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The Effect of improvisations and Observations on Standardized Patient Encounters, Subjective Workload and Stress

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THE EFFECT OF IMPROVISATIONS AND OBSERVATIONS ON STANDARDIZED PATIENT ENCOUNTERS, SUBJECTIVE WORKLOAD AND STRESS

by

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ABSTRACT

THE EFFECT OF IMPROVISATIONS AND OBSERVATIONS ON STANDARDIZED PATIENT ENCOUNTERS, SUBJECTIVE WORKLOAD AND STRESS

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Standardized patients (SPs) are people trained to present a medical case for teaching and assessing medical students and they simultaneously perform several demanding tasks including portraying the patient, assessing the learner, and providing feedback. This study investigated the effect of improvisations and multiple task performance on the ability to observe another's nonverbal (NV) behaviors and rate their communication skills. Subjective reports of mental workload and stress were also obtained. The first study involved undergraduates interviewing for a job. Type of interview (rote and improvisational) and type of observation (passive and active) were manipulated within groups. Based on theories of attention and working memory, participants were expected to observe the fewest NV behaviors, provide the least accurate ratings, and report the highest levels of mental workload and stress after the active improvisational condition. The results indicated that the ability to observe and assess the interviewer was negatively affected for active observations and during improvisations. Mental workload was high after active improvisational observations and stress was higher after all active observations. The second study was conducted with SPs and followed a similar format with an additional between-subjects variable, experience (novice and experienced). The results indicated that both active observations and improvisations negatively influenced only the SPs' ability to observe the learner. The

results showed the same pattern found in the first study for the mental workload and stress data. Most importantly, SPs missed over 75% of NV behaviors during active improvisational encounters. In conclusion, theoretical models of attention and working memory were useful for understanding the cognitive challenges faced by SPs. In particular, the SPs had difficulty observing the learner and found it and more mentally demanding when simultaneously assessing the learner and portraying the patient particularly during periods of improvisation.

This dissertation is dedicated to Mike Canzone, Jim, Carol and Catherine Newlin, Ray and Lucy Cruce, Jim Sr. and Theresa Newlin for their love and support.

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INTRODUCTION

Over 210 million Americans visit physicians each year (Lee & Milner, 2005). Effective communication between a physician and a patient can have a positive impact on patient outcomes. Patients are more likely to disclose medically relevant personal information when their physicians demonstrate positively reinforcing nonverbal (NV) behaviors because these behaviors improve physician-patient rapport (Duggan & Parrott, 2000). The impact of NV communication on patient outcomes suggests that behaviors such as eye contact can improve patient satisfaction (Griffith, Wilson, Langer & Haist, 2003; Mast, 2007). Also, patients are more likely to implement their treatment programs in accordance with the physician's advice when their physician shows empathy (Squier, 1990).

Accordingly, the Association of American Medical Colleges (AAMC; 1999) urged medical faculty members to focus on both teaching and assessing physician-patient communication. Interviewing skills need to be practiced because many medical students lack experience conducting a clinical interview. Physicians must learn to build rapport and display sensitivity and empathy with patients while ascertaining information to make the correct diagnosis. The clinical interview is complex because the physician must pay attention to subtle cues regarding the patient's emotions; yet, these cues are often ignored because the physician is focused on a diagnosis (Suchman, Markakis, Beckman & Frankel, 1997). Although interviewing skills can be taught, most physicians require considerable training to improve their ability to convey empathy while gathering relevant medical information (Smith et al., 1998). Therefore, many medical schools rely on

specially trained individuals to improve their students' skills for conducting clinical interviews in a standardized format.

Overview of Standardized Patient Use

Standardized patients (SPs) are healthy (or sometimes sick) people who present medical cases in a standardized way for the purpose of training and assessing physicians, medical students, nurses, and other health professionals. They can perform as many as three duties during an encounter with a learner. These include portraying a patient, assessing the learner, and providing feedback about the learner's performance.

Standardized patients are currently used in over 75% of accredited medical schools in the United States (Brotherton, Simon & Etzel, 2001). Although, there are no more recent figures, it is estimated that nearly 95% of medical schools now utilize SPs (G. Gliva-McConvey, personal communication, October 7, 2009). The Liaison Committee on Medical Education (LCME; 2008) mandates that all medical students demonstrate mastery of core clinical skills prior to graduation and SPs are frequently used to assess these skills. Standardized patients are useful for training and evaluating medical professionals' clinical skills including their ability to take a patient's history, perform a physical examination, and communicate with patients (Barrows, 1993).

Standardized patients were originally called "programmed patients" to describe their ability to portray a real patient's medical case. They were later renamed "simulated patients" to describe their ability to simulate symptoms (Barrows & Abrahamson, 1964). Today there is a distinction between the terms "simulated" and "standardized" patients. Simulated patients are people who portray a medical case but often lack standardization of presentation because their portrayal is not rigorously trained to meet specific

requirements. By contrast, a standardized patient, describes any person who presents medical cases in a standardized way (Beullens, Rethans, Goedhuys & Buntinx, 1997). Standardized patients present consistent physical, verbal, or behavioral reactions when examined by a learner (Adamo, 2003). In addition to this role, some SPs are specially trained as "practical instructors" who use their bodies to teach medical students to perform physical examinations (Barrows, 1993; Stillman, Ruggill & Sabers, 1978). Practical instructors can also assess medical students' competency because the practical instructors are knowledgeable of their own anatomy and condition.

History of Standardized Patient Use

The role of SPs has changed over the last 50 years since they were first introduced in medical education. Standardized patients were developed to address issues with the assessment of medical students. In the 1960's a neurologist, Howard Barrows, developed "simulated patients" in response to two key events during his last year of residency (Barrows, 1993). First, Barrows noticed that a colleague, Dr. David Seegal, observed every student in his clerkship perform a physical examination and take a patient's medical history. Dr. Seegal's observations and feedback were useful to the students; however, the observation process was incredibly time consuming. Second, Dr. Barrows conducted the board examination for his psychiatry and neurology students and he recruited several real patients for the exam. One of the medical students was impolite and hostile to a patient. In response to the student's hostility, the patient portrayed false neurological symptoms to confuse the student. Dr. Barrows realized that the patient simulated his symptoms and this realization led Dr. Barrows to believe that other people could be taught to simulate symptoms and convince a medical student that they were real

patients. Subsequently, Dr. Barrows successfully trained a female model to portray the symptoms and the emotional distress of a paraplegic woman.

Barrows (1993) also recognized a need to provide medical students with feedback concerning their physical examination and history taking skills. He instructed the female model about the core clinical skills needed to perform a neurological examination and she was able to provide feedback to Dr. Barrows about the student's ability to think critically, perform a clinical interview, and relate interpersonally to the patient. Dr. Barrows provided his students with this feedback and the students also valued it and requested more encounters with simulated patients. Barrows continued to use the model and coached other people to be simulated patients.

Barrows (1993) continued his work with SPs. However, the medical education community failed to see the value of SPs until 1984, during a conference at Southern Illinois University (SIU) for the purpose of reforming medical curricula. The researchers and medical faculty at the conference wanted a better tool to evaluate their students' clinical competency. The major outcome of the conference was the Clinical Practical Examination (CPE), an assessment utilizing SPs to evaluate senior medical students. The SIU conference was the beginning of the acceptance of SPs in medical education. Since 1984, the American Board of Internal Medicine (ABIM) focused on assessing the use of SPs as a viable alternative for traditional bedside oral examinations (Stillman et al., 1991). The use of SPs has grown considerably since the LCME established the importance of SPs for assessing a medical student's clinical skills (LCME, 1991). Today, SPs are recognized to have several advantages over traditional assessment techniques.

Advantages of Using Standardized Patients

Standardized patients cannot replace learning gained from real patients because there are limitations and these will be discussed in the next section. Despite some limitations, there are several advantages to using SPs (Barrows, 1993). These advantages fall into three broad categories: training, assessment, and medical curricula.

Advantages for training clinical skills. There are many benefits to training medical students with SPs. First, SPs can provide standardized presentations of medical cases to all students. It is difficult for real patients to consistently present cases because their condition changes over time. The use of SPs also ensures that all students can be exposed to the same cases. Faculty can create core cases that address specific educational objectives. Faculty can also control the level of difficulty and case content to match students' abilities. Further, the most obvious advantage is that faculty members do not need to find suitable real patients for physician-patient interactions (Norcini et al., 1993). Standardized patients can be trained to present a variety of symptoms including abdominal pain, muscle weakness, tremors and wheezing all of which can be used to portray specific medical cases. Standardized patients are more readily available and they can be used in a variety of settings such as a classroom or clinic.

Medical students often respond favorably to SPs because the encounters allow them to practice clinical skills in a safe environment. Learners can use a "time in-time out" method, which allows them to pause an encounter. During the "time out" the SP remains in the room but acts unaware. Either a learner or instructor can call a "time out" if they feel that the learner requires immediate feedback.

Many medical students prefer the use of SPs because it ensures that real patients are not mistreated while they practice their skills. Students can hone their physical examination and history taking skills before performing them on real patients. The SP encounters provide a safe environment for students to practice their clinical skills without the fear of making mistakes on a real patient such as taking an insufficient medical history or making the patient feel uncomfortable. Standardized patients are especially useful for sensitive and rare medical cases. Students can gain exposure to cases that would otherwise be difficult to find in a population of real patients.

Another advantage for students is that time can be compressed with SPs. In a period of days, students can perform a diagnosis, prescribe treatment, and then jump ahead several months to see how the treatment is working. Compressing time is impossible with real patients. Finally, SP encounters are usually recorded which allows students to review their own performance.

Advantages for the assessment of student competency. Standardized patients are primarily used to assess clinical skills such as taking a patient's medical history or performing a physical exam. Standardized patients provide a means to evaluate students' knowledge and skills without relying on multiple choice tests, oral bedside examinations, or students' medical charts. Standardized patient assessments do not replace traditional evaluations; yet, SP encounters provide a method for assessing the subjective physician-patient interaction in a standardized way. In addition, SPs can provide immediate feedback to students about their communication skills. With SPs, faculty can develop performance criteria based on teaching objectives; therefore, making the encounters consistent across students. Further, the use of SPs allow faculty to adjust performance

criteria to match teaching objectives. With genuine patient encounters, it is impossible to anticipate how the real patient will act; therefore, faculty cannot ensure that all students experience the same encounter when using real patients.

Advantages for medical curricula. The use of SPs is beneficial for medical educational programs because it can be less resource intensive than other evaluation methods. Specifically, finding suitable real patient cases often requires a significant time commitment for faculty members. Standardized patient encounters provide valuable information to faculty about the effect of their teaching on students' mastery of clinical and communication skills. The performance feedback indicates whether students achieved the educational objectives. Another benefit for medical educational programs is that SP programs reinforce the importance of a patient-centered approach; specifically, physician-patient communication. Finally, SPs are often used to certify foreign physicians, recertify physicians, and remediate students following graduation.

Disadvantages of Using Standardized Patients

Despite the many benefits of using SPs, there are some limitations. Standardized patients often undergo long and intensive training sessions to portray a case convincingly and to achieve standardization of portrayal. Barrows (1993) argues that novice SPs can learn to portray a patient in a few hours, but that lengthy training is necessary for SPs to learn the assessment checklists. Another possible limitation concerns the type of cases that SPs can simulate. Barrows (1993) argued that SPs can easily portray over 60 medical cases; however, they are unable to simulate many conditions with physiological symptoms such as a heart murmur or irregular heart beat.

One of the main challenges for SPs is the need to accurately remember and report

on the student's performance. Memorizing and recalling case details and checklist items can potentially place heavy demands on an SP's long-term and working memory. Another possible disadvantage is the idea of "case specificity" (Barrows, 1993). For example, a single student can perform well on one case yet struggle on another. Researchers have found that a student's communication skills often depend on the content of the case (Guiton, Hodgson, Delandshere & Wilkerson 2004). Barrows argues that there may be some variability of performance; therefore, students should have multiple SP encounters to establish reliability. Despite these drawbacks, the benefits of SPs seem to outweigh the disadvantages by providing a viable method for assessing and providing feedback to students about their patient interactions.

Uses for Standardized Patients

Barrows (1993) suggests that there are three main objectives for using SPs. The first objective is to use SPs to teach junior level medical students and evaluate their knowledge, skills, and abilities. The second is to assess students' clinical skills upon completion of their medical clerkships. The third objective is to ensure that each graduating medical student can demonstrate clinical skills at a minimum level of competency.

Medical schools assess four levels of clinical competency (Miller, 1990). First, students must demonstrate that they "know" the core medical content. Second, students must show that they "know how" to apply their medical knowledge in a given situation. Third, students must be able to "show how" to respond to a medical scenario. Finally, students must "do" the actions required without hesitation. The medical community assesses each of these types of knowledge with different techniques such as multiple

choice tests and oral bedside examinations. In 1984, the American Board of Internal Medicine (ABIM) supported research to investigate whether standardized patient assessments provide a viable means to assess clinical skills and ultimately the research demonstrated the utility of SPs in residency programs (Stillman et al., 1991).

There are many uses for SPs depending on the learning objectives. For example, SPs are frequently used in the objective structured clinical examination (OSCE; Harden, 1988; Harden, Stevenson, Downie & Wilson, 1975). The OSCE is a station type exam where students perform an entire clinical interview or one specific task such as reading a chart. Students encounter several SPs in a series of different stations. At some stations students perform one or more clinical tasks and at other stations they answer questions about the previous encounter. The OSCE is frequently used because an entire class can be assessed quickly.

The Objective Unstructured Clinical Examination (OUCE) is another type of station exam that allows students to encounter an SP and perform a more detailed examination for 20 minutes (Barrows, 1993). Barrows suggested calling the OUCE a "clinical practice examination" (CPX) because the exam more closely resembles an actual encounter with a real patient. Students must exercise their judgment to determine how to question the SP and perform the physical examination. The CPX is a more comprehensive exam compared to an OSCE; therefore, Barrows suggested that students should experience both types of assessments to receive feedback on their specific skills and comprehensive examination techniques.

The clinical skills examination is another station type exam and uses SPs to assess all possible history taking and physical examination skills (Barrows, 1993). The clinical

skills examination is similar to the CPX because students perform their clinical skills while faculty members observe their performance. Barrows (1993) suggests that the clinical skills examination is useful at the end of an introductory course to assess whether students have mastered basic examination skills. The OSCE and clinical skills examinations are useful early in medical training and the CPX is typically reserved for more senior students.

Standardized patients are also used to certify that medical graduates and residents meet basic standards in their medical knowledge and clinical skills. In 2004, the National Board of Medical Examiners (NBME) developed the United States Medical Licensing Examination Step 2 Clinical Skills (USMLE Step 2 CS) to assess whether medical graduates can apply their clinical knowledge and skills without supervision (United States Medical Licensing Examination, 2008). The USMLE Step 2 CS involves 12 SP encounters and is considered a national high stakes exam.

In addition, SPs are useful for certifying foreign physicians. For example, the Educational Commission for Foreign Medical Graduates (ECFMG) ensures that foreign medical graduates meet US standards before enrolling in US residency programs or medical practices (Ben-David et al., 1999).

Teaching communication skills. Good communication with patients is a crucial part of the physician-patient relationship. The AAMC believes that good communication is necessary to relieve patient suffering and build trust (Whitcomb, 2000) and the Accreditation Council for Graduate Medical Education (ACGME) considers communication skills as one of six necessary competencies to practice medicine (Iramaneerat, 2007). According to the ACGME (2007) communication skills are defined

as the effective exchange of information between the patient, physician, patient's caregivers or family members, and other medical team members.

Medical schools across the country include communication skills instruction as an essential part of their curriculum and the assessment often involves the use of SPs (Donnelly, Sloan, Plymale & Schwarz, 2000). Yudkowsky, Downing, and Sandlow (2006) modified a typical OSCE to focus solely on the assessment of communication and interpersonal skills (CIS). The CIS-OSCE provides an assessment of residents' communication skills and unlike the traditional OSCE the CIS-OSCE can be used in a variety of specialty areas.

An assumption of the CIS-OSCE is that communication skills are consistent regardless of differences in specific medical cases. However several researchers (Cohen, Colliver, Robbs & Schartz, 1997; Colliver, Schartz, Robbs & Cohen 1999; Donnelly, et al., 2000; Guiton et al., 2004) found inconsistent ratings of medical students' communication skills across different cases. These findings raised questions about the consistency of students' performances depending on the case content; i.e., "case specificity". The issue of case specificity presents a problem for the use of SPs to assess communication skills; yet, there are other considerations surrounding the use of SPs that are more psychological in nature.

Psychological Considerations

Standardized patients perform a unique and demanding job. They must pretend to be someone else and have extensive knowledge of that person or character. In this way, SPs are similar to actors because they learn about their character's personal history and understand the "plot" of the scenario. Standardized patients study details about their

character, the setting of the story, their character's physical ailment, and then they must portray the information convincingly.

Yet, the SP's job is more demanding than an actor's. In addition to memorizing character details and portraying the patient, SPs must memorize checklist items and rate student performances based on these items. Standardized patients also have to be aware of their subjective impressions of how they felt they were treated by the learner.

Standardized Patients and Improvisations

Standardized patients differ from traditional actors in another important way; the scenarios they portray are not fully scripted. Instead, they work from a set of core concepts that are presented depending on how the learner conducts the interview. However, they are also not improvisational artists because they must follow written materials and portray a patient within preset parameters. Their role is particularly difficult considering all the functions they perform. One of the most challenging requirements is improvising a plausible response when the learner asks an unanticipated question.

Standardized patients are trained to present a case in a standard way. Case details are central to the SP's training which usually includes written materials with some spoken lines, but mainly background information. These materials are meant to ensure the standardization of portrayal across encounters. Although the encounter is improvisational (Wallace, 2007), the written materials provide a framework for constructing plausible answers based on the patient information. Standardized patients are trained to provide plausible responses because inappropriate responses can cause the learner to make a different or incorrect diagnosis.

