This means information about you may be revealed to people that you have not given permission to see this information.

Protections are in place to minimize these risks. We will protect your research records so that your personal information will be kept private. Researchers involved in this study have received training about confidentiality and privacy.

BENEFITS: You will not get any direct benefit from taking part in this study. You will be helping us understand Animal Assisted Therapy in hospital settings. This will allow us to study how these programs can affect the success of patients in rehab. The results may help us find new approaches to speech-language therapy.
ALTERNATIVES: This is not a treatment study and it will not impact your services or therapy sessions in any way. Your alternative is not to participate in this study.

DETAILED INFORMATION

WHO IS DOING THE RESEARCH?
The person in charge of this study is Dr. Julie Hengst from the Department of Speech and Hearing Science at UIUC. The on-site researcher is Martha Sherrill who is being guided in this study by Dr. Hengst. There may be other people on the research team assisting at different times during the study.

WHAT WILL I BE ASKED TO DO?
This is an observation study and will not change your therapy or treatment.

- You will be asked to complete a short interview with a researcher (30 minutes).
- You will be asked to let us observe and video-record 2 therapy sessions (30 minutes each). One of those sessions will be an individual session with your Speech Therapist.
- If you choose to participate in Animal Assisted Therapy one of those sessions will include a therapy dog.
- If you choose not to participate in Animal Assisted Therapy one of those sessions will be with another therapist (physical or occupational therapy).
- Your therapists will be asked to participate as research participants during your sessions. You are welcome to invite your family members to participate in sessions or interviews, however we will not ask them to do anything.
- Approximately two weeks after you discharge from rehab we will contact you about a short follow-up interview. This interview can be in person at your home or over the phone, and will take about 30 minutes.

All sessions will take place in a private gym or therapy office. These sessions will not change or disrupt your therapy schedule. The interview and both sessions will take around 2 hours total.
The analysis of your data will take place at the Speech and Hearing Science Department. We will be using the video recordings to analyze the types and patterns of language used in Speech Therapy sessions.

WHAT HAPPENS TO THE INFORMATION COLLECTED FOR THIS RESEARCH STUDY?

All information collected about you during this study will be kept confidential to the extent permitted by law. The following agencies responsible for monitoring this study may inspect the records:

- Members of the Institutional Review Board (a committee that overseas human subject protections at Carle Foundation Hospital)
- The Office for Human Research Protections at the Department of Health and Human Services.
- Employees of Carle may have access to your information for quality assurance purposes. These employees will protect the confidentiality of your information unless disclosure is required by law.

Any information obtained during the study that may identify you as an individual will be removed by the research team. Your information will be assigned a code number for tracking of your research data. The code number will not contain any identifiable information, such as your initials or birthdate. Only designated University of Illinois and Carle researchers will have access to the key that connects the number code to your identifiable information.
We will take steps to keep your personal information confidential. Electronic data will be stored on password protected computers. Hard copies of consent forms and study documents will be stored in a locked file cabinet in Dr. Julie Hengst's Lab in the Speech and Hearing Science Department at UIUC.
Once your information is no longer traceable to you we may share your information with other researchers. Your information will be combined with that of other participants in the study to be analyzed. Your name will not be used when we publish results. All the information collected for this study will be destroyed when the data analysis is complete.

WHAT ARE THE COSTS?

There will be no cost to taking part in this study.

CAN I STOP BEING IN THIS RESEARCH STUDY?

Taking part in this study is voluntary.
You can choose not to take part. Your decision whether or not to participate will not affect your current or future services from Carle Foundation Hospital or Carle Physician Group.
You can agree to take part and later change your mind. You are free to withdraw at any time.
If you leave the study you will get to decide if data colleted can be used or if you would like it to be destroyed.

WHO DO I CALL IF I HAVE QUESTIONS OR PROBLEMS?

If you have questions, concerns, or complaints, or think that this research has hurt you or made you sick, contact Dawn Henry at 217-383-6423 or Dawn.Henry@Carle.com.
For questions about your rights as a research participant, including concerns, complaints, or to offer input, contact the Carle Institutional Review Board (a group of people who review the research to protect your rights) at (217) 383-4366 or email IRB@carle.com.

Remember:

Your participation in this research is voluntary. Your decision whether or not to participate will not harm your relationship with your physician, Carle, or those conducting the research. If you decide to participate you are free to withdraw at any time.

Signature of Subject

Your signature on this form means that: you have read (or someone has read to you) the above information. You have been given an opportunity to ask questions and your questions have been answered to your satisfaction. You agree to participate in this research. You will be given a copy of this signed and dated form.

_____ _____

Signature Date

_____

Printed Name

_____ _____

Signature of Person Obtaining Consent Date

_____

Printed Name of Person Obtaining Consent

INFORMED CONSENT FOR PARTICIPATION IN A RESEARCH STUDY

Study Title: Transforming Clinical Spaces through Animal Assisted Therapy.

Principal Investigator: Dr. Julie A. Hengst, PhD.CCC-SLP
Department and Institution: Department of Speech and Hearing Science
University of Illinois at Urbana Champaign
Address: 901 S. Sixth Street, Champaign IL
Contact Information: 217-333-2230

You are being asked to participate in a research study. Your participation in this research study is voluntary. This form contains information that will help you decide whether to take part.

KEY INFORMATION

PURPOSE: The purpose of this research study is to look at how language is used during Animal Assisted Therapy (AAT) sessions at Carle Hospital. We are asking you to participate in this study because you are either the family member of a primary participant or you are a Carle therapist providing therapy to a primary participant who has agreed to participate in this research project.
By doing this study we hope to learn more about how to use programs like Animal Assisted Therapy in hospital settings to meet Speech Therapy goals.

PROCEDURES: We will be gathering data that includes videos of therapy sessions and interviews.

RISKS: The risks involved in this project are minimal. We will be video recording these sessions, so there is the chance that someone will recognize you from the video recording. If any of the interview questions make you feel uncomfortable you do not have to answer them. A risk of this research is loss of confidentiality. This means information about you may be revealed to people that you have not given permission to see this information. Protections are in place to minimize these risks. We will protect your research records so that your personal information will be kept private. Researchers involved in this study have received training about confidentiality and privacy.

BENEFITS: You will not get any direct benefit from taking part in this study. You will be helping us understand Animal Assisted Therapy in hospital settings. This will allow us to study how these programs can affect the success of patients in rehab. The results may help us find new approaches to speech-language therapy.
ALTERNATIVES: This is not a treatment study and it will not impact the services provided to the primary participants in any way. Your alternative is not to participate in this study.

