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# The Effect of Narrative Feedback on the Learning and Transfer of Complex Communication Skills

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# THE EFFECT OF NARRATIVE FEEDBACK ON THE LEARNING AND TRANSFER OF COMPLEX COMMUNICATION SKILLS

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**ABSTRACT**

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The purpose of the present research was to examine the effects of narrative performance feedback on learning and transfer of intercultural communication skills learned in an experiential training task. It was predicted that feedback based on a narrative structure, especially from a first-person perspective, would enhance learning by providing schemas for memory organization, contextual information, and emotional content. Using a healthcare-related training task, participants learned the CRASH principles of intercultural sensitivity and then performed a low-fidelity, text-based simulated conversation with a patient and patient's family member. Participants were randomly assigned to one of three kinds of performance feedback: didactic, third-person narrative, or first-person narrative. Dependent variables were content knowledge as assessed by content quiz scores, transfer of training as assessed by situational judgment tests (SJTs), and subjective experiential learning as assessed by items from the Experiential Learning Survey (ELS). Two separate experiments were conducted: 133 participants completed the task with testing immediately following training, and in a follow-up study 46 participants completed the task with a one-week interval between training and testing. The results showed few significant effects of feedback type. The predicted effects of feedback type on CRASH quiz scores, SJT responses, and ELS scores were not observed. However, there were some interactions between feedback type and gender. Male participants scored

significantly lower than female participants on the CRASH content quiz in the didactic feedback condition only, suggesting narrative feedback was uniquely beneficial for males for remembering content. Results from some ELS items suggested that there were gender differences in the didactic condition only, with males giving lower ratings for utility of the training. Taken together, the findings suggest that the type of communication skills performance feedback might not have broad implications in learning, transfer, or subjective experience, but there may be some benefits of narrative feedback for males. Further research is needed to determine whether this effect holds in other contexts with other tasks and measures.

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# CHAPTER I

# INTRODUCTION

In healthcare, communication is a critical skill for delivering quality patient care. However, communication skills are ambiguous and ill-defined, making them difficult to train and assess. In particular, intercultural sensitivity is an important part of communication that supports care by healthcare providers for patients with different cultural viewpoints from their own (Allison, Echenmendia, Crawford, & Robinson, 1996; Ben-Ari, 1998; Hipolito-Delgado, Cook, Avrus, & Bonham, 2011). To improve complex communication skills, experiential training activities can provide real or simulated intercultural experiences to help trainees improve their self-awareness, develop empathy, and learn intercultural skills that transfer to practice (Arthur & Achenbach, 2002; Clem, Mennicke, & Beasley, 2014). However, from a training standpoint, little is known about how instructors should provide performance feedback to trainees following the experiential training activities.

In general, the effectiveness of instructional feedback depends on how well it prompts the trainee to engage in reflective thinking. Guided feedback and reflective thinking are especially important for developing complex skills like communication (Bangert-Drowns, Kulik, Kulik, & Morgan, 1991). One way to create a structured organization for performance feedback would be to use a narrative format, with feedback giving a story-like retelling of the experience. An examination of literature on human memory research provides a rationale for the general effectiveness of storytelling for learning. Narratives are structured in a way that provides schemas for memory organization (Mandler, 1984; Thorndyke, 1975; 1977), contextual information (Schank, 1998), and emotional content (Oatley 1994; 1999; Richtey, LaBar, & Cabeza, 2011) that assist reflective thinking and retention of information in long-term memory.

Therefore, for the present research, the role of narrative feedback was examined for its effect on learning and transferring intercultural communication skills. The purpose of the research was to investigate how different forms of narrative would affect the ability of individuals to communicate in a culturally-sensitive manner.

# CHAPTER II

## BACKGROUND

### Simulation-Based Training

The use of simulation for training is becoming increasingly common. Decades ago, Raser (1969) suggested that humans tend to rely on several kinds of simulation and storytelling to support learning in our everyday lives, including the use of metaphors, analogies, and mental representations in place of real events. Although simulations can range in technological complexity from written examples to immersive and interactive virtual environments, the term *simulation* often refers to the use of technology for approximating realistic experiences (Cannon-Bowers & Bowers, 2008). In the context of training and education, simulations are considered exercises that enable learners to apply knowledge, skills, and strategies in safe and realistic contexts (Gredler, 2004).

Simulation-based training can support learning objectives for a range of skills, whether cognitive, affective, or behavioral. Gredler (1994) identified two broad categories of simulations: tactical-decision and social-process simulations. Tactical decision simulations include diagnostic, crisis management, and data management simulations. In healthcare, tactical decision simulations might be used to train clinical skills such as patient diagnosis and treatment. In contrast, social-process simulations target social-system, communication, and empathy/insight learning objectives. Social-process simulations might be used in healthcare to train communication skills, such as role-playing activities with human standardized patients. The present research is focused on social-process simulation rather than tactical decision simulation.

The technology used for training simulations has quickly become more accessible in recent decades due to the proliferation of computers (Moroney & Lilienthal, 2009). Advantages of using simulation as a training tool include cost-effectiveness, safety, instructional flexibility, and repeatability in a standardized training environment (Hays & Singer, 1989; Moroney & Lilienthal, 2009). Simulations can provide trainees with experiences that are otherwise unsafe or rare in the real world (Alessi & Trollip, 1991; Cannon-Bowers & Bowers, 2008), such as learning how to operate a nuclear power plant, for which real-world consequences of poor performance could be catastrophic (Alessi & Trollip, 1991). Simulation also affords the instructional flexibility to use techniques like part-task training, pausing the scenario, changing the difficulty level of the task, and giving performance feedback (Hays & Singer, 1989).

In healthcare training, simulations give trainees the opportunity to experience events that they may not be exposed to during clinical rotations (Curtin & Dupuis, 2008). Simulation-based training as part of an instructional curriculum has been shown to improve trainee performance in the clinical environment (Anderson, Aylor, & Leonard, 2008) in specialties such as anesthesia (Schwid, Rooke, Michalowski, & Ross, 2001), laparoscopic surgery (Aggarwal, Balasundaram, & Darzi, 2008; Bashir, 2010), and team skills (Weaver, Salas, Lyons, Lazzara, Rosen, DiazGranados et al., 2010).

The present research focuses on intercultural communication skills training delivered through low-fidelity, scenario-based training. *Scenario-based training* involves the use of a story structure to engage trainees in the instructional process and involve them as active decision makers (Spiker, 2010). Although often implemented in virtual environments simulating realistic experiences (Schmorrow et al., 2009), scenarios can be implemented in several ways varying in technological complexity, such as written descriptions and responses, role playing, or interaction with virtual characters. Designers of training scenarios write events and scripts to give trainees opportunities for developing or practicing targeted skills in a realistic context (Schmorrow et al., 2009).

*Bloom's Taxonomy*

When designing training experiences, scenarios should be written based on defined learning objectives. Learning objectives specify the knowledge and skills targeted by the training.

From a broad perspective, training can be considered in the context of the categories of learning objectives identified by Bloom's Taxonomy (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956). The original taxonomy introduced six major categories in the cognitive domain. From lower order to higher order skill, these categories are: knowledge, comprehension, application, analysis, synthesis, and evaluation. In this taxonomy, achievement of a complex skill requires success in preceding lower-order categories. In 2002, Anderson and Krathwohl revised the taxonomy, renaming the categories using verbs to maintain a consistent emphasis on the learner's actions: remember, understand, apply, analyze, evaluate, and create.

Conceptually, lower levels of Bloom's taxonomy refer to shallow kinds of learning, like memorization and procedural learning. Higher levels of the taxonomy represent complex learning that requires individuals to generate inferences, answer causal questions, diagnose and solve problems, make conceptual comparisons, generate coherent explanations, and demonstrate application and the transfer of acquired knowledge (Graesser, Ozuru, & Sullins, 2010; D'Mello & Graesser, 2012).

Simulation-based training can assist with learning at all levels of Bloom's taxonomy. Simulations can provide complex, dynamic, realistic situations to which learners apply, synthesize, and evaluate information at the high end of the taxonomy that was learned at lower levels of the taxonomy (Cannon & Feinstein, 2005); providing a form of *experiential learning* in a safe environment.

*Experiential Learning and Reflection*

Simulation-based training and scenario-based training are instructional methods that promote *experiential learning*, a process that Kolb (1984) described as "learning by doing." Experiential learning differs from classroom learning that has traditionally been built on didactic teaching in which the instructor imparts information and students provide little contribution. According to Kolb (1984), experiential learning consists of four related parts: concrete experience, reflective observation, abstract conceptualization, and active experimentation. Learning is thus described as the combination of an experience, whether real or simulated, and the reflective processes surrounding the experience that help the individual apply what he or she has learned to new situations.

Other researchers have described phases of experiential learning that are similar to Kolb's (1984) four parts. Drawing on Kolb's (1984) theory, Gibbs (1988) emphasized the instructional importance of links between "doing" and "thinking," conceptualizing the four phases of experiential learning as planning for action, carrying out action, reflecting on action, and relating what happens back to theory. Alternatively, Grant and Marsden

(1992) considered experiential learning to be a similar four-phase process: an experience, thinking about the experience, identifying gaps in learning, and applying new learning to practice. Although the specific phases of experiential learning vary according to different theorists, each of these perspectives includes reflection as a core component.

In fact, educational researchers have long considered reflection to be a crucial part of learning and education. Well-known psychologist John Dewey (1913) referred to “self activity” as a method for extracting new meaning about the world and the self to improve learning. Boud and colleagues (1985) later defined reflection more generically, as a process for improving future behavior. Boud et al. described reflection in three stages: returning to an experience, attending to feelings, and re-evaluating the experience. Similarly, Sandars (2009) defined reflection as “a metacognitive process that occurs before, during, and after situations with the purpose of developing greater understanding of both the self and the situation so future encounters with the situation are informed from previous encounters” (p. 685). These definitions of reflection describe the process as a method by which individuals examine a learning experience to influence future behavior.

The effect of training on future behavior is also related to the concept of transfer. Transfer of training refers to the extent to which a learned skill is applied in a new environment. By measuring transfer, researchers can determine the effectiveness of a training program (Wightman & Lintern, 1985). Theories (Holding, 1965; Thorndike & Woodworth, 1901) suggest that transfer is enhanced when there is high psychological similarity between the experience of performing in the training environment and performing in the real-world environment it represents, highlighting the importance of realistic experiential learning.

Beyond the idea of trainees learning and transferring specific skills, Boenink and colleagues (2004) also suggested that the act of reflection is a prerequisite for developing a professional identity. Building on prior definitions, they described reflection in the context of medical students' development of communication and interpersonal skills. They posited that reflection involves the conscious weighing and integrating of multiple perspectives when analyzing a situation, influencing communication and interpersonal skills. Reflective thinking may be more important for communication and interpersonal skills than for other domains that have common performance objectives and standards, making it easier for trainees to achieve clarity on their own (Richardson, 2004). However, reflection is more valuable in less standardized areas, like communication skills, because quality of performance is less obvious. Instructor-guided reflection processes that incorporate feedback and suggestions can be an effective way to prompt learners to critically examine themselves and their performance (Sandars, 2009), especially for ill-defined, less objective skills.

In sum, simulation-based training is a method of experiential learning, which is thought to support learning by encouraging active participation in the learning process and encouraging reflection about how the experience can be applied to other situations. A guided reflection process, using structured performance feedback, is a method to extend the benefits of experiential learning, especially for more ambiguous skills like communication that have no pre-defined, objectively correct behavior.

*Reflection in Healthcare*

In healthcare, reflection is increasingly being accepted as a critical component of patient-centered care (Koole et al., 2012). Fanning and Gaba (2007) point out that reflection is an important element of training that is required to meet learning and improvement goals as identified by the Accreditation Council on Graduate Medical Education in (ACGME) in the United States. It is thought that reflection is essential for a practitioner's ongoing personal and professional development (Boenink et al., 2004; Plack & Greenberg, 2005).

Despite the supposed benefits of guided reflection on professional development, there has been little empirical evidence suggesting that reflection positively impacts clinical performance in healthcare. Sobral (2001) reported a small but significant correlation between students' reflection-in-learning scale scores and academic achievement, measured by grade point averages, suggesting that reflection and academic performance might be linked. Koole et al. (2012) found a similar pattern when undergraduate medical students solved video cases and completed the 6-item Student Assessment of Reflection Scoring (StARS) rubric that addresses the three main elements of reflection: awareness, understanding, and future action.

Although reflective thinking is a skill that clinicians should ideally develop and use, many medical students might not fully engage in the reflective process if they do not think it relates to the curriculum and assessments (Grant, Kinnersley, Metcalf, Pill, & Houston, 2006). Further, because reflection is a metacognitive process (Sandars, 2009), individuals must first be aware of the need to reflect. Therefore, many individuals might benefit from prompting or guided reflection to make connections and identify future actions. This guidance can be achieved through a feedback and debriefing process that highlights gaps between desired and actual performances during a training scenario.

## Communication Skills Training in Healthcare

As mentioned previously, communication skills are important for providing effective healthcare. However, these skills are difficult to train because they are not well defined and they depend heavily on individual factors like emotional intelligence (Mayer, Roberts, & Barsade, 2008; Mayer & Salovey, 1995; Salovey & Mayer, 1990) and personal experience. Communication skills are also difficult to assess because there are no clear, objective measurements to reference when providing performance feedback. To address these limitations, simulation-based training can provide an environment for trainees to practice sensitive communication skills and review their performance to reflect on how they might improve.

### *Intercultural Sensitivity and Healthcare*

In service industries like healthcare and social work, cultural sensitivity is of paramount importance. Instructors often use experiential learning techniques to provide real or simulated experiences with patients from varying cultures (Clem, Mennicke, & Beasley, 2014). Through these exercises, individuals can improve self-awareness about multicultural issues, develop cultural empathy, and learn how to translate intercultural learning into practice (Arthur & Achenbach, 2002).

In the context of cultural sensitivity, Allison and colleagues (1996) reported that a significant predictor of psychologists' self-rated competence for serving diverse clients was the number of therapy cases experienced during training with members of specific cultural groups, suggesting experiential activities with cultural diversity can help prepare psychologists for actual practice. Ben-Ari (1998) also found that homophobic attitudes of social work students significantly decreased after taking part in a course using experiential learning to teach diversity. Experiential activities for training intercultural skills might include immersion in a cultural community (Hipolito-Delgado, Cook, Avrus, & Bonham, 2011), viewing and discussing popular movies that depict culturally diverse characters (Villalba & Redmond, 2008), and role playing to directly experience simulated intercultural issues.

### *Role Playing as Communication Simulation*

Role playing represents a broad category of language skills, defined by Gredler (1994) as simulations used to support individuals' development of skills needed to communicate in unfamiliar situations. Role playing has long been used in education to teach social skills (Kane, 1964), and role playing in healthcare training helps trainees develop skills by giving them active roles to play such as that of a patient or physician (Barrows, 1993).

For cultural learning, role playing with simulated humans has been used with some success. Babu and colleagues (2007) investigated the use of life-size-projected virtual humans to teach social verbal and nonverbal protocols in south Indian culture. In this particular culture, social interactions are highly specific and complex with rules for temporality, intensity, and synchronicity of verbal greetings and nonverbal gestures. The researchers compared instruction and interactive feedback from virtual characters with instruction via written study guides with illustrations. Although both instructional methods resulted in learning, interaction with the virtual humans resulted in better, more consistent results for carrying out the proper cultural protocol in testing scenarios.

Researchers have also found positive training benefits with intercultural communication games developed for the United States military, including Tactical Iraqi (Surface, Dierdorff, & Watson, 2007) and ELECT BiLAT (Enhanced Learning Environments with Creative Technologies for Bilateral Negotiation; Hays et al., 2009; Kim et al., 2009; Lane, Hays, Auerbach, & Core, 2010). Tactical Iraqi is a scenario-based virtual system that provides an opportunity for trainees to learn and practice Iraqi culture, language, and gestures. Trainees who interacted with Tactical Iraqi demonstrated improved Arabic language and cultural knowledge (Surface et al., 2007). BiLAT is an immersive learning environment that simulates face-to-face meetings with virtual characters to practice negotiating skills in Middle Eastern cultures. In BiLAT, there are objectives that the learner should achieve while also respecting the norms of the targeted culture. The learners communicate with BiLAT by selecting communicative actions from a predetermined list. The list of possible actions includes conversational actions and physical actions. After a learner selects an action, the character responds with physical gestures and synthesized voices. The character's response to learner actions depends on several variables, including a "trust meter" and a virtual dice roll: the trust meter builds upon the learner's prior actions such that culturally appropriate actions increase a character's trust and cultural missteps decrease it, and the virtual dice roll simulates the inherent unpredictability in human behavior (Kim et al., 2009). Trainees who interacted with BiLAT to learn intercultural communication skills were shown to have success in a situational judgment test (SJT) measuring learning transfer (Lane, Hays, Core, & Auerbach, 2013). Thus, simulated intercultural scenarios show promise for improving intercultural communication skills.

## Feedback and Training

### *History of Feedback Research*

Researchers understand that feedback is an important component of learning and skill acquisition. When behaviorism dominated learning theory in the early twentieth century, feedback was seen as a method of reinforcing or suppressing associations between a behavior and an outcome (Bangert-Drowns, Kulik, Kulik, & Morgan, 1991). Research during this time was focused on simple, observable perceptual or motor tasks, and feedback in these kinds of tasks was termed *knowledge of results* (KR) or *knowledge of performance* (KP).

KR and KP can guide learners toward their goals by helping them determine the next sequence of operations in a task. For example, Trowbridge and Cason (1932) investigated the use of feedback by asking blindfolded participants to draw lines exactly three inches long. When participants were given feedback telling them when they had made good approximations of 3-inch lines, they showed improvement, whereas those who did not receive feedback showed no improvement over 100 trials. Holding (1965) suggested that systematic research can help identify how much feedback is best for specific tasks, as well as how and when this feedback should be given.

The benefits of feedback on learning have transcended behaviorism into widespread acceptance among modern learning and cognitive researchers (Shuell, 1986).

In contrast to the behaviorist view, cognitive theorists argue that feedback does more than simply strengthen stimulus-response associations; it also provides strategically useful information that the learner can implement in novel situations. According to cognitive learning  principles, learning occurs when individuals actively attend to stimuli, access existing knowledge, realign the structure of that knowledge to accommodate new information, and encode this restructured knowledge into long-term memory (Jonassen, 1988). Therefore, from a cognitive viewpoint, feedback is most effective when it fosters these active cognitive processes (Azevedo & Bernard, 1995; Bangert-Drowns et al., 1991).

Most research concerning instructional feedback has been carried out in the context of well-established learning and training domains for which there are objectively correct answers. However, skills like interpersonal communication are less well-defined. Bangert-Drowns and colleagues (1991) conducted a meta-analysis of feedback research and found that feedback is more important when the content to be learned is complex and somewhat subjective, as opposed to well-defined problems.

*Feedback in Simulation-Based Training*

In simulation-based training, feedback is often complex and given in the form of structured debriefing, which is often conversational. Debriefing is defined as the process of guiding individuals to reflect on learning experiences to draw out meaningful, transferable lessons (Thiagarajan, 1993). Indeed, structured debriefing has been shown to extend learning benefits of training experiences by reinforcing learning as well as supporting reflective thinking (Fanning & Gaba, 2007; Morgan et al., 2009; Qudrat-Ullah, 2004; Savoldelli et al, 2006; Welke, et al., 2009).