Improvisations are a pervasive issue in SP programs. At the 2009 annual meeting of the Association for Standardized Patient Educators (ASPE), Wallace and Lyman (2009) held a workshop to address training improvisational skills. Most SP trainers find it difficult to teach improvisational skills and they have not yet studied the potential impact these improvisations can have on the SP's ability to perform their three primary duties. From a psychological perspective, the influence of improvisations on an SP is an important issue because the SP's assessment can impact the learner's academic standing in medical school. Standardized patients strive to make reliable judgments; yet, it is possible that improvisations may impact the reliability of these ratings. At present, there is little or no research about how these improvisations potentially impact an SP's judgments.

Standardized patients perform several complex tasks simultaneously; yet, the difficulty of this job is often unappreciated. When forced to improvise it is possible that SPs have difficulty attending to the learner when their attention is focused inward to draw information from memory to generate plausible responses. Knowledge of basic psychological constructs such as attention and working memory may provide important insights into understanding how SPs manage this challenging task.

Attentional and Working Memory Demands

Attention. Attention refers to the allocation of mental resources to different inputs of information (Kahneman, 1973). There are three primary categories: selective, focused and divided. Selective attention occurs when a person chooses specific elements of the environment to process. Focused attention is the sustained processing of one source of information in the environment while ignoring others. Divided attention is the allocation

of attention to multiple elements in an environment so that mental resources can be applied to multiple tasks.

Historically, there have been two primary models of attention: filter and capacity models. The filter models of attention suggest that there is a single channel of attention. Early selection filter models suggest that attention is focused on a single input early in the process based on bottom-up processing (Broadbent, 1958) and late selection models suggest that selection occurs later based on top-down processing (Deutsch & Deutsch, 1963; Norman, 1968). In addition, the attenuator model suggests that multiple inputs can be processed at different strengths (Treisman, 1964).

Capacity models of attention suggest that there are limited cognitive resources (Kahneman, 1973) and people are restricted in the amount of information they can process concurrently (Hunt & Ellis, 2004). Unlike the single channel models of attention (Kahneman, 1973), Wickens (1984) suggests there are multiple resources. The multiple resource theory (MRT) states that there are different pools of attentional resources dedicated to different sources of information including: processing codes (spatial or verbal), processing modalities (auditory or visual), processing stages (perception/cognition or response) and response codes (manual or vocal; Wickens, 1984, 2002).

The MRT (Wickens, 2002) is a unique theory of attention because it can be used to predict how performance is affected when performing concurrent tasks. The MRT predicts that two concurrent tasks can be time shared with little or no interference when each task draws on separate pools of attentional resources. Each of the four categories of the MRT consists of two dimensions. For example, there are spatial and verbal

processing codes; therefore, a spatial task like a continuous tracking task can easily be time shared with a verbal response task. The MRT predicts that two concurrent verbal tasks may exceed the available resources and result in performance decrements in one or both tasks. For example, when a physician reads a medical chart while listening to a patient describe their symptoms both compete for verbal resources and cannot be easily performed together.

In addition to separate processing codes, people possess different perceptual modalities (e.g., auditory and visual). According to Wickens (1984; 2002) people are better able to timeshare activities when they utilize different modalities: an auditory and a visual task. For example, SPs can simultaneously watch the learner's behavior and listen to them. The ability to perform two intramodal tasks, such as two visual tasks is difficult because both tasks usually require the same pool of resources. Because resources are limited, two or more tasks demanding the same resources can quickly deplete the available resources. For example, it is very difficult to attend to two conversations simultaneously.

In 2002, Wickens made a distinction between focal and ambient vision. Focal vision refers to highly detailed information processed in foveal vision. The fovea is a small section of the retina used in high acuity tasks like reading. Ambient vision includes the peripheral visual input and is frequently used for perceiving motion. Objects seen in the periphery lie outside a person's central gaze and are difficult to distinguish in detail. Therefore, focal vision is needed to perceive fine details, like reading a medical chart, and ambient vision is used to monitor one's surroundings when reading a medical chart while walking down the hall.

Wickens (1984, 2002) also separated processing stages into perception/cognition encoding and response stages. There are distinct and limited resources for perceptual/cognitive tasks and response tasks. The combination of a perceptual/cognitive and a response task are more easily timeshared because each draws on separate resources. The MRT predicts that concurrent cognitive or perceptual tasks will result in performance decrements for one or both tasks if the task demands exceed the available resources. For example, a highly demanding task such as trying to recall information about the patient case will leave few spare resources for the SP to perceive external stimuli. Wickens (1984, 2002) also describes separate resources for responding including verbal and manual responses. A task requiring a manual and verbal response can be more easily timeshared than one requiring two manual responses or two verbal responses.

The MRT has been particularly useful when describing the attention component of the information processing model. Working memory is another important aspect of information processing. People can attend to external and internal information stored in memory.

Atkinson and Shiffrin (1968) describe memory as the storage and retrieval of information and propose that memory is made of subsystems including the short-term sensory store (STSS), working memory (WM), and long-term memory (LTM; Hunt & Ellis, 2004). The STSS is a brief and temporary store of sensory information. Information can only be retained briefly (i.e., a few hundred milliseconds to a few seconds) and is lost unless it is actively rehearsed and transferred to working or long-term memory. Working memory is also a temporary store of information, but one that is actively attended to or processed. Without rehearsal, information only remains in WM for 10 to 15 seconds; yet,

the interval over which memory can be retained grows smaller as the amount of stored information increases (Brown, 1958; Peterson & Peterson, 1959). There is a limited capacity for WM such that five to nine chunks of information can be maintained at a time (Miller, 1956). A chunk is any number of associated items that form a single unit of information. For SPs, they must remember specific parts of the encounter so they can provide feedback to the learner. The SP may mentally organize all of the history taking and physical exam issues into two distinct chunks. Long-term memory is an unlimited storage of information over an indefinite period of time. The amount of information stored and duration of retention depend on the level of processing, so that deeply encoded information is more easily retained (Craik & Lockhart, 1972). For many experienced SPs, they perform the same case for several years and they often commit information about the case to their LTM. It is the nature of WM that is the most relevant for the present study.

Working memory. In the early 1900's researchers believed that memory was simply a series of associations between stimuli; therefore, information would be lost if these associations were not strengthened or maintained (Matlin, 2002). Later, Hebb (1949) suggested a two-part memory system comprised of STM and LTM. In 1956, Miller demonstrated the limited capacity of WM and Brown (1958) and the Petersons (1959) showed how easily information is lost from WM without rehearsal.

Working memory is the storage, processing, and integration of incoming information with that stored in LTM (Baddeley & Hitch, 1974). Currently, the most widely accepted theory of WM is Baddeley (1986, 1990) and Baddeley and Hitch's (1974) multicomponent working memory model. It is comprised of four systems including the central executive (CE), visuospatial sketchpad (VS), phonological loop

(PL) and the episodic buffer (Baddeley, 2000, 2007). The CE is the primary system directing the other subsystems. The model is based on the idea that information from the subsystems is processed, encoded, and integrated in the CE with information from LTM.

The CE is the most important component of the model. In the early versions of the model, the CE was a pool of general resources. The CE was originally based on the supervisory attentional subsystem (SAS; Norman & Shallice, 1986) that suggested behavior is controlled by either automatic or controlled processes. Automatic processes guide behavior based on schemata and habits stored in memory so that cues in the environment trigger the automatic behavior. This is similar to when a SP recites a memorized response when asked an expected question. Controlled processes occur in novel situations when the cues in the environment suggest that a routine will be insufficient given the current situation. Controlled processes are performed by a SAS that has attentional limits. The SAS is useful in novel situations because it combines information from LTM with information from the current environment to develop a solution. This is similar to when SPs have to improvise a response on the spot to an unexpected question.

The CE allocates and focuses attention and temporarily stores and processes information. It is primarily responsible for top-down processing and coordinating between several simultaneous tasks (Baddeley, 1996). It often draws information from LTM and integrates it with incoming information. This is similar to how SPs must integrate their knowledge of the patient case stored in LTM to generate the appropriate response to a learner's question. The CE manages controlled tasks while assigning automatic tasks to be performed by a slave system. There are limited attentional

resources; therefore, tasks drawing heavily on these resources cannot be performed concurrently with other tasks demanding similar resources (McCutchen, Covill, Hoyne & Mildes, 1994). Therefore, SPs may find it difficult when they have the additional demand of improvising responses to unanticipated questions.

The CE performs four core functions. First, the CE focuses attention while ignoring distracters. Second, the CE coordinates divided attention among multiple tasks. The third function is to switch attention among tasks and the last function is to integrate information from the slave systems with information from LTM. The CE processes controlled tasks and automatic tasks are assigned to be performed by slave systems. Multiple tasks requiring controlled processing will drain the CE's limited resources and result in performance decrements (McCutchen et al., 1994). The CE is the system of WM most related to the SP's job which involves managing portrayal and assessment tasks and incorporating information from LTM to generate responses. Therefore, increased demands on the CE will likely negatively affect the SP's ability to observe and assess the learner.

The VS is a subsystem devoted to processing visual and spatial information. Most of the research concerning the VS concerns tracking tasks paired with other display tasks drawing on the same resources (Baddeley, Grant, Wight & Thomson, 1973). The PL consists of a phonological store and articulatory rehearsal system. The main function of the PL is to process and store auditory and verbal information. Finally, the episodic buffer is the most recent addition to the multicomponent WM model (Baddeley, 2000). The purpose of the episodic buffer is to store integrated information of both spatial and verbal codes and to provide a link between the PL and the VS. The multicomponent WM

model proposes that WM consists of a primary system, the CE, which controls attention allocation and other subsystems such as the PL, VS and the episodic buffer.

Baddeley (1986, 1990; Baddeley & Hitch, 1974) and Wickens' (1984) models are useful to explain how operators divide their attention between tasks and sensory inputs and it is important to understand if the models are consistent or differ in their predictions. First, Baddeley's (1986, 1990) VS and PL are similar to the verbal and spatial processing codes in Wickens' MRT (1984). Despite these similarities, however, each model makes some different predictions. For example, Wickens (2002) elaborated further on the visual processing modality by dividing it into focal and ambient vision; therefore, the Wickens (2002) model suggests that two visual tasks can be timeshared if one relies on focal and the other on ambient vision. Also Baddely's (1986; 1990) concept of the CE is a more general cognitive store that performs task allocation and complex synthesis of information from LTM with the current situation. In Baddeley's (1986, 1990) model, all of these functions compete for the same limited resources, whereas in Wickens' (1984) model, only some of these functions are included in the perception/cognition processing stage. Second, both theories predict that performing two similar tasks simultaneously may result in poorer performance on one or both tasks. This prediction may be useful in explaining how SPs timeshare portrayal and assessment tasks. Baddeley (1986, 1990) makes a distinction between controlled and automatic tasks so that the CE performs controlled tasks and delegates automatic tasks to one of the slave systems; therefore, this model predicts that novel tasks, like improvising, will draw on the CE's limited resources. Wickens (1984, 2002) provides more specific predictions regarding timesharing focal and ambient vision tasks or timesharing perceptual cognitive tasks.

Overall, these models suggest that similar tasks may compete for the same resources and task performance can suffer.

The research also shows that the demands of the task can affect attention and how working memory are used to perform a task. The construct, mental workload, is used to describe task demands as well as their impact on attentional resources.

Mental Workload

Mental workload (MWL) refers to the effort experienced by an individual resulting from the interaction between a person and a task (Gopher & Donchin, 1986). Hart and Staveland (1988) described MWL as the cost of performing a task. Mental workload and attention are related but they are distinct constructs. Attention concerns the allocation of limited cognitive resources and MWL refers to the task demands imposed on these limited cognitive resources. Mental workload also describes the mental effort expended during task performance (Eggemeier, 1988).

Mental workload is often a function of the relationship between the supply of available resources and the task demands. There are external factors that can affect MWL as well as the internal utilization of resources. External factors, or exogenous task demands, include the difficulty of the task, task priorities, and any situational conditions that increase the task difficulty (Tsang & Vidulich, 2006). For example, SPs may experience high levels of MWL when they must simultaneously attend to many different sources of information in a scenario. The endogenous, or internal, supply of resources determines the available resources that can be used to perform tasks. In addition to task demands and available resources, individual differences also influence MWL. A person's experience level, knowledge, and skills can affect their MWL (Liu & Wickens, 1994;

Young & Stanton, 2007). Therefore, experienced SPs should experience low levels of MWL because they can rely on their extensive experience.

Mental workload is related to attention because it changes as a function of available resources. Mental workload may fluctuate with task demands and is likely to increase with high task demands, especially if the task demands exceed the available resources (O'Donnell & Eggemeier, 1986). People often perform tasks well when the demands do not exceed available resources; thus, providing spare resources for unexpected events. According to Wickens' (1984, 2002) MRT, an operator can experience greater MWL when two tasks competing for similar resources exceed the resource capacity (Navon & Gopher, 1979; O'Donnell & Eggemeier, 1986).

Operators can experience both a physiological and a subjective response to MWL and there are different measures to assess each (O'Donnell & Eggemeier, 1986; Wierwille, 1979). Physiological measures of MWL reflect the body's response to changes in effort (Wierwille, 1979). One drawback to these physiological indices is that they cannot be measured without elaborate hardware and equipment. In contrast, subjective measures are much easier to obtain.

Subjective measures reflect a participant's own interpretation of his or her MWL. There are several well established measures including the Subjective Workload Assessment Technique (SWAT; Reid & Nygren, 1988), the Subjective Workload Dominance Technique (SWORD; Vidulich, 1989) and the NASA Task Load Index (TLX; Hart & Staveland, 1988). The NASA-TLX is one of the more widely used subjective measures of MWL consisting of 6 subscales including: mental, physical and temporal demand, effort, performance, and frustration (Hart & Staveland, 1988). This

scale provides an overall measure of MWL based on the subscales and numerous studies show it to be valid and reliable (Hart & Staveland, 1988; Vidulich & Tsang, 1985, 1986). People often report high levels of MWL during demanding tasks. Further, it is common for people to experience stress during periods of high MWL (MacDonald, 2003). Therefore, it is important to understand the distinction between stress and MWL. Mental workload is the cognitive effort experienced during work. By contrast, stress is the cognitive and affective response to environmental stressors.

Stress

Stress is defined as the evaluation of environmental demands in relation to available resources that can result in the experience of physical or psychological discomfort or even decreased performance (Hancock, 1989; Helton, Matthews & Warm, 2009; Matthews, 2001; Salas, Driskell & Hughes, 1996). Stressors can have internal origins like frustration and fatigue, or external origins like heat, cold, acceleration, and lighting (Svension & Maule, 1993). The presence of stressors can produce an emotional response or degrade cognitive and physical functioning (Matthews, Davies, Westerman & Stammers, 2000).

Stress can be either physiological or emotional, but stress also depends on a person's perception (Mandler, 1982). The transactional stress theory emphasizes the relationship between the person and the environment suggesting that the person evaluates the situational demands and their available resources (Matthews, 2001). People will experience stress when they perceive that they are unable to meet the task demands (Lazarus & Folkman, 1984). The transactional model of stress (Matthews, 2001) suggests a complicated relationship between the stressor and the person; specifically, that the person's appraisal of the stressor determines the stress experienced. Therefore, the same

stressors under different conditions can evoke different responses. Under the same conditions one person may experience higher stress than another depending on their perception of the strain on their limited resources. Therefore, SPs may experience high levels of stress if they perceive the demands of the encounter to exceed their ability to perform the portrayal and assessment tasks.

There has been considerable research concerning the negative effects of stressors on cognitive functioning and information processing. Matthews' (2001) state mediation model suggests that stressors influence internal states, thereby affecting information processing. Matthews (2001) suggests that stressors produce an internal state and it is the state, not the stressor that directly impacts the internal cognitive processes.

Matthews, Joyner, Gilliland, Huggins and Falconer (1999) developed the Dundee Stress State Questionnaire to identify stress states related to motivation, affect, and cognition. The questionnaire revealed three primary factors related to stress: task engagement, distress, and worry. Task engagement describes the person's interest and focus on the task and is specifically related to arousal. Distress describes a negative mood and feelings of low confidence and perceived control. Worry includes feelings of self-esteem and any cognitive task interference due to internal thoughts. Overall, Matthews (2001) suggests that a task appraised as difficult may induce stress.

Moderate stress can improve performance, but excessive stress can place a large burden on attentional resources (Hockey, 1986) and can lead to cognitive tunneling (Baddeley, 1972; Hockey, 1970). Research concerning anxiety reveals that worrisome thoughts can divert attention away from the task and these thoughts may degrade performance on attentionally demanding tasks (Sarason, Sarason & Pierce, 1990).

The psychological theories of attention and WM describe how high task demands can result in increased MWL and stress. People often experience high MWL when the task demands exceed their cognitive resources. Also, excessive stress can lead to negative feelings and a greater burden on cognitive resources. Yet, there is little information concerning how limitations in attention and WM impact the perception of others.

Nonverbal Communication

Communication can be thought of as a shared social code (Weiner, Devoe, Rubinow & Geller, 1972) or "the process of one person stimulating meaning in the mind of another person or persons by means of verbal or NV messages" (Richmond & McCroskey, 2000, p. 1). Human communication modes are classified broadly into verbal and NV categories. Verbal communication involves spoken language and NV communication involves nonlinguistic expressive behaviors (Buck & VanLear, 2002).

Verbal communication. Verbal communication can be spoken or written and involves language. People use verbal communication by stringing words together to create an utterance. Verbal communication is successful when someone perceives the verbal message and interprets its meaning correctly. Although the verbal component is essential to communication, the focus of the proposed research is aimed at NV communication.

Nonverbal communication. Nonverbal communication is any communication without a linguistic component; however, NV communication often occurs with verbal communication (Richmond & McCroskey, 2000). Nonverbal communication often conveys messages that are universally understood by members of the same society (Burgoon, Buller & Woodall, 1996). Although some behaviors, like a smile, can stop and

start, most NV messages are continuous; thus, verbal communication involves language and is discontinuous (Richmond & McCroskey, 2000). There is a distinction in the literature between behaviors and communication. Behaviors are the actions that produce the message such as a gesture or facial expression and communication refers to the decoding and interpretation of these behaviors.