DETAILED INFORMATION

WHO IS DOING THE RESEARCH?
The person in charge of this study is Dr. Julie Hengst from the Department of Speech and Hearing Science at UIUC. The on-site researcher is Martha Sherrill who is being guided in this study by Dr. Hengst. There may be other people on the research team assisting at different times during the study.

WHAT WILL I BE ASKED TO DO?
This is an observation study and will not change the therapy or treatment of the primary participant in any way.

If you are participating as a Carle Therapist:

- You may be asked to complete or sit in on a short interview with a researcher.
- You will be asked to let us observe and video-record therapy sessions that you are participating in or observing.
- All participants will be completing two 30-minute observed therapy sessions. We will ask to record your involvement in one to two of these sessions per participant.

If you are participating as a family member:

- You will be asked to let us observe and video-record your involvement in the therapy sessions for your family member involved in this study.
- All participants will be completing two 30-minute observed therapy sessions. We will ask to record your involvement in one to two sessions.

The analysis of your data will take place at the Speech and Hearing Science Department. We will be using the video recordings to analyze the types and patterns of language used in Speech Therapy sessions.

WHAT HAPPENS TO THE INFORMATION COLLECTED FOR THIS RESEARCH STUDY?

All information collected about you during this study will be kept confidential to the extent permitted by law. The following agencies responsible for monitoring this study may inspect the records:

- Members of the Institutional Review Board (a committee that overseas human subject protections at Carle Foundation Hospital)
- The Office for Human Research Protections at the Department of Health and Human Services.

- Employees of Carle may have access to your information for quality assurance purposes. These employees will protect the confidentiality of your information unless disclosure is required by law.

All the information collected for this study will be destroyed when the data analysis is complete.
Your information will be recorded and coded with a participant number. We will take steps to keep your personal information confidential. Electronic data will be stored on password protected computers. Hard copies of consent forms and study documents will be stored in a locked file cabinet in Dr. Julie Hengst's Lab in the Speech and Hearing Science Department at UIUC.
Once your information is no longer traceable to you we may share your information with other researchers. Your information will be combined with that of other participants in the study to be analyzed. Your name will not be used when we publish results.

WHAT ARE THE COSTS?

There will be no cost to taking part in this study.

CAN I STOP BEING IN THIS RESEARCH STUDY?

Taking part in this study is voluntary.
You can choose not to take part. Your decision whether or not to participate will not affect services or employment from Carle Foundation Hospital or Carle Physician Group.
You can agree to take part and later change your mind. You are free to withdraw at any time. If you leave the study you will get to decide if data colleted can be used or if you would like it to be destroyed.

WHO DO I CALL IF I HAVE QUESTIONS OR PROBLEMS?

If you have questions, concerns, or complaints, or think that this research has hurt you or made you sick, contact Dawn Henry at 217-383-6423 or Dawn.Henry@Carle.com**.**
For questions about your rights as a research participant, including concerns, complaints, or to offer input, contact the Carle Institutional Review Board (a group of people who review the research to protect your rights) at (217) 383-4366 or email IRB@carle.com.

Remember:
Your participation in this research is voluntary. Your decision whether or not to participate will not harm your relationship with Carle or those conducting the research. If you decide to participate you are free to withdraw at any time.

Signature of Subject: Your signature on this form means that: you have read (or someone has read to you) the above information. You have been given an opportunity to ask questions and your questions have been answered to your satisfaction. You agree to participate in this research. You will be given a copy of this signed and dated form.

Signature Date

Printed Name

Signature of Person Obtaining Consent Date

Printed Name of Person Obtaining Consent

Signature of Adult Subject and/or Parent/Guardian

You have read (or someone has read to you) the above information. You have been given an opportunity to ask questions and your questions have been answered to your satisfaction. You will be given a copy of this signed and dated form. Your signature documents your permission for you and/or the minor subject named below to take part in this research.

Signature of Adult Subject and/or Parent or Guardian Date

Printed Name of Adult Subject and/or Parent or Guardian and Relationship to the Minor Subject

Printed Name of Minor Subject

Signature of Person Obtaining Consent Date

Printed Name of Person Obtaining Consent

APPENDIX C: INTERVIEW TEMPLATES

Primary Participant Interview

Items adapted from the *Lexington Attachment to Pets Scale* (LAPS) (Johnson et al., 1992) marked with ***.**

Items adapted from the *Communication Confidence Rating Scale for Aphasia* (CCRSA) (Babbitt & Cherney, 2010) marked with **#**.

Personal History with Animals:

1) Do you currently have animals or pets in your house?
(continue if Patient answers *yes*, skip to #2 if Pt answers *no*)
a. What are their names?
b. How do you refer to them (e.g., are they pets, animals, or family)?*
c. Where do your pets sleep?
d. Do you keep any pictures of your pets with you?*
e. Are you responsible for caring for them (e.g., feeding, grooming)?
f. Do you think anything with their care will change when you go home? -Will you need help?

2) How often do you interact with your (or other) animals in the world?*

3) Do you ever talk to your pets or animals?* -How do you talk to them?
a. What do you talk about?*

4) Did you have pets or animals in your life when you were growing up?
a. What kind?
b. What was your relationship with them (pets, farm animals)?

5) Do you feel comfortable around animals?
a. Any more or less than others?

6) What made you want to participate in AAT while you are at this rehab?

7) What kinds of things do you think you'll be doing in AAT?

8) How do you think it will be different (or the same) from other Speech Therapy sessions?

9) Do you know what day or time you're scheduled to have your AAT?

Personal Health / Communication Status:

1) What brought you to the hospital?

a. What does that mean to you? (e.g., do you feel that you fully understand all of your diagnoses and recent medical issues?)

2) Have you ever had experienced this situation (illness/injury) or setting (rehab) before?
a. What were your previous experiences like?
b. How did you deal with those difficulties before?
c. Does this time feel the same/different?

3) You're in rehab now – what are you working on?
a. What issues are you dealing with (physical, speech) that are the most important (or noticeable) to you?
b. What are your personal goals for your time in rehab?
c. How close to you feel you are to reaching those goals?

4) How do you communicate with the people in your life (e.g., phone, email, texting)? #

5) When you talk to people, do you feel like you use a lot of gestures?
a. Do you talk with your hands?
b. Do you feel like you use your face or your body a lot when you talk to people?

6) Do you feel confident talking to new people, or in new situations (like rehab, this interview)?#

Communication Challenges and Participation in Rehab:

1) Who do you typically communicate with at home?

2) Is it harder to communicate with people since ___?