According to Lederman (1992), there are three historical uses of structured debriefings: military campaigns or other critical incidents, psychological studies involving deception, and educational settings. Debriefing in military campaigns and war games provides a way to discuss what has occurred and what new strategies could be developed to improve performance. In psychological studies, debriefing sessions are meant to give participants background and reasoning for the research in which they have just taken part, aimed at providing information rather than encouraging reflection or learning. Finally, debriefing in educational settings is meant to facilitate learning based on an activity that has taken place. Thiagarajan (1993) suggested that debriefing after an instructional experience is useful whenever meaningful insights can be derived through discussion.

Debriefing sessions, also called after-action reviews, are often loosely structured, providing a general level of feedback and discussion that promotes active learning when individuals reflect and make connections between the feedback and their own performance (Ellis & Davidi, 2005). In the past, researchers have mostly focused on the benefits of debriefing as a form of "cooling down" after a simulation when the experience is particularly stressful or emotionally charged (Peters & Vissers, 2004). Although participants may benefit from releasing emotional tension from the simulation exercise (Fritzsche, Leonard, Boscia, & Anderson, 2004), debriefing can also support continued learning as a form of performance feedback. However, previous research concerning debriefing in the context of training has been conducted across diverse disciplines (e.g., military, medicine, aviation, education) and has provided little objective evidence, making it difficult to synthesize general findings (Levett-Jones & Lapkins, 2014; Tannenbaum & Cerasoli, 2013). Levett-Jones and Lapkins (2014) reviewed the available research on simulation-based debriefing in healthcare and concluded that debriefing has often been found to enhance learning, but further research is needed to determine which methods and components of debriefing are most effective.

A potentially effective component of debriefing is the provision of feedback that supports reflective thinking. Guided reflections on specific actions during training will likely benefit students' development of professionalism and competence (Tannenbaum & Cerasoli, 2013). Research is needed to examine components of feedback that can support experiential learning and reflective thinking in simulation-based training in healthcare.

### *Feedback Specificity*

Research on feedback formats for complex tasks is sparse, but researchers have examined how changes in *feedback specificity* influence learning and transfer. Feedback specificity refers to the level of detail provided by the feedback, and so a distinction may be made between general and specific feedback. General feedback provides broad, conceptual information about task performance, whereas specific feedback provides explicit information about performance errors and how to correct them (Davis, Carson, Ammeter, & Treadway, 2005; Shute, 2008). Therefore, specific feedback is much more directive, perhaps even giving directive information for every item in the task (Black & William, 1998).

The level of feedback specificity has implications for the amount of cognitive effort needed to process information and apply it to future actions. Specific feedback is beneficial for learning, especially for novices, because it often presents direct suggestions for improving performance. This detailed feedback requires less cognitive effort because there is little information open to interpretation (Kalyuga, 2007; Reiser, 2004; van Merrienboer & Sweller, 2005); that is, specific feedback guides the learner to the correct response or action (Goodman, Wood, & Hendrickx, 2004). In terms of cognitive load theory (Sweller, 1988; Sweller, 2011), the learner invokes less cognitive processing when given specific feedback because the errors and corrective actions are identified for them. Cognitive load is therefore lower, leaving more attention available to facilitate learning.

However, for more complex skills, general feedback might have advantages over specific feedback. In fact, in game-based training, specific feedback has been found to hinder performance on transfer tasks (Goodman, Wood, & Chen, 2011; Goodman et al., 2004). In contrast to specific feedback, general feedback is inherently vague and requires more cognitive effort to interpret (Billings, 2012). An advantage of investing cognitive effort is that it can result in a more active learning process to support reflective thinking and better retention (Bangert-Drowns et al., 1991). A similar finding has been reported in the context of error management training (Keith & Frese, 2008): unclear guidance may prompt learners to explicitly consider why an error has occurred and what to do about it. However, findings about transfer of error management training based on feedback clarity have been mixed (Keith & Frese, 2008).

The present research will address feedback for a complex communication task by varying the format to be either general, in the form of a narrative, or specific and based on didactic learning objectives. The different presentation styles represent different levels of specificity, because narratives provide contextual information rather than performance details. Similar research has been conducted by Hays and colleagues (2009), in which they compared feedback specificity for a cultural learning task in a simulation-based environment. Two sets of feedback were provided during virtual interactions: specific feedback regarding corrective actions, and vague feedback providing conceptual information. Hays et al. (2009) predicted that specific feedback would enable learners to progress through training faster because the feedback was easier to implement, but the conceptual feedback would provide better long-term retention and transfer because it required more effortful processing to interpret. As predicted, those who received conceptual feedback made fewer errors in transfer scenarios, supporting the hypothesis that feedback requiring more active processing leads to better transfer. However, results did not appear to depend on the kind of feedback participants received. The absence of differences between types of feedback could be due to the specific measures used. Conceptual learning was measured using a situational judgment test, which requires application of knowledge (Fritzsche, Stagl, Salas, & Burke, 2006), a higher level in Bloom's taxonomy. In the following section, research on human memory and narratives will be described to support an argument for why general, narrative feedback might be effective for complex skills.

## Narrative

Narratives and storytelling have long been used to enhance student interest and learning in instruction. Centuries ago, storytelling enabled cultures without written language to pass down information about their society's history and values (Andrews, Hull, & Donahue, 2009). Storytelling remains a powerful teaching tool for education and training in disciplines like medicine, aviation, and law (Andrews, Hull, & Donahue, 2009).

Many researchers claim that humans naturally engage in storytelling as a part of everyday life and create stories to make sense out of events (Bruner, 1991; Connelly & Clandinin, 1990; Gudmundsdottir, 1991). In 1944, Heider and Simmel observed that individuals tended to spontaneously create cohesive stories after observing the movement of simple shapes in a short film, attributing motivations and emotions to a small triangle, large triangle, and circle moving in and around a house-shaped figure. According to Gottschall (2012), narratives can powerfully shape how we think; from a child engaging in make believe play, to the way we tend to perceive ourselves as protagonists in our own life stories, to the influence of a fictional book like *Uncle Tom's Cabin* in changing many nineteenth-century readers' opinions on slavery in the United States.

Despite the widespread acceptance and use of narratives in education and training, there is a general lack of theory for why narratives are effective instructional tools (Andrews, 2010). In this section, the definition and components of narrative will be described and research will be discussed regarding the effects of narrative on learning and retention of material.

### *Definition and Components of Narrative*

The concepts of storytelling and narrative are similar, but narrative can be considered a specific kind of storytelling. Gudmundsdottir (1995) pointed out that the word "narrative" has Latin roots suggesting knowledge and expertise. In typical colloquial use, *narrative* refers to a structure of a story (Gudmundsdottir, 1995). More specifically, narratives tend to provide information from the perspective of someone's life and in the context of someone's emotions (McEwan & Egan, 1995).

Branaghan (2010) identified five components of narrative structure: 1) a storyteller or narrator, 2) a geographical, temporal, and social context, 3) a set of events that occur in a specific sequence, 4) an audience, and 5) a message, intent, or moral. Therefore, a story is a narrative when it contains a storyteller with motives and goals who experiences and reacts to an unfolding set of events. The context and personal perspectives provided by narratives are what distinguish them from other kinds of storytelling and makes them a unique format for conveying information.

### *Narrative and Instruction*

Humans have a natural tendency to generate and understand stories; therefore, the presentation of instructional information in a narrative format seems to have advantages for human learning and understanding. Andrews (2010) identified four main instructional methods that use a form of storytelling: case-based instruction, narrative-based instruction, scenario-based instruction, and problem-based instruction. These four methods differ according to the purpose of training and the manner in which the story is used. The methods are not mutually exclusive; instruction may include components from multiple methods.

First, *cases* are stories of real events that have occurred in the past. They are often used in medical, law, and business applications. Trainees are unable to alter the outcome of a case, which is comprised of actual facts, but they observe the process. In healthcare training, cases might take the form of a detailed recounting of the diagnosis and care of a patient with a particular illness.

*Narrative-based instruction* is used to immerse the learner in a series of events, creating a story. Again, the learner typically does not play an active role. Narratives are used to evoke emotions in addition to conveying facts and events (Martin, 1986). To extend the case example, the diagnosis and treatment of a patient's illness may be recounted in narrative-based instruction within the context of the patient's experience and the experience of the patient's family.

Scenario-based instruction and problem-based instruction are similar. *Scenario-based instruction* enables trainees to interact within a simulated scenario and produce outcomes depending on choices and actions, but there is usually a fixed solution. Finally, *problem-based instruction* is used for ill-structured problems, for which there is *not* a fixed solution. Problem-based instruction is often carried out with teams and unlike cases or narrative-based instruction, learners actively seek solutions in scenario- and problem-based instruction, supporting experiential learning. In healthcare training, these activities may be carried out using live role playing or virtual scenarios in which a problem is identified, such as patient trauma, and trainees attempt to solve it. The benefits of scenario-based and problem-based training are well documented (e.g., Bearman & Cesnik, 2001; Park, et al., 2010; Spiker, 2010), but the narrative component of these training methods has not been adequately examined. In the following section, theories of human memory will be discussed to suggest ways in which narrative might influence memory and learning.

*Human Memory*

Memory and learning are now interrelated concepts in psychology. According to Hunt and Ellis (2004), memory is “the process by which past experience influences present thought and behavior.” This description is similar to the basic definition of learning as “a relatively durable change in behavior or knowledge that is due to experience” (Weiten, 2008). Thus, learning might be considered the process of acquiring skills or knowledge, whereas memory is considered the lasting effect of that learning process.

*Structures of Memory.* Researchers tend to agree on the conceptualization of human memory as multiple processes that work together, rather than a unitary system. William James (1890) made a philosophical distinction between events available in an individual’s consciousness, called *primary memory*, and events that belong to the psychological past along with the awareness that they have been experienced before, called *secondary memory*. James (1890) also proposed that primary memory is limited in duration such that a state of mind must endure a certain length of time before it can exist in secondary memory.

In the 1960s, the introduction of the human information processing model greatly influenced memory research. The concept of multiple memory components was revisited when Waugh and Norman (1965) redefined James’ (1890) concepts of primary and secondary memory in terms of a capacity limitation, not only temporal limitations. Waugh and Norman (1965) suggested that primary memory is a limited, temporary storage structure and secondary memory is a larger, long-term storage system. Further, this model suggests that information in primary memory is rapidly lost when new inputs interfere, unless that information is transferred to secondary memory. A few years later, Atkinson and Shiffrin (1968, 1971) presented a model describing human memory in terms of information flowing through a system. Their description of short-term and long-term memory is analogous to Waugh and Norman's (1965) concepts of primary and secondary memory, but Atkinson and Shiffrin additionally identified a third stage of memory called sensory memory. According to this three-stage model, information is first detected by the human sensory systems and temporarily held in the sensory register. Then, information is either quickly lost or, if attention is directed to the information, it enters a limited-capacity, short-term memory storage structure. Information in short-term memory is then either transferred to long-term memory or forgotten.

Baddeley and Hitch (1974) further expanded on prior theories of short-term memory by proposing the concept of working memory. Since then, the concept of working memory has replaced the older concept of short-term memory (Baddeley, 1992). According to Baddeley and Hitch (1974), *working memory* includes subsystems that are responsible for reasoning and comprehension. Specifically, working memory refers to "the temporary storage of information that is being processed in any of a range of cognitive tasks" (Baddeley, 1986, p. 34). Baddeley and Hitch's (1974) model of working memory takes into account the nature of human errors, suggesting that working memory consists of a central executive and two "slave systems" called the visuospatial sketchpad and phonological loop, responsible for rehearsing visual and auditory information, respectively. There are limits to how long information can remain in working memory. Without rehearsal, information can be easily forgotten. Besides duration limits, information in working memory is also subject to interference by new information when it interrupts the rehearsal process. Baddeley (2000) later proposed an additional component to the working memory model to account for the process of integrating information from long-term memory and the working memory slave systems into a unitary episodic representation. This component is called the episodic buffer, and as with other components of working memory, it seems to be limited in capacity (Baddeley, 2000). As will be described later, these components might relate to a better recall of narrative information.

*Research on Capacity Limits*. A central facet of memory research has been the idea that human memory is subject to capacity limits. In a seminal article, Miller (1956) suggested that the number of items an individual can hold in short-term memory is limited to five-to-nine items, or about seven. Decades later, Cowan (2000) suggested that the human working memory limit is even lower than what Miller (1956) had initially proposed. When rehearsal and access to long-term memory are prevented, working memory seems to be limited to about four pieces of information (Cowan, 2000).

Models of human memory suggest that capacity limits cause information to be forgotten. Unless the information is transferred to long-term memory, it is subject to interference from other information (Underwood & Postman, 1960), or decay from the memory fading (Brown, 1958; Peterson & Peterson, 1959). According to Atkinson and Shiffrin’s (1968, 1971) model, there are two critical points at which information is either retained or forgotten. If information is unattended by the sensory store, it will not reach consciousness or short-term memory at all. On the other hand, if information does reach short-term memory, whether it is transferred to long-term memory depends on the organizational processes used to encode and integrate it into long-term memory.

The organization of information strongly influences how well this information is remembered or learned. Although there are well-recognized capacity limits to human memory identified in laboratory research, humans engaging in everyday activities are capable of remembering a lot of information at once, not just four or even seven items. Miller (1956) explained that capacity limits can be overcome when information is "chunked." As a simple example, letters are individual units that are chunked into words. A structured organization of chunks enables a person to retain large amounts of material. Therefore, individuals will have an easier time learning and remembering chunks of related information rather than lists of disparate facts or items (Martinez, 2010).

*Elaborative Encoding.* Encoding refers to the process of transferring information from the individual's working memory store to long-term memory. Recall that the phonological loop and visuospatial sketchpad components of working memory are responsible for rehearsing information. Craik and Watkins (1973) proposed that information is encoded through either of two kinds of rehearsal: maintenance rehearsal or elaborative rehearsal. Maintenance rehearsal, like rote memorization, occurs through repetition of information in short-term memory until it is encoded in long-term memory. In contrast, elaborative rehearsal occurs when an individual elaborates on the meaning of the material, creating semantic significance and associations with other knowledge and experiences in long-term memory.

Because elaborative rehearsal requires an individual to attach meaning to information and maintenance rehearsal does not, not all information is encoded equally. Craik and Lockhart (1972) conducted seminal research on memory in which they posited that successful encoding and retrieval of information depends on *how* the information is rehearsed. Their results suggest that a superficial encoding of material, such as maintenance rehearsal, does little to aid in recall, whereas deeper and more meaningful elaborative encoding of material creates memories that are easier to recall. According to Craik and Lockhart's (1972) *levels of processing theory*, retention of information is related to an individual's processing of semantic meaning. If an individual encodes deep meaning rather than superficial aspects of the material, information stored in memory is more durable and more easily recalled later. As will be discussed, narrative information may naturally engage individuals in deeper processing.

*Narrative and Memory*

Although researchers tend to agree that narratives are beneficial for education, there are few formal explanations for why this might be true (Andrews, 2010). Knowledge of human memory processes is necessary for understanding how narratives affect learning. Specifically, narrative information is robust to capacity limits of memory and facilitates deep processing through two major mechanisms: organization and elaboration of information.

*Organization*. On a general level, humans are better at remembering information that is organized rather than unorganized. Laboratory studies have compared recall of categorized and uncategorized lists and found that participants tend to remember categorized lists better (Bousfield, 1953; Bower, Clark, Lesgold, & Winzenz, 1969). Therefore, the inherent organizational structure provided by a narrative will likely facilitate memory.

Thorndyke (1977) suggested that narratives have a specific internal structure, a story grammar, which enables individuals to generate expectations based on knowledge of characters and situations. The story grammar provides an identifiable organizational structure to assist individuals with comprehension and memory (Thorndyke, 1975; 1977). Mandler (1984) suggested that a person mentally represents the story grammar as a mental story schema, which provides a way to easily recount experiences and extract meaning from them.

A narrative structure also seems to suit humans' natural ways of organizing content in long-term memory. Bruner (1991) described how humans tend to organize experiences as personalized stories, as a coherent whole. That is, we tend to connect our experiences together to create a meaningful story through which we understand concepts and events.

*Elaboration*. Schank (1998) suggested that narratives help learners understand information by conveying meaningful context via indices like location, problems, decisions, and conclusions. By incorporating all of these different types of information, narratives provide the opportunity for a learner to elaborate on the material and make meaningful connections with their own past experiences. These details engender a deeper processing of material, which, according to Craik and Lockhart's (1972) levels of processing theory, creates memories that are easy to recall. Actively constructing narrative stories has similarly been shown to enhance recall of word lists, in a technique called narrative chaining (Bower & Clark, 1969).

*Emotion*. A specific aspect of narrative that may lead to more elaborative encoding is emotional content. Craik and Lockhart (1972) did not discuss the impact of emotion directly, but they did posit that meaningful stimuli are processed more deeply and will be better retained in long-term memory. Emotional information can provide meaning beyond facts and events alone, supporting deeper encoding of memories (Richtey, LaBar, & Cabeza, 2011). Indeed, several studies have provided evidence that events with high emotional content are likely to be remembered (e.g., Bradley, Greenwald, Petry, & Lang, 1992; Cahill, Babinsky, Markowitz, & McGaugh, 1995; Kensinger & Corkin, 2003; Sharot, Delgado, & Phelps, 2004). Thus, narratives with emotional components can influence memory and learning. Oatley (1994; 1999) suggests that even reading narrative fiction can be a powerful way to induce emotions of identification, sympathy, and empathy.

*Human Memory and Narrative Summary.* In summary, strong memories are formed when information is well organized, provides context for elaboration, and contains deep meaning such as that provided by emotional content. Narratives can assist with all three of these factors, facilitating deeper processing and better retention. That is, narratives provide a recognizable organizational structure, contextual information through characters and events, and emotional meaning through evoked identification, sympathy, and empathy. As an instructional method, simulation-based training can utilize aspects of narrative to enhance potential learning benefits. The following sections contain more specific information about how narrative is related to simulation-based training and healthcare.

*Narrative and Simulation-Based Training*

*Simulation Scenarios.* Instructors and researchers can purposefully design simulation-based training experiences to include rich narrative to enhance learning benefits. Researchers have indeed discovered that the use of narrative in simulation-based training can improve comprehension and retention (Conle, 2003; Laurillard, 1998). Narrative is a format for tying training activities together and situating the learning in a realistic scenario (Ellaway, Poulton, Fors, McGee, & Albright, 2008).

Narrative simulation scenarios can provide an organizational structure to support the integration of learned information in memory. Scenarios contextualize learning through settings, characters, and events for more elaborative encoding of information. Narrative scenarios can also be an effective way to elicit realistic emotional responses by providing multiple character perspectives and by demonstrating the effects of learner actions. Huang and Alessi (1999) note that emotions are an essential component of how individuals experience events in the real world, making them essential for training experiences that represent real-world situations.

*Feedback.* Once the simulation scenario has been completed, feedback and debriefing might be used to organize complex training events into a chronological story, emphasizing causality of events, consequences of learner actions, and character perspectives and emotions. Fiore, Johnston, and McDaniel (2007) considered the use of narrative as a tool in simulation-based training for organizing debriefing around events and actors in a military team exercise. These researchers suggested that narrative debriefing provides a conceptual organizational structure for conveying complex information and encouraging trainees to reflect on their performance.

The use of feedback and the structure of narrative have rarely been theoretically or empirically connected. However, narrative has been linked in the literature to reflection, a crucial aspect of experiential learning. Narrative creates meaning through contextual and often emotional information, which can naturally engender reflective thinking (e.g., Campion-Smith, Austin, Criswick, Dowling, & Francis, 2011). As discussed, reflection is an essential component of experiential learning (Kolb, 1984) and may help individuals connect a training experience to their own personal experiences (Cassidy, 2001). Narrative simulations can naturally encourage reflection by focusing on the effects of the trainee's decisions and actions (Bearman, Cesnik, & Liddell, 2001; McCrary, 2002; McCrary & Mazur, 2010; Zary, Johnson, Boberg, & Fors, 2006) or by providing differing perspectives that lead to new insights (Sandars, 2009).