The NV component of communication is critical in patient-physician encounters because patients use NV behaviors to express their concerns and to interpret their physician's verbal message (Ishikawa, Hashimoto, Kinoshita, Fujimori, Shimizu & Yano, 2006), particularly when they do not understand the physician (Friedman, 1979). Overall, patients rely on NV communication to express their fears, relate to their physician, and understand their situation when the verbal message is unclear (Buller & Street, 1992).

Since the 1950's, interest has increased in theories concerning NV communication (Knapp, 2006); yet, the majority of theories focus on the production or encoding of NV behaviors rather than the perceptual processes. It should be noted, that human factors researchers use the terms "encoding" and "decoding" in information processing to describe the storage (encoding) and retrieval of information (decoding). However, communication researchers use the terms differently; that is, encoding refers to message production and occurs when someone sends a message to another person and decoding refers to the perception and interpretation of another's message.

At present, there has been little emphasis on decoding NV communication. Even in deception research, little is known about the process of decoding rote and deceptive cues (Vrij, 2000; 2006). There are several books describing NV behaviors and their meanings (Feldman, 1992; Knapp & Miller, 1994; Manusov & Patterson, 2006;

Richmond & McCroskey, 2000); but these books lack information about the perceptual and cognitive processes involved when perceiving and interpreting NV behaviors (Richmond & McCroskey, 2000).

There are numerous types of NV behaviors and multiple types can occur concurrently (Richmond & McCroskey, 2000). Vocal behavior, known as vocalics or paralanguage, includes accents, dialects, voice pitch, and rate of speech. Vocalics is useful to indicate when someone wants to speak or is finished speaking (i.e., turn taking). People can also employ gestures and movements, known as kinesics (Richmond & McCroskey, 2000). Facial expressions and eye movements are the most prominent and complicated NV behaviors (Cohn & Ekman, 2005). Space cues or proxemics can demonstrate territoriality of space. People can signal a violation of personal space by withdrawing. They can also demonstrate defensiveness of personal space by demonstrating insulation behaviors such as crossing their legs. Nonverbal behaviors can be diverse and also include physical appearance, touch, and personalization of the environment; however, these three NV behaviors will not be addressed in the current study (Knapp, 1978; Richmond & McCroskey, 2000). Nonverbal behaviors are an essential part of communication (Burgoon, 1994) and the parallel process model (PPM) of NV communication describes how the encoding and decoding of these behaviors can be timeshared.

Parallel process model of nonverbal communication. The PPM explains the interdependence of encoding and decoding and how these processes can occur simultaneously (Patterson, 1995, 2006). The PPM suggests that a single system is devoted to simultaneously encoding and decoding messages. The system is goal driven

and affected by several factors: determinants, social environment, social judgment/behavioral processes, and cognitive-affective mediators. Determinants are person-specific factors such as a person's culture, biology, gender and personality that affect one's ability to send and receive messages. Both determinants and the social environment set the context for communication. The social environment is another component that can indirectly affect communication. Interactions depend on the setting; the same people may interact differently at the gym or a doctor's office. Social judgment and behavioral processes also affect communication interactions. People behave according to their judgment of another person. For example, a patient may behave more passively when they judge their physician to be authoritative. Of the four components of the PPM, the cognitive-affective mediators are the most pertinent to the present study. These include the person's affect and disposition, communication goals, and most importantly cognitive resources. These cognitive resources are limited so when the majority of resources are devoted to one process (e.g., encoding) there are fewer resources to apply to the decoding process. This is consistent with psychological theories of attention, MWL, and WM described earlier.

The PPM explains how people utilize their limited resources to make social judgments and portray social behavior. Communication is goal oriented and most often people try to achieve their communication goals using as few resources as possible. They will reduce their mental effort if possible to conserve their cognitive resources (Fiske & Taylor, 1995). For example, people are often able to make social judgments automatically (Bargh, 1994; Brewer, 1988, Lakin, 2006) except when the NV behaviors are ambiguous; then the receiver must expend a high amount of cognitive effort (Gilbert

& Krull, 1988). Some research shows that peoples' judgments of personality are more accurate for brief observations than when they invest more time and cognitive effort (Ambady & Rosenthal, 1992), because expending additional cognitive effort may impede automatic processes for making social judgments (Patterson, 2006; Patterson & Stockbridge, 1998; Wilson & Schooler, 1991). Also, people often rely on their initial judgments because they are unwilling to use additional cognitive resources to correct their judgments. Therefore, people will use the smallest amount of cognitive resources possible, but more complex communication tasks may require additional resources. People make social judgments every day with little effort; yet, some social judgments, such as assessments made by SPs, are more critical than others, require additional effort, and can place high demands on limited resources.

People send (encode) and receive (decode) messages constantly and the PPM states that people often decode messages with minimal effort. Two key assumptions of the PPM are that people have limited cognitive resources and that some communication tasks require significant cognitive effort. Overall, the PPM suggests that people have limited cognitive resources to divide among encoding and decoding NV behaviors. To date, there is no research that considers how these limited resources impact an SP's ability to simultaneously send and decode NV messages. The PPM does not account for the influence of experience on communication processes; yet, some psychological theories of skill acquisition suggest that with practice people may become more skilled at cognitive tasks.

Experience of Standardized Patients

Research concerning skill acquisition suggests that with practice, complex skills may become more automatic (Fitts, 1964; Fitts & Posner, 1967). Fitts (1964) proposed that there were three phases of skill acquisition. In the first phase, known as cognitive/encoding, a person learns the basics of a task. Their performance during this phase is slow and effortful. In the second phase, proceduralization, a person begins to improve their speed of performance because they are strengthening their knowledge of the task. In the final phase, a person's performance becomes more automatic. They have already acquired the knowledge of task rules and are able to perform the task with less effort. It is only after continued practice that skills may become automatic and require little effort.

Research concerning automaticity (Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977) suggests that people experience fewer cognitive demands when they reach a level of automaticity of task performance. Schneider and Shiffrin (1977) suggested that task performance can improve by practicing with consistent pairings of stimuli and responses. During the controlled processing stage of task performance, a person's performance is typically slow and effortful and makes significant demands on limited cognitive resources. After extensive practice on consistent components skills become more automated and people can perform a task quickly and easily with fewer demands on limited resources. It is unlikely that SPs will experience the level of consistency in real SP-learner encounters that is necessary to achieve true automaticity suggested by Schneider and Shiffrin (1977), but even partial consistency can improve

skilled performance. Thus, Fitts' (1964) three phases of skill acquisition may be useful for understanding differences between experienced and novice SPs in the present study.

Each SP encounter follows a general path based on the case details; yet, each SP-learner interaction varies widely. It is possible that experienced SPs develop heuristics and LTM shortcuts to cope with improvisations. Standardized patients with more experience may be better able to handle unexpected events because they can rely on their more extensive LTM to construct answers in response to unexpected questions. Research concerning decision making provides some insight about how SPs may respond to unexpected events under uncertainty. It is possible that SPs use representative heuristics to construct plausible responses to "out-of-the-box questions" (Tversky & Kahneman, 1974). The representativeness heuristic suggests that people base their decisions on their knowledge of past events by comparing information from the current situation to heuristics stored in LTM. It is possible that novice SPs have few or no heuristics to guide them during times of uncertainty and therefore, must expend considerable mental resources to construct a response, leaving fewer resources for observing the learner's NV behaviors.

Goals of this Research

Standardized patients must perform several concurrent tasks and they often experience unexpected events requiring them to divert attention away from their three primary responsibilities. Research concerning attention suggests that individuals have limited cognitive resources (Baddeley, 2000; Wickens, 1984). However, Wickens' MRT and Baddeley's WM models have not been used to explore how SPs perform their tasks. These theories are clearly relevant and the present study represents an initial attempt to

understand the demanding job of an SP in the context of attention and MWL. Past research concerning SPs has been primarily aimed at benefitting medical students and not focused on the people performing the portrayal and assessment tasks.

The MRT suggests that people can experience an increase in task demands during unexpected events; therefore, it is likely that SPs may experience high task demands during improvisations that divert their attention away from their primary tasks such as assessing the learner and portraying the patient. Research concerning WM suggests that the CE is used to allocate attention among different tasks (Baddeley & Hitch, 1994). Baddeley's theory also suggests that the CE is limited in its resources. Thus, it is important to determine if SPs suffer from limited WM resources during times of high task demands.

Research concerning attention suggests that the SPs' MWL is likely to increase with increasing task demands. Based on previous stress research, it is possible that SPs may also experience high levels of stress when task demands increase (Matthews et al., 1999).

To date, psychological theories of attention and WM have not been applied to interpersonal communication to explain how demanding situations can affect a person's ability to perceive NV communication. Because of limitations in attention and WM, SPs may be less likely to perceive and decode NV cues during these periods of high demand. The PPM of NV communication (Patterson, 1995, 2006) also suggests that there are limited cognitive resources available for encoding and decoding NV behavior. It is also likely that during times of high demand (Baddeley, 1972) SPs are less able to devote cognitive resources to observing the learners.

The purpose of the proposed research was to harness theories of attention and WM to better understand SP performance. This is the first attempt to use the MRT (Wickens, 1984) and Baddeley's (1986, 1990) model of WM to make predictions about the ability of SPs to perceive NV behaviors during periods of attentionally demanding interpersonal communication. It was important to determine if increased task demands draw on WM and attentional resources; thus, increasing the SP's MWL and stress.

Improvisations are a pervasive issue in SP programs and there is little knowledge of how the act of improvising impacts the ability of SPs to assess learners. Additionally, it was important to investigate how SPs managed the demanding job of timesharing portrayal and assessment tasks during periods of improvisation.

Considering the above, the goal of the present study was to determine how improvisations and performance on multiple tasks affect the SP's ability to assess the learner's communication. Specifically, the ability of SPs to observe NV behaviors and rate the interviewer's communication was examined along with their subjective ratings of MWL and stress.

Description of Present Research

In the first study, Old Dominion University undergraduates were instructed to participate in two job interviews and either improvise responses or provide rote responses. During the interview they assessed the interviewer's NV behaviors. They also passively observed video taped improvisational and rote interviews. The participants also indicated their subjective MWL and stress. Undergraduate students were used in the first study to test the basic assumptions of the hypotheses and to see if multitasking and

improvising during an interpersonal interaction affected their ability to observe the interviewer and their subjective MWL and stress.

In the second study, SPs were used to examine the effects of experience. It was suggested by subject matter experts (SME) in the SP field that experienced SPs may be able to handle improvisational questions and multitasking with little effect on their ability to observe the learner and their subjective MWL and stress. This is consistent with research in skill acquisition (Fitts, 1964) and automaticity (Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977) that suggests practice can lead to automaticity of task performance and greatly reduce the demands on limited cognitive resources. The SPs were divided into novice and experienced groups. Also, it was important to determine how multitasking and improvisation affected actual SPs during encounters. The SPs participated in encounters with and without improvisations. The SPs actively participated in two encounters and passively observed two encounters with different amounts of improvisations. After each encounter, their ability to observe NV behaviors and rate the interviewer's communication was assessed along with their MWL and stress.

Study 1 Hypotheses

Hypotheses for improvisational and rote interviews. Based on Baddeley and Hitch's (1974; Baddeley, 1986, 1990) model of WM, participants were expected to draw information directly from LTM to answer questions in rote interviews. During improvisational interviews, participants would construct responses based on the current situation and information stored in LTM. The hypothesis based on Baddeley's (1986, 1990) WM model is consistent with Wickens' (1984, 2002) MRT and predicts participants would focus their attention inward during improvisational interviews.

Participants would have few spare resources to devote to observing their interviewer when constructing improvisational responses. Therefore, it was expected that participants would observe fewer NV behaviors and provide less accurate ratings of NV communication during interviews requiring improvisation because they would have greater demands on their attentional and WM resources (see Figure 1).

People possess limited attentional resources and they often experience greater MWL when task demands exceed available resources (O'Donnell & Eggemeier, 1986; Wickens, 1984, 2008). It was expected that participants would devote more attention to constructing improvisational responses compared to producing rote responses. Therefore, it was predicted that participants would indicate higher levels of subjective MWL after improvisational interviews.

Matthews' (2001) state mediation model suggests that people can experience stress when they perceive the task demands to be high. Therefore, it was hypothesized that participants would indicate higher levels of stress measured on a subjective questionnaire after improvisational interviews because participants would perceive improvising responses of an unexpected nature as a more demanding task than producing rote responses.

Hypotheses for passive and active observations. Consistent with Baddeley's (1986, 1990) WM model and Wickens' (1984, 2002) MRT, people have limited resources to divide among concurrent tasks. Participants would have more spare resources to devote to the observation task in the passive conditions compared to the active observation conditions when they must timeshare observation and portrayal activities. This is also consistent with the PPM of NV communication (Patterson, 1995,

2006) that suggests people have limited resources to divide among encoding and decoding communication. Participants encoded and decoded NV information during active observation conditions whereas they decoded NV information only during passive observation conditions. Therefore, it was expected that participants would observe fewer NV behaviors and provide less accurate ratings of the interviewer's communication after the active observation conditions.

It was expected that participants would experience higher MWL and stress during active observation conditions compared to passive observations because participants would be required to timeshare portrayal and observation tasks during active observation conditions (Matthews et al., 1999; Wickens, 1984, 2008).

Hypotheses for the interaction between observations and interview type. Consistent with research concerning attention (Wickens, 1984), WM (Baddeley, 1986, 1990) and the PPM (Patterson, 1995, 2006), participants were expected to observe fewer NV behaviors and provide less accurate ratings of communication skills after active observations compared to passive observations, particularly in the improvisational condition. It was expected in the active improvisational condition that participants would have fewer resources to divide among observing the interviewer, portraying the character, and producing improvised responses (Wickens, 1984; see Figure 1). Also, it was expected that there would be no difference in the observation of NV behaviors ratings of the interviewer's communication during both passive observation interviews because participants performed only the observation task.

Again, participants were expected to experience the highest subjective MWL (Wickens, 1984, 2008) and stress (Matthews et al., 1999) during active observation

improvisational interviews because they were timesharing observation and portrayal tasks with the additional improvisational task. This condition is the most likely to exceed the participant's available resources. Further, participants would also be expected to experience the lowest MWL and stress in both passive observation conditions because they are observing only the interviewer.

<table>
<tr><td></td><td></td><td colspan="2">Type of Interview</td></tr>
<tr><td></td><td></td><td>Rote</td><td>Improvisational</td></tr>
<tr><td rowspan="2">Type of Observation</td><td>Passive</td><td colspan="2">1) There would be no difference in the observation of NV behaviors or the ratings of the interviewer's communication.

2) Participants would experience the lowest MWL and stress.</td></tr>
<tr><td>Active</td><td>1) Participants would observe fewer NV behaviors and provide less accurate ratings of the interviewer's communication than both passive groups.

2) Participants would experience higher MWL and stress than both passive groups.</td><td>1) Participants would observe fewer NV behaviors and provide less accurate ratings of the interviewer's communication compared to the active rote group.

2) Participants would experience higher MWL and stress compared to the active rote group.</td></tr>
</table>

Figure 1. Hypotheses for study 1.

Study 2 Hypotheses

The second study included the passive and active observation conditions used in the first study. The terms encounters with and without improvisations were used instead

of rote and improvisational interviews to reflect that the SP participants would use memorized case details to answer the learner's questions rather than relying on their own personal information such as in the rote condition in the first study. It was expected that the results regarding observation and interview type for the novices in the second study would follow the same trends as in the first study because the novice SPs were expected to perform similarly to the undergraduate participants in the first study.

In addition to the previously mentioned goals and hypotheses, it was expected that SPs with more experience would be better able to handle improvisations and multitasking. This is the initial attempt to understand performance differences due to the experience levels of SPs by applying psychological models for attention and WM.

Standardized patient experience level hypotheses. Research concerning decision making (Tversky & Kahneman, 1974) suggests people often rely on past experiences to guide their responses during periods of uncertainty. Experienced SPs may develop heuristics for handling unexpected questions over time so that they would be better able to observe NV behaviors and provide the most accurate ratings of the interviewer's communication. Likewise, experienced SPs would report lower MWL (Liu & Wickens, 1994) and stress (see Figure 2). By contrast, novice SPs were expected to perform similarly to the participants in the first study.

<table>
<tr><td></td><td></td><td colspan="4">Type of Encounter</td></tr>
<tr><td></td><td></td><td colspan="2">No Improvisations</td><td colspan="2">Improvisational</td></tr>
<tr><td></td><td></td><td>Novice</td><td>Experienced</td><td>Novice</td><td>Experienced</td></tr>
<tr><td rowspan="3">Type of Observation</td><td>Passive</td><td colspan="4">1) There would be no difference in the observation of NV behaviors or the ratings of the learner's communication.

2) Participants would experience the lowest MWL and stress.</td></tr>
<tr><td>Active</td><td colspan="4">1) All participants would observe fewer NV behaviors and provide less accurate ratings of NV communication in the active compared to the passive groups.

2) All participants would experience higher MWL and stress in the active compared to the passive groups.</td></tr>
<tr><td></td><td></td><td></td><td>1) Novices would observe the fewest NV behaviors and provide the least accurate ratings of NV communication in the active improvisational group.

2) Novices would experience the highest MWL and stress in the active improvisational group.</td><td></td></tr>
</table>

Figure 2. Hypotheses for study 2.

METHOD

Study 1 Design

The purpose of the first study was to assess the participant's ability to perceive and understand the interviewer's NV behaviors, attitudes, and interpersonal communication. A 2 type of interview (rote or improvisational) x 2 type of observation (passive or active) within-subjects design was used for this study. The type of interview was a within-subjects variable with two levels: participants participated in one interview with improvisational responses and another interview with rote responses. The type of observation was a within-subjects variable with two levels. They actively participated in an improvisational and rote interview and also passively watched two video taped interviews consisting of an improvisational and a rote interview. The two types of interviews and types of observations were counterbalanced across participants by alternating their assignments to the experimental conditions.