3) Do you feel like people understand you when you're talking to them? #
a. What do you do if they don't?

4) Do you feel included in conversations? #

5) Do you feel like people talk more about you, or to you? #

6) Are there some people you communicate with better than others?

7) Are there some people who understand you better than others? What do they do differently?

8) Do you look forward to going to therapy?

9) What is the most challenging part of therapy right now?
a. Are there any activities that are particularly hard for you?

10) What activities would you like to participate in more regularly?

Secondary Participant Interview
AAT and Departmental Personnel

General questions for all:

1) Do you have any animals/pets at home?

2) Do you have a strong personal opinion about using animals in therapy?

3) How long have you been involved with the CFH AAT program?
a. What is your role in this program?
b. Have you ever been involved with an AAT program at any other facility?

4) What were your ideas about AAT before you started it?
a. Have those ideas have changed since your involvement with this program?

5) Would you want AAT if you were ever in a rehabilitation setting? -Would you want it for your loved ones?

6) Do your patients talk about AAT after they have received it?

Administrators/directors of the program:

1) What can you tell me about the history of the program?

2) Were you involved in any aspects of the construction of this program (research, funding, legal/ethical issues, recruiting handlers)?
a. What can you tell me about the legal requirements of a program that involves animals?
b. Have you ever had a legal concern/issue with the AAT program?
c. What are the ethical considerations in place to ensure the safety of the dog, as well as the patients?
d. What requirements do you have for a therapy dog club/handler team to participate?

3) Do you allow animals in any other capacity in this hospital?
a. Can family members bring in personal / companion animals to visit patients?

4) What steps does a volunteer need to take to be involved in this program?

Therapists utilizing AAT:

1) How do you select (or recommend) patients for AAT?
a. Are there criteria, or something about patient diagnoses, personality, etc. that leads you to think some patients are better candidates than others?

2) Have you seen noticeable changes or differences in patients when they are receiving AAT?
a. Can you describe some of those changes?
b. Have you ever been surprised by a patient's reaction to the dog during AAT?

3) Can you think of any specific examples of when AAT has worked well for you, or any situations in which it resulted in a negative experience for the patient?

4) How difficult is it to plan for/incorporate AAT into your daily sessions?

5) Do you modify your general goals for the session when you know the dog will be present?
a. How / do you change your documentation when you participate in AAT?

6) What do you think is the role of a therapy dog?
a. What can they accomplish in a therapeutic situation?

7) Would you ever consider training and using your own therapy dog?

AAT Dog Handlers:

1) How did you get started as an AAT provider?
a. What made you want to become an AAT handler/provider?

2) Specific information about your dog (breed, age, gender).
a. What made you think he/she would be a good therapy dog?
b. What general characteristics make a good therapy dog?

3) Has your dog ever responded negatively to a patient or situation? -What did you do?

4) What concerns do you have about your dog's safety, or what are you watching for when you are with patients in a medical setting to ensure their safety?

5) What is your (and your dog's) training background (certifications, courses attended)?
a. Were there specific methods of training used in the programs you attended?
b. What type of training/behavioral methods do you use?
c. Do you have a particular preference, or dislike for certain training methods?

6) What aspects of training or behavior are most important for a successful AAT team?

7) Can you describe some of the places/settings you've worked at as an AAT provider? -Do you have a preference for certain settings?

8) Tell me about your experiences specifically at CFH:
a. How does the dog impact the therapeutic environment there?

9) Who do you think responds to, or benefits from AAT?
a. Have you seen differences across age groups, or medical settings?
b. Are there any therapeutic situations, or therapists, who respond better to the dog's presence?

10) What do you think is the role of a therapy dog?

Primary Participant Follow-up Interview

Participant

Date of interview:

Place/situation (e.g., phone, in-person):

1. What do you remember about the speech therapy session with the therapy dog and handler?
   a. General impressions about the AAT-ST session
   b. Did you enjoy it?
2. What did you like the least/most about the AAT session?
   a. Do you think it was a generally positive, neutral, or negative experience?
3. Did it feel like you were addressing your Speech Therapy goals during the AAT session?
4. Can you tell me any details you learned about the dog (name, breed, age)?
5. What activities did you complete with the dog?
   a. Did it feel like a group activity, or just you and the dog?
6. Did you have any concerns when you were working with the dog (safety)?
7. Did you talk to the dog?
   a. What did you say?
   b. How did you communicate with him/her?
8. If you were ever back in the hospital, would you want/ask to receive AAT again?

APPENDIX D: SLP PLANNING AND CONSULTATION MATERIALS

SLP Weekly Planning Meeting

SLP (1 or 2) Date of Planning Meeting

Patient(s) Identified for sessions:

Participant Number:

DOB:

Medical DX:

ST DX:

Current ST goals:

SLP Repeated / Longitudinal Questions:

1) How comfortable are you utilizing AAT as part of your SLP treatment sessions? (refer to Likert Scale on back of page)

2) How much time (approximately)have you had to put towards planning for this session this week?

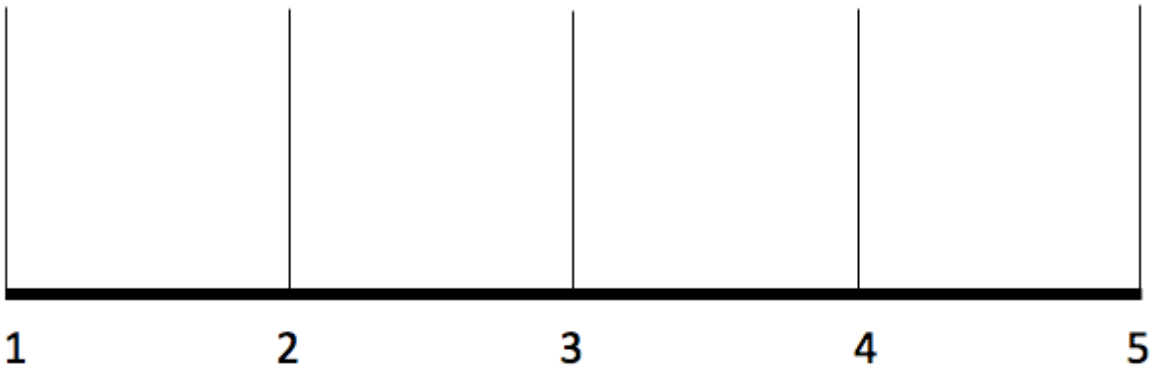
3) Are you thinking about adapting or modifying tasks/activities you frequently use, or are you planning to try new activities?