*Narrative and Healthcare*

The general role of narrative in healthcare contexts has been increasingly recognized as important in both training and professional development (Charon, 1986; Gray, 2009). In any clinical encounter, information is exchanged and relationships are developed among physicians and patients. Physicians must learn to understand each patient's unique illness experience to deliver the best patient-centered care. That is, every patient has a story. Physicians also experience their own narratives based on their role as healthcare providers, upon which they can reflect and make improvements.

Broadly, narrative as a communication style has been used in healthcare in three main ways: clinical interaction, patient education, and physician education (Gray, 2009). In clinical interaction, researchers have recognized that giving patients time to tell their stories, and recording patients' narratives, results in improved health outcomes as part of a patient-centered environment. Narratives can also be used to convey medical information to patients. When faced with health challenges, patients often seek information about other people's similar experiences to help them clarify decisions to be made, identify and appraise options, and support coping (Entwistle et al., 2011).

Simulation-based training used in healthcare education can also benefit from narrative tools that facilitate learning and reflection. In addition to the benefits of narrative for memory in terms of organization and elaboration of information, narrative simulation scenarios may help emphasize a more patient-centered approach by encouraging reflection on interactions with simulated patients (Bearman & Cesnik, 2001). Sandars, Murray, and Pellow (2008) further suggested that narrative can drive reflective thinking and deeper learning for medical students by explicitly describing and highlighting characters' emotions and the reasons for these emotions.

# CHAPTER III

# PRESENT STUDY

The aim of the present research was to investigate the use of narrative in the context of postsimulation feedback for complex communication skills training in healthcare. To my knowledge, no previous research has specifically examined how a narrative organization of feedback might influence reflection, retention, and transfer of communication skills learned in a simulation, but an understanding of this concept would lead to better understanding of how to deliver feedback to support learning and reflection.

Toward this aim, participants interacted with a descriptive, text-only, low-fidelity simulation scenario created from a script that was developed through collaboration among clinicians, psychologists, and instructional designers. The research team previously developed a script for assessing trainees' abilities to break bad news to virtual patients (Kron, Fetters, Scerbo, Campbell, & White, 2011). An advantage of using a text-based simulation conversation exercise for research purposes is that it enables the experimental examination of different kinds of feedback with a high degree of control before implementing higher-fidelity structural changes in a learning system.

As discussed previously, feedback content can vary in specificity, which has implications for the level of processing that learners invoke to manage information. Narrative information is general rather than specific because it retells the story of the experience broadly, prompting a learner's reflective thinking and deep cognitive processing. On the other hand, specific feedback might directly address the didactic goals of the training experience in terms of connecting learner performance to learning objectives, which is more appropriate for novices. Although both kinds of feedback are beneficial, they might influence different aspects of learning. Specifically, didactic feedback might assist with outcomes related to lower levels of Bloom's taxonomy (Anderson & Krathwohl, 2002; Bloom et al., 1956), but narrative feedback might offer more meaningful debriefing experiences to better instill retention and transfer.

Therefore, three possible types of feedback were used: didactic, third-person narrative, and first-person narrative (see Table 1). Didactic feedback provided information grouped by learning objectives, whereas both types of narrative feedback were ordered chronologically to emphasize the sequential component of narrative structure. Narrative feedback also contained information about the characters' emotions whereas didactic feedback did not. Narrative feedback was further presented either in third-person perspective, from a narrator, or first-person perspective, from the viewpoint of the patient's mother. It should be noted that a stronger experimental manipulation would have been to examine organization and emotional content separately as different conditions, but the disorganization of information would have deviated from the definition of narrative and resulted in feedback conditions that lacked meaning or practical relevance.

The experiential task required participants to read through a descriptive scenario in which they took on the role of an attending physician who must address an intercultural issue with a patient and the patient's mother. As the participant read the scenario, he or she selected responses from three choices based on information they learned about intercultural competence, which was described in terms of a CRASH acronym (culture, respect, assess/affirm differences, sensitivity and self-awareness, and humility; Rust, Kondwani, Martinez, Dansie, Wong, Fry-Johnson, et al., 2006). After completing the scenario, the participant then read feedback about the scenario before completing tests to measure learning and transfer to a new task.

The standardized feedback gave participants information about how they could have optimally completed the scenario by demonstrating intercultural competence. For all three formats, the feedback was expected to encourage reflection because participants had to relate the feedback to their own performance. However, there were expected differences in *how* the reflection might impact learning. Didactic feedback was predicted to encourage reflection on CRASH principles, whereas narrative feedback was predicted to encourage reflection based on personal connection with character experiences. First-person narrative feedback was expected to further encourage reflection over third-person narrative by stimulating feelings of empathy, based on Craik and Lockhart's (1972) levels of processing theory and prior research on point of view and feelings of empathy and sympathy (Berntsen & Rubin, 2006; Deen et al., 2010; Marshall & O'Keefe, 1995; McIsaac & Eich, 2002).

Table 1.

Description of the Three Kinds of Feedback.

| | **Organization** | **Emotion** | **Perspective** |
|---|---|---|---|
| **Didactic feedback** | Grouped by learning objectives | No information about characters' emotions | Third-person |
| **Third-person narrative feedback** | Ordered chronologically | Information about characters' emotions | Third-person |
| **First-person narrative feedback** | Ordered chronologically | Information about characters' emotions | First-person |

Learning was assessed in terms of both *content learning*, assessed by short-term retention of knowledge, and *transfer*, assessing the application of knowledge to a novel but structurally similar scenario. It should be noted that transfer was assessed for a novel written task, and therefore does not represent true transfer to a clinical environment.

The separation of content learning and transfer as outcome measures to compare different feedback types is consistent with how Hays et al. (2009) conducted with their BiLAT study. Framing these concepts within Bloom's Taxonomy (Anderson & Krathwohl, 2002; Bloom et al., 1956), content learning is representative of lower levels of the taxonomy and transfer represents more advanced levels. Both kinds of learning are important, but demonstrating transfer shows the application of knowledge. Therefore, transfer is an essential prerequisite for long-term retention that in a healthcare context might lead to benefits in quality of patient care.

*Content Learning*. When Hays et al. (2009) measured content learning from BiLAT, they used a situational judgment test (SJT) as a measure and did not find differences between specific and conceptual feedback. However, a SJT is not a direct measure of content learning, but rather a more abstract measure of decision-making and application of content more similar to a measurement of transfer. The present research measured content learning more directly by assessing conceptual knowledge with a set of quiz questions.

*Transfer*. A measure of transfer was used to assess learning at higher levels of Bloom's Taxonomy (Anderson & Krathwohl, 2002; Bloom et al., 1956); that is, whether participants could apply the information to new situations. Transfer was assessed using SJTs written specifically for this study. SJTs are defined broadly as measures that examine individuals' interpretations of scenarios describing complex realistic events (Legree & Psotka, 2006). These tests can be presented in various formats, including multiple choice questions, Likert scale ratings, or open-ended questions. A common use for SJTs is the evaluation of a job candidate's projected behavior for personnel selection (McDaniel, Morgeson, Finnegan, Campion, & Braverman, 2001). Typical components of an SJT include a description of a scenario, response alternatives, and a scoring rubric (Legree & Psotka, 2006). Thus, an SJT can be used to assess training transfer even in a low-fidelity simulation (Motowildo, Dunnette, & Carter, 1990). For example, better performance on an SJT measuring pilot decision making was associated with a lower likelihood of later experiencing hazardous flight events (Hunter, 2003), suggesting SJTs are a valid way to measure training. Further, an SJT is a way of measuring application of knowledge to a description of a complex, ambiguous situation, making it a good technique for assessing transfer of communication skills (Motowildo et al., 1990).

In the present study, the SJT scenarios were structurally similar to the scenario in the experiential training exercise, in that they described an intercultural situation that required the same CRASH principles to address issues. The SJTs were open ended such that participants generated their own written responses. With an open-ended SJT, participants cannot rely on recognizing responses that are correct, but rather must generate their own responses relying on the information they learned (Fritzsche, Stagl, Salas, & Burke, 2006). That is, an open-ended SJT requires participants to recall information rather than recognize it.

*Experiential Learning*. This present study also investigated learner reflection as a component of experiential learning. Reflection has been said to be beneficial for training because it may help individuals connect the training experience to their own personal narrative (Cassidy, 2001). Boud et al. (1985) explicitly suggested the importance of emotional aspects of experience in reflection. Narrative information is likely to be more easily relatable to one's own life and emotions than didactic information, because it is more likely to prompt reflection as part of the experiential learning process. To assess reflection and experiential learning, participants completed items from the Experiential Learning Survey (Clem et al., 2014) at the end of the study. The purpose of using ELS items was to assess participants' subjective ratings of the learning experience.

*Hypotheses*

As described, two kinds of learning were assessed: content learning and transfer of learning to a new task. Didactic feedback, which relates performance information to learning objectives, was expected to be better suited for content learning as measured by a conceptual quiz on CRASH principles.

> *H1: Didactic feedback was expected to better support content learning, as measured by a quiz on CRASH principles, than either third-person narrative feedback or first-person narrative feedback.*

Beyond content learning, transfer of learned skills to novel tasks or situations addresses higher levels of the taxonomy, specifically, *applying* information. A deeper processing of information through narrative should better support the application of knowledge to new situations. Further, first-person narrative feedback was expected to result in deeper processing than third-person, because first-person information is more likely to elicit feelings of empathy. This prediction was based on the idea that narrative will result in deeper processing of information according to Craik and Lockhart's (1972) levels of processing theory, as well as prior research on narrative point of view and emotional responses (Berntsen & Rubin, 2006; Deen et al., 2010; Marshall & O'Keefe, 1995; McIsaac & Eich, 2002). Open-ended SJT responses were assessed in terms of the number of CRASH principles directly or indirectly addressed, based on a scoring rubric, as well as the length of the responses in number of words.

> *H2: Narrative feedback (both third-person and first-person) was expected to better support learning transfer than didactic, as measured by the SJTs, but first-person narrative feedback was expected to result in the best transfer in describing culturally sensitive actions more completely and with more details.*

Finally, the subjective opinions of the participants were assessed using relevant items from the Experiential Learning Survey (ELS; Clem et al., 2014). Although the participant population consisted of students rather than healthcare professionals, it was expected that they might find value in a relatable training activity. Narrative information is more easily relatable to one's own life than didactic information. That is, narratives are thought to naturally induce emotions of identification and sympathy (Oatley, 1994) and a reliving of autobiographical memories (Scheff, 1979). Therefore, narrative feedback was expected to result in higher reported experiential learning, including reflection, than didactic feedback. Further, first-person narrative feedback was expected to facilitate experiential learning more than third-person narratives because first-person emotional content is thought to form more personal connections to the material (Berntsen & Rubin, 2006; Deen et al., 2010; Marshall & O'Keefe, 1995; McIsaac & Eich, 2002), leading to deeper processing (Craik & Lockhart, 1972; Oatley, 1994, 1999, 2002). Thus, it was expected that higher transfer as assessed by the SJT would correspond to higher reflection, which would provide an explanation for *how* certain conditions support better transfer.

> *H3: Self-report ratings of experiential learning, measured through items from the Experiential Learning Survey, was expected to be higher for those receiving narrative feedback (third- or first-person) than those receiving didactic feedback, but highest for first-person narrative feedback.*

Other exploratory variables were included in analyses. Academic major was included because it may influence participants' motivation for completing the healthcare-related training activity. Healthcare-related majors identified were nursing, exercise science, human services, dental hygiene, and pre-med biology. Gender was included because there is some evidence that females show more empathy in medical and intercultural contexts (Berg, Majdan, Berg, Veloski, & Hojat, 2011; Constantine, 2000; Cowan & Khatchadourian, 2003; Cundiff & Komarraju, 2008; Cundiff, Nadler, & Swan, 2009; Holm, Nokelainen, & Tirri, 2009; Hojat, Gonnella, Mangione, Nasca, Veloski, Erdmann et al., 2002; Nieto & Booth, 2010; Wang, Davidson, Yashuko, Savoy, Tan, & Bleier, 2003). Finally, ethnicity was included because the training task involves intercultural communication, the implications for which are likely to be different for those of a dominant culture and/or ethnicity. Therefore, a distinction was made between non-white and white participants, limiting the comparison to minority and non-minority ethnicities for the United States.

# CHAPTER IV

# METHOD

*Participants*

A statistical power analysis was conducted using G*Power power analysis software (Faul, Erdfelder, Lang, & Buchner, 2007). The power analysis for a between-subjects design indicated that a total of 84 participants (28 per group) were needed to achieve a power of 0.80 to detect a medium effect size of 0.35 with an alpha level of $p < .05$ (Cohen, 1992). This $p$ value was selected because of the experimentally controlled nature of the research (i.e., applied studies, on the other hand, are often exploratory in nature, potentially warranting an increased $p$ value; Wickens, 1998). Therefore, the goal was to recruit a minimum of 90 participants to include 30 for each of the three feedback groups, to account for the potential removal of data from outliers or participants' failure on the attention check quiz (see below).

In total, 239 undergraduate students (187 female, 52 male) from Old Dominion University completed the proposed study. IRB approval was obtained from Old Dominion University prior to beginning data collection.

During analysis, data were removed for participants who scored less than 100% correct on the four-question attention check and for participants who completed the study in 19 minutes or less (see Results section). After these data were removed, there were 128 participants (93 female, 35 male) included in the analyses. The average age of participants was 24.40 years, with an age range of 18 to 62.

*Procedure*

Participants were randomly assigned to receive feedback that was either didactic, third-person narrative, or first-person narrative in format. All materials were presented using Qualtrics survey software.

After accessing the survey online, participants first completed an IRB-approved Informed Consent Form (Appendix A) followed by questions about demographics and background information (Appendix B). The background information collected included age, gender, ethnicity, prior experience working in clinical settings, and prior experience with communication skills training.

After completing these forms, participants were given instructional information about the CRASH principles of intercultural communication (Rust et al., 2006; Appendix C), presented as slide images using PowerPoint. The content provided information about the overall importance of intercultural competence as well as steps specified by the CRASH acronym: culture, respect, assess/affirm differences, sensitivity and self-awareness, and humility. Immediately after completing the CRASH instructional material, participants completed four multiple-choice questions that served as an attention check to ensure that participants attended to and understood the instructional material (Appendix D). Participants who could not correctly answer these fundamental questions would not have the requisite knowledge to progress through the remainder of the training. Thus, for the participant's data to be included in analysis, they had to answer all four of the questions correctly.

Next, participants completed the experiential training scenario, which was a text-based script describing a doctor-patient interaction (Appendix E). Participants read the scenario, and for each written interaction with the patient and her mother, the participant selected what he or she believed to be best of three response choices. After completing the training and the experiential learning scenario, participants then read through standardized textual feedback about how performance could be improved. As described in Table 1, the content of the feedback was similar for every participant, but differed in format and perspective for each feedback group. The feedback was not adaptive to participant performance.

Following the learning activity and the feedback, participants engaged in three postsimulation activities: two open-ended situational judgment tests (SJTs; Appendix H), a quiz about CRASH principles (Appendix I), and selected items from the Experiential Learning Survey (Clem et al., 2014; Appendix J). The SJTs were completed before the other postsimulation activities to elicit responses that were not influenced by the CRASH quiz content reinforcing CRASH principles.

*Content Knowledge Test*. The quiz on CRASH principles (Appendix J) was used to measure content learning; that is, the learning of the cultural sensitivity principles themselves. Participants were given a quiz consisting of five multiple-choice questions about the content from the CRASH instructional material from the beginning of the experiment. The content learning questions differed from the pretest attention check questions; therefore, no questions were repeated between the pretest and content learning test to avoid priming effects. One question on the content learning quiz asked the participant to choose an example of cultural sensitivity. Three questions asked participants to recognize specific items from CRASH mnemonic (i.e., R, A, and S). One question indirectly asked participants to recognize the meaning of one CRASH item (i.e., H).

*SJT Transfer Tests*. SJTs are intended to assess transfer of skills learned in the training experience to a new situation that is structurally similar to the training scenario. The two SJTs created for the present research were based on examples given in Rust et al.'s (2006) paper on the CRASH principles of cultural competence. The examples were expanded to include more information to give fuller context from which participants could describe corrective, culturally sensitive actions. The first SJT describes an interaction with an older African American woman who is offended by the informality displayed by a young, white, male doctor. The second SJT describes a young Latina mother who cries after a white doctor told she needs to sign an informed consent form to give her baby a spinal tap without having enough time to first consult with her family. As with the first SJT, the doctor in the scenario is white. Participants were asked to take on the role of a doctor in both SJTs and describe how they would use cultural sensitivity to improve the described situation going forward. In the first SJT, participants were instructed to take on the role of a Caucasian male doctor and face racial issues, and in the second SJT, they were asked to take on the role of a female, American-born doctor and face language barriers.

Open-ended SJT written responses were assessed with two measures: word count and score. Word count was used to measure the length of responses, to measure the amount of written content in response to the SJT scenario. The number of words was used to indirectly measure the amount of details participants provided, as a quantifiable measure. The SJT scores were measures of qualitative responses, calculated through content analysis. Based on a rubric (Appendix M), a score was calculated to determine how well participants applied CRASH principles directly or indirectly in their written responses to the SJT scenario. The rubric minimized subjectivity by including examples of predicted responses. There were scores for each individual CRASH category, and these items were summed for a total score. If the participant gave multiple examples of behavior within a specific CRASH category, one point was given for each example. Therefore, there was no maximum score. The observed combined scores for both SJTs ranged from 0 to 12. The SJT analyses provided a measure of the number of principles participants applied to the new SJT scenario, serving as a measure of transfer. In addition, measures for each individual principle were analyzed to determine whether there were some principles that were more sensitive to the different types of feedback than the summed SJT score.

*Experiential Learning Survey*. The purpose of the Experiential Learning Survey (ELS) was to gather self-reports of active learning and reflection. The ELS was developed and validated by Clem and colleagues (2014) to measure learners' perceptions of experience-based educational instruction. Twenty-eight items in the ELS are divided into four subscales: authenticity of environment, active learning, relevance, and utility. Participants make responses by responding to personal statements on a 7-point Likert scale from "Strongly Disagree" to "Strongly Agree." Researchers derive subscale scores by summing item scores and calculate the global score by summing the subscale scores.

Clem et al. (2014) reported that the ELS global score yielded an alpha coefficient of 0.95. An assessment of construct validity also showed that the ELS global scores were significantly and positively correlated with global scores of the Course Valuing

Inventory, with an alpha coefficient of 0.78 (Clem et al., 2014), a theoretically similar instrument. Thus, ELS global scores offer a previously validated and reliable means for assessing learner perceptions of experience-based learning activities.

For the present research, the ELS was used to determine whether participants perceive differences in the experiential value of the training activity depending on the feedback condition to which they were assigned. Nineteen of the 28 ELS items were selected for inclusion based on their appropriateness to the training used in the present research. The nine ELS items that were excluded refer to aspects of learning not addressed in the training and are mostly from the Environment subscale of the ELS. Thus, the version of the ELS used in this study retained three items from the Environment subscale, seven from the Active subscale, seven from the Relevance subscale, and four from the Utility subscale. For the present research, the ELS measure was examined for global score, individual subscales (Environment, Active, Relevance, and Utility), and each individual question. Four of the questions required reverse scoring prior to analyses (i.e., “I find this learning experience boring,” “This learning experience has nothing to do with me,” “This learning experience will not be useful to me in the future,” and “I doubt I will ever use this learning experience again.”).