Study 1 Participants

A power analysis indicated that a total of 32 participants were required to achieve a power of .80 with a medium effect size at an alpha level of .05 (Keppel & Wickens, 2004). Thirty-six participants were included in the first study. The experimenter attempted to select equal numbers of male and female undergraduates attending Old Dominion University; yet, the majority of participants were female [30 (83.3%) females and 6 (16.7%) males], reflecting the predominance of females who major in psychology. All participants were at least 18 years of age and their ages ranged from 19 to 58 (M = 27.03, SD = 8.03) years. Participants also had self-reported normal or corrected-to-normal hearing and vision. Participants received 2 research credits for their participation.

The research was approved by the Institutional Review Board at Old Dominion University (IRB # 10-031).

Study 1 Materials

Informed consent. The Informed Consent Form provided a brief description of the study and information about the risks and benefits of participating (see Appendix A). The informed consent document for use of photo/video materials provided information about the confidentiality of all photographic and audio material taken during the experiment (see Appendix B).

Instruction sheet. The instruction sheet (see Appendix C) provided information about the purpose of the study and a description of the experimental procedures.

Character script and background details. Participants were assigned a character for the improvisational condition and there were two character types. One was applying for a business manager position at a sports club and the other was interviewing for a middle school foreign language teaching position. The character type was counterbalanced so that half of the participants portrayed the teacher applicant and observed the business manager applicant. Character type was switched for the remaining participants.

The participants were asked to learn the following materials before they arrived for the experiment. Participants received a script (see Appendix D), a resume (Appendix E) and transcript (Appendix F) that provided background information about the character. The script included predetermined responses for four of the interview questions. For example, participants portraying the teacher applicant were asked, "If I walked into your classroom while you were practicing conversational skills, what would I see?" and the

participant would respond with this answer: "I really try to encourage my students to feel at ease and comfortable when they practice conversational skills. I would probably break the students up into pairs and give them a topic to discuss while I walk around the room."

The resume included a career objective statement and the work and educational history of the character. For example, the resume included the following statement in the career objective section of the teacher applicant's resume: "My personal educational philosophy is to develop the whole child and inspire a sense of curiosity and learning so they will be motivated to continue their foreign language education." The transcript provided a list of college classes taken by the character and the grades they received for each class. The teacher applicant's transcript listed that they received an A in a "Classroom Management and Discipline" class.

Upon arrival for the experiment, the participants received a short script to practice with the confederate (see Appendix G). After practicing, the participants were given a set of 10 interview questions for the rote interview. The participants were instructed to answer these questions as themselves and write their answers in the space provided. For example, participants were asked to respond to the following question: "What led you to choose your career path?"

Interviews. The interviews were conducted by a confederate. The confederate was a 64 year old female. She is a retired junior high Spanish teacher who was recently trained as an SP at the Baylor College of Medicine. The confederate was trained to conduct all four types of interviews and she followed a written script (see Appendix H). The script included the scripted interview questions along with the corresponding NV

behaviors. For example, the interviewer would ask, "Why do you want to be a first grade teacher" while she scratched her face and appeared like she was very interested.

The short stress state questionnaire (SSSQ). The SSSQ (see Appendix I) is a 24-item questionnaire that measures subjective stress. It was developed as a more concise alternative to the longer Dundee Stress State Questionnaire (DSSQ; Matthews et al., 2002; Matthews et al., 1999). It has been shown to be valid and sensitive to different task demands (Helton, 2004). The SSSQ contains three subscales for task engagement, distress and worry with internal consistency reliabilities of .81, .87, and .84 respectively. Participants indicated on a scale of 1 to 5 how well a statement described their feelings from 1 (not at all) to 5 (extremely) on items such as, "I feel alert", "I feel impatient" and, "I want to succeed on the task". Participants answered all 24 items before the experiment and after each interview.

Modified Master Interview Rating Scale (MMIRS). After each interview, the participants rated the interviewer's communication using an abbreviated and modified Master Interview Rating Scale (MIRS; see Appendix J). The MIRS was developed at the EVMS Skills Center as a tool for SPs to assess the clinical interview (MIRS, 2005). This checklist is based on the Arizona Clinical Interview Rating Scale (ACIRS; Stillman, Brown, Redfield & Sabers, 1977). The ACIRS consists of 16 clinical interview skills and has an internal consistency reliability of .80 (Stillman et al., 1977). The scale ranges from poor (1) to excellent (5). The MIRS score is often compared to another rater's score of a videotape of the same encounter to determine the inter-rater reliability of the two scores.

The modified MMIRS consists of nine items. The MMIRS contains the same items used by SPs but the wording was modified by the lead SP trainer for a general

rather than a medical interview. The participants rated the interviewer's conversational style, her questions and verification of information, verbal and NV facilitation, tone of voice, conversational pacing, guidance through the interview, and her ability to elicit the interviewee's beliefs. On each of these items, the participants rated the interviewer on a scale of 1 to 5 with 5 indicating that the interviewer met all the objectives and 1 indicating that they completely failed to meet the objectives. For example, on the "NV facilitation skills" item the participant rated the interview as a 5 if the interviewer put the participant at ease and encouraged open communication with the use of consistent eye contact, open body posture, lack of physical barriers, and kind and supportive facial expressions. The interviewer received a rating of 3 if she used some NV facilitative gestures but did not fully put the participant at ease. For example, the interviewer may have displayed good eye contact but with physical barriers present. A rating of 1 indicates that the interviewer failed to use appropriate NV facilitative skills and was unable to make the participant feel comfortable. For example, if the interviewer received a rating of 1, she may have demonstrated NV behaviors that were counterproductive and failed to put the participant at ease. These behaviors could include tapping her feet or pen and avoiding eye contact while the participant spoke.

Post-interview query. After each interview, the participants completed a query of communication behaviors and attitudes. The participants were instructed to indicate which behaviors and attitudes they perceived during the interview. The query includes a list of NV behaviors and attitudes including: turning away from the participant, tapping their foot, expressing interest in what the participant says, and appearing surprised by a response (see Appendix K). This query was used to assess the participant's ability to

recall characteristics of the interviewer's interpersonal communication after completing the interview.

NASA Task Load Index (TLX). The participants also rated their perceived MWL on the NASA-TLX after each interview (see Appendix L; Hart & Staveland, 1988). This instrument measures subjective MWL and consists of six subscales: mental, physical, and temporal demand, performance, effort and frustration. Participants indicated on a scale of 0 (low) to 20 (high) their perceived demands on each subscale. This instrument has been shown to be valid and has a test/retest reliability of .83 (Hart & Staveland, 1988). This instrument is widely used however there are still concerns over the psychometric properties of the NASA TLX (Bustamante, Bailey, Spain, Fallon, Newlin & Bliss, 2006). There were criticisms of the measurement invariance of the NASA TLX (Bustamante & Spain, 2008). Some researchers suggest using the raw scores rather weighted scores based on pairwise comparisons of the different subscales (Moroney, Biers, Eggemeier & Mitchell, 1992); therefore, raw scores were used in the present study. Participants completed this instrument with a paper and pencil and provided ratings on all six subscales.

Study 1 Procedure

Upon arrival, participants read and signed the Informed Consent Form (see Appendix A) and consent document for use of photo/video materials (see Appendix B). Participants were told that the interviews would be recorded and these recordings might be used in demonstrations at conferences. Then, the participants completed the SSSQ. Next, the participants read the instructions silently as the experimenter read them aloud. Afterward, the experimenter asked the participants if they had any questions. The

participants watched a 10-minute video about assessing the interviewer's communication skills. Participants were given a practice script to learn before practicing with the interviewer. After the practice interview, half of the participants were assigned at random to either the active or passive condition.

Active observation phase. Participants played the role of the interviewee and were interviewed in both a rote and improvisational condition. Each interview lasted approximately five minutes. Half of the participants were assigned to begin in the rote condition and were given the interview questions beforehand and asked to answer their interview questions with their prepared responses. The rote interview utilized the participants' rote memory. Participants were told to produce a response similar to the one they prepared if they could not produce the response verbatim.

For the improvisational condition, participants received the interview materials and a script and they were given sufficient time to learn the material. Participants were instructed that they should memorize the scripted responses and produce them for the appropriate interview questions. Participants were told that only four responses were scripted and they should improvise a response if they were asked additional questions. Again, the participants did not have to produce the responses verbatim.

In the improvisational condition, six questions on the confederate's script were not included in the participants' script. The confederate portrayed six NV behaviors during specific points throughout the interview. Three of these behaviors occurred during interview questions that required the participants to improvise and three occurred during scripted responses. After each interview, participants completed the SSSQ, the MMIRS, the post-interview query and the NASA-TLX.

Passive observation phase. Participants watched a previously recorded video tape of two interviews involving the confederate and another participant. The experimenter read the instructions for the passive observation phase to the participants before they observed the first interview. The order of the rote and improvisational interviews during the passive observation phase was counterbalanced across participants. After observing each interview, participants again completed the SSSQ, the MMIRS, the post-interview query and the NASA-TLX. After observing the final interview, the experimenter debriefed the participants (see Appendix M).

Dependent measures. After each encounter, participants rated the learner's communication skills on the MMIRS. The participants used the questionnaire to assess the interviewer's NV and verbal facilitation skills along with other communication skills. The participants completed the SSSQ before the experiment and following each condition. The participants also completed the NASA-TLX and post-interview query following each interview.

Study 2 Design

The purpose of the second study was to examine how the theoretical assumptions tested in the first study apply to the ability of genuine SPs to perform multiple tasks and improvise when observing and assessing learners. It was also important to incorporate the experience level of the SPs in the design. As mentioned earlier, the type of interview variable was changed to reflect a type of encounter that would rely on the ability of SPs to recall relevant case details.

A 2 type of observation (passive or active) x 2 type of encounter (with and without improvisations) x 2 experience (novice or experienced) quasi-experimental

mixed design was used for this study. Type of observation was a within-subjects variable with two levels so that active observers participated in the encounter and passive observers watched the encounter. Type of encounter was also a within-subjects variable with two levels: with or without improvisation. During the active observation phase, participants participated in one encounter involving no improvisations and another encounter with improvisations. Participants also passively observed two encounters, one with and one without improvisations. Experience was a between-subjects variable with two levels. Half of the participants were experienced SPs and remaining participants were novices.

Study 2 Participants

Twenty-one SPs from the Skills Center participated; however, one experienced participant was excluded from the analyses because of incomplete data. The experimenter attempted to select equal numbers of male and female participants; yet, the majority were female [13 (65%) females and 7 (35%) males]. All were at least 18 years of age and their ages ranged from 23 to 71 ($M = 49.60$, $SD = 14.36$) years. All participants reported normal or corrected-to-normal hearing and vision. Participants were told after the study that they would be paid $30 for their time. All the participants originally volunteered for the study without the expectation of pay; however, the director of the Skills Center offered to compensate them for their participation.

The participants were divided into novice or experienced groups based on internal classification criteria for experience levels adopted by the director of the Skills Center and lead SP trainers. Novice SPs were those that require additional training time for their clinical cases and had performed fewer than 12 cases. They also have low reliability

scores (85% or lower inter-rater reliability) on the MIRS checklist and had performed less than five complicated cases. Experienced SPs consistently perform three to five cases and perform 24 or more encounters each month. They also perform a wide variety of cases including complicated cases and those that involve both teaching and assessing the learner. Experienced SPs also have higher reliabilities (90% or above inter-rater reliability) on the MIRS checklist.

The experimenter attempted to recruit equal numbers of experienced and novice SPs; however, there was difficulty recruiting novice volunteers. The study included nine (45%) novice and 11 (55%) experienced SPs. The trainers at the Skills Center attempted to select participants who fit the criteria for novice or experienced; however, subsequent analysis of the participants' experiences at the Skills Center indicates that some participants did not fit the criteria at the time of the study. In particular, there was a wide range of inter-rater reliabilities within each group demonstrating a lack of consistency among both novice and experienced SPs. Therefore, it is unlikely that the data would be useful in interpreting the influence of experience level on the SPs' observation and assessment performance or their subjective MWL and stress. This will be discussed further in the Results section. The novice participants had inter-rater reliabilities ranging from 48% to 88% ($M = .70$, $SD = .12$) and had performed 60 to 636 encounters ($M = 233.89$, $SD = 180.32$). Novices also required 2 to 6 hours of preparation ($M = 3.88$, $SD = 1.25$) for a clinical case and had been working in the Skills Center from 3 to 48 months ($M = 18.44$, $SD = 15.20$). The experienced participants had inter-rater reliabilities ranging from 82% to 95% ($M = .91$, $SD = .04$) and had performed 402 to 1728 encounters ($M = 987.45$, $SD = 483.65$). Experienced participants required only 1 to 2 hours case

preparation ($M = 1.77$, $SD = .41$) and had been working in the Skills Center from 25 to 181 months ($M = 64.85$, $SD = 45.85$).

Study 2 Materials

Informed consent forms. Similar to study 1, participants read and signed an Informed Consent Form for Old Dominion University (see Appendix N) and for Eastern Virginia Medical School (see Appendix O) and an informed consent document for use of photo/video materials (see Appendix B).

Background information form. Participants also completed a brief background information form (see Appendix P). Participants provided information about their age, sex, years of experience as an SP, average number of encounters performed in a month, and any special training they received as an SP. The experimenter received other metrics to assess the experience levels of the participants directly from the program director at the Skills Center. These metrics included training time, accuracy on MIRS, number of encounters performed and length of time as an SP.

Instruction sheet. The participants read the instructions with the experimenter. The instruction sheet (see Appendix Q) provided information about the purpose of the study and a description of the experimental procedures

Case details. The program director from the Skills Center provided four case details for the experiment: two were very predictable (no improvisations) and two were very unpredictable (improvisational; see Appendix R). The difference in predictability was related to the amount of improvisation required during an encounter so that highly predictable cases required no improvisations and highly unpredictable cases required ten improvisations.

The case details contained patient demographics including the patient's age, sex, and race along with a summary of the case. The case summary included a scripted opening sentence that the SP must produce verbatim. There was a patient agenda that describes the order of topics the SP must present to the learner along with scripted phrases. The case details consisted of a history of present illness that described all the relevant patient information regarding their current health concern. This included a description of symptoms like a fever, cough, or sore throat. The past medical history described the patient's past health issues. For example, in one case the patient had seasonal allergies. The family history included information about the patient's relatives' medical history. In this example, the mother had glaucoma. The social history included information about the patient's personal life that may be medically relevant. Finally the case details included the MIRS items for the encounter such as verbal and NV facilitation skills. For the present study, each case included the same MIRS items.

Standardized learner's script. The standardized learner (SL) had four scripts to follow for each of the encounters (see Appendix S). These included scripted questions with the corresponding NV behaviors. The encounters were scripted so that 10 NV behaviors occurred while the participant improvised a response and 10 occurred when the participant had a prepared response. The participant improvised responses to unexpected questions such as, "what was your last blood pressure reading?" and "can you tell me what you had to eat today?"

The Master Interview Rating Scale. The MIRS consists of 27 clinical skills items. The rating scale for each item is the same as described in the first study. For the purposes of the present study, the SPs used an abbreviated version of the MIRS consisting of only

six items (see Appendix T). Unlike the MMIRS, the abbreviated MIRS contained wording relevant to medical interviews. These MIRS items were selected because they are useful for assessing the SP's perceptions of the learner's interpersonal communication. The abbreviated MIRS consisted of the following items. First, the "questioning skills-types of questions" item was used to assess the learner's ability to gather relevant information from the SP. Second, the "verbal facilitation skills and encouragement" item was useful for assessing the learner's verbal communication skills, specifically the learner's ability to clarify, agree and echo important phrases the SP said. This item was used to assess the learner's skill at verbally encouraging the SP to disclose information. Third, SPs often use the "NV facilitation skills" item to assess how the learner uses their NV communication. The learner should remove any physical barriers between themselves and the SP and make appropriate physical and eye contact with the patient. This item was useful for assessing the learner's ability to encourage communication and make the patient feel comfortable. Fourth, the "empathy and acknowledging patient cues" item was useful for assessing the learner's sensitivity to the SP. The learner should acknowledge the SP's concerns, demonstrate empathy and express understanding and support. Fifth, the "overall interview technique" item was used by SPs to assess whether the learner conducted the clinical interview with a patient-centered approach. The learner should create an appropriate and collaborative physician-patient relationship. Finally, the "organization" item was used to assess the overall flow and continuity of the interview.

The post-interview query, SSSQ, and the NASA-TLX. Similar to the first study, the participant completed the same query of communication behaviors and attitudes after

each encounter (see Appendix K). The participant also completed the SSSQ (see Appendix I) and the NASA-TLX used in the first study (see Appendix L).

Study 2 Procedure

Approximately 35 people from the pool of SPs at EVMS were asked to participate in the study. The director of the Skills Center and two SP trainers determined which of the volunteers met the criteria of novice and experienced SPs. They also selected two cases for each participant based on the participant's prior experience with the cases. The participants were assigned two cases for which they had the least amount of experience prior to the experiment. The participants received case details so that they could become familiar with the cases several days before the experiment. The participants used these case details to answer the SL's questions during the encounter. The SP trainer trained the participants to portray two cases. The participant's training followed the typical procedure for a low stakes encounter. First, the participant received the case details with the corresponding abbreviated MIRS items. Then the participant learned the case and discussed how they would portray the patient with the trainer. During their general training, all SPs learn to improvise when asked unexpected questions. Even novice SPs receive some training, although the participants were not specifically trained to improvise in this study. At the Skills Center, the SPs are instructed to think of the patient as a real person; therefore, the SPs improvise responses based on their personal impression of the patient.

Upon arrival at the Skills Center, the participants read and signed three consent forms before filling out the background information form. Participants were informed

that their encounters would be recorded but that these recordings were solely for use in the experiment. Before reading the instructions, the participant completed the SSSQ.