4) Is there an aspect of AAT that you think will be particularly helpful with this patient? E.g., are you targeting pitch/intonation, are you trying to increase their motivation for ST, are you just trying to improve language production?

5) What follow-up activities or carry-over would you recommend for this patient after the AAT session? (E.g., delayed recall, conversational topic, etc.).

Confidence Scale

(used with SLP longitudinal question#1)



1 = no confidence
2 = some/little confidence
3 = moderate confidence
4 = high/significant confidence
5 = complete confidence / independence

Animal Assisted Therapy (AAT)
Dog and Handler Information Sheet

Get to know the dog:

- What is the dog's name?
- What breed is the dog?
- How old are they?
- Do they know any tricks?
- What is their favorite food or treat?
- What is their favorite toy?
- Do they have any brothers or sisters (other pets) at home?

Get to know the handler:

- How long have you been a handler?
- Is this your first therapy dog?
- What kind of training is involved to be an AAT handler?
- How often do you volunteer?
- What's your favorite part about being an AAT handler?

Animal Assisted Therapy (AAT)
Dog and Handler Interview

Suggested Interview Topics:

- Specifics about the dog (name, breed, age, etc.)
- Dog's preferences (toys, treats, etc.)
- Tricks or special behaviors (sit, fetch, any unique tricks)
- Process for training / becoming a certified team
    - certifications or classes taken
    - specific skills they must demonstrate to be certified
- History as an AAT team (hospital units, any special circumstances)
- Schedule for volunteering
- Motivation for volunteering
- Memorable moments/experiences

Other Questions:

_____

_____

_____

_____

_____

AAT in Speech Therapy
Examples of Activities and Stimuli

Language:

- Description of the dog (his/her features, behaviors)
- Same/different features (vs their own pets, other dogs)
- Topical categorical naming (e.g., types of foods dogs like, what to take if you're going on a trip with your dog, tricks you can teach a dog)
- Narratives (either spontaneous or cued - their pets, histories with dogs, etc.)

Sequencing:

- Teaching the dog commands (sit, stay, shake) with either cued or printed steps
- Daily routine of caring for a dog
- Create an obstacle course or sequential trick

Memory:

- Place patient in charge of remembering date and time of session
- Prospectively provide them with the dog and handler name
- Functional/WM for details about the dog/handler team (e.g., name, breed, age, etc.)
- Recall of tricks trained/demonstrated during session
- Recall of information gained through info sheet/interview
- Recall of key word for trick or behavior ("you have to tell him, 'find it'")

Problem Solving/reasoning:

- Interview or info sheet (which questions to ask in what order)
- Solution to a problem in context (what would happen if he got off his leash in the parking lot, etc.)
- Listing of skills/behaviors a therapy dog should have

Speech Intelligibility:

- Intelligible production of commands (dependent on level of intelligibility deficit) (with/without handler assistance with hand signals and gestures)
- Repetition / drill with trick-related words the dog responds to (sit, stay, come, shake)

Visual Attention:

- Place dog on neglected side for petting/grooming
- Place interview or cuing sheet for tricks on neglected side

Reading/writing:

- Use of simple info or interview sheet
- Reading required elements of training program (e.g., AKC CGC, Pet Partners, etc.)

APPENDIX E: KEY TO TRANSCRIPTION CONVENTIONS
AND OPERATIONAL DEFINITIONS

Key To Transcription Conventions

Preferred Codes	**Description**
Color Code	Multiple conversations are marked by color coding talk of dyads
Bold	Marked voice change for emphasis. Bold speech, raising voice.
(what)	Questionable transcription (sounds, including vocalizations, are in grey)
XXX	Unintelligible sequence, roughly XXX per syllable
…3…	Number of seconds of relative silence (dots correspond to number of seconds)
…	Notes a **pause** in speech of less than 1 second
^^h	Audible inhalations and exhalations
[cough]	Descriptions of non-speech sounds and audible gestures such as cough, sigh, laugh, tongue click, etc.
We- well-	Word cut off short
O:kay	Indicates a prolonged sound or syllable
Hey dad,	Voice spoken with decreased intensity, kind of like the opposite of bold
<u>And she fell it was so funny [laughing]</u>	Indicates the speaker was laughing while saying this phrase
<u>She is just the prettiest thing [gaze: S].</u>	Indicates whom the speaker is looking at while talking – in this example, S would indicate looking at Sully (dog). Can be used when the speaker is talking to or about the dog – specific to gaze direction.
descr↑iption↓	an upward arrow denotes marked rising shift in intonation, while a downward arrow denotes a marked falling shift in intonation
/gin/	Phonetic transcription using International Phonetic Alphabet
S l o w	Stretched out or slower rate relative to surrounding speech
Hurryup	Rapid rate relative to surrounding speech (To get condensed font on a PC, highlight the word > right click > fonts > go to the advanced tab > spacing, choose "condensed." On a Mac, click "format" at the top > fonts > advanced > spacing "condensed")
[unintelligible conv. ….……10…….] [chewing…3…] [laughing…..5……]	Long stretch of unintelligible vocalization/sound (dots correspond to number of seconds)

[VIP:]	Vocal Initiating Posture: Marked struggle in initiation of articulation with audible/inaudible speech/non-speech sounds that are usually associated with stiffness in neck and tongue muscles and retraction of the body and neck
[VIP:...4…]	Prolonged VIP
(J):	Participant is overhearer only, in room but not participating in conversation or is not a potential agent
TV:	Documentation of background noise
Okay.	Period (.) indicates end of turn intonation
A dog,	Comma (,) indicates continuing intonation pattern
(Jester)	When a participant's real name is used in conversation, replace it with their (pseudonym)
(BK):	Indicates any background content. There should always be a "conversation participant" line for (BK) in the transcription.
A dog?	Question mark (?) indicates a questioning intonation pattern
S K I	Speaker is saying the names of letters, as if spelling out loud
*flapping arms	Activity note in black correlates temporally to * in a line of speech produced by that person. Used here primarily to record iconic/communicative gestures
m hm	Nasal agreement
uh huh	Oral agreement
m m	Nasal disagreement
uh uh	Oral disagreement
m |m	Nasal "I don't know"
Hm?	Nasal Question
Uh-oh	"Oh no"

Transcription Key elements adapted from Hengst (2001) and The Handbook of Classroom Discourse and Interaction (online April 2015).

Dog Code

Alignments:

Alignments are defined as gross motor actions that describe how the dog is moving and aligning to / with / around other group members in the space. They will be identified **in-line** for the dog. They are related to the proximity and/or the attention the dog directs towards another participant and/or the entire space.