# CHAPTER V

# RESULTS

*Data Cleaning and Assumptions*

Prior to conducting statistical analyses, all data were assessed for missing values and for outliers. For survey completion time, a meaningful outlier was defined as a survey duration that was more than two standard deviations lower than the mean completion time, in minutes, observed in a supervised pilot study with undergraduate students ($M$ = 29, range = 22 to 35). Therefore, participants with durations below 19 minutes were removed. Because participants completed the study online at their convenience, these short durations suggested they did not invest the time needed to read, reflect upon, and respond to the material. There was a wide range in study durations. Retained participants spent between 19 and 199 minutes completing the experiment ($M$ = 43.8, $SD$ = 29.81). Data were also removed for the participants who did not meet the criterion of four correct answers on the attention check quiz. Out of the 239 participants who completed the study, 128 were retained for analysis. Table 2 displays the number of participants in each group for each of the variables.

All data were checked for assumptions of normality and variance using methods outlined by Field (2009). A visual inspection of histograms to assess normality revealed that overall content quiz and ELS scores, as well as individual questions for each, were skewed toward higher scores, meaning content quiz performance was good and ELS ratings of the training experience were positive. In fact, almost half of the participants (60 out of 128, or 46.8%) achieved 100% correct responses on the content quiz. Kolmogorov-

Smironov tests of normality also confirmed that every variable was significantly different from a normal distribution.

Additionally, Levene's test was used as a method to check for variance assumption violations. The tests revealed that the assumption of homogeneity of variance was met for all variables for the three feedback groups.

Table 2
*Number of Participants in Each Group*

| Factor | Levels of Factor | Number of Participants |
|---|---|---|
| Feedback Type | Didactic | 44 |
| | Third-Person Narrative | 42 |
| | First-Person Narrative | 42 |
| | Total | 128 |
| Academic Major | Not healthcare-related | 103 |
| | Healthcare-related | 25 |
| | Total | 128 |
| Gender | Female | 93 |
| | Male | 35 |
| | Total | 128 |
| Ethnicity | Non-white | 61 |
| | White | 67 |
| | Total | 128 |

*Statistical Analyses.* First, the data that addressed the hypotheses directly were analyzed together using a multivariate analysis of variance (MANOVA; Table 3). The purpose of conducting the MANOVA was to detect multivariate response patterns along these theoretically-linked variables, while controlling the familywise error rate to minimize the likelihood of a Type I error (Field, 2009). To test the three hypotheses, the fixed factor was feedback type (didactic, third-person narrative, first-person narrative), and the dependent variables were content quiz score to measure content learning, SJT word count and SJT score to measure transfer, and ELS score to measure subjective experiences.

Table 3
*Results of the MANOVA to Test the Three Feedback Hypotheses*

| Source | DV | SS | df | MS | *F* | *p* | partial $\eta^2$ | power |
|---|---|---|---|---|---|---|---|---|
| Feedback | Quiz Score | 4.20 | 2 | 2.10 | 2.27 | 0.11 | 0.041 | 0.45 |
| | SJT Words | 1303.18 | 2 | 651.59 | 0.21 | 0.81 | 0.004 | 0.08 |
| | SJT Score | 1.76 | 2 | 0.88 | 0.20 | 0.82 | 0.004 | 0.08 |
| | ELS Score | 192.84 | 2 | 96.42 | 0.23 | 0.79 | 0.004 | 0.09 |
| Error | Quiz Score | 99.02 | 107 | 0.93 | | | | |
| | SJT Words | 325423.56 | 107 | 3041.34 | | | | |
| | SJT Score | 467.15 | 107 | 4.37 | | | | |
| | ELS Score | 43081.07 | 107 | 384.65 | | | | |

The MANOVA revealed that none of the predicted significant effects for feedback type were observed for the predicted dependent variables. Therefore, separate ANOVAs were not necessary to follow up the main MANOVA.

Additional dependent variables besides the four hypothesized variables were compared using separate ANOVAs. These additional variables were analyzed to determine whether certain specific aspects of the content quiz, SJT, and ELS might have been sensitive to differences in feedback condition that were masked by the overall measures. In other words, for the content quiz, correct responses for each individual quiz question were examined, for the SJT, each individual mnemonic item was analyzed as a separate variable, and for the ELS, each ELS subscale was examined. The results of these analyses will be discussed according to each hypothesis.

Additionally, exploratory factorial ANOVAs were conducted to determine whether there might be interactions between feedback type and other fixed variables collected in the demographics survey. In addition to feedback type as a variable, academic major (healthcare-related, not healthcare-related), gender (female, male), and ethnicity (nonwhite, white) were included as exploratory factors, although no specific hypotheses were provided for them. Bonferroni-corrected *post hoc* tests were performed to examine individual mean comparisons among the three feedback groups, two academic major groups, two gender groups, and two ethnicity groups. The Bonferroni correction was chosen over the Tukey correction because the Bonferroni correction has more statistical power when the number of comparisons is small, as is the case with the present analyses.

*Hypothesis 1: Content Learning*

The first prediction was that didactic feedback would better support content learning than the narrative feedback conditions, as evidenced by higher scores on the content quiz. The overall score on the CRASH quiz was analyzed as well as the scores for individual questions.

As reported in Table 4, there was no significant effect of feedback type on overall content quiz score, $F(2, 107) = 2.27$, $p = 0.11$, partial $\eta^2 = 0.041$. Additional one-way ANOVAs also revealed no significant effects for individual quiz questions based on feedback type. Therefore, Hypothesis 1 was not directly supported. Though not significant, the means were not in the expected direction of lower quiz scores for participants in the didactic feedback condition (see Table 4). Overall, the mean content quiz score out of 5 was 4.02 (*SE* = 0.15) for didactic feedback, 4.31 (*SE* = 0.15) for third-person narrative feedback, and 4.33 for first-person narrative feedback (*SE* = 0.15).

Table 4
*Means and Standard Errors of Correct Quiz Responses*

| Quiz Question | Feedback Type | Mean | SE |
|---|---|---|---|
| *An example of deep cultural sensitivity is which of the following?* | Didactic | 0.57 | 0.07 |
| | Third-Person Narrative | 0.71 | 0.07 |
| | First-Person Narrative | 0.74 | 0.07 |
| *What is the best immediate course of action in the case of cultural missteps?* | Didactic | 0.80 | 0.06 |
| | Third-Person Narrative | 0.83 | 0.06 |
| | First-Person Narrative | 0.83 | 0.06 |
| *In the CRASH mnemonic, what does the R stand for?* | Didactic | 0.84 | 0.05 |
| | Third-Person Narrative | 0.86 | 0.05 |
| | First-Person Narrative | 0.88 | 0.05 |
| *In the CRASH mnemonic, what does the A stand for?* | Didactic | 0.98 | 0.03 |
| | Third-Person Narrative | 0.98 | 0.03 |
| | First-Person Narrative | 1.00 | 0.03 |
| *In the CRASH mnemonic, what does the S stand for?* | Didactic | 0.93 | 0.03 |
| | Third-Person Narrative | 0.93 | 0.03 |
| | First-Person Narrative | 1.00 | 0.03 |
| Overall Quiz score | Didactic | 4.02 | 1.11 |
| | Third-Person Narrative | 4.31 | 0.95 |
| | First-Person Narrative | 4.33 | 0.82 |

After directly testing the predictions in Hypothesis 1, a factorial MANOVA was conducted to include both feedback and gender as fixed variables and quiz scores as dependent variables (see Table 5). The results of this MANOVA revealed a significant effect of gender on the quiz question about respect, $F(1, 122) = 4.61$, $p < 0.05$, partial $\eta^2 = 0.038$. Pairwise comparisons revealed that female participants scored significantly higher on this quiz question overall ($M = 0.90$, $SE = 0.04$) than male participants ($M = 0.75$, $SE = 0.06$), meaning female participants better remembered the respect component of CRASH.

Table 5
*Results of Factorial MANOVA for Feedback Type and Gender on Quiz Question Responses*

| Source | Dependent Variable | SS | df | MS | *F* | *p* | partial $\eta^2$ | power |
|---|---|---|---|---|---|---|---|---|
| Feedback | Question 1 | 0.46 | 2 | 0.23 | 1.03 | 0.36 | 0.017 | 0.23 |
| | Question 2 | 0.19 | 2 | 0.09 | 0.63 | 0.54 | 0.010 | 0.15 |
| | Question 3 | 0.11 | 2 | 0.06 | 0.47 | 0.63 | 0.008 | 0.13 |
| | Question 4 | 0.07 | 2 | 0.03 | 0.72 | 0.49 | 0.012 | 0.17 |
| | Question 5 | 0.21 | 2 | 0.12 | 2.52 | 0.09 | 0.040 | 0.50 |
| | Quiz Score | 4.02 | 2 | 2.01 | 2.15 | 0.12 | 0.034 | 0.37 |
| Gender | Question 1 | 0.02 | 1 | 0.02 | 0.10 | 0.75 | 0.001 | 0.06 |
| | Question 2 | 0.07 | 1 | 0.07 | 0.43 | 0.51 | 0.004 | 0.10 |
| | Question 3 | 0.58 | 1 | 0.58 | 4.86 | 0.03* | 0.038 | 0.59 |
| | Question 4 | 0.02 | 1 | 0.02 | 0.33 | 0.57 | 0.003 | 0.09 |
| | Question 5 | 0.04 | 1 | 0.04 | 1.01 | 0.32 | 0.008 | 0.17 |
| | Quiz Score | 0.70 | 1 | 0.70 | 0.74 | 0.39 | 0.006 | 0.32 |
| Feedback x Gender | Question 1 | 0.22 | 2 | 0.11 | 0.50 | 0.61 | 0.008 | 0.13 |
| | Question 2 | 0.41 | 2 | 0.20 | 1.36 | 0.26 | 0.022 | 0.29 |
| | Question 3 | 0.26 | 2 | 0.13 | 1.10 | 0.34 | 0.018 | 0.24 |
| | Question 4 | 0.16 | 2 | 0.08 | 1.70 | 0.19 | 0.027 | 0.35 |
| | Question 5 | 0.42 | 2 | 0.21 | 5.02 | 0.01* | 0.076 | 0.81 |
| | Quiz Score | 2.25 | 2 | 1.13 | 1.21 | 0.30 | 0.019 | 0.31 |

*Table 5 Continued*

| Source | Dependent Variable | SS | df | MS | *F* | *p* | partial $\eta^2$ |
|---|---|---|---|---|---|---|---|
| Error | Question 1 | 27.20 | 122 | 0.22 | | | |
| | Question 2 | 18.31 | 122 | 0.15 | | | |
| | Question 3 | 14.52 | 122 | 0.12 | | | |
| | Question 4 | 5.78 | 122 | 0.05 | | | |
| | Question 5 | 5.09 | 122 | 0.04 | | | |
| | Quiz Score | 113.10 | 122 | 0.93 | | | |

Note. $^*p < 0.05$

The factorial MANOVA also revealed a significant interaction between feedback and gender for Question 5, the quiz question about *Sensitivity*, $F(2, 122) = 5.02$, $p < 0.05$, partial $\eta^2 = 0.076$. A test of simple effects showed that in the didactic feedback condition only, female participants scored significantly higher on this quiz question, $p < 0.05$. In the first-person narrative feedback, the scores on this question were equivalent between male and female participants ($M = 1.00$, $SE$ for females = 0.04, $SE$ for males = 0.06). Figure 1 displays the Feedback x Gender interaction. Thus, there was a clear ceiling effect with the exception of males in the didactic condition.

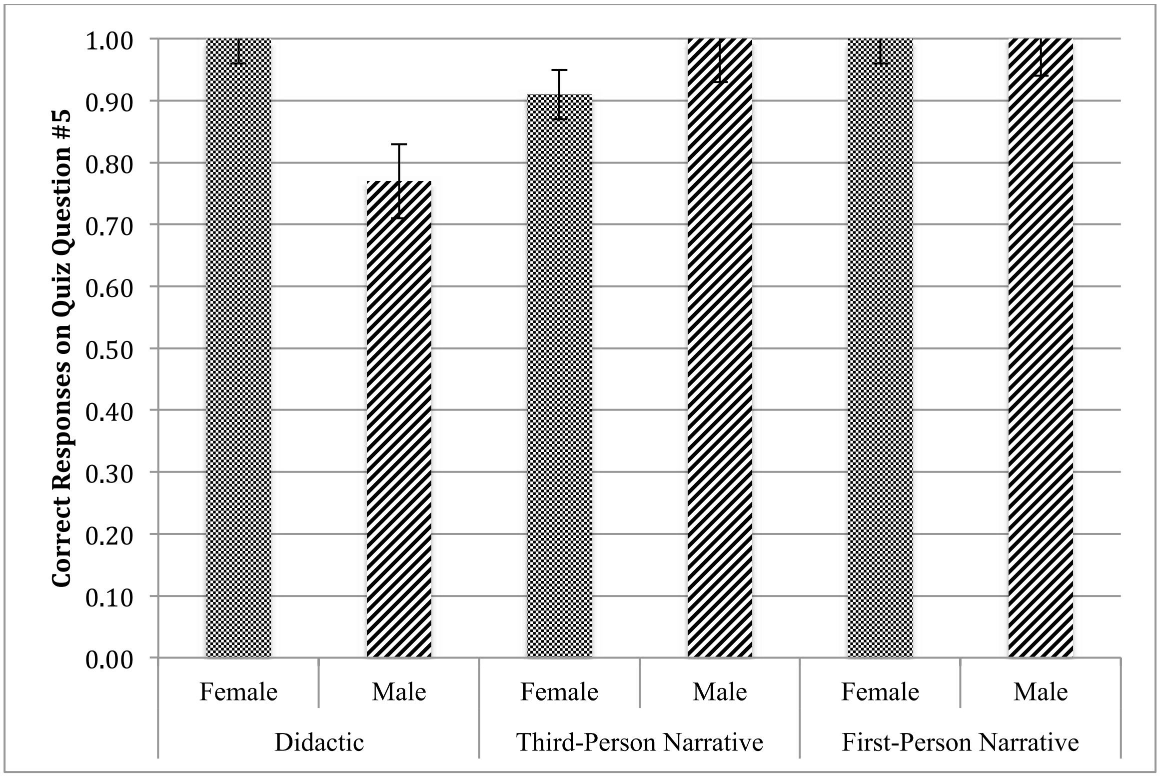


Figure 1. *A significant interaction between feedback type and participant gender on correct responses to Quiz Question #5 about Sensitivity. The error bars represent standard error. The mean correct responses for these items were significantly lower for males for the didactic feedback condition only.*

*Hypothesis 2: Learning Transfer*

The second hypothesis was that intercultural skills practiced in the experiential training activity and transferred to an SJT would show better performance for the narrative feedback groups than the didactic feedback group, as evidenced by measures of SJT word count and SJT score based on number of CRASH items applied to the scenario. Further, it was expected that first-person narrative feedback would provide an additional advantage. As Table 3 displays, initial results showed no significant effect of feedback type on SJT word count, $F(2, 107) = 0.21$, $p = 0.81$ or SJT overall score, $F(2, 107) =$

0.20, $p = 0.82$ (see Table 6 for means). Therefore, Hypothesis 2 was not directly supported.

Table 6
*Means and Standard Errors of SJT Performance*

| Dependent Variable | Feedback Condition | Mean | SE |
|---|---|---|---|
| SJT Word Sum | Didactic | 118.02 | 8.26 |
| | Third-person narrative | 118.93 | 8.45 |
| | First-person narrative | 123.45 | 8.45 |
| SJT Score Sum | Didactic | 5.77 | 0.31 |
| | Third-person narrative | 5.23 | 0.32 |
| | First-person narrative | 5.74 | 0.32 |

The SJT scores were also analyzed in terms of application of individual CRASH items, using a factorial MANOVA to investigate feedback type and gender effects (see Table 7). There was a significant effect of feedback type on applying the *Assess and Affirm Differences* principle (A in the CRASH mnemonic) to SJT responses, $F(2,122) = 1.34$, $p < 0.05$, partial $\eta^2 = 0.050$. Pairwise comparisons revealed that first-person narrative feedback ($M = 0.61$, $SE = 0.11$) was associated with the highest mean instances of applying the concept of *Assess and Affirm Differences* in the SJT responses, which was significantly higher than third-person narrative feedback ($M = 0.50$, $SE = 0.11$), $p < 0.05$ (see Figure 2).

Table 7

*Results of Factorial MANOVA for Feedback Type and Gender on Application of Specific CRASH Items in SJT Responses*

| Source | Dependent Variable | SS | df | MS | *F* | *p* | partial $\eta^2$ | power |
|---|---|---|---|---|---|---|---|---|
| Feedback | SJT: C | 0.10 | 2 | 0.05 | 0.10 | 0.91 | 0.002 | 0.06 |
| | SJT: R | 0.69 | 2 | 0.34 | 0.23 | 0.80 | 0.004 | 0.09 |
| | SJT: A | 2.69 | 2 | 1.34 | 3.23 | 0.04* | 0.050 | 0.60 |
| | SJT: S | 1.00 | 2 | 0.50 | 0.64 | 0.53 | 0.010 | 0.16 |
| | SJT: H | 0.14 | 2 | 0.07 | 0.14 | 0.87 | 0.002 | 0.07 |
| Gender | SJT: C | 0.80 | 1 | 0.80 | 1.48 | 0.23 | 0.012 | 0.23 |
| | SJT: R | 3.10 | 1 | 3.095 | 2.07 | 0.15 | 0.017 | 0.30 |
| | SJT: A | 0.10 | 1 | 0.10 | 0.23 | 0.63 | 0.002 | 0.08 |
| | SJT: S | 0.48 | 1 | 0.48 | 0.61 | 0.44 | 0.005 | 0.12 |
| | SJT: H | 0.06 | 1 | 0.06 | 0.12 | 0.74 | 0.001 | 0.06 |
| Feedback x Gender | SJT: C | 0.31 | 2 | 0.15 | 0.28 | 0.75 | 0.005 | 0.09 |
| | SJT: R | 0.46 | 2 | 0.23 | 0.16 | 0.86 | 0.003 | 0.07 |
| | SJT: A | 0.80 | 2 | 0.40 | 0.96 | 0.39 | 0.016 | 0.21 |
| | SJT: S | 2.99 | 2 | 1.49 | 1.92 | 0.15 | 0.031 | 0.39 |
| | SJT: H | 0.70 | 2 | 0.35 | 0.71 | 0.49 | 0.011 | 0.17 |
| Error | SJT: C | 66.03 | 122 | 0.54 | | | | |
| | SJT: R | 82.17 | 122 | 1.49 | | | | |
| | SJT: A | 50.98 | 122 | 0.42 | | | | |
| | SJT: S | 94.94 | 122 | 0.78 | | | | |
| | SJT: H | 59.97 | 122 | 0.49 | | | | |

Note. $*p < .05$

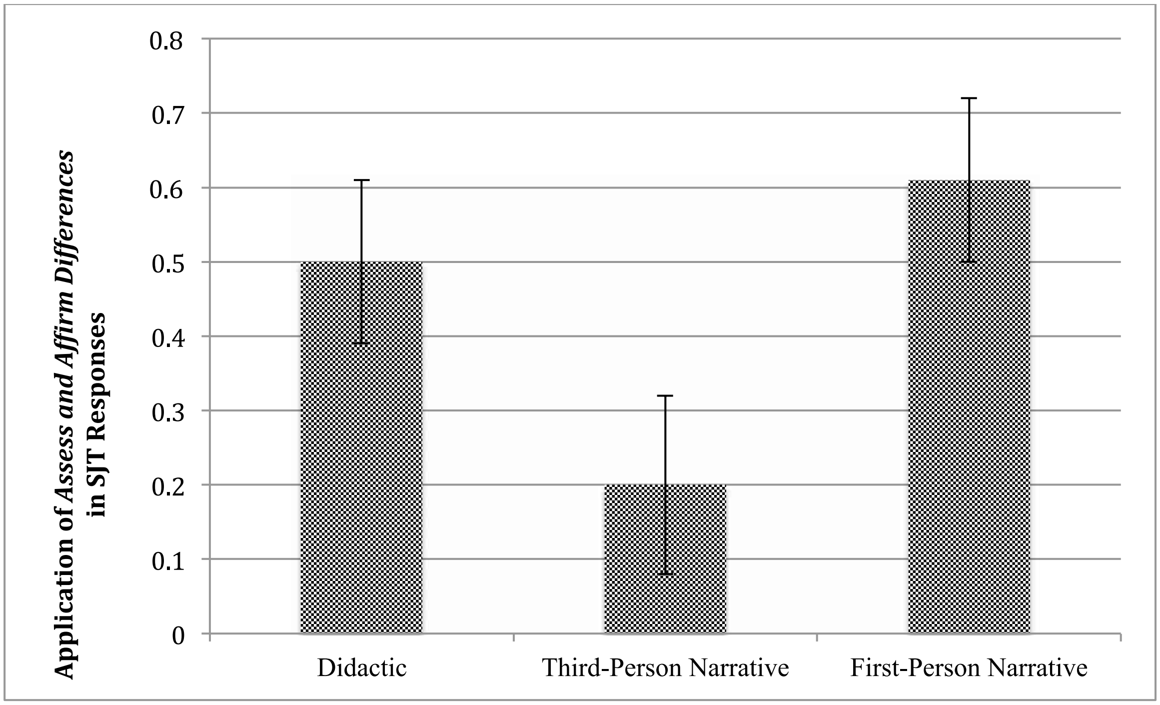


Figure 2. *A significant main effect of feedback type on application of* Assess and Affirm Differences *principle from the CRASH mnemonic in SJT responses. The error bars represent standard error.*

*Hypothesis 3: Self-Reported Experiential Learning*

The final hypothesis was that narrative feedback would be associated with higher self-reports of experiential learning, as measured using the overall ELS score (Clem et al., 2014). This hypothesis was not supported. There was no significant effect observed for feedback type on ELS global score, $F(2, 107) = 0.23$, $p = 0.79$, as shown in Table 3.