Each participant experienced all four encounters; two of these encounters were in the passive observation phase and two in the active observation phase. Each encounter lasted approximately 5 minutes. Both types of encounter and types of observation were counterbalanced across participants. Participants actively observed two different cases of low (improvisational) and high (no improvisations) predictability. Participants also passively observed two different cases of low and high predictability. This ensured that the participants never observed the same case twice. The total time to complete the experiment was approximately 1.5 hours.

Active observation phase. During the active observation phase the participant performed the SP's duties of portraying a patient and observing the learner. They performed as an SP in one encounter with no improvisations and a second encounter with improvisations. The participant was unaware of the amount of improvisation during the encounters.

The participants were allowed to review the case details prior to beginning the first encounter. They portrayed their cases in an exam room at the Skills Center. Another SP from the Skills Center played the part of the learner in the encounter and his portrayal was standardized. The SL was a 22 year old male. He was a student at Old Dominion University and he has worked as an SP for a year and a half. The SL received a script for each encounter and he said the scripted questions along with the corresponding NV behaviors. In the improvisational condition, half of these NV behaviors occurred while the participant was improvising a response.

Similar to the first study, the participants completed the SSSQ, the abbreviated MIRS, the post-interview query and the NASA-TLX after all encounters. The participants were allowed to review the case details before beginning the next encounter and completing the same process.

Passive observation phase. Participants read the instructions for the passive observation phase before passively observing a video tape of another SP in two encounters: one with and one without improvisations. Again, the participants completed the four questionnaires after each encounter.

The experimenter debriefed the participants (see Appendix U) after they completed the final encounter. Participants were asked about their experience with the study while their answers were recorded on a digital audio recorder (see Appendix V).

Dependent measures. The same procedures and instruments used in the first study were used in the second to assess the participant's stress state, MWL, and ability to recall the learner's NV behaviors. After each encounter, the participants completed an abbreviated version of the MIRS. These items were used to assess the participant's assessment of the learner's verbal and NV communication.

RESULTS

Study 1

All data were screened for outliers, unequal sample sizes and missing data to ensure normality before beginning any statistical analyses. The descriptive statistics showed that there were 29 outliers and several variables were skewed or kurtotic. All data greater than three standard deviations above or below the mean were considered statistical outliers (Tabachnick & Fidell, 2001). All outliers were replaced with a score one unit higher or lower than the next most extreme deviant score in the data set (Dixon & Yuen, 1974). The descriptive statistics showed that all the data were normally distributed after replacing the outliers (see Appendix W).

Communication ratings. Participants rated the NV communication skills of the interviewer after each interview. The NV communication score was generated by summing the scores for each item on the modified MIRS. An expert rater scored the videos used in the passive observation condition. Only the passive observation ratings were compared because the expert was not present in the room during the active observation conditions. The expert's scores of the passive observation videos were correlated with the participants' scores of the same videos to determine the inter-rater reliability. The results showed that the expert's and participants' ratings were not significantly correlated, $r(142) = .01$, ns.

The results of a 2 type of interview (rote and improvisational) x 2 type of observation (passive and active) repeated measures ANOVA did not show a significant interaction between type of interview and type of observation on the participant's ratings of the interviewer's NV communication ($p > .05$, see Table 1). The results showed that

participants' ratings of the interviewer's communication skills were higher after active observations ($M = 25.52$, $SD = 7.10$) than passive observations ($M = 22.14$, $SD = 5.78$), $F(1, 35) = 10.18$, $p < .01$, partial $\eta^2 = .23$, power = .87. The results also showed that participants' ratings of the interviewer's communication skills were higher after improvisational interviews ($M = 24.68$, $SD = 6.98$) than rote interviews ($M = 22.97$, $SD = 5.90$), $F(1, 35) = 8.61$, $p < .01$, partial $\eta^2 = .20$, power = .81.

Table 1

Analysis of Type of Observation and Type of Interview on Participants' Ratings of the Interviewer's Communication

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	412.60	1	412.60	10.18	.00**	.23
Interview (I)	105.49	1	105.49	8.61	.00**	.20
O x I	13.60	1	13.60	.99	.33	.03
O x I within-group error	480.78	35	13.74			

** $p < .01$.

Nonverbal behavior query. Participants indicated the NV behaviors they perceived after each interview. The proportion of NV behaviors correctly identified was generated by summing the number of behaviors correctly identified and dividing the sum

by the total NV behaviors that occurred during the interview. In addition to the planned analyses, the number of correctly identified, missed and incorrectly identified behaviors were tallied to determine if there were any patterns in the types of behaviors that the participants observed (see Appendix X). All NV behavior data were analyzed with a 2 type of interview (rote and improvisational) x 2 type of observation (passive and active) repeated measures ANOVA.

Regarding the proportion of correctly identified behaviors, the results showed no significant interaction between type of interview and type of observation ($p > .05$). The results showed a significant main effect for type of observation on the participants' ability to correctly identify NV behaviors, $F(1, 35) = 79.12$, $p < .001$, partial $\eta^2 = .69$, power = 1.00 (see Table 2). Participants correctly identified fewer NV behaviors when the behaviors occurred during an active observation ($M = .27$, $SD = .11$) than a passive observation ($M = .45$, $SD = .13$). Participants also correctly identified fewer NV behaviors when the behaviors occurred during an improvisational interview ($M = .32$, $SD = .11$) than those that occurred during a rote interview ($M = .39$, $SD = .12$), $F(1, 35) = 26.96$, $p < .001$, partial $\eta^2 = .44$, power = 1.00.

Table 2

Analysis of Type of Observation and Type of Interview on the Correctly Identified Behaviors

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	1.20	1	1.20	79.12	.00***	.69
Interview (I)	.17	1	.17	26.96	.00***	.44
O x I	.00	1	.00	.53	.47	.02
O x I within-group error	.28	35	.01			

*** $p < .001$.

Any NV behaviors reported by the participants that did not occur during the interview were recorded as incorrectly identified behaviors. The total number of incorrectly identified behaviors was analyzed for each participant. The results failed to show a significant interaction between type of interview and type of observation ($p > .05$). The results, however, showed a significant main effect for type of observation on the number of behaviors that were incorrectly identified, $F(1, 35) = 51.16$, $p < .001$, partial $\eta^2 = .59$, power = 1.00 (see Table 3). Participants incorrectly identified more NV behaviors after passive observations ($M = 4.88$, $SD = 2.59$) than active observations ($M = 2.51$, $SD = 1.76$). The results also showed participants incorrectly identified more NV behaviors after rote interviews ($M = 4.33$, $SD = 2.43$) than those that contained

improvisations ($M = 3.06$, $SD = 1.91$), $F(1, 35) = 25.64$, $p < .001$, partial $\eta^2 = .42$, power = 1.00.

Table 3

Analysis of Type of Observation and Type of Interview on the Incorrectly Identified Behaviors

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	200.69	1	200.69	51.16	.00***	.59
Interview (I)	58.78	1	58.78	25.64	.00***	.42
O x I	12.25	1	12.25	2.35	.14	.06
O x I within-group error	182.75	35	5.22			

*** $p < .001$.

Subjective mental workload. Participants rated their subjective MWL using the NASA TLX after each interview. The overall MWL score was generated by summing all six subscales. Results of a 2 type of interview (rote and improvisational) x 2 type of observation (passive and active) repeated measures ANOVA showed a significant interaction between type of interview and type of observation on the participants' subjective mental workload, $F(1, 35) = 20.29$, $p < .001$, partial $\eta^2 = .37$, power = .99 (see Figure 3 and Table 4). Results of simple effects analyses showed that participants

indicated significantly higher MWL after active improvisational interviews ($M = 58.19$, $SD = 16.13$) than active rote interviews ($M = 48.72$, $SD = 17.34$), $F(1, 70) = 11.95$, $p < .001$, passive rote interviews ($M = 41.61$, $SD = 16.16$), $F(1, 70) = 36.64$, $p < .001$, and passive improvisational interviews ($M = 38.41$, $SD = 13.37$), $F(1, 70) = 52.17$, $p < .001$. Results of simple effects analyses also showed that participants indicated significantly higher MWL after active rote interviews ($M = 48.72$, $SD = 17.34$) than passive rote interviews ($M = 41.61$, $SD = 16.16$), $F(1, 70) = 6.74$, $p < .05$, and passive improvisational interviews ($M = 38.41$, $SD = 13.37$), $F(1, 70) = 14.18$, $p < .001$. There was a significant main effect for type of observation on the participants' subjective MWL, $F(1, 35) = 36.68$, $p < .001$, partial $\eta^2 = .51$, power = 1.00. Participants indicated significantly higher MWL after active observations ($M = 53.46$, $SD = 16.73$) than passive observations ($M = 40.01$, $SD = 14.76$). There was no significant main effect for type of interview on the participants' subjective MWL ($p > .05$).

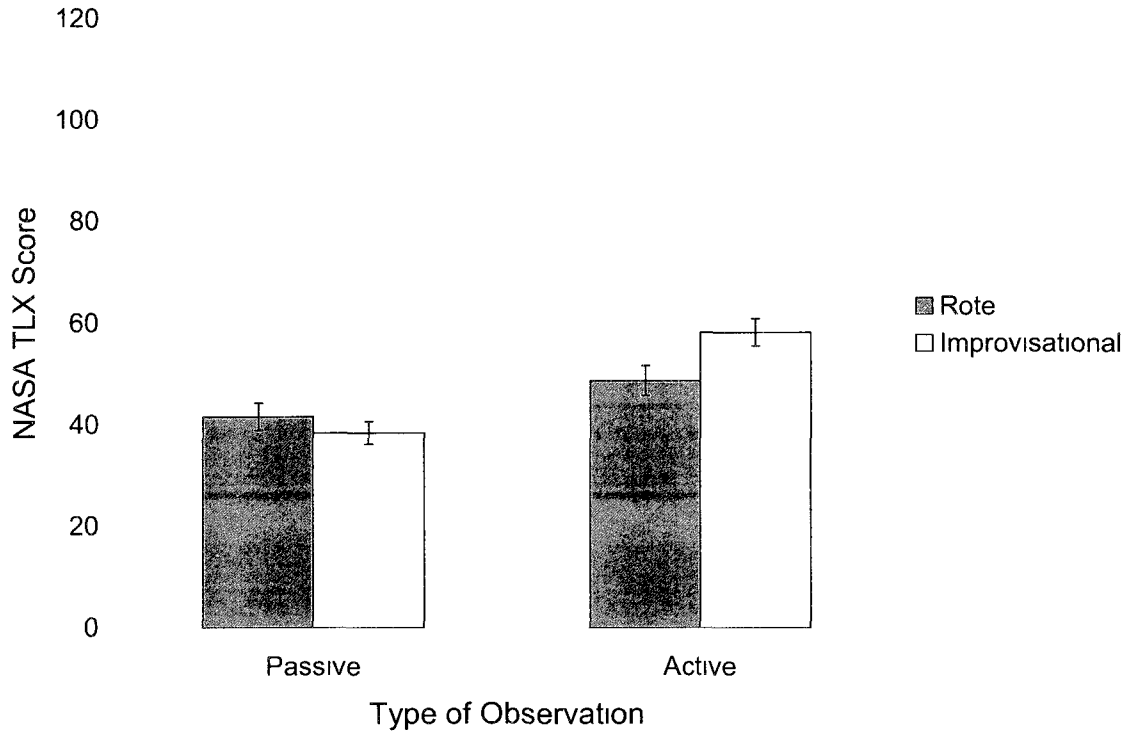

Figure 3 NASA TLX scores as a function of type of observation and interview

Table 4

Analysis of Type of Observation and Type of Interview on the Overall Mental Workload Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	6512.49	1	6512.49	36.68	.00***	.51
Interview (I)	353.44	1	353.44	3.82	.06	.10
O x I	1446.53	1	1446.53	20.29	.00***	.37
O x I within-group error	2494.72	35	71.28			

*** $p < .001$.

In addition, the individual subscales of the NASA TLX were analyzed with a series of 2 type of interview (rote and improvisational) x 2 type of observation (passive and active) repeated measures ANOVAs. Regarding the mental demand subscale, the results showed a significant interaction between type of interview and type of observation, $F(1, 35) = 17.67, p < .001$, partial $\eta^2 = .34$, power = .98 (see Figure 4 and Table 5). Results of simple effects analyses showed that participants indicated significantly higher mental demand after active rote interviews ($M = 9.33$, $SD = 4.64$) than passive rote interviews ($M = 7.26$, $SD = 4.75$), $F(1, 70) = 6.12, p < .05$, and passive improvisational interviews ($M = 7.10$, $SD = 4.33$), $F(1, 70) = 7.12, p < .01$. The results also showed that participants indicated significantly higher mental demand after active

improvisational interviews (M = 13.28, SD = 4.27) than active rote interviews (M = 9.33, SD = 4.64), $F(1, 70) = 22.37$, $p < .001$, passive rote interviews (M = 7.26, SD = 4.75), $F(1, 70) = 51.91$, $p < .001$, and passive improvisational interviews (M = 7.10, SD = 4.33), $F(1, 70) = 54.72$, $p < .001$. There was a significant main effect for type of observation on the participants' mental demand, $F(1, 35) = 37.07$, $p < .001$, partial η^2= .51, power = 1.00. Participants indicated significantly higher mental demand after active observations (M = 11.30, SD = 4.45) than passive observations (M = 7.18, SD = 4.54). The results showed that participants indicated significantly higher mental demand after improvisational interviews (M = 10.91, SD = 4.30) than rote interviews (M = 8.29, SD = 4.69), $F(1, 35) = 15.02$, $p < .001$, partial η^2= .30, power = .97.

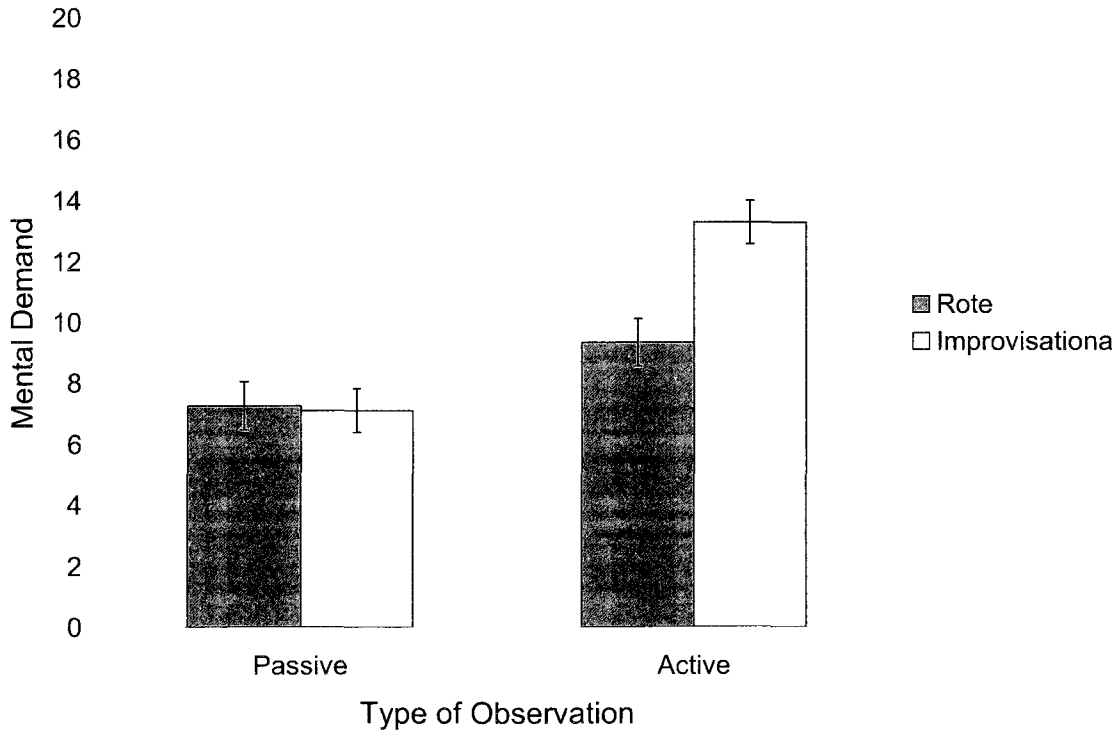

Figure 4. Mental demand scores as a function of type of observation and interview.

Table 5

Analysis of Type of Observation and Type of Interview on the Mental Demand Scores.

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	611.74	1	611.74	37.07	.00***	.51
Interview (I)	129.20	1	129.20	15.02	.00***	.30
O x I	152.11	1	152.11	17.67	.00***	.34
O x I within-group error	301.33	35	8.61			

*** $p < .001$.

The results showed a significant interaction between type of interview and type of observation on the participants' physical demand, $F(1, 35) = 8.80$, $p < .01$, partial $\eta^2 = .20$, power = .82 (see Figure 5 and Table 6). Results of simple effects analyses showed that participants indicated significantly higher physical demand after active improvisational interviews ($M = 3.48$, $SD = 4.53$) than active rote interviews ($M = 1.94$, $SD = 1.87$), $F(1, 70) = 11.55$, $p < .01$, passive rote interviews ($M = 1.52$, $SD = 1.68$), $F(1, 70) = 18.79$, $p < .001$, and passive improvisational interviews ($M = 1.31$, $SD = 1.52$), $F(1, 70) = 23.18$, $p < .001$. There was a significant main effect for type of observation on the participants' physical demand, $F(1, 35) = 13.36$, $p < .01$, partial $\eta^2 = .28$, power = .94. Participants indicated significantly higher physical demand after active observations ($M = 2.71$, $SD = 3.20$) than passive observations ($M = 1.41$, $SD = 1.60$). The results also

showed that participants indicated significantly higher mental demand after improvisational interviews ($M = 2.39$, $SD = 3.02$) than rote interviews ($M = 1.73$, $SD = 1.77$), $F(1, 35) = 5.59$, $p < .05$, partial $\eta^2 = .14$, power = .63.