PLEASE NOTE: Some of the behaviors described below (indicated with a * in the column) may (in certain situations) be signs of anxiety or stress. Attend closely to these behaviors and describe them thoroughly in session notes.

Walking / full body movement:		
	Approaching in greeting	Apprs →P1
*	*Backs up/ away and facing*	Bcks ←P1
	Returns or walks to when called	CL→H1
	Sitting to side of chair (Right – R or Left- L), facing one or more participants	▲R:H1→P1
	Seated and facing	▲→H1
	Standing and facing	△→H1
	Guided by Handler through leash movement	▯ to ___
	Turns body to	↵ ↳
	Runs after / chases	↻
	Returns to	Rtn →P1
Vertical position:		
*	*Sits up partially from laying position (front paws up, still seated) – facing P1*	↑▲→P1
	Stands up fully from laying or seated position – facing P1	↑△→P1
	Sits down from standing position (back legs only – front paws up), facing P1	↓▲→P1
	Lays down fully – facing H1	V→H1

Physical Contact:		
	facing H1 – body in contact with P1's's leg to allow for petting	→H1 >| P1:leg
	places paw on P1's knee, facing him	→P1: ❋>| P1:knee
	backs in between P1 legs – facing H1	Bcks >|< P1:legs →H1:
	Lifts paw / uses paw to contact something	↑❋
	In between	>|<
	Wheelchair	WC
Attention shift:		
	body faces H1 – turns to look at P1	→H1: ↗P1 →H1: ↖P1
	Head tilt	◂▸
Eagerness and comfort level:		
*	*Ears perk up or down, facing H1*	⩓⩓→H1 ⩔⩔→H1
	Tail wagging	⇆⇉
	Tail straight up, facing P1	⭱→P1
*	*Bends back legs in anticipation (half-sitting)*	⤵
*	*Tail tucked down / between legs*	⇊
*	*Bends front legs in bow*	⤴
	Licking	⌥

Dog Gestures:

- *Gestures* are defined as small physical movements that don't necessarily require a change in position, and may or may not be relative to the room or any singular speaker (think *behaviors* or *responses*). Gestures are indicated **in-line** (in the dog's line) with a * and described further below in the gesture line.

Examples of other dog gestures to attend to / include (but **are not limited to**):

sniffs	takes treat	runs	raises paw
sneezes	turns	licks	hits with nose
drops ball	chases	tongue lolling	*scratching
catches	jumps	*panting	Leans into (petting, scratching)

Transcription Passes and Consensus Procedures:

A "pass" is a full, complete transcription and identification of all elements of transcription and manuscript procedures required by that pass.

*Please note:

- A single pass of a 30 min session may take 15+ hrs depending on complexity.
- This is an active transcription process to engage with the data and researchers.
- You must complete at least 3 passes before arranging consensus – more as needed with complicated transcripts.
- Remember - If you're unsure of something, highlight it in green and follow-up during consensus.

Pass 1: Full audio pass

- Also includes minute count, page numbers, and empty brackets [ ] for obvious dog alignments.
- The initial pass is done from the camera closest to the subject (Camera 1).
- Record the primary audio (talk) from all speakers involved in the interview or session.
- Establish the formatting for the transcript

Pass 2: Pet Register and Gesture pass

- ID pet register, ambient sounds, eye gaze, and first pass of gestures (both human and canine).
- Double check * and gestures coded (e.g. do the number of * in-line match the number of * underneath?)
- These passes are done using views from all available cameras (1-4)
- This first gesture pass should be used to add gestures.
- Subsequent passes are used to add additional gestures, eye gaze, attention to participants, intonation patterns, and other notable features (additional examples to be added as observed by transcribers).
- *For interviews subsequent passes should clarify audio

Pass 3: Alignments

- All dog alignments (see "Dog Code")
- Fill in or delete empty brackets
- Researcher impression sheet should describe: What stood out? Additional questions? Technical issues?

Consensus Pass: The process of finalizing the transcript.

- Involves both the original transcriber *and* either 1) a more experienced transcriber, or 2) Martha
- Used to fix *accidental* errors, answer and correct questions, ID trouble spots before coding
- Consensus should result in a transcript that is FULLY prepared in all areas so coding may begin. If an abundance of errors or missed information are revealed in consensus, you will be asked to complete additional passes as needed to correct them before completing consensus.

Operational Definitions - Words and Turns

Words are defined and counted individually as verbal utterances that include:

- Fully formed words (apple)
- Neologisms (aphasic neologisms, newly formed words)
- False starts (I-I want)
- Placeholders (uhm, well, okay, mhmm)
- Words spelled out intentionally (T-R-E-A-T) – counted as one word per letter
- XXX (three x's together) is counted as one word. This indicates an unintelligible word, and may occur singly jointly. XXX XXX = 2 words

Word Category	Example	Word Count
Fully formed words (1 each)	Apple	1
Neologisms (1 each)	I went to wist – wasta - Walmart.	6
False starts (1 each)	S-s-sip	3
Placeholders – both real and filler words (uhm, well, okay, mhmm) (1 each)	I uhm, went to go to the store.	8
Words spelled out intentionally (1 per letter)	T-R-E-A-T	5
Part-word repetitions (1 each)	Pi-pi-pick	3

Interactional turns include (and are counted individually as:

- Both verbal (formed utterance or response of any length) and nonverbal interactions (e.g., nodding, laughing, and sighing) from all participants.
- Turns are counted if they overlapped/occurred at the same time as another participant's turn, and laugher was only counted if it occurred in isolation of other words, (not during or immediately prior to/after an utterance.

Operational Definitions - Interactional Discourse Resources (IDR)

The following patterns of interactional alignments were coded to allow for analysis of the conversational patterns and varied resources used by all participants during AAT activities. Interactional discourse resources (IDRs) (Hengst 2001, 2003) were coded both individually (single participant conversational narrative) and in groups (multiple participants all engaging in a playful activity).

Conversational narrative (CN)

The operational definition for narratives in the coding of this data was adapted from Hengst in *Semiotic Remediation, Conversational Narratives and Aphasia* (in Prior & Hengst, 2010). Hengst (2010) operationally defines conversational narrative as: "the verbal or nonverbal presentation of an event displaced from the moment of telling that is linked to a second temporally related event or a related evaluation" (pg. 112). Hengst (2010) also discusses the possibility of narrative to present as "small, fleeting, or incomplete," as well as "extended and highly polished" (pg. 108). For example, "My son brought my dog yesterday" is coded equally with a multi-line, extended narrative.