The individual ELS subscales were also examined. For these analyses, the additional fixed factors of gender, academic major, and ethnicity were included, which could all feasibly influence a participant's subjective experience as reported in the ELS. The factorial MANOVA (see Table 8) revealed a significant effect of feedback type on the ELS Environment subscale. Inconsistent with predictions, participants in the didactic feedback group reported higher Environment ratings of the training ($M = 16.43$, $SE =$

0.58), significantly higher than the third-person feedback group (*M* = 14.41, *SE* = 0.73), $F(2, 107) = 3.86$, $p < 0.05$, partial $\eta^2 = 0.067$. This result also did not support the hypothesis. Further analyses, below, revealed that this effect was likely due to an interaction between feedback and academic major.

For the ELS Environment subscale, there was a significant effect observed for gender. However, pairwise comparisons were not significant, $p = 0.09$. Means suggested that female participants did not rate the Environment subscale significantly higher than male participants.

Table 8
*Results of Factorial MANOVA for Feedback Type, Academic Major, and Gender on ELS Scores*

| Source | Dependent Variable | SS | df | MS | *F* | *p* | partial $\eta^2$ | power |
|---|---|---|---|---|---|---|---|---|
| Feedback | ELS Total Score | 192.84 | 2 | 96.42 | 0.23 | 0.79 | 0.004 | 0.09 |
| | Environment Score | 81.11 | 2 | 40.56 | 3.86 | 0.02* | 0.067 | 0.69 |
| | Active Score | 6.52 | 2 | 3.26 | 0.06 | 0.95 | 0.001 | 0.05 |
| | Relevance Score | 6.64 | 2 | 3.32 | 0.08 | 0.92 | 0.002 | 0.06 |
| | Utility Score | 2.76 | 2 | 1.38 | 0.10 | 0.90 | 0.002 | 0.07 |
| Major | ELS Total Score | 31.97 | 1 | 31.97 | 0.08 | 0.78 | 0.001 | 0.06 |
| | Environment Score | 41.25 | 1 | 41.25 | 3.92 | 0.05* | 0.035 | 0.50 |
| | Active Score | 0.72 | 1 | 0.72 | 0.01 | 0.91 | 0.000 | 0.05 |
| | Relevance Score | 30.97 | 1 | 30.97 | 0.76 | 0.39 | 0.007 | 0.14 |
| | Utility Score | 0.19 | 1 | 0.19 | 0.01 | 0.91 | 0.000 | 0.05 |
| Ethnicity | ELS Total Score | 49.58 | 1 | 49.58 | 0.12 | 0.73 | 0.001 | 0.06 |
| | Environment Score | 1.46 | 1 | 1.46 | 0.14 | 0.71 | 0.001 | 0.07 |
| | Active Score | 23.91 | 1 | 23.91 | 0.41 | 0.53 | 0.004 | 0.10 |
| | Relevance Score | 8.40 | 1 | 8.40 | 0.21 | 0.65 | 0.002 | 0.07 |
| | Utility Score | 16.03 | 1 | 16.03 | 1.18 | 0.28 | 0.011 | 0.19 |

*Table 8 Continued*

| Source | Dependent Variable | SS | df | MS | *F* | *p* | partial $\eta^2$ | power |
|---|---|---|---|---|---|---|---|---|
| Gender | ELS Total Score | 436.21 | 1 | 436.21 | 1.05 | 0.31 | 0.010 | 0.17 |
| | Environment Score | 44.29 | 1 | 44.29 | 4.21 | 0.04* | 0.043 | 0.53 |
| | Active Score | 4.48 | 1 | 4.48 | 0.08 | 0.78 | 0.001 | 0.06 |
| | Relevance Score | 44.08 | 1 | 44.08 | 1.08 | 0.30 | 0.010 | 0.18 |
| | Utility Score | 6.225 | 1 | 6.225 | 0.46 | 0.50 | 0.001 | 0.10 |
| Feedback x Major | | | | | | | | |
| | ELS Total Score | 825.17 | 2 | 412.59 | 1.00 | 0.37 | 0.018 | 0.22 |
| | Environment Score | 80.54 | 2 | 40.27 | 3.83 | 0.03* | 0.067 | 0.68 |
| | Active Score | 67.92 | 2 | 33.96 | 0.58 | 0.56 | 0.011 | 0.14 |
| | Relevance Score | 73.75 | 2 | 36.87 | 0.90 | 0.41 | 0.017 | 0.20 |
| | Utility Score | 52.85 | 2 | 26.43 | 1.94 | 0.15 | 0.035 | 0.10 |
| Feedback x Ethnicity | | | | | | | | |
| | ELS Total Score | 98.66 | 2 | 48.83 | 0.12 | 0.89 | 0.002 | 0.07 |
| | Environment Score | 13.34 | 2 | 6.67 | 0.63 | 0.53 | 0.012 | 0.15 |
| | Active Score | 2.75 | 2 | 1.37 | 0.02 | 0.98 | 0.000 | 0.05 |
| | Relevance Score | 15.99 | 2 | 8.00 | 0.20 | 0.82 | 0.004 | 0.08 |
| | Utility Score | 13.89 | 2 | 6.94 | 0.51 | 0.60 | 0.009 | 0.13 |
| Feedback x Gender | | | | | | | | |
| | ELS Total Score | 993.02 | 2 | 496.51 | 1.20 | 0.31 | 0.022 | 0.26 |
| | Environment Score | 17.81 | 2 | 8.90 | 0.85 | 0.43 | 0.016 | 0.19 |
| | Active Score | 111.07 | 2 | 55.53 | 0.94 | 0.39 | 0.017 | 0.21 |
| | Relevance Score | 169.70 | 2 | 84.85 | 2.08 | 0.13 | 0.013 | 0.42 |
| | Utility Score | 88.07 | 2 | 44.03 | 3.23 | 0.04* | 0.057 | 0.61 |
| Error | ELS Total Score | 44316.51 | 107 | 414.17 | | | | |
| | Environment Score | 1125.16 | 107 | 10.52 | | | | |
| | Active Score | 6316.92 | 107 | 59.04 | | | | |
| | Relevance Score | 4364.43 | 107 | 40.79 | | | | |
| | Utility Score | 1457.65 | 107 | 13.62 | | | | |

Note. $^*p < .05$

There was also a significant interaction observed between feedback type and gender for the Utility subscale of the ELS. A test of simple effects showed significant gender differences for the didactic and first-person narrative feedback conditions. In the didactic feedback condition, females reported significantly higher utility scores (*M* = 23.20, *SE* = 0.67) than male participants (*M* = 20.50, *SE* = 0.98). In the first-person narrative feedback condition, males reported significantly higher utility scores (*M* = 23.67, *SE* = 1.06) than female participants (*M* = 21.30, *SE* = 0.67). Figure 3 displays this interaction between feedback and gender.

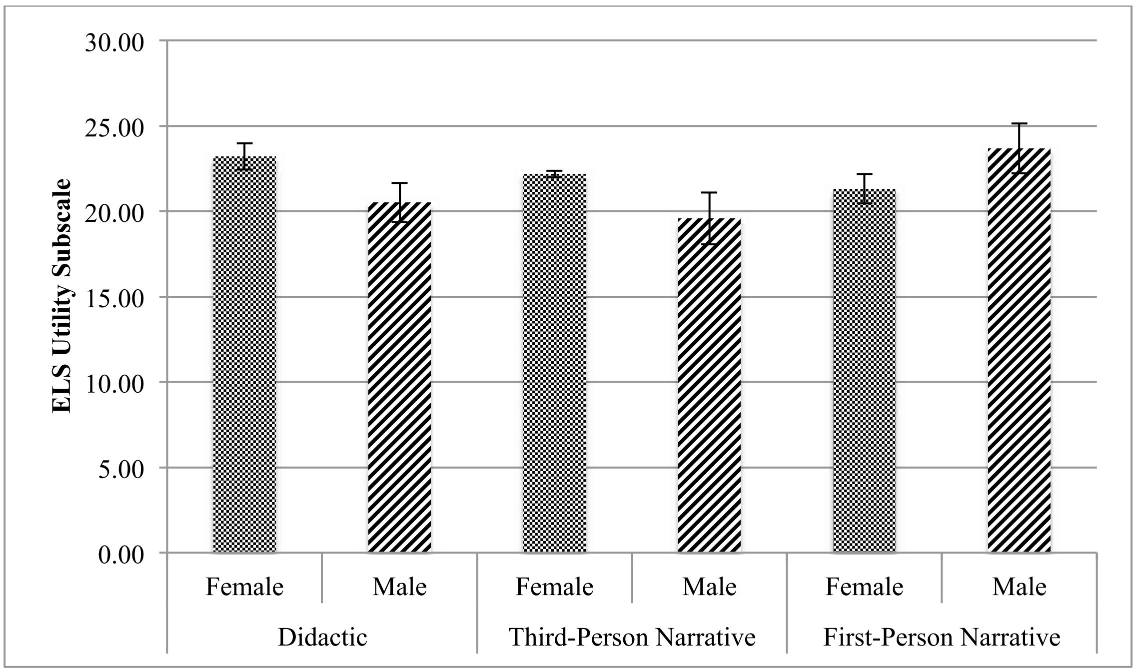


Figure 3. *A significant interaction between feedback type and gender for responses on the ELS Utility Subscale. The error bars represent standard error.*

Finally, the factorial MANOVA revealed a significant interaction between feedback type and academic major for the ELS Environment subscale. However, a test of simple effects showed no significant pairwise comparison.

# CHAPTER VI

# FOLLOW-UP STUDY

*Rationale*

The results from the original study showed an overall lack of significant effects. In the original study, the testing immediately followed the training within a single experimental session. It may have been that recall was too easy especially with so little time elapsed between training and testing. Therefore, a follow-up study was conducted to determine whether the observed effects in the data were due to this particular limitation in the experimental design.

Additional data were collected for another cohort of participants who completed training (Phase1) and then testing one week later (Phase 2). These data were again collected through Qualtrics using the same method and the same pool of undergraduate students at Old Dominion University. The only experimental difference between the original and the follow-up study was that the researcher invited participants by email to take part in Phase 2 one week after completing Phase 1, rather than testing taking place in the same session as training, Participants received credit only after both sections were complete.

*Follow-Up Results*

One hundred undergraduate students participated in this follow-up study. Of these, 53 completed both Part 1 and Part 2. In other words, almost half of the participants who signed up did not complete the testing portion after receiving the Qualtrics link one week after the training portion. After removing outliers and participants who did not pass the attention check, using the same method as in the original study, data from 46 participants were analyzed in the follow-up study. Table 9 displays the number of participants in each group for this set of data.

Table 9
*Number of Participants in Each Group for the Follow-Up Study*

| Factor | Levels of Factor | Number of Participants |
|---|---|---|
| Feedback Type | Didactic | 12 |
| | Third-Person Narrative | 20 |
| | First-Person Narrative | 14 |
| | Total | 46 |
| Academic Major | Not healthcare-related | 36 |
| | Healthcare-related | 10 |
| | Total | 46 |
| Gender | Female | 38 |
| | Male | 8 |
| | Total | 46 |
| Ethnicity | Non-white | 19 |
| | White | 27 |
| | Total | 46 |

As in the original study, all data were checked for assumptions of normality and variance using methods outlined by Field (2009). A visual inspection of histograms to assess normality revealed that SJT word sum was skewed toward lower word counts with a few individuals writing a large number of words, which is because there was no maximum for word count. The histograms also suggested that, as in the original data, SJT score and ELS scores were again skewed toward higher scores. Whereas content quiz scores in the original data were skewed highly because many achieved 100% correct responses on the content quiz, the follow-up data histograms showed that content quiz scores were closer to a normal distribution. Kolmogorov-Smironov tests of normality revealed that most variables were significantly different from a normal distribution, except ELS score ($p = 0.20$), ELS Active subscale ($p = 0.20$), ELS Relevance subscale ($p = 0.20$), and ELS Utility subscale ($p = 0.20$). Levene’s test for homogeneity of variance revealed that the assumption of variance was met for all variables in the follow-up study data.

A factorial MANOVA was used to compare the results of the main analyses between the original data and the follow-up data (see Table 10). There was a significant difference in content quiz scores between the original and follow-up data. In the original study, the mean content quiz score was 4.22 ($SE = 0.09$) out of 5, and in the follow-up study, the mean content quiz score was 3.67 ($SE = 0.04$). This difference suggests that the content quiz in Phase 2 was indeed more challenging when a time interval was introduced between training and testing, $F(1, 172) = 10.05$, $p < 0.05$, partial $\eta^2 = 0.055$. The lack of differences for SJT word count and SJT score may suggest that performance on these intended measures of transfer are not degraded with a time interval, and perception of the training measured with the ELS remains consistent as well.

To retest the hypotheses, the follow-up data were again analyzed with multivariate analyses of variance, with Bonferroni-corrected *post hoc* tests. The results of this MANOVA are displayed in Table 11.

Table 10
*Results of the MANOVA to Compare Original and Follow-Up Datasets*

| Source | DV | SS | df | MS | $F$ | $p$ | partial $\eta^2$ | power |
|---|---|---|---|---|---|---|---|---|
| Dataset | Quiz Score | 10.05 | 1 | 10.05 | 9.93 | 0.00* | 0.055 | 0.88 |
| | SJT Words | 3072.57 | 1 | 3072.57 | 1.05 | 0.31 | 0.006 | 0.17 |
| | SJT Score | 13.49 | 1 | 13.49 | 3.40 | 0.07 | 0.019 | 0.45 |
| | ELS Score | 458.27 | 1 | 458.27 | 1.19 | 0.28 | 0.007 | 0.19 |
| Error | Quiz Score | 173.98 | 172 | 1.01 | | | | |
| | SJT Words | 626285.40 | 172 | 2936.48 | | | | |
| | SJT Score | 682.88 | 172 | 3.97 | | | | |
| | ELS Score | 66495.71 | 172 | 386.60 | | | | |

Note. $*p < 0.05$

Table 11
*Results of the MANOVA to Test the Three Feedback Hypotheses in Follow-Up Study*

| Source | DV | SS | df | MS | $F$ | $p$ | partial $\eta^2$ | power |
|---|---|---|---|---|---|---|---|---|
| Feedback | Quiz Score | 0.03 | 2 | 0.02 | 0.30 | 0.74 | 0.014 | 0.94 |
| | SJT Words | 9789.64 | 2 | 4894.82 | 1.76 | 0.18 | 0.076 | 0.35 |
| | SJT Score | 1.20 | 2 | 0.60 | 0.18 | 0.83 | 0.008 | 0.08 |
| | ELS Score | 516.09 | 2 | 258.05 | 0.80 | 0.46 | 0.036 | 0.18 |
| Error | Quiz Score | 2.14 | 43 | 0.05 | | | | |
| | SJT Words | 119547.08 | 43 | 2780.17 | | | | |
| | SJT Score | 140.63 | 43 | 3.27 | | | | |
| | ELS Score | 13957.65 | 43 | 324.60 | | | | |

*Hypothesis 1: Content Learning*. To retest Hypothesis 1, content quiz scores were again analyzed. There was still, however, no significant overall effect for feedback type on content quiz score, $F(2, 43) = 0.30$, *ns*, as shown in Table 11. Again, as in the original set of data, the first hypothesis was not supported. Didactic feedback did not provide advantages for remembering CRASH content for the quiz.

As with the original data, gender was added as a fixed factor, and individual content quiz questions were examined as additional dependent variables. Table 12 displays the results from this factorial MANOVA.

There was a significant interaction between feedback type and gender for content quiz score (see Figure 4), $F(2, 40) = 8.41$, $p < 0.05$, partial $\eta^2 = 0.296$. A *post hoc* test of simple effects was conducted to analyze the individual factors in the interaction. In the didactic feedback condition, content quiz scores were significantly higher for female participants ($M = 4.21$, $SE = 0.16$) than male participants ($M = 3.47$, $SE = 0.25$), $p < 0.05$. The opposite effect was found for first-person narrative feedback. When receiving first-person narrative feedback, male participants scored significantly higher ($M = 4.33$, $SE = 0.26$) than female participants ($M = 4.05$, $SE = 0.16$), $p < 0.05$. The scores for female participants were statistically equivalent for third-person and first-person narrative feedback, and significantly higher for didactic feedback, $p < 0.05$.