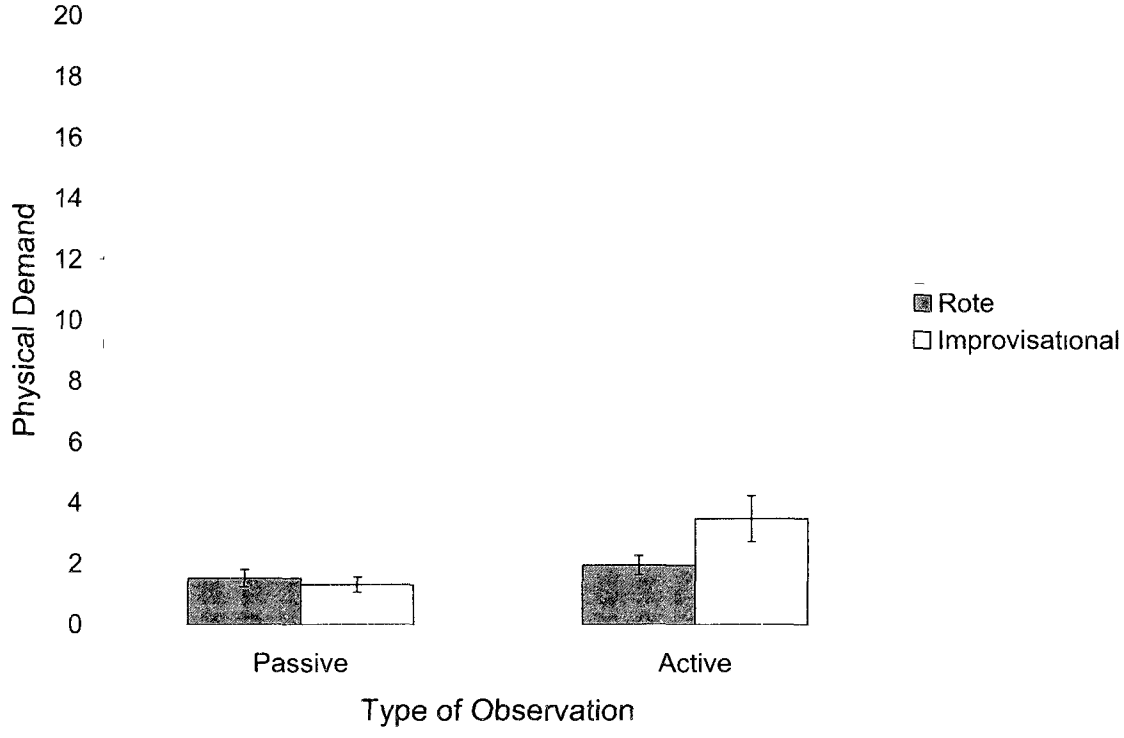

Figure 5. Physical demand scores as a function of type of observation and interview.

Table 6

Analysis of Type of Observation and Type of Interview on the Physical Demand Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	60.58	1	60.58	13.36	.00**	.28
Interview (I)	15.60	1	15.60	5.59	.02*	.14
O x I	27.56	1	27.56	8.80	.00**	.20
O x I within-group error	109.67	35	3.13			

* $p < .05$. ** $p < .01$.

Regarding the participants' temporal demand, the results showed a significant interaction between type of interview and type of observation, $F(1, 35) = 6.26, p < .05$, partial $\eta^2 = .15$, power = .68 (see Figure 6 and Table 7). Results of simple effects analyses showed that participants indicated significantly higher temporal demand after active improvisational interviews ($M = 7.74$, $SD = 5.02$) than passive rote interviews ($M = 5.64$, $SD = 5.03$), $F(1, 70) = 5.41, p < .05$, and passive improvisational interviews ($M = 4.25$, $SD = 3.49$), $F(1, 70) = 14.94, p < .001$. The results of the simple effects analyses also showed that participants indicated significantly higher temporal demand after active rote interviews ($M = 6.62$, $SD = 4.20$) than passive improvisational interviews ($M = 4.25$, $SD = 3.49$), $F(1, 70) = 6.91, p < .05$. The results showed that participants indicated significantly higher temporal demand after active observations ($M = 7.18$, $SD = 4.61$)

than passive observations ($M = 4.94$, $SD = 4.26$), $F(1, 35) = 9.05$, $p < .01$, partial $\eta^2 = .21$, power = .83. There was no significant main effect for type of interview on the participants' temporal demand ($p > .05$).

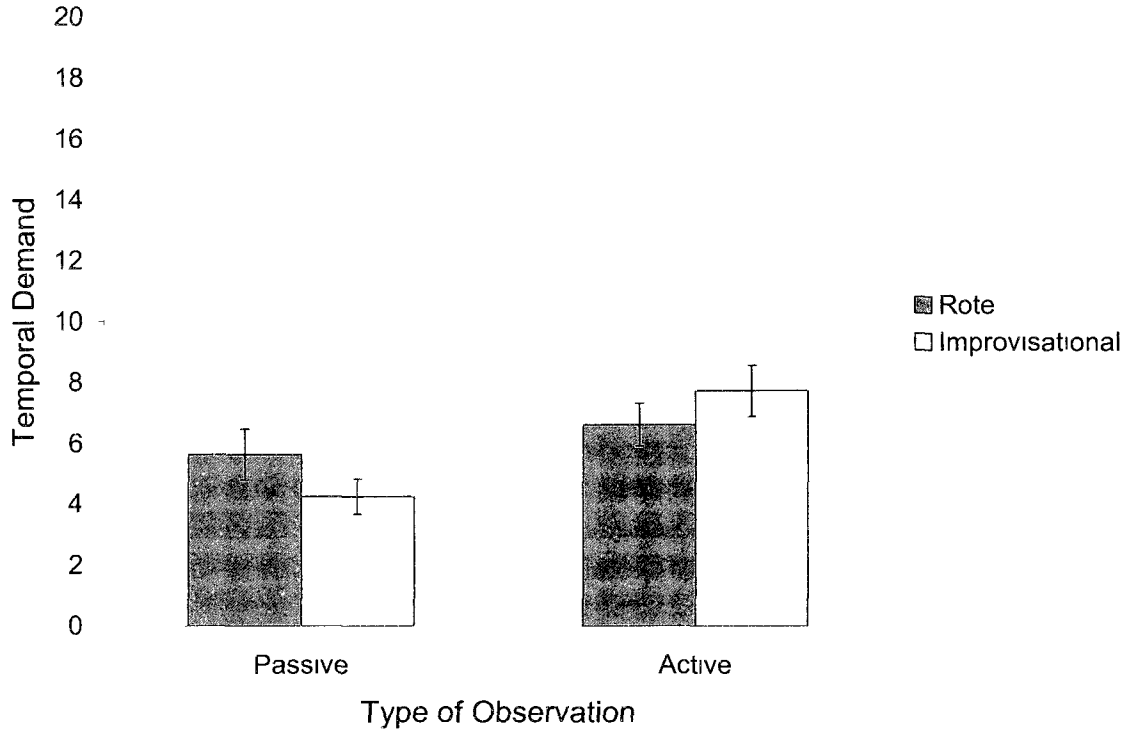

Figure 6. Temporal demand scores as a function of type of observation and interview.

Table 7

Analysis of Type of Observation and Type of Interview on the Temporal Demand Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	180.01	1	180.01	9.05	.00**	.21
Interview (I)	.67	1	.67	.07	.79	.00
O x I	56.50	1	56.50	6.26	.02*	.15
O x I within-group error	315.87	35	9.03			

* $p < .05$. ** $p < .01$.

An analysis of the effort subscale showed a significant interaction between type of interview and type of observation, $F(1, 35) = 4.28$, $p < .05$, partial $\eta^2 = .11$, power = .52 (see Figure 7 and Table 8). Results of simple effects analyses showed that participants indicated significantly higher effort after active rote interviews ($M = 9.88$, $SD = 5.17$) than passive rote interviews ($M = 6.21$, $SD = 4.38$), $F(1, 70) = 20.85$, $p < .001$, and passive improvisational interviews ($M = 5.65$, $SD = 4.29$), $F(1, 70) = 27.64$, $p < .001$. The results of the simple effects analyses also showed that participants indicated significantly higher effort after active improvisational interviews ($M = 11.82$, $SD = 4.34$) than active rote interviews ($M = 9.88$, $SD = 5.17$), $F(1, 70) = 5.81$, $p < .05$, passive rote interviews ($M = 6.21$, $SD = 4.38$), $F(1, 70) = 48.69$, $p < .001$, and passive improvisational interviews ($M = 5.65$, $SD = 4.29$), $F(1, 70) = 58.81$, $p < .001$. There was

a significant main effect for type of observation on the participants' effort, $F(1, 35) = 67.43$, $p < .001$, partial $\eta^2 = .66$, power = 1.00. Participants indicated significantly higher effort after active observations ($M = 10.85$, $SD = 4.76$) than passive observations ($M = 5.93$, $SD = 4.34$). There was no significant main effect for type of interview on the participants' effort ($p > .05$).

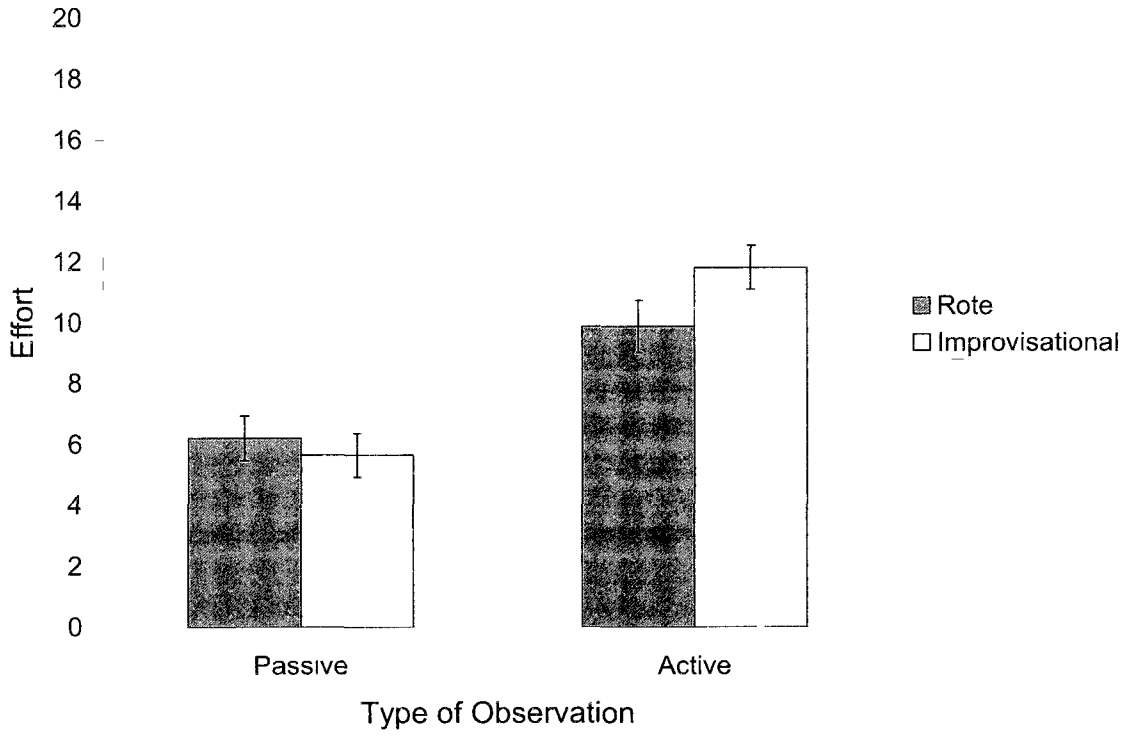

Figure 7. Effort scores as a function of type of observation and interview.

Table 8

Analysis of Type of Observation and Type of Interview on the Effort Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	871.23	1	871.23	67.43	.00***	.66
Interview (I)	17.22	1	17.22	1.66	.21	.05
O x I	56.00	1	56.00	4.28	.04*	.11
O x I within-group error	458.39	35	13.10			

* $p < .05$. *** $p < .001$.

The results showed that participants indicated lower ratings of their performance after active observations ($M = 13.55$, $SD = 3.89$) than passive observations ($M = 14.74$, $SD = 3.61$, see Table 9), $F(1, 35) = 7.43$, $p < .05$, partial $\eta^2 = .18$, power = .76. There was no significant interaction between type of interview and type of observation and no significant main effect for interview on the participants' rating of their performance ($p > .05$).

Table 9

Analysis of Type of Observation and Type of Interview on the Performance Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	50.89	1	50.89	7.43	.01*	.18
Interview (I)	14.95	1	14.95	1.80	.19	.05
O x I	16.00	1	16.00	2.59	.12	.07
O x I within-group error	219.48	35	6.19			

* $p < .05$.

Regarding the frustration subscale, the results showed a significant interaction between type of interview and type of observation, $F(1, 35) = 13.65$, $p < .01$, partial $\eta^2 = .28$, power = .95 (see Figure 8 and Table 10). Results of simple effects analyses showed that participants indicated significantly higher frustration after active improvisational interviews ($M = 9.12$, $SD = 5.46$) than active rote interviews ($M = 6.19$, $SD = 5.31$), $F(1, 70) = 10.11$, $p < .01$, passive rote interviews ($M = 5.59$, $SD = 5.37$), $F(1, 70) = 14.68$, $p < .001$, and passive improvisational interviews ($M = 5.01$, $SD = 4.71$), $F(1, 70) = 19.93$, $p < .001$. There was a significant main effect for type of observation on the participants' frustration, $F(1, 35) = 9.97$, $p < .01$, partial $\eta^2 = .22$, power = .87. Participants indicated significantly higher frustration after active observations ($M = 7.65$, $SD = 5.39$) than passive observations ($M = 5.30$, $SD = 5.04$). The results also showed that participants

indicated significantly higher frustration after improvisational interviews ($M = 7.06$, $SD = 5.09$) than rote interviews ($M = 5.89$, $SD = 5.34$), $F(1, 35) = 4.72$, $p < .05$, partial $\eta^2 = .12$, power = .56.

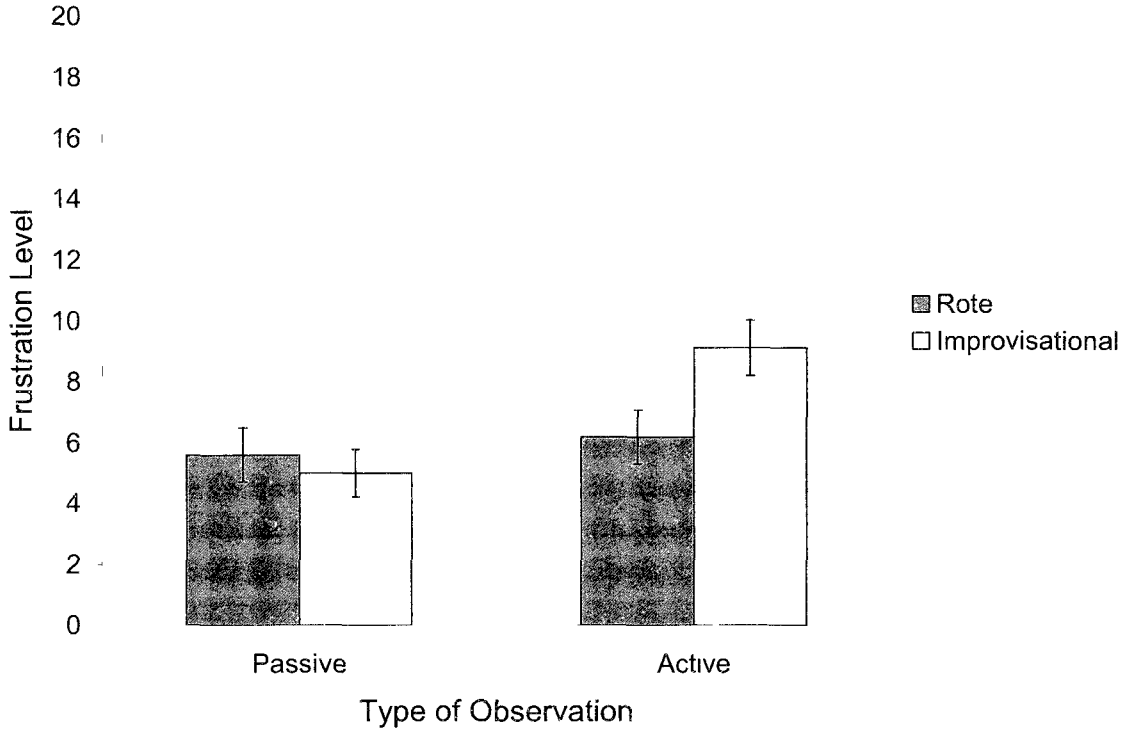

Figure 8. Frustration level scores as a function of type of observation and interview.

Table 10

Analysis of Type of Observation and Type of Interview on the Frustration Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	199.75	1	199.75	9.97	.00**	.22
Interview (I)	49.47	1	49.47	4.72	.05*	.12
O x I	110.95	1	110.95	13.65	.00**	.28
O x I within-group error	284.55	35	8.13			

* $p < .05$. ** $p < .01$.

Stress. Participants rated their subjective stress using the SSSQ after each interview. The overall stress score was generated by averaging all 24 items. A 2 type of interview (rote and improvisational) x 2 type of observation (passive and active) repeated measures ANOVA was used for the overall stress scale and the three subscales. The results showed a significant main effect for type of observation on the participants' overall subjective stress, $F(1, 35) = 24.82$, $p < .001$, partial $\eta^2 = .42$, power = 1.00 (see Table 11). Participants indicated significantly higher stress after active observations ($M = 2.46$, $SD = .31$) than passive observations ($M = 2.29$, $SD = .28$). There was no significant interaction between type of interview and type of observation and no significant main effect for interview and on participants' overall stress ($p > .05$).