Playful episode (PE)

Playful episode is defined as a single or multiple utterances or non-verbal display sharing a common playful theme. A laughter only utterance can be a playful episode if it occurs as a response to a playful utterance. Hengst's (2006) definition includes:

- *Simple playful episodes*: "short, either single-utterance episodes, or episodes consisting of a playful utterance and a response from one or more interlocutors" (pg. 318). Playful episodes in this category may be completed in a single turn of the speaker, or extended to multiple turns/interactions with other speakers, but may involve short utterances or exclamations. Examples include subject reactions and responses to the ball-throwing activity that are playful, joking, or jovial in nature, but not always part of a multi-turn interaction.
- *Extended playful episodes*: "multiple thematically related and contiguous utterances" (pg. 319). Examples of extended playful episodes include an extended telling of a joke or playful teasing by a single subject or as multi-turn interactions between subjects on a consistent topic.

Playful episodes may be coded simultaneously with all other categories, including responses to procedural discourse (e.g., mock protesting from a subject to a therapist's directions), as part of a conversational narrative (e.g., a subject telling an amusing story about behavior of a past pet), and may also be coded with pet register and engagement/eye gaze as well. Playful episodes may (and commonly do) involve multiple participants at once.

Procedural discourse (PD)

The operational coding definition for procedural discourse is: verbal interaction that through which a novice-expert pattern is established. The length and complexity of procedural discourse may vary from single turn, single words or short phrases with no response from the listener ("stop," "reach back for the chair") up to extended discussions of a multi-step sequence needed to complete a given task with multiple subjects involved with responses or interactional turns (Therapist: "okay, first we're going to stand up, and then we're going to walk down the hall and

hide the Frisbee." Subject: "Down there?" Therapist: "yes, but stand up first, and then we'll walk down the hall"). Also includes discourse in which the relationship and direction is phrased in the form of a "display" question – "can you show me, can you tell me," etc.). Procedural discourse is coded for all participants (primary, secondary, etc.) and can be directed at any other member present in the communicative space.

Envoicing (EV)

The operational definition for the coding of *envoicing* in this study is any verbalization in which the speaker is talking *for* the dog. This includes instances in which the speaker prefaces or introduces the envoicing ("she's thinking, 'where's my treat'"), as well as when envoicing is clear but not introduced ("big deal mom," "I'm the coolest dog ever"). Envoicing is used/coded when the speaker is attempting to explain the dogs' actions, responses, thoughts, or emotions. Envoicing was not used when subjects were describing the dog or discussing her training history, personality, or physicality (breed type, favorite treats, etc.) in an attempt to distinguish between dog as participant in the communicative interaction and dog as topic of discussion.

Pet register

This current study draws on previous research to establish an operational definition of this *pet register*. The decision to label this register as *pet register* rather than adoption of "doggerel" or "speech to dogs" was based on the context and situation of the interaction. Previous studies have examined dyad human/animal pairs only, and did not include the social component of group interaction visible and necessary to the discussion of AAT as a social approach. The operational definition for *pet register* in this study was speech directed at the therapy dog that included one or more of the following features:

Prosodic: (use of altered pitch (usually higher), whispered/confidential intensity, or extended word duration).

Diminutives/endearments: directed to the dog, accompanied by eye gaze (e.g., "good doggie, sweetie pie, pretty girl").

Short, simple, redundant speech: usually used as an attention getting or control device directed to the dog, accompanied by eye gaze (e.g., "come here," ""get back").

Questions/imperatives/declaratives: contextual in nature in which the dog's name is used, accompanied by eye gaze (e.g., "Sully – are you a good girl?") Pet register was coded during initial passes utilizing a light grey-scale font ("You're such a good girl") to indicate the prosodic/pitch change aspects of pet register only. Consensus transcription passes were used to maximize agreement of identification of pet register with coding of linguistic elements completed by primary investigator.

Table 4: Examples of identified Interactional Discourse Resource

Analysis Code	Example
Pet Register	Good girl! You're a good girl! Good girl.
Eye Gaze	I think she likes me [gaze:S]
Conversational Narrative	- One time the dog catcher came over to our house (…) - My son buy now another dog.
Procedural Discourse	PT: Alright, we're going to stand for a bit for a few more tosses. C: Okay. How many can I do? PT: Let's start with five.
Playful Episode	- You're not going to catch it this time! - C: **Who:a!** A: She caught that one! OT2: Well that was cool! MC: Wow![laughs]
Envoicing	-She's says "this isn't supposed to be this much work" -Like the cookies. I waiting for the cookies.

APPENDIX F: INDIVIDUAL PRIMARY PARTICIPANT PROFILES

Ed (P1). Ed had a long history of animals in his home as both a child and an adult, however he spoke primarily about a recent pet – a cocker spaniel who passed away around 3 years ago from cancer. He told multiple stories during the interview about this dog that were repeated later during the AAT session, including the fact that when they went as a family to put down the dog "[…] I cried like a baby. The vet said usually it's women cry – he'd never seen a man cry like I did." Ed requested AAT services, and participation in this study because he had a history with the Carle Therapy Dog program. Ed remembered seeing and benefiting from in-room AAA visits that he characterized as being "therapeutic." He was able to recall details about Therapy Dogs from this rehab stay as well as previous ones, and reported that he thought the visits were "social," and "what I need right now." Ed's primary ST diagnoses was aphasia, and his goals included moderate level verbal expression tasks. His SLP session was highly structured, utilizing printed worksheets to complete an abstract divergent naming and a complex-level sentence construction task. The same goals were targeted in the his AAT-ST session, however Jenny adapted the categorical naming stimuli to topics involving the dog (e.g., "what items do you need to take care of a dog," "what do you need to take a dog on a trip,"). Ed participated in a follow-up interview in which he returned frequently to the word "therapeutic" to describe his experiences with the therapy dogs during his inpatient stay, and referred to his AAT-ST session as "the best hour of the whole week." At the time of his follow-up interview he was receiving extended services at a local skilled nursing facility, and reported that "this place really needs a dog."