Table 12
*Results of Factorial MANOVA for Feedback Type and Gender on Quiz Question Responses in Follow-Up Study*

| Source | Dependent Variable | SS | df | MS | *F* | *p* | partial $\eta^2$ | power |
|---|---|---|---|---|---|---|---|---|
| Feedback | Question 1 | 0.02 | 2 | 0.01 | 0.04 | 0.96 | 0.002 | 0.06 |
| | Question 2 | 0.77 | 2 | 0.38 | 2.65 | 0.08 | 0.117 | 0.50 |
| | Question 3 | 0.12 | 2 | 0.05 | 0.24 | 0.80 | 0.112 | 0.09 |
| | Question 4 | 0.11 | 2 | 0.38 | 1.82 | 0.17 | 0.084 | 0.36 |
| | Question 5 | 0.76 | 2 | 0.38 | 1.82 | 0.17 | 0.084 | 1.00 |
| | Quiz Score | 0.18 | 2 | 0.08 | 2.17 | 0.13 | 0.10 | 0.42 |
| Gender | Question 1 | 0.07 | 1 | 0.07 | 0.27 | 0.61 | 0.007 | 0.80 |
| | Question 2 | 0.14 | 1 | 0.14 | 0.98 | 0.33 | 0.024 | 0.16 |
| | Question 3 | 0.01 | 1 | 0.01 | 0.05 | 0.83 | 0.001 | 0.06 |
| | Question 4 | 0.12 | 1 | 0.12 | 0.58 | 0.45 | 0.014 | 0.12 |
| | Question 5 | 0.58 | 1 | 0.58 | 25.53 | 0.00* | 0.390 | 1.00 |
| | Quiz Score | 0.11 | 1 | 0.11 | 2.97 | 0.09 | 0.069 | 0.39 |
| Feedback x Gender | Question 1 | 0.66 | 2 | 0.33 | 1.32 | 0.28 | 0.062 | 0.27 |
| | Question 2 | 2.37 | 2 | 1.19 | 8.19 | 0.00* | 0.296 | 0.95 |
| | Question 3 | 0.58 | 2 | 0.29 | 1.27 | 0.29 | 0.060 | 0.26 |
| | Question 4 | 1.36 | 2 | 0.68 | 3.26 | 0.05* | 0.140 | 0.59 |
| | Question 5 | 1.43 | 2 | 0.71 | 31.40 | 0.00* | 0.611 | 1.00 |
| | Quiz Score | 0.61 | 2 | 0.31 | 8.41 | 0.00* | 0.296 | 0.96 |
| Error | Question 1 | 9.93 | 40 | 0.04 | | | | |
| | Question 2 | 5.79 | 40 | 0.25 | | | | |
| | Question 3 | 9.06 | 40 | 0.23 | | | | |
| | Question 4 | 8.32 | 40 | 0.21 | | | | |
| | Question 5 | 0.91 | 40 | 0.02 | | | | |
| | Quiz Score | 1.45 | 40 | 0.04 | | | | |

Note. $*p < 0.05$

There were also significant interactions between feedback and gender for three of the specific quiz questions: about *Humility*, *Assess and Affirm Differences*, and *Sensitivity* (see Table 13). A test of simple effects revealed that the quiz question indirectly addressing *Humility* showed significantly higher female scores ($M = 1.00$, $SE = 0.13$) than male scores ($M = 0.00$, $SE = 0.22$) in the didactic feedback condition, $p < 0.05$. For the question directly addressing *Assess and Affirm Differences*, the third-person feedback condition was associated with significantly higher female scores (*M* = 0.78, *SE* = 0.11) than male scores (*M* = 0.00, *SE* = 0.11). Finally, for the question directly addressing *Show Sensitivity*, the third-person feedback condition again showed significantly higher female scores (*M* = 1.00, *SE* = 0.04) than male scores (*M* = 0.00, *SE* = 0.11). Therefore, didactic feedback was less effective for males for one question, and third-person feedback offered disadvantages for males for two questions.

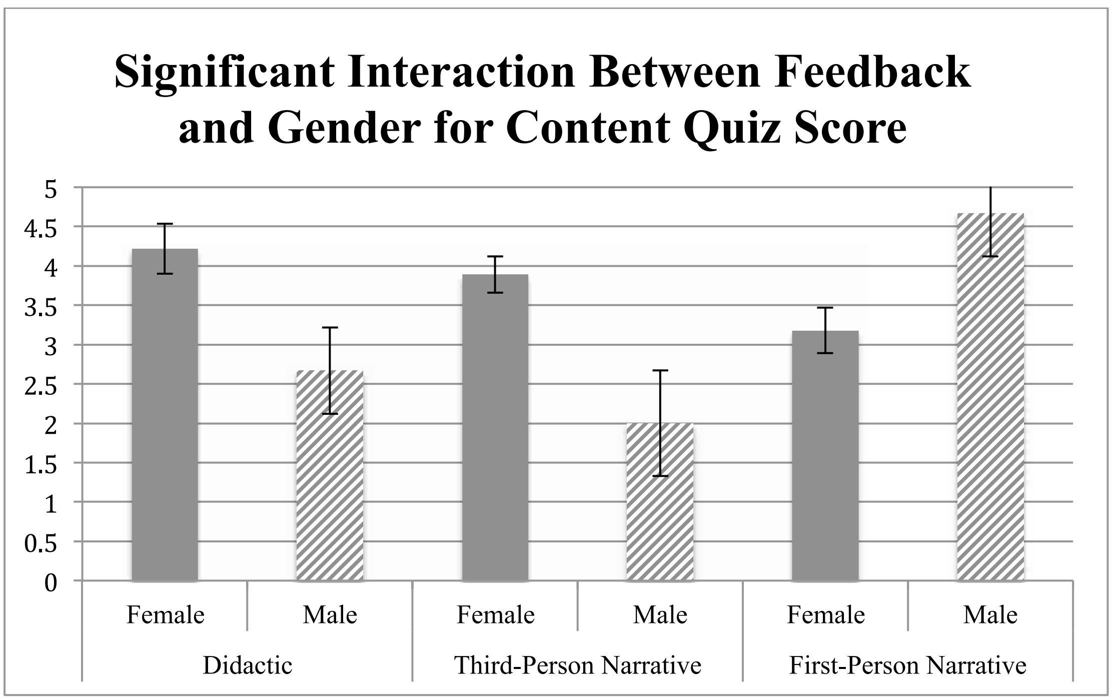


*Figure 4.* Feedback x Gender interaction for content quiz score in the follow-up study. The error bars represent standard error.

Table 13
*Means and Standard Errors of Correct Quiz Responses According to Feedback Type and Gender in Follow-Up Study*

| Quiz Question | Feedback Type | Gender | Mean | SE |
|---|---|---|---|---|
| *An example of deep cultural sensitivity is which of the following?* | Didactic | Female | 0.78 | 0.17 |
| | | Male | 0.33 | 0.29 |
| | Third-Person Narrative | Female | 0.67 | 0.12 |
| | | Male | 0.50 | 0.35 |
| | First-Person Narrative | Female | 0.36 | 0.15 |
| | | Male | 0.67 | 0.29 |
| *What is the best immediate course of action in the case of cultural missteps?* | Didactic * | Female | 1.00 | 0.13 |
| | | Male | 0.00 | 0.22 |
| | Third-Person Narrative | Female | 0.72 | 0.09 |
| | | Male | 1.00 | 0.27 |
| | First-Person Narrative | Female | 0.73 | 0.12 |
| | | Male | 1.00 | 0.22 |
| *In the CRASH mnemonic, what does the R stand for?* | Didactic | Female | 0.78 | 0.16 |
| | | Male | 0.67 | 0.28 |
| | Third-Person Narrative | Female | 0.72 | 0.11 |
| | | Male | 0.50 | 0.34 |
| | First-Person Narrative | Female | 0.55 | 0.14 |
| | | Male | 1.00 | 0.28 |
| *In the CRASH mnemonic, what does the A stand for?* | Didactic | Female | 0.67 | 0.15 |
| | | Male | 0.67 | 0.26 |
| | Third-Person Narrative * | Female | 0.78 | 0.11 |
| | | Male | 0.00 | 0.32 |
| | First-Person Narrative | Female | 0.64 | 0.14 |
| | | Male | 1.00 | 0.26 |
| *In the CRASH mnemonic, what does the S stand for?* | Didactic | Female | 1.00 | 0.05 |
| | | Male | 1.00 | 0.09 |
| | Third-Person Narrative * | Female | 1.00 | 0.11 |
| | | Male | 0.00 | 0.11 |
| | First-Person Narrative | Female | 0.91 | 0.05 |
| | | Male | 1.00 | 0.09 |

Note. $*p < 0.05$

*Hypothesis 2: Learning Transfer*. For the second hypothesis, there were again no significant effects of feedback type on SJT Word Count, $F(2, 43) = 1.76$, *ns*, or SJT score

*F*(2, 43) = 0.18, *ns*, either overall (see Table 11) or with score broken down by individual CRASH items (see Table 14).

The introduction of a one-week interval between training and testing therefore did not reveal any overall effects of feedback on transfer, consistent with the original findings. However, an effect that was present in the original data, a significant impact of feedback on applying the CRASH *Assess and Affirm Differences* principle in the SJT, was not replicated in this follow-up data.

Table 14
*Follow-Up Results of Factorial ANOVA for Feedback Type and Gender on Inclusion of Specific CRASH Items in SJT Responses*

| Source | Dependent Variable | SS | df | MS | *F* | *p* | partial $\eta^2$ | power |
|---|---|---|---|---|---|---|---|---|
| Feedback | SJT: C | 0.28 | 2 | 0.14 | 0.25 | 0.78 | 0.012 | 0.09 |
| | SJT: R | 2.53 | 2 | 1.26 | 0.53 | 0.59 | 0.026 | 0.13 |
| | SJT: A | 0.08 | 2 | 0.04 | 0.09 | 0.91 | 0.005 | 0.06 |
| | SJT: S | 2.91 | 2 | 1.45 | 2.32 | 0.11 | 0.104 | 0.44 |
| | SJT: H | 1.12 | 2 | 0.56 | 0.96 | 0.39 | 0.046 | 0.21 |
| Gender | SJT: C | 0.23 | 1 | 0.23 | 0.40 | 0.53 | 0.010 | 0.10 |
| | SJT: R | 3.76 | 1 | 3.76 | 1.57 | 0.22 | 0.038 | 0.23 |
| | SJT: A | 0.10 | 1 | 0.10 | 0.23 | 0.63 | 0.006 | 0.08 |
| | SJT: S | 0.18 | 1 | 0.18 | 0.29 | 0.60 | 0.007 | 0.08 |
| | SJT: H | 0.13 | 1 | 0.13 | 0.22 | 0.64 | 0.006 | 0.08 |
| Feedback x Gender | SJT: C | 1.37 | 2 | 0.69 | 1.20 | 0.31 | 0.057 | 0.25 |
| | SJT: R | 7.87 | 2 | 3.94 | 1.65 | 0.21 | 0.076 | 0.33 |
| | SJT: A | 0.03 | 2 | 0.01 | 0.03 | 0.97 | 0.002 | 0.05 |
| | SJT: S | 3.86 | 2 | 1.93 | 3.08 | 0.06 | 0.133 | 0.56 |
| | SJT: H | 0.36 | 2 | 0.18 | 0.31 | 0.73 | 0.015 | 0.10 |
| Error | SJT: C | 22.80 | 40 | 0.57 | | | | |
| | SJT: R | 95.69 | 40 | 2.39 | | | | |
| | SJT: A | 17.23 | 40 | 0.43 | | | | |
| | SJT: S | 25.07 | 40 | 0.63 | | | | |
| | SJT: H | 23.25 | 40 | 0.58 | | | | |

*Hypothesis 3: Self-Reported Experiential Learning*. For the third hypothesis, there was again no significant effect of feedback type on ELS global score, $F(2, 43) = 0.80$, *ns*. The ELS subscales were also examined, with no significant effects observed for feedback. There were also no significant effects for academic major, ethnicity, or gender for ELS overall score or subscales. Therefore, ELS scores in the follow-up study did not reveal any differences in participants' subjective experience of the training. Table 15 displays these follow-up results for ELS scores and subscores.

Table 15
*Follow-Up Results of Factorial MANOVA for Feedback Type, Academic Major, and Gender on ELS Scores*

| Source | Dependent Variable | SS | df | MS | *F* | *p* | partial $\eta^2$ | power |
|---|---|---|---|---|---|---|---|---|
| Feedback | ELS Total Score | 541.02 | 2 | 270.51 | 0.82 | 0.45 | 0.052 | 0.18 |
| | Environment Score | 13.86 | 2 | 6.93 | 0.81 | 0.45 | 0.051 | 0.18 |
| | Active Score | 51.00 | 2 | 25.50 | 0.47 | 0.63 | 0.030 | 0.12 |
| | Relevance Score | 60.13 | 2 | 30.07 | 0.83 | 0.44 | 0.053 | 0.18 |
| | Utility Score | 22.98 | 2 | 11.49 | 0.57 | 0.57 | 0.036 | 0.14 |
| Gender | ELS Total Score | 22.14 | 1 | 22.14 | 0.07 | 0.80 | 0.002 | 0.06 |
| | Environment Score | 0.01 | 1 | 0.01 | 0.00 | 0.97 | 0.000 | 0.05 |
| | Active Score | 0.62 | 1 | 0.62 | 0.01 | 0.92 | 0.000 | 0.05 |
| | Relevance Score | 4.94 | 1 | 4.94 | 0.14 | 0.71 | 0.005 | 0.07 |
| | Utility Score | 3.30 | 1 | 3.30 | 0.16 | 0.69 | 0.005 | 0.07 |
| Major | ELS Total Score | 386.39 | 1 | 386.93 | 1.71 | 0.29 | 0.038 | 0.18 |
| | Environment Score | 24.03 | 1 | 24.03 | 2.81 | 0.10 | 0.086 | 0.37 |
| | Active Score | 22.33 | 1 | 22.33 | 0.41 | 0.53 | 0.014 | 0.10 |
| | Relevance Score | 59.68 | 1 | 59.68 | 1.66 | 0.21 | 0.052 | 0.24 |
| | Utility Score | 5.31 | 1 | 5.31 | 0.26 | 0.61 | 0.009 | 0.08 |

*Table 15 Continued*

| Source | Dependent Variable | SS | df | MS | *F* | *p* | partial $\eta^2$ | power |
|---|---|---|---|---|---|---|---|---|
| Ethnicity | ELS Total Score | 616.97 | 1 | 616.97 | 1.87 | 0.18 | 0.059 | 0.26 |
| | Environment Score | 16.71 | 1 | 16.71 | 1.96 | 0.17 | 0.061 | 0.27 |
| | Active Score | 70.00 | 1 | 70.00 | 1.29 | 0.27 | 0.041 | 0.20 |
| | Relevance Score | 44.99 | 1 | 44.99 | 1.25 | 0.27 | 0.040 | 0.19 |
| | Utility Score | 32.22 | 1 | 32.22 | 1.60 | 0.22 | 0.050 | 0.23 |
| Feedback x Gender | | | | | | | | |
| | ELS Total Score | 797.45 | 2 | 398.72 | 1.21 | 0.31 | 0.075 | 0.24 |
| | Environment Score | 12.86 | 2 | 6.43 | 0.75 | 0.48 | 0.048 | 0.17 |
| | Active Score | 195.12 | 2 | 97.56 | 1.80 | 0.18 | 0.107 | 0.35 |
| | Relevance Score | 53.62 | 2 | 26.81 | 0.74 | 0.48 | 0.047 | 0.16 |
| | Utility Score | 21.72 | 2 | 10.86 | 0.54 | 0.59 | 0.035 | 0.13 |
| Feedback x Major | | | | | | | | |
| | ELS Total Score | 449.68 | 2 | 224.84 | 0.68 | 0.51 | 0.043 | 0.15 |
| | Environment Score | 3.30 | 2 | 1.65 | 0.19 | 0.83 | 0.013 | 0.08 |
| | Active Score | 90.66 | 2 | 45.33 | 0.84 | 0.44 | 0.053 | 0.18 |
| | Relevance Score | 102.62 | 2 | 51.31 | 1.42 | 0.56 | 0.087 | 0.28 |
| | Utility Score | 8.68 | 2 | 4.34 | 0.21 | 0.81 | 0.014 | 0.08 |
| Feedback x Ethnicity | | | | | | | | |
| | ELS Total Score | 29.17 | 2 | 14.58 | 0.04 | 0.96 | 0.003 | 0.06 |
| | Environment Score | 1.51 | 2 | 0.75 | 0.09 | 0.92 | 0.006 | 0.06 |
| | Active Score | 2.34 | 2 | 1.17 | 0.02 | 0.98 | 0.001 | 0.05 |
| | Relevance Score | 4.99 | 2 | 2.50 | 0.07 | 0.93 | 0.005 | 0.06 |
| | Utility Score | 14.20 | 2 | 7.10 | 0.35 | 0.71 | 0.023 | 0.10 |
| Error | ELS Total Score | 9903.13 | 30 | 330.10 | | | | |
| | Environment Score | 256.42 | 30 | 8.55 | | | | |
| | Active Score | 1628.19 | 30 | 54.27 | | | | |
| | Relevance Score | 1080.96 | 30 | 36.03 | | | | |
| | Utility Score | 607.52 | 30 | 20.25 | | | | |

# CHAPTER VII

# DISCUSSION

The purpose of this research was to investigate the effects of narrative performance feedback for an intercultural communication skills training task. The rationale for the research is that intercultural communication skills are ill-defined, making them suitable for training via experiential learning and reflection. It was expected that performance feedback retold as a chronological story with a character's point of view would benefit participants' reflective thinking and retention of information in long-term memory by providing a schema for organization (Mandler, 1984; Thorndyke, 1975; 1977), contextual information (Schank, 1998), and emotional content (Oatley 1994; 1999; Richtey, LaBar, & Cabeza, 2011). In particular, this study assessed how narrative feedback influenced three measures of learning effectiveness: content learning of intercultural communication principles, transfer of intercultural communication skills to a new task, and subjective ratings of experiential learning.

This research represents an attempt to control and experimentally manipulate narrative feedback to measure its impact on learning and transfer compared to didactic feedback, which focused on learning objectives. The training was meant to teach participants the CRASH principles of intercultural communication (Rust et al., 2006), and assess how well participants could recall the principles during a content quiz and apply them to new situations in open-ended SJTs. Additionally, data were analyzed according to participants' academic major, gender, and ethnicity to determine whether these individual differences affected the training experience as a whole or were moderated by feedback type.

*Summary of Findings*

In the following sections, the findings will be summarized first according to each of the three hypotheses, and then for the observed effects that were not hypothesized at the outset. The results for the original study and the follow-up study are discussed together within each section.

*Hypothesis 1: Content Learning*. The first prediction was that didactic feedback would be best for content learning. Because the didactic feedback directly reinforced the content and wording in the CRASH mnemonic (Rust et al., 2006) and constituted the learning objectives for the training, it was expected that this high specificity of CRASH content feedback would assist participants with "remembering" and "understanding" information (i.e., lower levels of Bloom's taxonomy; Anderson & Krathwohl, 2002; Bloom et al., 1956) and reinforce shallow learning (Craik & Lockhart, 1972) of the CRASH items. Specifically, it was expected that because the didactic feedback reinforced the CRASH mnemonic (Rust et al., 2006), it would help participants recall CRASH items as assessed by content quiz questions.

The expected effect, however, was not observed. In the original set of data, the results of the content quiz scores showed ceiling effects, revealing few differences among the groups. There was no significant effect of feedback type on overall quiz score. This lack of variability suggested that the CRASH quiz might have been too easy when presented immediately following the training. Data from the follow-up study showed that a one-week interval between training and testing indeed created some memory decay regarding the CRASH principles: these data showed significantly lower quiz scores than the original data, but still no overall significant effect for feedback type. The individual quiz questions were also examined and there were again no significant effects of feedback on correct responses to individual questions. The follow-up data also showed no significant effect of feedback on overall content quiz score or scores for individual questions. Therefore, Hypothesis 1 was not supported. There were no observed overall effects of feedback type on content learning, as assessed using the content quiz.

*Hypothesis 2: Learning Transfer*. Second, it was expected that transfer of learned intercultural communication skills would be best for narrative feedback, especially first-person narrative feedback. Narrative feedback was expected to provide organization and context (Mandler, 1984; Schank, 1998; Thorndyke, 1977), resulting in deeper learning than didactic feedback (Craik & Lockhart, 1972), and better application of the learned material to a new task. Further, it was expected there would be more participant emotion and reflection supported by first-person over third-person presentation style (Berntsen & Rubin, 2006; Deen et al., 2010; Marshall & O'Keefe, 1995; McIsaac & Eich, 2002).

This hypothesis was not supported. There were no significant differences observed among the feedback groups for SJT word count or score. The same pattern of results was found in the follow-up study with the added interval between training and testing, suggesting there was no longer-term retention effect of feedback type on overall SJT performance.