Table 11

Analysis of Type of Observation and Type of Interview on the Overall Stress Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	1.02	1	1.02	24.82	.00***	.42
Interview (I)	.02	1	.02	1.12	.30	.03
O x I	.00	1	.00	.00	.97	.00
O x I within-group error	.48	35	.01			

*** $p < .001$.

A one-way repeated measures ANOVA for time was used to examine the difference between the stress scores before and after each of the four conditions: passive rote, passive improvisational, active rote and active improvisational (see Table 12). The analysis was performed on the overall stress scores and the scores for the three subscales. Pairwise comparisons were conducted using a Bonferroni correction with an adjusted alpha level of .01 for each test (.05/5). The results of the pairwise comparisons did not show a significant difference between the pre- and postsession stress scores in any of the four conditions ($p > .01$).

Table 12

Analysis of Time on the Overall Stress Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Time (T)	1.07	4	.27	9.31	.00***	.21
Error	4.01	140	.03			

*** $p < .001$.

The SSSQ contains three subscales for task engagement, distress and worry and these subscales were analyzed separately. The results showed that participants indicated significantly higher task engagement after active observations ($M = 3.84$, $SD = .66$) than passive observations ($M = 3.68$, $SD = .65$), $F(1, 35) = 10.34$, $p < .01$, partial $\eta^2 = .42$, power = .88 (see Table 13). There was no significant interaction between type of interview and type of observation and no significant main effect for interview on participants' task engagement ($p > .05$). The results also failed to show any significant difference between the pre- and postsession task engagement scores from any of the four conditions ($p > .01$, see Table 14).

Table 13

Analysis of Type of Observation and Type of Interview on the Task Engagement Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	.98	1	.98	10.34	.00**	.42
Interview (I)	.09	1	.09	1.48	.23	.04
O x I	.08	1	.08	1.32	.26	.04
O x I within-group error	2.10	35	.06			

** $p < .01$.

Table 14

Analysis of Time on the Task Engagement Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Time (T)	1.27	4	.32	.01	.01*	.09
Error	13.16	140	.09			

* $p < .05$.

The results did not show a significant interaction between type of interview and type of observation on the participants' distress and there were no significant main effects ($p > .05$, see Table 15). Results also failed to show a significant difference between the pre- and postsession distress scores from any of the four conditions ($p > .01$, see Table 16).

Table 15

Analysis of Type of Observation and Type of Interview on the Distress Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	.05	1	.05	.84	.37	.02
Interview (I)	.01	1	.01	.40	.53	.01
O x I	.04	1	.04	2.57	.12	.07
O x I within-group error	.54	35	.02			

Table 16

Analysis of Time on the Distress Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Time (T)	.11	4	.03	.62	.65	.02
Error	6.35	140	.05			

Regarding the participants' worry, the results showed a significant main effect for type of observation, $F(1, 35) = 16.18$, $p < .001$, partial $\eta^2 = .32$, power = .97 (see Table 17). Participants indicated significantly higher worry after active observations ($M = 2.23$, $SD = .82$) than passive observations ($M = 1.87$, $SD = .78$). There was no significant interaction between type of interview and type of observation and no significant main effect for interview on participants' worry ($p > .05$). Results also failed to show a significant difference between the pre- and postsession worry scores in any of the four conditions ($p > .01$, see Table 18).

Table 17

Analysis of Type of Observation and Type of Interview on the Worry Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	4.69	1	4.69	16.18	.00***	.32
Interview (I)	.02	1	.02	.13	.72	.00
O x I	.10	1	.10	.95	.34	.03
O x I within-group error	3.61	35	.10			

*** $p < .001$.

Table 18

Analysis of Time on the Worry Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Time (T)	4.91	4	1.23	6.01	.00***	.15
Error	28.61	140	.20			

*** $p < .001$.

Study 2

Similar to the first study, data were screened for outliers, unequal sample sizes and missing data. The descriptive statistics showed that there were seven outliers. All data greater than three standard deviations above or below the mean were considered statistical outliers (Tabachnick & Fidell, 2001). All outliers were replaced with a score one unit higher or lower than the next most extreme deviant score in the data set (Dixon & Yuen, 1974). The descriptive statistics showed that all the data were normally distributed after replacing the outliers (see Appendix W).

There were unequal sample sizes with nine novice and 11 expert participants. However, further analysis of the novice and experienced SPs' backgrounds showed that the classification of novice and experienced SPs was inappropriate because it was based on incomplete data available at that time. Therefore, the experience factor was dropped from the experimental design and no main effects or interactions with respect to the experience will be discussed for the following reasons. Due to delays in scheduling participants, novice SPs gained additional experience after they were selected to participate with the majority of the novice SPs participating in several different encounters and gaining significant amounts of experience. The SP educators noted that novices do not remain at that level for long. People who cannot perform well as an SP often choose to leave the program; therefore, the remaining SPs often gain experience and their skills progress quickly beyond the novice level. In as little as two or three weeks, a novice SP can portray a variety of cases and participate in a few dozen encounters.

Further, the SPs were assigned to experienced and novice groups based on partial information about their total number of encounters and their inter-rater reliability. This occurred because of an upgrade to a computer system used for tracking SP activity. The computer system also only collected data from SPs under certain conditions (e.g., completing a MIRS checklist). Consequently, the total number of encounters logged in the system is lower than the SP's actual number of encounters. After more information regarding the SPs was compiled, it became apparent that at least four experienced SPs did not meet the minimum 90% reliability to be considered experienced. Further, there was great variability among the experienced SPs' encounters (e.g., the total number of encounters completed ranged from 402 to 1728).

Thus, where possible other variables reflecting level of experience (the number of encounters completed by the SPs and the number of months in the program) were correlated with the participants' observations and assessment performance, MWL and stress. Correlations with these two measures of experience are discussed in the following sections in lieu of the experience factor in the original design.

Communication ratings. Similar to the first study, participants rated the NV communication skills of the SL after each interview. The NV communication score was generated by summing the score for each item on the abbreviated MIRS. An expert's ratings of the videos used in the passive observation condition were correlated with the participant's ratings of the same videos to determine the inter-rater reliability. The results showed that the expert's and participants' ratings were not significantly correlated, $r(40) = -.19$, ns.

The results of a 2 type of encounter (with and without improvisations) x 2 type of observation (passive and active) repeated measures ANOVA did not show a significant interaction or main effects on the participant's rating of the SL's communication ($p > .05$, see Table 19). Also, neither measure of experience was significantly correlated with participant ratings: number of encounters, $r(38) = .24$, ns; and months in the program, $r(38) = .21$, ns.

Table 19

Analysis of Type of Observation and Type of Encounter on Participants' Ratings of the Interviewer's Communication

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	56.11	1	56.11	2.68	.12	.12
Encounter (E)	30.01	1	30.01	3.25	.09	.15
O x E	35.11	1	35.11	5.68	.11	.13
O x E within-group error	229.64	19	12.09			

Nonverbal behavior query. After each interview participants indicated the NV behaviors they perceived. The proportion of NV behaviors correctly identified was calculated by the same method used in the first study. The NV behavior data were analyzed with a 2 type of encounter (with and without improvisations) x 2 type of

observation (passive and active) repeated measures ANOVA. The results for correctly identified NV behaviors did not show a significant interaction between type of observation and encounter ($p > .05$, see Table 20). However, there was a significant main effect for type of observation on the participants' ability to correctly identify NV behaviors, $F(1, 19) = 138.15$, $p < .001$, partial $\eta^2 = .88$, power = 1.00. Participants correctly identified significantly fewer NV behaviors when the behaviors occurred during an active observation ($M = .24$, $SD = .09$) than a passive observation ($M = .54$, $SD = .14$). The results also showed that participants correctly identified significantly fewer NV behaviors when the behaviors occurred during an improvisational encounter ($M = .36$, $SD = .11$) than those that occurred during an encounter without improvisations ($M = .42$, $SD = .12$), $F(1, 19) = 6.56$, $p < .05$, partial $\eta^2 = .26$, power = .68. In addition, neither measure of experience was significantly correlated with the correctly identified behaviors: number of encounters, $r(38) = .09$, ns; and months in the program, $r(38) = .09$, ns.

Table 20

Analysis of Type of Observation and Type of Encounter on the Correctly Identified Behaviors

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	1.74	1	1.74	138 15	.00***	.88
Encounter (E)	.06	1	.06	6.56	.02*	.26
O x E	.01	1	.01	.71	.41	.04
O x E within-group error	.19	19	.01			

*$p < .05$. ***$p < .001$.

Regarding the number of NV behaviors that were incorrectly identified, the ANOVA did not show a significant interaction or main effects ($p > .05$, see Table 21). Similar to the first study, all the correctly identified, missed and incorrectly identified were counted for each type of NV behavior (see Appendix X).

Table 21

Analysis of Type of Observation and Type of Encounter on the Incorrectly Identified Behaviors

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	21.01	1	21.01	3.15	.09	.14
Encounter (E)	.11	1	.11	.05	.82	.00
O x E	5.51	1	5.51	2.97	.10	.14
O x E within-group error	35.24	19	1.86			

Subjective mental workload. Participants rated their subjective MWL using the NASA TLX after each interview. Results of a 2 type of encounter (with and without improvisations) x 2 type of observation (passive and active) repeated measures ANOVA failed to show a significant interaction or main effects on participants' subjective mental workload ($p > .05$; see Table 22). With respect to experience, the number of encounters, $r(18) = -.65$, $p < .01$, $r^2 = .42$, and number of months as an SP, $r(18) = -.44$, $p < .05$, $r^2 = .19$, were both significantly and negatively correlated with the participants' overall MWL after active encounters without improvisations (see Table 23). The number of encounters was also significantly negatively correlated to the participants overall MWL after active improvisational encounters, $r(18) = -.52$, $p < .05$, $r^2 = .27$. There were no other significant correlations for overall MWL ($p > .05$).

Table 22

Analysis of Type of Observation and Type of Encounter on the Overall Mental Workload Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	680.95	1	680.95	3.38	.08	.15
Encounter (E)	37.81	1	37.81	.48	.50	.03
O x E	24.42	1	24.42	.66	.43	.03
O x E within-group error	701.97	19	36.95			

Table 23

Correlations between the Participants' Number of Encounters and Months as a Standardized Patient and Measures of Mental Workload

Variable	Encounters	Months
Encounters	__	.88**
Months	.88**	__
Overall MWL active without improvisations	-.65**	-.44*
Overall MWL active improvisational	-.52*	-.33
Overall MWL passive without improvisations	-.41	-.35
Overall MWL passive improvisational	-.25	-.13
Mental demand active without improvisations	-.36	-.21
Mental demand active improvisational	-.37	-.13
Mental demand passive without improvisations	-.33	-.32
Mental demand passive improvisational	-.33	-.19
Physical demand active without improvisations	-.30	-.12
Physical demand active improvisational	-.39	-.26
Physical demand passive without improvisations	-.36	-.29
Physical demand passive improvisational	-.20	-.06
Temporal demand active without improvisations	-.33	-.23
Temporal demand active improvisational	-.53*	-.51*

Continued

Variable	Encounters	Months
Temporal demand passive without improvisations	-.51*	-.45*
Temporal demand passive improvisational	-.33	-.29
Effort score active without improvisations	-.71**	-.50*
Effort score active improvisational	-.43	-.30
Effort score passive without improvisations	-.31	-.25
Effort score passive improvisational	-.17	-.06
Performance score active without improvisations	.14	.25
Performance score active improvisational	.08	.26
Performance score passive without improvisations	.08	.33
Performance score passive improvisational	.34	.45*
Frustration score active without improvisations	-.59**	-.55*
Frustration score active improvisational	-.23	-.18
Frustration score passive without improvisations	-.12	-.24
Frustration score passive improvisational	-.18	-.23

*$p < .05$. **$p < .01$.

Similar to the first study, the individual subscales of the NASA TLX were analyzed with a series of 2 type of encounter (with and without improvisations) x 2 type of observation (passive and active) repeated measures ANOVAs. Regarding the mental

demand subscale, the results showed a significant interaction between type of observation and type of encounter, $F(1, 19) = 13.09$, $p < .01$, partial $\eta^2 = .41$, power = .93 (see Figure 9 and Table 24). Results of simple effects analyses showed that participants indicated significantly higher mental demand after active improvisational encounters ($M = 13.08$, $SD = 3.08$) than active encounters without improvisations ($M = 9.77$, $SD = 4.90$), $F(1, 38) = 13.10$, $p < .01$, and passive improvisational encounters ($M = 11.06$, $SD = 4507$), $F(1, 38) = 4.88$, $p < .05$. The results also showed a significant main effect for type of encounter on the participants' mental demand, $F(1, 19) = 12.05$, $p < .01$, partial $\eta^2 = .39$, power = .91. Participants indicated significantly higher mental demand after improvisational encounters ($M = 12.07$, $SD = 4.70$) than encounters without improvisations ($M = 10.58$, $SD = 4.32$). There was no main effect for type of observation or any significant correlations between the mental demand scores and the participants' number of encounters or months as an SP ($p > .05$, see Table 25).

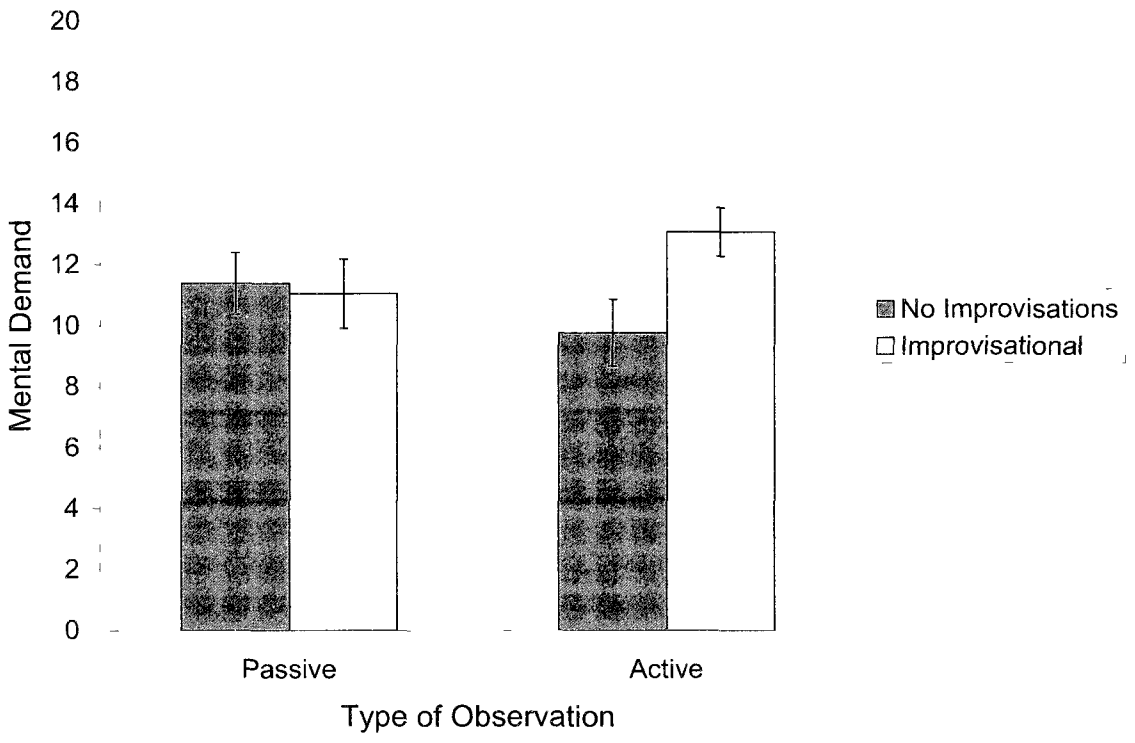

Figure 9. Mental demand scores as a function of type of observation and encounter.

Table 24

Analysis of Type of Observation and Type of Encounter on the Mental Demand Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	.80	1	.80	.06	.81	.00
Encounter (E)	44.40	1	44.40	12.05	.00**	.39
O x E	66.25	1	66.25	13.09	.00**	.41
O x E within-group error	96.19	19	5.09			

**$p < .01$.

There was no significant interaction regarding the participants' physical demand ($p > .05$. see Table 25), but there was a significant main effect for type of observation, $F(1, 19) = 15.01, p < .01$, partial $\eta^2 = .44$, power = .96. Participants indicated significantly higher physical demand after active observations ($M = 2.91$, $SD = 2.55$) than passive observations ($M = 1.57$, $SD = 1.63$). There was no significant main effect for type of encounter or any significant correlations between the physical demand scores and the participants' number of encounters or months as an SP ($p > .05$, see Table 23).

Table 25

Analysis of Type of Observation and Type of Encounter on the Physical Demand Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	36.18	1	36.18	15.01	.00**	.44
Encounter (E)	11.75	1	11.40	3.82	.07	.17
O x E	.18	1	.18	.25	.62	.01
O x E within-group error	13.63	19	.72			

**$p < .01$.

There was no significant interaction regarding temporal demand ($p > .05$. see Table 26). The results did show that participants indicated significantly higher temporal demand after active observations ($M = 9.31$, $SD = 4.72$) than passive observations ($M =$

7.33, *SD* = 4.22), $F(1, 19) = 4.96$, $p < .05$, partial $\eta^2 = .21$, power = .56. There was no significant main effect for type of encounter ($p > .05$). With respect to the correlations, the number of encounters, $r(18) = -.53$, $p < .05$, $r^2 = .28$, and number of months as an SP, $r(18) = -.51$, $p < .05$, $r^2 = .26$, were both significantly negatively correlated to the participants temporal demand after active improvisational encounters (see Table 23). The number of encounters, $r(18) = -.51$, $p < .05$, $r^2 = .26$, and number of months as an SP, $r(18) = -.45$ $p < .05$, $r^2 = .20$, were also significantly negatively correlated to the participants temporal after passive encounters without improvisations. There were no other significant correlations for temporal demand ($p > .05$).

Table 26

Analysis of Type of Observation and Type of Encounter on the Temporal Demand Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	78.41	1	78.41	4.96	.04*	.21
Encounter (E)	31.25	1	36.25	3.24	.09	.15
O x E	.00	1	.00	.00	1.00	.00
O x E within-group error	78.22	19	4.12			

*$p < .05$.