Bill (P2). Bill reported that both he and his spouse had noted gradual but recently accelerating changes in cognition, and he was highly concerned that this hospitalization would "give them an excuse to make me stop driving." Bill had a life-long history with dogs, although he did not have a dog at the time of the study. His last dog died approximately 1 year ago, and he said "I knew I'd never find another one like him." Bill had a decades-long history of competing in local and national bird-dog championships, and had raised multiple breeds of dogs as competitors (e.g., Pointers, English Setters, Brittany's, etc.). During the interview he talked about dogs somewhat brusquely, in that he displayed an obvious affection for them, but was also clear that all of his dogs were outside dogs and not family members/pets. Bill elected to participate in the Therapy Dog program and this study because "I probably owned more dogs than any man ever lived," and he was "intrigued" by adding dogs into the therapy experience. He also reported that he was "really, really bored," and that he didn't know what he was working on in rehab besides walking. Bill's SLP session consisted of sequencing, problem solving activities and delayed recall (memory) activities, all of which were worksheet or text-based. In the AAT-ST session Jenny targeted sequencing goals with a dog trick-training exercise, in which he utilized his dog-training knowledge to teach Trooper the "whoa" command. Sequencing and verbal problem solving was targeted by asking the patient to describe the steps or process in acquiring and training a bird-dog, and steps training needed to apply for competitions, and memory/delayed recall was targeted by asking the patient to report details about the therapy dog (e.g., name, breed, age) at the end of the session. A follow-up interview was completed with Bill, in which he stated that he was "thinking about getting another dog – I couldn't train one, but it might be good to have around the house."

Henry (P3). Henry was "semi-retired" at the time of his rehab admission from a professional career as a writer and editor, and continued to work as an author for small local publications. Henry had an extensive history with animals, and approximately 3 minutes of his AAT-ST session was spent discussing his own dog, who had been brought in by his wife and daughter to visit him just a day before the AAT-ST session. Henry was interested in AAT (and this study) at CFH because he has a friend who is trying to train a therapy dog, and he had done some research into the topic prior to his CVA/admission to CFH. Henry stated that he believed that dogs can have a "broad range of potential benefits" in medical settings, and again used the term "therapeutic" multiple times to describe his dog's visit the day before. Henry also reported that after a week of rehab he had "serious cabin fever," and was surprised at the minimal opportunities to socialize in a rehab setting. Henry's ST goals of high level attention, problem solving, and complex organization skills were targeted in the SLP session through a text-based problem solving task requiring him to identify the best solution to a scenario and a review and report of his notes taken during his AAT-ST session. In his AAT-ST session his goals were targeted through a patient-led "interview" of both the handler and the dog needed to construct an article-type report of his visit. Henry appeared to be highly engaged in the interview activity during the AAT-ST session, and asked permission from all group members to publish his findings/experiences in a short article following discharge. Henry participated in an extensive follow-up interview, in which he asked for research sources and materials to extend his personal readings on AAT, recalled and ask about the handler and dog team by name, and reported that he had seen other therapy dogs in the hallway as he made his way to his current outpatient speech therapy services. When I informed him that the Therapy Dogs made outpatient visits as well he abruptly asked to conclude the phone interview so he could immediately contact CFH's outpatient speech therapy department to request the therapy dogs for his scheduled session the next day.

Jack (P4) Participant 4. Jack reported that he did not have pets at home currently, but he had animals growing up, including a canary that "sang to me when I needed it." Jack had heard of AAT before, and reported that he thought it was about "interacting" with animals, and "seeing if they respond to you." He reported that he was interested in AAT because he was "bored," and "needed something to pass the time here." Jack had more current Speech Therapy goals than any other participant including target areas such as functional reading/writing, functional memory, naming/word finding, attention (both cognitive and left visual field), and use of speech intelligibility strategies. During the SLP session these goals were targeted through a text-based worksheet task requiring him to answer simple questions about a schedule (simulated tv guide activity) and utilize a highlighter line drawn to the left side of the page to "look left" and attend to the left visual field. During the AAT-ST session, the Allison used a provided "info sheet" with prompts to ask questions and complete a semi-structured interview of the handler and dog. The dog was placed on Jack's left side, so he was required to look left to physically interact or see the dog. Jack completed a follow-up interview by phone in which he reported that the AAT-ST session "really broke up the day," and his spouse (audible in the background but did not speak directly to me) was heard saying "tell her how much you talked about it later." Jack declined follow-up ST services at CFH (or any other facility) following his discharge, but asked me if he agreed to home health services, "can they bring the dogs out to me?"

Rick (P5). Rick was originally slated to be P1, however he was transferred to the medical floor s/p pulmonary embolism, and was off the rehab floor for 2 weeks. When he returned, he asked for the DCSS to "make sure I could still get the dog thing." Rick was semi-retired at the time of his hospitalization, however reported significant stress about returning home with chronic or permanent physical disabilities. Rick had no pets in his home at the time of his study, however spoke extensively about his last pet, a beagle who died after being hit by a car approximately 9 years ago, and a dog from his childhood who lived to be 18 years old. He spoke of making a headstone for his beagle, one that he chiseled himself and placed in his backyard. He compared the loss of his beagle to "like putting down kids." Rick's goals (word-finding / naming tasks, auditory comprehension at the sentence-level, use of word-finding strategies to decrease anomic blocks) were addressed in the SLP session through worksheet tasks that included naming items in a given category and following written directions. He participated in the SLP session, however required frequent "re-direction" to stay on task, and frequently referred to tasks as "silly". During the AAT-ST session Jenny targeted categorical item naming by first asking Rick to name/list words he may need to train the dog to do a few tricks, and then to "guess" the things the handler had in her dog accessory bag. The majority of the session was spent with Rick directing the dog through various tricks (e.g., picking up items, sitting), and teaching her the new trick of "low five" to accompany a known "high five" trick. Unfortunately Rick's condition progressed following completion of on-site data collection, and he was not able to complete a follow-up interview as he was re-hospitalized out of the area after CFH discharge.

Ron (P6). Ron had a complex recent medical history included multiple surgeries to address an active sub-lingual tumor, as well as radiation, chemotherapy, tracheostomy placement, and debility/weakness. Ron reported awareness of his intelligibility deficits, however demonstrated significant difficulty using strategies (slow rate, over-articulation) during interview and SLP sessions, requiring frequent requests for clarification. Ron currently had pets in his home, including a rare breed of Rottweiler belonging to a family member who he referred to as "my buddy," and also reported a long history with other pets including kittens and "some kind of bird." He reported concern about being alone at home following discharge from CFH, but staid that he thought his "buddy" would be of comfort and help to him in his home. He requested Therapy Dog visits and participating in the study because "I'm back in the corner here – I never see anyone and it's lonely." Ron's intelligibility goals were targeted during the SLP session through a verbal/expression tasks including a description/definition task with text-based stimuli (e.g., "choose one of the words on this list"), and a verbal reasoning task (e.g., "why do we need air conditioning"). In the AAT-ST session goals were targeted through an interview, with Allison acting as "assistant" to take notes. Requests for repetition frequently occurred in the AAT-ST session as well, from both the Allison and Rich. Ron was unable to complete a follow-up interview due to a change in disposition status (per report from family member who answered home phone).