There was, however, a significant effect in the original data of feedback type on applying the *Assess and Affirm Differences* principle in SJT responses, showing that this principle was applied significantly more often for participants who had received first-person narrative feedback over third-person narrative feedback. Although this finding supports the hypothesis that first-person narrative feedback provided the best advantage for transferring skills, it does not support the overarching hypothesis that both narrative types would be advantageous over didactic feedback. This finding was not replicated in the follow-up study. More data are needed to determine whether different kinds of feedback do indeed consistently impact some aspect of training transfer.

Notably, the follow-up study did not reveal overall differences from the original study for SJT word count or scores, suggesting there was no degradation in SJT performance when a time interval was introduced between training and testing. Although not hypothesized, this finding may suggest an overall strength of narrative simulation-based training in general.

Overall, there was a lack of effects of type of performance feedback on SJT responses. It might be the case that the SJTs, although intended to be a measure of transfer, still demonstrated surface-level recall of the CRASH principles. A testing method that better assesses deep learning, as opposed to more surface-level recall, might reveal differential effects for feedback types. Transfer might alternatively be measured with a role-playing test, calling on deeper, more active thinking among participants that would likely differ based on depth of learning of the material (Davis, O'Brien, Freemantle, Wolf, Mazmanian, & Taylor-Vaisey, 1999).

Another possibility is that the experiential training task itself with the text-based conversation was not challenging enough to prompt deep thinking (D'Mello & Graesser, 2012), thereby minimizing the potential differences among the kinds of feedback used in this study. Again, role-playing with actual humans during the training, as well as role-playing as a transfer task, would add cognitive load when participants need to actively generate their own responses, as opposed to selecting from three response choices in a computer-based task. A more challenging training task may make the performance feedback more relevant and therefore more influential for transfer.

By contrast, it also could be the case that the training task was too challenging, given that the participant population consisted of novices. For novices, narrative feedback that is adaptive and specific to the user's performance would likely be more effective than the static, general narratives provided in the present research, to help learners make accurate connections between the feedback and their own performance (Billings, 2010; Moreno, 2004; Serge, Priest, Durlach, & Johnson, 2013). Perhaps the participant sample was too naive for the general narrative feedback to be effective beyond the specific didactic feedback. Serge and colleagues (2013) found in a game-based training environment that specific feedback was more beneficial for trainees at the start of training, but all feedback was effective after they had made further progress. In the present research, the benefit of specific, didactic feedback for novices may have cancelled out any potential benefits of narrative feedback, which was by definition more general.

It could also be the case that the intervals between training and testing were too brief. A longer interval between training and testing might reveal differences that were not found in the immediate testing in the original study or the one-week delayed testing in the follow-up study. However, Hays et al. (2009) offered the opposite argument. They stated that their research might have revealed an effect on feedback type on BiLAT performance if they had used an immediate posttest instead of a nine-day delayed test, suggesting that an extended time to reflect enabled learners in both groups to generalize their learning. Delayed testing is still uncommon in the context of simulations and serious games with a range of intervals used and no established rationale for the timing. A meta-analysis by Wouters and colleagues (2013) found that delayed testing intervals for serious games research typically ranged from one week to five weeks, with one test in their search taking place 27 weeks after intervention. However, this meta-analysis focused on benefits of serious games compared to other instruction, not variations within serious games. Further research is needed to understand retention as it pertains to simulation and game-based learning of communication skills.

*Hypothesis 3: Self-Reported Experiential Learning*. The third hypothesis was that narrative feedback, especially first-person narrative feedback, would be associated with higher self-reported experiential learning, measured using items from the ELS (Clem et al., 2014). However, there was no significant impact of feedback type on ELS global score, in either the original or follow-up data.

A significant effect was found for one ELS subscale, which was counter to predictions. Participants in the didactic feedback group reported higher Environmental ratings of the training, significantly higher than those in the third-person feedback group. The cause of this effect was an interaction between feedback and academic major, and follow-up tests revealed no significant simple effects. Therefore, this finding was not very robust and it may not be prudent to interpret it.

Overall, the conclusion is for Hypothesis 3 is that that feedback type did not significantly influence overall perception of the training. Therefore, this hypothesis was not supported.

*Effects of Academic Major, Ethnicity, and Gender*

Three variables were included in analyses that were not addressed by the hypotheses: gender, academic major, and ethnicity. Gender was included to test whether observed gender-related differences in empathy would result in differential effects in the training. For ELS analyses, academic major was included because of the healthcare training context and the possibility for differences in motivation and interest among those with and without healthcare-related majors, and ethnicity was included because of the intercultural component of the training activity, which might be impacted by a participant's ethnicity.

*Academic Major*. In the original study, academic major revealed no significant effects on the overall ELS score or the ELS subscales. There was a significant interaction between feedback and academic major on the ELS Environment subscale, but pairwise comparisons were not significant. The follow-up study showed no significant effects or interactions for academic major. Therefore, academic major and presumed interest in healthcare were not moderated by type of feedback and had no significant effects on ELS scores.

*Ethnicity*. There were no observed significant effects of ethnicity, for either the original or follow-up set of data. Although not significant, the means were often higher for ELS ratings by nonwhite participants, suggesting nonwhite participants viewed the training as somewhat more relevant and effective than white participants. It makes intuitive sense that nonwhite individuals who experience life as a racial minority in this region, may understand the importance of intercultural sensitivity more readily than individuals who likely experience fewer intercultural issues. However, with a lack of statistical significance, this finding is not interpretable.

*Gender*. There were some observed gender effects, although there were no predictions based on gender as a variable. For content quiz scores in the original data, females showed significantly higher scores than males on the question about respect. This finding suggests that perhaps the natural tendency for females to display higher empathy may have impacted how well they remembered the CRASH principle of demonstrating respect in intercultural communication.

The original data also revealed a significant interaction between feedback and gender for the quiz question about *Sensitivity*. In the didactic feedback condition only, female participants scored significantly higher on that question. This finding suggests that male participants tended to recall less information from the didactic feedback. Thus, it is possible that the narrative conditions offered unique advantages for males by providing more information to guide a personal connection with the material.

Data from the follow-up study provided additional support for this gender difference in shallow content learning. When tested one week after training, there was a significant interaction between feedback type and gender for the content quiz scores, showing that didactic feedback was most effective for female participants, and first-person narrative feedback was most effective for male participants. The follow-up study also revealed significant interactions between feedback and gender for three specific quiz questions, suggesting males scored significantly lower than females in the didactic feedback condition for one quiz question and in the third-person narrative feedback for two quiz questions. It seems that the first-person narrative feedback condition was most effective for male participants for content learning.

For learning transfer measured using SJTs, there were no significant effects when gender was included as a variable, in either the original or follow-up sets of data. Therefore, neither feedback nor gender significantly influenced SJT responses.

Finally, for analyses of ELS scores and subscores there was a significant effect of gender on Environment subscale score, but without significant pairwise comparisons. There was also a significant interaction between feedback and gender for the Utility subscale, showing higher reports of utility by females compared to males in the didactic feedback condition, and higher reports of utility by males compared to females in the first-person narrative feedback condition. Again, this finding provides some support for the idea that male participants preferred the first-person narrative feedback. It seems that both narrative feedback conditions improved males' subjective experience of training utility so that their ratings were equivalent to or higher than females' ratings. This gender effect on subjective experiential learning ratings was not observed in the follow-up study. Perhaps with a larger sample size in the follow-up study, this effect for gender and feedback would be replicated.

Taken together, it seems that the types of feedback had a larger impact for male than female participants, though the hypotheses for the present research did not directly address gender. Another study from the literature on intercultural sensitivity reported a similar pattern between gender and training environment (Coffey, Kamhawi, Fishwick, & Henderson, 2013; Coffey, Kamhawi, Fishwick, & Henderson, 2017). Coffey and colleagues (2013, 2017) observed that female participants were equally attentive and achieved equivalent questionnaire-based intercultural sensitivity in a 2D web environment and a 3D virtual environment in Second Life. However, male attentiveness and cultural sensitivity were significantly lower in the 2D than the 3D environment. The authors attributed this difference to the higher tendency for females to communicate with others, empathize with others, and seek to understand others in the context of intercultural issues (Constantine, 2000; Cowan & Khatchadourian, 2003; Cundiff & Komarraju, 2008; Cundiff et al., 2009; Holm et al., 2009; Nieto & Booth, 2010; Wang et al., 2003). Similar to the present study, in which narrative feedback was used as an attempt to evoke deep learning and emotion, Coffey et al. had used a 3D virtual environment to increase interactivity and sense of presence. Coffey et al. found that the biggest positive effects of the 3D virtual environment were for attentiveness, suggesting that more engaging content for intercultural communication training may be more crucial for male participants, based on gender differences in motivation.

As mentioned, gender was included in the present study as an exploratory variable because many studies find gender differences in measures of empathy skills and motivation for improving communication (Berg et al., 2011; Constantine, 2000; Cowan & Khatchadourian, 2003; Cundiff & Komarraju, 2008; Cundiff et al., 2009; Holm et al., 2009; Hojat et al., 2002; Nieto & Booth, 2010; Wang et al., 2003). Although this study did not directly measure empathy, one reason for including the narrative condition was to invoke feelings of empathy. The findings suggest that narrative feedback, especially first-person narrative feedback, may offer advantages particularly for males is that males may experience less empathy and less motivation for improving communication in general, making the advantages of narrative more pronounced.

*Lack of Differences Between Third- and First-Person Narrative Feedback*

The hypotheses predicted benefits of narrative over didactic feedback, but also benefits of first-person over third-person narrative. However, the results showed few significant differences between the two types of narrative.

There is little empirical research comparing differences between these verbal perspectives. One example of a benefit of first-person perspective was observed in a visualization study of personal health intentions (Rennie, Uskul, Adams, & Appleton, 2014), which used an active form of self-perspective-taking. By contrast, the text-based training activity used in the present study, in which participants passively read and responded to a scenario and passively received feedback, may have eliminated potential differences between first- and third-person information.

Further, the perspectives in the present study did not involve the participant's *own* perspective, but rather the perspective of the patient's mother from the scenario. Both narrative conditions referred to the participant in the second person ("you"). This distinction may not have been meaningful enough to influence participants' empathy and reflection.

*Research Limitations*

The present research had some limitations. First, the participants were undergraduate students, not healthcare providers. Thus, it is possible that the levels of motivation for or knowledge about this healthcare communication task observed in this sample might differ from those of actual healthcare providers. The data were compared between healthcare-related majors and those with other majors to measure possible differences in motivation or interest in the content. A few differences were uncovered based on academic major, but these did not result in significant differences in performance on the content quiz or SJTs, only in differences in self-reported experiential aspects of the training activity. Based on the lack of statistical differences between healthcare and non-healthcare majors, the lack of applicability of the training to this participant population likely did not influence the results.

Second, participants completed the study online. Although this methodology facilitated data collection, the tradeoff is that there was no experimenter control over participant behavior. An effort to assuage this drawback was to omit data from participants who completed the study in less than 19 minutes, based on times calculated during a pilot study, because these participants likely rushed through the study. An analysis of these groups of participants showed no significant differences between the data for those retained and those dropped, except for SJT word sum. Those who were retained ($M$ = 125.87, $SE$ = 5.88) included significantly more words than those who were omitted ($M$ = 121.30, $SE$ = 13.83), $p < 0.05$. Although the participants who completed the tasks too quickly would not have shifted the results of most analyses, they were eliminated because it was clear that they did not put forth the expected effort, so the validity of their scores and subjective ratings was suspect.

Third, in the original study, the testing phase of the experiment occurred immediately following the training. A follow-up study was conducted with the testing phase occurring one week after the training, to assess whether the absence of effects could have been due to the very brief retention interval. Although the follow-up study showed more variability and an additional effect for content quiz score, one week may still not have afforded enough time to show differences among the different types of feedback. As the interval increases between training and testing, there is more opportunity for decay and interference in memory (Brown, 1958; Peterson & Peterson, 1959; Underwood & Postman, 1960), making the learned information more difficult to recall. Under circumstances of much longer delayed testing, it is possible that benefits of narrative feedback for retention might emerge. Further research should examine whether narrative feedback might have effects on longer-term retention and transfer of information.

Fourth, for practical and purposes of control, the feedback that participants received was not adapted to their actual performance. Rather, feedback was identical for every participant within each of the three feedback groups. Future research should investigate the effects of narrative in an adaptive context, where feedback is more specific at the start of training and gets more general as participants become proficient in the task. Adaptive feedback in simulation-based training is known to have advantages over fixed feedback (Billings, 2012; Durlach & Lesgold, 2012). If the adaptive feedback is more useful than static feedback in the present context of the communication skills task, perhaps the specific type of adaptive feedback, such as narrative, would lead to varying effects.

Fifth, the SJT transfer test was not truly a measure of behavioral transfer, but was a convenient and feasible way of measuring application of learned information to new intercultural situations. The data did not reveal significant differences in SJT word count or score based on feedback type, or any other exploratory variables. It is possible that differences would emerge for truer transfer tasks, more similar to real situations. In the future, it would be beneficial to know how narrative feedback may influence behavior beyond the testing environment, such as in a human role-playing task.

Sixth, the scoring for the SJTs was conducted by a single researcher, and therefore there are no calculations for interrater reliability. Although the use of a rubric contributed to consistency of ratings, there may be some subjectivity that could influence scores. In particular, in a few instances some statements did not match up with rubric examples and could have fallen in multiple categories (e.g., either respect or sensitivity/self-awareness). Future research should ensure that the interrater reliability is high and thus the ratings provided by multiple raters are consistent, validating the SJT scenarios and the rubric.

Finally, the ELS was used as a measure of subjective experiential and emotional experience during the training. There are some limitations to using self-report measures. There are individual differences in how participants respond to questionnaires (Austin, Deary, Gibson, McGregor, & Dent, 1998), and some participants may not be particularly sensitive to their own affective experiences (Barrett, Quigley, Bliss-Moreau, & Aronson, 2004). Therefore, a more objective measure of emotion (for example, using a system that interprets emotion from facial expressions or physiological measures) may reveal differences in participant emotion displayed during the training task in real time. This kind of measure may identify differences in affect due to feedback style, with narrative feedback possibly incurring a more prominent emotional response.

*Research Implications*

The findings from the present study have some implications for intercultural communication skills training. This research provides some preliminary evidence that narrative feedback can influence learning of communication skills, especially for male participants.

A broad effect of narrative feedback across all participants was not found, despite predictions. The only significant finding when examining all participants collectively was that narrative feedback, both third- and first-person, may have helped participants remember the sensitivity and self-awareness component of the CRASH mnemonic.

Interestingly, however, this research uncovered individual differences suggesting that the effects of narrative feedback may be more pronounced for male trainees than female trainees, in terms of both content learning and the subjective learning experience. Narrative feedback improved content quiz scores for male participants, and led to higher male ratings for perceived value, belief that the skills will be used again, and belief that the skills will be useful in the future. A possible explanation is that male motivation may naturally be lower than female motivation for learning communication skills, and the narrative feedback helps attenuate this difference.

Further research with varying experimental techniques and varying measures would provide more complete insights into how narrative might influence learning and transfer. In addition, individual differences such as gender should be considered to determine whether narratives may provide further benefits for some populations over others.

*Conclusion*

The purpose of this research was to investigate how a narrative format for performance feedback might influence learning and retention of learned communication skills. In healthcare, intercultural communication skills are important for delivering quality patient care, and these complex skills are difficult for training and giving feedback (Bangert-Drowns et al., 1991). Guided feedback is especially important in healthcare because medical trainees might not naturally reflect on their own performance without prompting (Grant et al., 2006; Sandars, 2009). Therefore, structured information using narrative for performance feedback might enhance learning by providing schemas for memory organization (Mandler, 1984; Thorndyke, 1975; 1977), contextual information (Schank, 1998), and emotional content (Oatley 1994; 1999; Richtey, LaBar, & Cabeza, 2011).

On the basis of this study alone, it is difficult to conclude that narrative feedback is advantageous for retention and transfer of learned communication skills. It might be useful to provide narrative performance feedback in a training context to engage trainees who might not otherwise be engaged in the material. For example, narratives may offer advantages for male participants in the context of communication skills, or other areas where there are gender differences in motivation.

It seems, therefore, that even if there are not universal benefits for narrative feedback structures, retelling the training experience as a story may have benefits over simply reviewing the learning objectives for the training. The specific kind of narrative might not matter, providing there is a chronological story, seeing as there were no differences observed between third- and first-person narrative feedback.

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# APPENDIX A

## Instructions and Informed Consent
## Old Dominion University

**Thank you for agreeing to participate in the study!**

The purpose of this training experience is to help you develop intercultural communication skills. Even though the training talks about healthcare specifically, these skills can apply to all areas of life.

For this training exercise, you will:

- Complete a brief questionnaire about your background information
- Learn a CRASH mnemonic for remembering intercultural skills
- Complete a training exercise in which you imagine you are a physician who must navigate an intercultural dilemma with patients
- Receive feedback on your performance in that task
- Complete surveys testing what you've learned
- Complete a survey asking your opinions of the training experience as a whole

This training exercise will take approximately **30-45 minutes**.

**INFORMED CONSENT DOCUMENT --** OLD DOMINION UNIVERSITY
IRB# 796655-2

**PROJECT TITLE: Training Intercultural Communication Skills Using Simulation**

**INTRODUCTION**
The purposes of this form are to give you information that may affect your decision whether to say YES or NO to participation in this research, and to record the consent of those who say YES. The title of this research study is Project InterculturalSkillsTraining. This research is being conducted in partial fulfillment of the requirements for the degree of Ph.D. in Human Factors Psychology.

**RESEARCHERS**
Faculty Research Advisor:
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**DESCRIPTION OF RESEARCH STUDY**
Communication skills are difficult to train but important for providing quality healthcare. Methods for training such as role-playing and simulation can give healthcare providers practice interacting with patients in difficult situations such as intercultural conflicts.

If you decide to participate, then you will be one of approximately 90 undergraduate students involved in a study designed to improve current methods for training future healthcare providers using a computer-based simulator. You will be instructed to perform several tasks on the computer requiring you to respond to survey questions, select multiple-choice answers, and write short essays. The total amount of time for participation is approximately one hour.

**EXCLUSIONARY CRITERIA**
None.

**RISKS AND BENEFITS**
RISKS: If you decide to participate in this study, then you may face a risk of slight physical fatigue and eye strain associated with normal computer use. And, as with any research, there is some possibility that you may be subject to risks that have not yet been identified.

BENEFITS: The benefit of participating in this study is the opportunity to learn and practice intercultural communication skills. There are no expected additional benefits.

**COSTS AND PAYMENTS**
You will receive 1 Psychology department research credit, which may be applied to course requirements or extra credit in certain Psychology courses. Equivalent credits may be obtained in other ways, such as conducting library reports and online surveys. You do not

have to participate in this study, or any Psychology Department study, in order to obtain this credit.

**NEW INFORMATION**
If the researchers find new information during this study that would reasonably change your decision about participating, then they will give it to you.

**CONFIDENTIALITY**
The researchers will take reasonable steps to keep private information, such as questionnaires and task performance and findings confidential. The researchers will remove all identifying information from questionnaires and store all data separately from the informed consent documents. The results of this study may be used in reports, presentations, and publications; but the researcher will not identify you. Of course, your records may be subpoenaed by court order or inspected by government bodies with oversight authority.

**WITHDRAWAL PRIVILEGE**
It is OK for you to say NO. Even if you say YES now, you are free to say NO later, and walk away or withdraw from the study – at any time. If at any point during the study you wish to stop, simply close out of Qualtrics and you will not be penalized in any way. Any data that has already been collected will be destroyed and will not be included in the final analysis.

**COMPENSATION FOR ILLNESS AND INJURY**
If you say YES, then your consent in this document does not waive any of your legal rights. However, in the event of injury, or illness arising from this study, neither Old Dominion University nor the researchers are able to give you any money, insurance coverage, free medical care, or any other compensation for such injury. In the event that you suffer injury as a result of participation in any research project, you may contact the Faculty research advisor, and responsible principle investigator at 757-683-4217 or Dr. George Maihafer the current IRB chair at 757-683-4520 at Old Dominion University, who will be glad to review the matter with you.

**VOLUNTARY CONSENT**
By signing this form, you are saying several things. You are saying that you have read this form or have had it read to you, that you are satisfied that you understand this form, the research study, and its risks and benefits. The researchers should have answered any questions you may have had about the research. If you have any questions later on, then the researchers should be able to answer them:

Student Researcher: Rebecca A. Kennedy rkenn014@odu.edu 518-423-3226

Faculty Advisor: Mark W. Scerbo, Ph.D. mscerbo@odu.edu 757-683-4217

If at any time you feel pressured to participate, or if you have any questions about your rights or this form, then you should call Dr. George Maihafer, the current IRB chair, at 757-683-4520, or the Old Dominion University Office of Research, at 757-683-3460.

And importantly, by signing below, you are telling the researcher YES, that you agree to participate in this study.

# APPENDIX B

PARTICIPANT BACKGROUND INFORMATION QUESTIONS

The purpose of this questionnaire is to obtain background information that will be used for research purposes only. Your information will remain anonymous

## General Information

1. Age______
2. Academic Major _______
3. Gender______
4. Ethnicity _______
5. Academic Major ___________________
6. Please briefly list any jobs you have held that required you to complete communication skills training, wand what kind of training that entailed:

## Clinical Experience

1. Do you have any formal clinical healthcare training? If yes, please describe:
2. Have you or do you currently work in a clinical setting (including dental, veterinary, etc.)? If yes, please describe:
3. Do you have a family member or close friend who works in the healthcare field? If yes, please describe:

# APPENDIX C

## CRASH Instructional Material

### Introduction

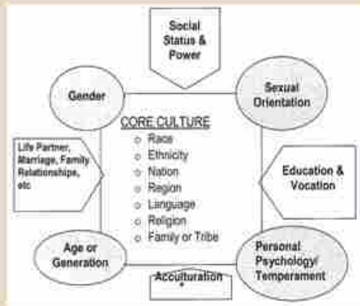
- This lesson will discuss:
  - The importance of cultural competence in healthcare
  - The CRASH mnemonic for remembering components of cultural competence
- You will be quizzed on this information later

### What is culture?

- **Culture** can be defined as an integrated pattern of shared values, beliefs, norms, behaviors, and customs

# What is Culture?

- Shared core culture is determined by race, ethnicity, religion, etc.
- An individual's expression of their culture is affected by:
  - **Personal characteristics:** age, birth order, gender, sexual orientation
  - **Characteristics developed over time:** education, vocation, family roles, degree of acculturation




# What is Culture?

- Culture is directly related to:
  - Health promotion
  - Disease prevention
  - Early detection
  - Access to healthcare
  - Trust and compliance

## Culture and Healthcare

- Physicians in the U.S. serve a diverse patient population.
  - Over 30% of the US population is:
    - African American
    - Hispanic
    - Asian
    - Other non-European origins
  - Expected to increase to nearly 50% by 2050

## What is Cultural Competence?

- Defined by US Department of Health and Human Services Workgroup:

*"**Cultural competence** comprises behaviors, attitudes, and policies that [...] ensure that a system, agency, program, or individual can **function effectively and appropriately** in diverse cultural interaction and settings."*

## CRASH

- **CRASH** = mnemonic for remembering essential components of cultural competence
  - **C**ulture
  - **R**espect
  - **A**ssess/**A**ffirm Differences
  - **S**ensitivity and **S**elf-Awareness
  - **H**umility

## CRASH

- Culture
  - Recognize the importance of an individual's **values and perceptions** in the experience of health and healthcare

## CRASH

- Respect
  - Determine how to **demonstrate respect** in various cultural contexts
  - Examples: active listening, eye contact, physical contact, addressing patients by first name or by "Mr." or "Ms."

## CRASH

- Assess/affirm differences
  - **Ask open-ended questions** about the person's cultural background in a non-threatening way

## CRASH

- Sensitivity and self-awareness
  - Develop awareness of specific values, beliefs, and perceptions within cultures
    - And be self-aware of how your own culture influences you
  - **Aim for deep sensitivity**, not just superficial sensitivity
    - Superficial – language, music, food, clothing
    - Deep – cultural, social, historical, environmental, psychological forces

## CRASH

- Humility
  - Be quick to **apologize and accept responsibility** for cultural missteps

# APPENDIX D

## CRASH Instruction Attention Check Pretest

1. Which of the following is not a core component of culture but influences cultural expression?

    a) Race
    **b) Education**
    c) Nationality
    d) Religion

2. Which aspect(s) of healthcare is/are influenced by a patient's culture?

    a) Early detection of disease
    b) Access to healthcare
    c) Trust and compliance
    **d) All of the above**

3. According to the definition by the US Department of Health and Human Services Workgroup, what is the ultimate purpose of cultural competence?

    a) To avoid embarrassment in the case of cultural missteps
    **b) To function effectively and appropriately with individuals from diverse cultures**
    c) To develop appropriate policies for intercultural behavior
    d) To encourage individuals from diverse cultures to become healthcare providers

4. CRASH is a mnemonic for remembering what?

    **a) Essential components for practicing cultural competence**
    b) How to correct a mistake that resulted in culturally offending someone
    c) The steps to be taken to sensitively describe your cultural point of view
    d) The kinds of questions to ask a person with a different cultural background

# APPENDIX E

## Experiential Training Scenario Sample

You enter the patient's room.

You see Robin Phillips, your 27-year-old patient. She is Latina but not obviously so in features or coloring. She lies in bed, wearing a patient's smock. She is annoyed, but also looks fatigued.

Robin's mother, Delmy, stands next to the bed. Delmy's brow is furrowed suggesting worry; nonetheless, she displays strength and a sense of control. Delmy is short, slightly stout, about 5'5". She wears a business-casual suit with slacks.

"Did somebody call for a doctor?" you ask.

**ROBIN**
Thank God you're here.

**DELMY**
Now maybe we can talk some sense into her!

- Good to meet you, Ms. Aguilar.
- Ms. Aguilar, so we don't disturb the other patients, would you please lower your voice?
- Hello, Ms. Aguilar. How are you dealing with your daughter being in the hospital?

# APPENDIX F

## Didactic Feedback

**Thank you for completing the intercultural skills training scenario.**

**Please consider the responses you chose during your interaction with Robin and Delmy as they relate to the CRASH principles you learned.**

### Culture

Acknowledging Delmy's cultural values demonstrates respect.

To learn more about Delmy's perspective, ask open-ended questions about how you can help her.

## Respect

When introducing yourself to Delmy, it is respectful to address Robin first and to not assume Delmy shares Robin's last name.

An empathetic response to the conflict you observe between Delmy and Robin is acknowledging that both were upset and asking questions to figure out why.

Asking Robin, the patient, whether it was okay for Delmy to share and explain her feelings is a way to demonstrate respect for both of them.

## Assess/affirm differences

Acknowledging the feelings of both Robin and Delmy could build a shared understanding of their differences.

Addressing the conflict directly can be effective in inviting further discussion on their differing perspectives.

## Sensitivity and self-awareness

When interrupted by something like a pager, it is important to remain engaged in the discussion.

Your culture as a medical practitioner might lead you to value efficiency over social connection, but you need to be sensitive to the patient's needs.

You should also have committed to a time you will return to discuss treatment plans.

## Humility

If you accidentally made a cultural misstep, you should have apologized quickly and sincerely.

# APPENDIX G

## Third-Person Narrative Feedback

**Thank you for completing the intercultural skills training scenario.**

**Please consider the responses you chose during your interaction with Robin and Delmy as they relate to the scenario as it unfolded.**

### Beginning the Conversation

First, after entering Robin's room, it is respectful to address Robin, the patient, first. You also should not assume Delmy shares Robin's last name.

After noticing immediately that there is a conflict between Delmy and Robin, an empathetic response is acknowledging that both are upset and asking questions to get a conversation started to figure out why.

# Identifying the Cultural Conflict

To learn more about Delmy's perspective, you should have asked open-ended questions about how you can help her.

While trying to identify the conflict, acknowledging Delmy's cultural values that she shares with you demonstrates respect.

# Throughout the Conversation

When interrupted by something like a pager, it is important to remain engaged in the discussion. Your culture as a medical practitioner might lead you to value efficiency over social connection, but you need to be sensitive to the patient's needs.

If you accidentally made a cultural misstep, you should have apologized quickly and sincerely.

## Addressing the Conflict

Asking Robin, the patient, whether it was okay for Delmy to share and explain her feelings is a way to demonstrate respect for both of them.

After validating Delmy's point of view about being involved in her daughter's care, it was important to acknowledge the feelings of Robin as well to build a shared understanding of their differences.

## Ending the Conversation

To close the conversation, you should have encouraged Delmy and Robin to continue speaking with one another, to invite further discussion about the conflict.

Finally, you should have committed to a time you will return to discuss treatment plans.

# APPENDIX H

## First-Person Narrative Feedback

**Thank you for completing the intercultural skills training scenario.**

**Please consider Delmy's reaction to the responses you chose during the interaction with Delmy and Robin as the scenario unfolded.**

### Beginning the Conversation

Hi, doctor. It's me, Delmy. Here is some feedback on the conversation we had.

First, after entering Robin's room, you should have asked Robin who I am without assuming I share her last name.

After noticing immediately that we had a conflict, it shows that you care if you acknowledge that both Robin and I are upset and you ask questions about what we were experiencing.

## Identifying the Cultural Conflict

Asking open-ended questions about how you can help me shows you care enough about my beliefs and priorities to find out about my fears about my daughter being in the hospital.

While you were trying to identify the conflict between Robin and me, acknowledging the cultural values I bravely shared with you demonstrates your respect for my role in my daughter's care.

## Throughout the Conversation

When interrupted by something like a pager, it is important to remain engaged in the discussion to avoid seeming like you are lacking compassion. Your culture as a medical practitioner might lead you to value efficiency over social connection, but it gives the hurtful impression that you simply don't care about us.

If you accidentally offend me, you should apologize quickly and sincerely so I know you didn't intend to hurt my feelings.

# Addressing the Conflict

Even though I'm her mother, Robin is the patient and she would appreciate being asked whether it is okay that I share and explain my feelings.

After I had the chance to describe my feelings about my daughter's care, it was important to acknowledge Robin's feelings, too, to help us all build a shared understanding of our differences.

# Ending the Conversation

To close the conversation, you should have encouraged Robin and me to continue speaking with one another, to invite further discussions about the conflict so we may continue to work things out as a family.

Finally, you should have committed to a time you will return to discuss treatment plans, so we know what to expect as a next step in this confusing time.

# APPENDIX I

## Situational Judgment Tests

SJT Scenario 1:

You are a young white male doctor. A sixty-three-year-old African American female, Elizabeth Jackson, waits in a small exam room in a neighborhood clinic and you enter the room without knocking. You greet her by her nickname ("Hello, Bessie!"), ask her how she's doing ("How's my girl today?"), and pat her on the shoulder. She turns away from you and does not respond.

Not being aware of the racial dynamics at play, your effort to appear friendly has unintentionally offended her. Her behavior suggests that she considers your behavior racially offensive and offensive to her as an elder.

Below, please describe in detail the actions you would take to correct your mistakes and behave in a more culturally sensitive manner going forward with this patient.

SJT Scenario 2:

You are a female, American-born doctor. A Latina mother, Gabriella Ramirez, brings her infant to the emergency room with a fever. Her husband and sisters are working, and her mother and grandmother are home with the other children.

After an examination, you (through an interpreter) tell the mother that a spinal tap is needed and ask her to sign an informed consent immediately. She hesitates, but it's important that she signs right away. When you ask her a second time, she begins to cry.

You realize that she might be upset because of cultural differences between your expectations and her expectations. From her perspective, you believe it may be problematic that you have not developed a sense of personal trust with her and she has been unable to consult with her family up to this point.

Below, please describe in detail the actions you would take to correct your mistakes and behave in a more culturally sensitive manner going forward with this patient.

# APPENDIX J

## Quiz to Assess Content Learning of CRASH Principles

1. An example of deep cultural sensitivity is an understanding of which of the following?

    **a) Historical background of the culture**
    b) Language rules for formally and informally addressing a person
    c) The kind of food eaten by members of a culture
    d) Cultural norms for conversation

2. What is the best immediate course of action in the case of cultural missteps?

    a) Be self-aware of your own cultural viewpoint and clearly and sensitively explain the misunderstanding.
    b) Address the misstep immediately when the other person responds negatively
    **c) Show humility and be quick to apologize**
    d) All of the above

3. In the CRASH mnemonic, what does R stand for?

    a) Recognize your own cultural viewpoints
    b) Recognize that cultural background influences healthcare decisions
    c) Take responsibility for cultural misunderstandings
    **d) Show respect in culturally-appropriate ways**

4. In the CRASH mnemonic, what does A stand for?

    **a) Assess/affirm differences**
    b) Assess/apply cultural sensitivity
    c) Arrange a meeting at a specific time and place
    d) Arrange the conversation around open-ended questions

5. In the CRASH mnemonic, what does S stand for?

    a) Selection of culturally-appropriate actions
    **b) Sensitivity and self awareness**
    c) Superficial and deep cultural understanding
    d) Specificity and sensitivity

# APPENDIX K

## Experiential Learning Survey (ELS; Clem et al., 2014)

| 1…………… | 2…………… | 3…………… | 4…………… | 5…………… | 6…………… | 7 |
|---|---|---|---|---|---|---|
| Stongly Disagree | Disagree | Somewhat Disagree | Neither | Somewhat Agree | Agree | Strongly Agree |

| | |
|---|---|
| 1. The setting where I learn helps me understand the material better. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 2. I expect real-world problems to come up during this learning experience. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 3. The environment I learn in does not enhance the learning experience. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 4. The learning experience requires me to interact with people other than students and teachers. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 5. I expect to return to an environment similar to the one where this learning experience occurs. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 6. I am stimulated by what I am learning. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 7. The learning experience requires me to do more than just listen. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 8. The learning experience is presented to me in a challenging way. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 9. I find this learning experience boring. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 10. I feel like I am in an active part of the learning experience. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 11. The learning experience requires me to really think about the information. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 12. I am emotionally invested in this experience. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 13. I care about the information I am being taught. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 14. The learning experience makes sense to me. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 15. This learning experience has nothing to do with me. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 16. This learning experience is enjoyable to me. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 17. I can identify with the learning experience. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 18. This learning experience is applicable to me and my interests. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 19. My educator encourages me to share my ideas and past experiences. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 20. This learning experience falls in line with my interests. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 21. I can think of tangible ways to put this learning experience into future practice. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 22. This learning experience will help me do my job better. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 23. This learning experience will not be useful to me in the future. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 24. I will continue to use what I am being taught after this learning experience has ended. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 25. I can see the value in this learning experience. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 26. I believe this learning experience has prepared me for other experiences. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 27. I doubt I will ever use this learning experience again. | 1……... 2..…... 3……. 4…..... 5…..... 6…..... 7 |
| 28. I can see myself using this learning experience in the future. | 1……... 2..…... 3……. 4…..... 5…..... 6…… 7 |

# APPENDIX L

## Experiential Learning Survey Items Included in Present Research

| 1…………… | 2…………… | 3…………… | 4…………… | 5…………… | 6…………… | 7 |
|---|---|---|---|---|---|---|
| Stongly Disagree | Disagree | Somewhat Disagree | Neither | Somewhat Agree | Agree | Strongly Agree |

| | |
|---|---|
| 1. I am stimulated by what I am learning. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 2. The learning experience is presented to me in a challenging way. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 3. I find this learning experience boring. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 4. I feel like I am in an active part of the learning experience. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 5. The learning experience requires me to really think about the information. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 6. I am emotionally invested in this experience. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 7. I care about the information I am being taught. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 8. The learning experience makes sense to me. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 9. This learning experience has nothing to do with me. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 10. This learning experience is enjoyable to me. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 11. I can identify with the learning experience. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 12. I can think of tangible ways to put this learning experience into future practice. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 13. This learning experience will help me do my job better. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 14. This learning experience will not be useful to me in the future. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 15. I will continue to use what I am being taught after this learning experience has ended. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 16. I can see the value in this learning experience. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 17. I believe this learning experience has prepared me for other experiences. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 18. I doubt I will ever use this learning experience again. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |
| 19. I can see myself using this learning experience in the future. | 1…….... 2..….... 3……. 4….…. 5……. 6…..... 7 |

# APPENDIX M

## Rubric for Scoring Application of CRASH in SJTs

| | **Example Responses for SJT 1 – Ms. Jackson** | **Example Responses for SJT 2 – Ms. Ramirez** |
|---|---|---|
| **Culture** | • Recognize how she perceived your behavior as insensitive based on her cultural background | • Recognize the importance of her valuing having family involved |
| **Respect** | • Call her by the name Ms. Jackson<br>• Do not touch her unless she consents | • Offer to let her call her family quickly<br>• Speak with her and explain the situation better to build trust |
| **Assess/affirm differences** | • Ask open-ended questions about how she would like to be treated | • Ask open-ended questions about why she is upset |
| **Sensitivity and self awareness** | • Ask her how she is doing or feeling<br>• Explicitly demonstrate understanding that the cultural background of the white, male doctor has led to culturally insensitive behavior | • Explicitly demonstrate understanding that the healthcare culture (i.e., getting things done quickly) has made Ms. Ramirez uncomfortable<br>• Assure her that everything will be okay |
| **Humility** | • Apologize sincerely for greeting her informally | • Apologize sincerely for upsetting her |

# VITA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- **PhD in Human Factors and Ergonomics** — Aug 2017
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State University of New York College at Oneonta; Oneonta, NY
- **Bachelor of Science in Psychology** — May 2009

## PROFESSIONAL EXPERIENCE

**Cofounder and Partner**; Kennason, LLC; Troy, NY 12180
July 2015 – present
- Providing usability and user experience design and strategy consulting to local startups

**Director of Research**; Dumbstruck; Schenectady, NY 12305
Sept 2016 – May 2017
- Directing user experience strategy for a video testing and analytics product
- Directing research to support development of automated emotional analysis insights

**Human Factors Research Specialist**; Center for Modeling, Simulation, and Imaging in Medicine (CeMSIM); Rensselaer Polytechnic Institute; Troy, NY 12180
Aug 2014 – Jan 2016
- Conducted research experiments investigating cognitive issues in surgery
- Performed instructional design and usability tests for simulators for surgical training

**Usability and Pedagogy Consultant**; Medical Cyberworlds; Madison, WI 53719
June 2013 – May, 2015
- Assisted with training scenario script writing and refinement regarding learning objectives
- Created, distributed, and analyzed results of surveys used during the creative process
- Conducted iterative user testing throughout the design process

**Human Factors Research Assistant**; Virginia Modeling, Analysis, and Simulation Center (VMASC); Suffolk, VA 23435
May 2012 – Aug 2012
- Assisted with the creation of a list of guidelines for assessments of medical simulators
- Evaluated the usability of a Virtual IV system using learning objectives, relevant standards, a hierarchical task analysis, and user testing

**Human Factors Graduate Research Assistant**; Simulation Usability Research Facility (SURF); Old Dominion University Psychology Department; Norfolk, VA 23539
Aug 2009 – May 2014
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- Evaluated the usability and functionality of medical simulators