Jeff (P7). Jeff reported a complex recent medical history, and said during the initial interview that he was working on "coming up with words," and "finding answers." Jeff currently has several animals in his home, and was highly engaged in the interview in telling stories about his two dogs and his "grumpy" cat, as well as childhood pets. Jeff reported that his family accuses him frequently of "spoiling" his dogs, as he regularly "cooks them breakfast," and "if I eat, they eat." Jeff spoke of multiple tricks, personality traits, and idiosyncrasies of all of his current pets, and became quite emotional about much he missed "talking to them." He said he'd been "without them all" for several weeks, which he said was "the worst part" of being in the hospital. Jeff spoke of financial difficulties raised by his hospitalization, then segued quickly into a story of how he had sold some belongings to pay for a surgery for his Chihuahua following an attack from a neighbor dog. Jeff had no prior knowledge of AAT, but reported that it didn't matter how the dogs were used in therapy, as "All dogs are good. I want to see the dogs." Jeff's Speech Therapy goals included a variety of expressive language naming tasks, targeted during SLP sessions through drill-based picture card naming (e.g., Allison showed Jeff a card and asked him to label/name the picture), simple object function tasks (e.g., "what do you do with a belt") and verbal reasoning tasks (e.g., "what would happen if _"). During the AAT-ST session, Jenny cued Jeff to name items in dog-related categories (e.g., "name 10 different foods safe for dogs,") and to compare physical and behavioral features of his dog with the therapy dog present (e.g., "how is Trooper's coloring different from your Boxer?"). A follow-up interview was not possible ("no phone"), however I had an incidental meeting/conversation with him in the hallway 3 days following his SLP session (AAT-ST session occurred 3 days before his SLP session). Jeff reported that he had seen "another, smaller dog" for an in-room visit, and that he only had "2 days until I see my babies."

Howard (P8). Howard was unable to recall specific difficulties following his last CVA beyond "it was hard to walk and talk," and MDs suspected multiple recent CVAs of varying severity. Howard had a history with animals that began only recently, as he did not have animals as a child or younger adult but got his first pet 8 years ago. Howard spoke fondly of his miniature dachshund, who was a gift from his step-son to his wife, and yet "she wound up being mine." Howard's room was filled with dachshund-themed balloons, cards, and a pillow, all brought in by his family members. Howard stated that his interest in being involved in the study was "about getting as much dog time as I can." Howard's current Speech Therapy included naming tasks (simple divergent/convergent categorical naming), verbal reasoning tasks, working and delayed memory using chunking strategies, and both left visual field and functional attention tasks. In the SLP session Howard completed worksheets for following complex directions and identifying the best solution to a stated problem, and auditory activities for working memory in which P8 was presented with a list of words for later recall. Howard is the only participant with a family member present during the AAT-ST session, and the first 10-15 minutes of that session was spent with Howard and his spouse describing the habits and patterns of their dachshund. Other AAT-ST activities included delayed recall of information gathered about Pepper, categorical naming of snacks that were safe for her, and verbal reasoning for problems the handler was experiencing with recent behaviors. Howard completed a follow-up interview in which he was unable to recall many details about the session, however reported "I really enjoyed it" multiple

times during the interview. He said that the best thing about being home was being with his dog, although he was nervous about caring for him, and stated "that should have been something I worked on in rehab – that would of been worth the money."

Tina (P9). Tina was familiar with rehab from a previous CVA, but this new CVA was much more severe, and she stated in the initial interview that "no one can understand me," and "I feel like I lost my voice completely." Tina has an extensive history with animals as an adult, in that as soon as she was independent with her own family she began adopting dogs. She said that she was never allowed to have dogs as child as her father's military career prevented it, so she "made up for it" when she got her own home. She was very emotional during the initial interview when describing her three dogs, speaking of them as members of the family, and stating that her dogs were a lifeline for her: "I would just die if anything happened to them. Because after my first stroke – those pugs – they just mean the world to me." Tina requested to be a part of the study because "I knew that way I'd get dogs, right?" Her speech therapy goals included independent use of breath support and intelligibility strategies (e.g., slow rate, short phrases, increased volume, over-articulation), and strengthening/pharyngeal clearance exercises for dysphagia. These goals were addressed in the SLP session through review and discussion of recommended dysarthria strategies, and repeated prompts to "slow down," "take breaths," and repeat phrases as needed for increased intelligibility. Her speech therapy goals were targeted in the AAT-ST session through the use of the "info sheet," with additional questions added / expanded on during the session. Jenny cued her at the start of her AAT-ST session to "think about your strategies," and no other cuing was completed for the remainder of the session. P9 completed a follow-up interview in which she reported that she was "still struggling" to recover, and was worried that it would be a "long road ahead." She became tearful when discussing her pets at home, again stating that they were "the reason that I've made it so far – my family's great, but these dogs are my loves."

Brad (P10). Brad was the youngest of all study participants (18 years old), and reported a "lifelong" history with animals, in that he is the "caregiver" for his grandparent's and aunt's and uncle's dogs and cats. He reported a desire to pursue a career with animals, and has pursued employment options at the local animal shelter as well as through a school work-study program. Allison reported to the Rich and I that Brad had received several visits from the Therapy Dogs over the 2 weeks prior that he had been on the rehab floor, as well as a visit when he was in critical care/ICU immediately following his accident. Brad requested to be a part of this study because he was "so, so bored," and "if there's a way to see dogs more, sign met up." His ST goals focused on short term and working memory tasks and use of strategies, complex verbal and visual problem solving tasks, and complex organizational tasks. These goals were addressed in the SLP session through an organization task requiring him to "plan a pizza party" following cues on a worksheet/text-based prompt. Short term/working memory was targeted through delayed recall of details from worksheet information, including directions to be followed. His AAT-ST session included an interview activity with the added element of presenting the information to his family at the end of the session. At the end of the AAT-ST session, when repeat/follow-up Therapy Dog visits were being planned, the Allison reminded Brad that his family had requested that Cubbie visit the room following the session. Brad introduced Rich and Cubbie to his family, and his family reminded him that it was the same handler/dog team he had seen two days ago. Brad had no recollection whatsoever of seeing Cubbie previously, and was

shown “proof” (pictures) by his mother. Allison later described this incident as “pivotal,” as the rehab staff had been trying to educate Brad and his family on the significance of his memory / cognitive deficits, and the need for close supervision when he returned home. Brad’s mother reported “If he doesn’t remember seeing the dog – that’s a big problem.”