Regarding effort, there was no significant interaction or significant main effects ($p > .05$. see Table 27). The results showed that the number of encounters, $r(18) = -.71, p < .01, r^2 = .50$, and number of months as an SP, $r(18) = -.50\ p < .05, r^2 = .25$, were significantly negatively correlated with effort after active encounters without improvisations (see Table 23). There were no other significant correlations for the participants' effort ($p > .05$).

Table 27

Analysis of Type of Observation and Type of Encounter on the Effort Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	1.01	1	1.01	.06	.80	.00
Encounter (E)	.06	1	.06	.01	.93	.00
O x E	11.40	1	11.40	2.09	.17	.10
O x E within-group error	104.83	19	5.47			

The results did not show a significant interaction or main effects on the participants' performance score ($p > .05$, see Table 28). However, the number of months as an SP was significantly and positively correlated with the participants' performance score after passive improvisational encounters, $r(18) = .45, p < .05, r^2 = .20$ (see Table

23). There were no other significant correlations for the participants' performance scores ($p > .05$).

Table 28

Analysis of Type of Observation and Type of Encounter on the Performance Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	21.63	1	21.63	2.06	.17	.10
Encounter (E)	10.08	1	10.08	2.96	.10	.14
O x E	14.45	1	14.45	4.45	.05	.19
O x E within-group error	63.53	19	3.34			

Regarding the participants' frustration, the results did not show a significant interaction or significant main effects ($p > .05$, see Table 29). The results indicated the number of encounters, $r(18) = -.59$, $p < .01$, $r^2 = .35$, and number of months as an SP, $r(18) = -.55$, $p < .05$, $r^2 = .30$, were both significantly and negatively correlated with the participants' frustration after active encounters without improvisations (see Table 23). There were no other significant correlations for the participants' frustration ($p > .05$).

Table 29

Analysis of Type of Observation and Type of Encounter on the Frustration Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	6.16	1	6.16	.25	.62	.01
Encounter (E)	.14	1	.14	.02	.90	.00
O x E	18.24	1	18.24	1.86	.19	.09
O x E within-group error	186.25	19	9.80			

Stress. Participants rated their subjective stress using the SSSQ after each encounter. The overall stress score was generated by averaging all 24 items. A 2 type of encounter (with and without improvisations) x 2 type of observation (passive and active) repeated measures ANOVA was used for the overall stress scale and the three subscales. The results failed to show a significant interaction on participants' overall subjective stress ($p > .05$; see Table 30). There was a significant main effect for type of observation on the participants' overall subjective stress, $F(1, 19) = 4.50$, $p < .05$, partial $\eta^2 = .19$, power = .52. Participants indicated significantly higher overall stress after active observations ($M = 2.60$, $SD = .41$) than passive observations ($M = 2.50$, $SD = .44$). There was no significant main effect for type of encounter on the participants' overall subjective stress ($p > .05$). The correlation results showed that the number of the participants' encounters was significantly and negatively correlated with the participants'

overall stress after active improvisational encounters, $r(18) = -.46$, $p < .05$, $r^2 = .18$ (see Table 31). There were no other significant correlations for overall stress ($p > .05$).

Table 30

Analysis of Type of Observation and Type of Encounter on the Overall Stress Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	.19	1	.19	4.50	.04*	.19
Encounter (E)	.00	1	.00	.13	.72	.01
O x E	.00	1	.00	.16	.70	.01
O x E within-group error	.24	19	.24			

*$p < .05$.

Table 31

Correlations between the Participants' Number of Encounters and Months as a Standardized Patient and Measures of Stress

Variable	Encounters	Months
Overall stress presession score	-.28	-.17
Overall stress active without improvisations	-.37	-.25
Overall stress active improvisational	-.46*	-.36
Overall stress passive without improvisations	-.29	-.17
Overall stress passive improvisational	-.27	-.21
Task engagement presession score	-.04	.13
Task engagement active without improvisations	.03	.19
Task engagement active improvisational	-.13	-.01
Task engagement passive without improvisations	-.02	.15
Task engagement passive improvisational	-.22	-.02
Distress presession score	-.01	.19
Distress active without improvisations	-.29	-.28
Distress active improvisational	-.13	-.09
Distress passive without improvisations	-.09	-.04
Distress passive improvisational	-.17	-.22
Worry presession score	-.31	-.27

(Continued)

Variable	Encounters	Months
Worry active without improvisations	-.35	-.27
Worry active improvisational	-.45*	-.35
Worry passive without improvisations	-.30	-.21
Worry passive improvisational	-.16	-.14

*$p < .05$.

A one-way repeated measures ANOVA for time (presession score, passive with no improvisations, passive improvisational, active with no improvisations and active improvisational) was used to show the difference between the presession stress scores and the stress scores obtained after each of the four conditions. This analysis was used for the overall stress score and the scores for the three subscales. The results showed no significant main effect for time on the participants' overall stress score ($p > .05$, see Table 32).

Table 32

Analysis of Time on the Overall Stress Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Time (T)	.23	2.02	.11	1.58	.22	.08
Error	2.70	38.41	.07			

Similar to the first study, each of the three SSSQ subscales for task engagement, distress and worry were analyzed separately. The results did not show a significant interaction on participants' task engagement ($p > .05$; see Table 33). There was a significant main effect for type of observation on the participants' task engagement, $F(1, 19) = 5.85$, $p < .05$, partial $\eta^2 = .24$, power = .63. Participants indicated significantly higher task engagement after active observations ($M = 4.13$, $SD = .43$) than passive observations ($M = 4.01$, $SD = .43$). There was no significant main effect for type of encounter on the participants' task engagement or any significant correlations between the task engagement scores and the participants' number of encounters or months as an SP ($p > .05$, see Table 31). There was also no significant difference between the presession score for task engagement and the scores for each of the four conditions ($p > .05$, see Table 34).

Table 33

Analysis of Type of Observation and Type of Encounter on the Task Engagement Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	.31	1	.31	5.85	.03*	.24
Encounter (E)	.08	1	.08	1.12	.30	.06
O x E	.15	1	.15	2.86	.11	.13
O x E within-group error	1.02	19	.05			

*$p < .05$.

Table 34

Analysis of Time on the Task Engagement Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Time (T)	.57	2.58	.22	2.47	.08	.12
Error	4.37	49.09	.09			

The results failed to show a significant interaction or main effects on participants' distress ($p > .05$; see Table 35). There was also no significant difference between the

presession score for distress and the scores for each of the four conditions (see Table 36) and there were no significant correlations between the distress scores and the participants' number of encounters or months as an SP ($p > .05$, see Table 31).

Table 35

Analysis of Type of Observation and Type of Encounter on the Distress Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	.03	1	.03	.36	.56	.02
Encounter (E)	.01	1	.01	.22	.64	.01
O x E	.02	1	.02	.08	.52	.02
O x E within-group error	.66	19	.04			

Table 36

Analysis of Time on the Distress Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Time (T)	.40	2.54	.16	1.75	.18	.08
Error	4.33	48.30	.09			

Last, the results failed to show a significant interaction or main effects on participants' worry ($p > .05$; see Table 37). There was also no significant difference between the presession score for worry and the scores for each of the four conditions ($p > .05$, see Table 38). The number of encounters was significantly and negatively correlated with the participants' worry after active improvisational encounters, $r(18) = -.45$, $p < .05$, $r^2 = .20$; yet, there were no other significant correlations for the worry scores ($p > .05$, see Table 31).

Table 37

Analysis of Type of Observation and Type of Encounter on the Worry Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Observation (O)	.45	1	.45	3.51	.08	.16
Encounter (E)	.05	1	.05	.59	.45	.03
O x E	.08	1	.08	.65	.43	.03
O x E within-group error	2.29	19	.12			

Table 38

Analysis of Time on the Worry Scores

Source	*SS*	*df*	*MS*	*F*	*p*	partial η^2
Within subjects						
Time (T)	1.22	2.53	.48	2.83	.08	.12
Error	9.32	48.07	.19			

DISCUSSION

The present study was designed to better understand how timesharing multiple communication tasks and the act of improvisation affect SP's perceptions and assessments of a learner's NV communication as well as the SP's subjective experience of MWL and stress. The results of the two studies will be discussed individually followed by a discussion of the similarities and differences between the two.

Study 1

Type of Observation and Interview on the Assessment and Observation Performance. It was predicted that participants would provide the least accurate ratings of the interviewer's communication skills and observe the fewest NV behaviors after active observations and more so in the improvisational condition. These predictions are based on the MRT (Wickens, 1984, 2002) and Baddeley's (1986, 1990) WM model which suggest that people have limited attentional resources that can be divided among multiple tasks. Likewise, Patterson's (1995, 2006) theory states that there are limited cognitive resources that can be divided among encoding and decoding NV communication. This suggests that the need to portray and observe simultaneously may require additional resources beyond those needed for observing alone, resulting in fewer detected NV behaviors and less accurate ratings. Regarding improvisations, Baddeley's (1986, 1990) WM model and Wickens' (1984, 2002) MRT suggest that participants would have fewer spare attentional resources during improvisational interviews because their attention would be divided among improvising and observing the interviewer. The act of improvising may draw a person's attention inward to generate a response so they are less able to focus externally on the interviewer's communications skills because they

have fewer spare resources to devote to observing the interviewer. Thus, the combination of active observing and the need to improvise responses was expected to place the highest level of demands on attention and produce the poorest observing performance and least accurate ratings.

The results, however, did not produce a significant interaction between type of observation and type of interview on the NV behaviors detected or the interviewer ratings. Although the interactions did not reach significance, the data showed the predicted trends. The absence of an interaction may be due to the participants' ability to task switch effectively (Monsell, 2003; Rubinstein, Meyer & Evans, 2001). The interviewer noted that the participants would often look away when improvising and then look back when responding. This may indicate that participants routinely switched between improvising a response and observing the interviewer. Therefore, it is possible that the act of improvising may have distracted participants from observing the interviewer; however, the distraction was brief enough that they could quickly return to observing the interviewer.

Type of Observation and Assessment and Observation Performance. Although there were no interactions, there were main effects for type of observation and type of interview. Consistent with expectations, participants were significantly less accurate in their ratings of the interviewer's communication skills and they observed fewer NV behaviors after active observations. During active observations participants identified noticeable and recurring NV behaviors such as nodding the head, sitting up straight and moving their hands. However, during passive observations, participants were able to correctly identify more behaviors including those detected during active interviews plus

less conspicuous behaviors such as tapping a pen and shaking a foot. Despite the improvement in detections in the passive condition, participants often missed subtle facial expressions such as eye squinting and excessive eye blinking. Several participants said it was difficult to clearly see the interviewer's eyes and some facial behaviors on the video tape.

An unexpected finding emerged when falsely observed NV behaviors were analyzed; that is, participants falsely observed more NV behaviors during the passive rather than active condition. The most common falsely observed behaviors were of the interviewer crossing their legs, turning their head away, frowning leaning back and not making eye contact. Interestingly some of these falsely observed behaviors could indicate poor communication skills such as a lack or eye contact and turning their head away. The greater number of falsely observed behaviors during passive observations may be a sign of the participants' overconfidence in their ability to detect the interviewer's behaviors. Many participants said that they found watching the video to be easy and they may have mistakenly indicated more behaviors than they observed. Some participants also said that they were motivated to observe the most behaviors possible; yet, it may have been difficult for them to remember all the behaviors accurately. Further, the participants may have been more liberal when indicating all possible NV behaviors because there was no penalty for identifying more than actually occurred.

Improvisations and Assessment and Observation Performance. Data supported the predictions that participants would provide less accurate ratings of the interviewer's communication skills and observe fewer NV behaviors during interviews with improvisations. The results showed that improvisations negatively affected the

participants' ability to rate the interviewer's communication skills and observe NV behaviors. Patterns emerged from the NV behavior query that showed participants often missed all or almost every NV behavior occurring during improvisations including more noticeable behaviors such as crossing the arms and leaning forward.

Research concerning working memory (Baddeley & Hitch, 1974) may also explain the negative influence of improvisations on the participants' ability to observe and assess the interviewer. Specifically, retrieving information from LTM requires few WM resources (Baddeley, 2002). By contrast, improvising responses is a more challenging cognitive task that requires more WM resources and places more demands on the CE system. There is considerably more research concerning the phonological loop component of WM and less is understood about the specific functions of the CE. Yet, past research suggests that role of the CE is to incorporate information from the current situation with information stored in LTM and to process novel stimuli through controlled processing (Baddeley, 2002). Thus, in the improvisational condition, the participants had to generate a response and evaluate whether it was a plausible response for the character. The improvisation process is demanding for the CE because it is burdened with responding to a novel situation and relying on limited resources to create a response. Therefore, the participants were less accurate in their ratings and perceived fewer behaviors during improvisational interviews.

Analysis of the falsely observed NV behaviors, on the other hand, showed that participants reported more falsely observed NV behaviors after rote interviews. These results may be explained by the fact the several participants indicated after the experiment that they felt very confident in their ability to observe the interviewer because

there were less attentional demands during rote interviews. They also indicated that they felt they should have noticed more behaviors during the rote interviews because they were not distracted by portraying the character.

Comparing Participants' and an Expert's Ratings. The participants' ratings of the interviewer's communication skills were correlated with an expert's ratings to determine the level of agreement. Only the ratings of the passive observations were compared because both the participants and the expert watched the same video taped interviews. The active observations were not compared because the participants' experience of being interviewed was different from the expert's experience while passively watching a video tape of the same interview.

The results indicated that there was little agreement between the participants and the expert; therefore, the participants were less effective assessors than the expert rater. There are a few explanations for the discrepancy between the participants' and the expert's ratings. First, the participants had minimal training with the rating scale which may explain the lack of agreement. Second, several participants told the experimenter that they were reticent to rate the interviewer negatively. Third, only eight of the participants had extensive experience providing constructive criticism or performance related feedback; therefore, the majority of the participants were inexperienced rating someone else.

The Influence of Type of Observation and Interview on Mental Workload. The results supported the hypothesis that participants would experience the highest subjective MWL during active improvisational interviews because they were timesharing observation and portrayal tasks with the additional improvisational task (Wickens, 1984,

2008). Participants' overall MWL score and all the scores on the subscales except the performance subscale indicated that participants reported the highest subjective MWL after active improvisational interviews. This is consistent with research suggesting people possess limited attentional resources and often experience greater MWL when task demands exceed available resources (O'Donnell & Eggemeier, 1986; Wickens, 1984, 2008). These findings suggest that participants may judge timesharing the portrayal and observation tasks to be more demanding particularly during improvisational interviews because the act of improvising imposed higher mental demands on cognitive resources than providing rote responses (O'Donnell & Eggemeier, 1986; Wickens, 1984; 2008).

One exception to this pattern of results was observed on the performance subscale. Upon closer examination of the scores for performance, it appeared that almost every participant misunderstood the instructions for the performance subscale. The scores for all other subscales were consistent with each other except for the performance subscale which was often on the opposite end of the spectrum of the other subscales. The participants indicated that they thought that the purpose of this subscale was to determine how well they performed rather than the level of task demands needed to achieve their level of performance. Further, some participants told the experimenter that they believed their performance was better when their MWL was lower and that their scores on the questionnaire reflected this belief. One participant said she was confused by the performance question because, "I thought it was asking me how well I did and when I was overwhelmed and my workload was high my performance would obviously be lower". Therefore, for those participants who misunderstood the subscale, a low rating on the performance subscale would indicate that they felt their performance suffered because

the task was demanding.

Given the nature of the task, it is not surprising that participants indicated higher demand on subscales like physical and temporal demand and frustration. Particularly in the active improvisational condition, participants likely experienced higher physical demands because they portrayed a character through verbal responses and NV behaviors. The participants may have experienced higher temporal demands because the pace of the interview required them to respond quickly even when improvising responses. This may have resulted in the participants experiencing frustration because they were required to recall and produce memorized and improvised responses on the spot.

Type of Observation and Mental Workload. As predicted, a main effect for type of observation was obtained. The participants' overall MWL score and all the scores on the subscales except the performance subscale reflected higher subjective MWL after active observations. This finding suggests that participants experienced higher task demands when required to multitask (O'Donnell & Eggemeier, 1986). However, participants indicated lower ratings on the performance subscale after active observations. Again, most participants misunderstood the purpose of the performance subscale; therefore, a low rating on the performance subscale may reflect the participants' belief that their performance suffered because of high task demands.

Improvisations and Mental Workload. The data partially supported the prediction that participants would report higher MWL after improvisational interviews. Improvisations had no effect on the participants' overall MWL; however, participants did indicate greater mental demand, physical demand, and frustration after improvisational interviews, which is consistent with the idea that improvisations would be more

demanding. However, improvisations did not have a significant effect on the participants' temporal demand, effort, and their ratings of their performance. The results did show the predicted trend; that is both temporal demand and effort were the highest after active improvisational interviews. This likely reflects that participants experienced the highest demand when they improvised during the active observation. Also, participants observing the videos would be unable to tell which interview contained improvisations so their workload scores would be low in both passive conditions. Again, the results regarding the performance subscale may be explained by the fact that most participants misunderstood the purpose of the performance subscale.

The Influence of Type of Observation and Interview on Stress. Participants were expected to experience the highest levels of subjective stress during active observation improvisational interviews because they were timesharing observation and portrayal tasks with the additional improvisational task. It was expected that participants would perceive improvising responses as a more demanding task than producing rote responses. This is consistent with the transactional model of stress (Matthews, 2001) suggesting that that people experience stress when they appraise the task to demand more cognitive resources than are available.

The results did not support this hypothesis. It appears that improvisations during active observations had little influence on the participants' stress compared to the other conditions. It is possible that the participants did not experience more stress during the active improvisational interviews because the participants knew that this was not an actual job interview so they did not experience a significant amount of stress overall. Therefore, during the active improvisational interview, the participants may have been

less stressed about the interviewer's evaluation of them.

The participants did not show significant distress after the active improvisational interviews and their distress was relatively low throughout the experiment. Recall that the distress subscale measures one's emotional response, specifically their level of tension, perceived lack of control and confidence. The low ratings on the distress subscale indicate that the participants did not experience tension or low confidence during any of the interviews. This is not surprising given that the goal of the interviews was not to produce these negative feelings. Therefore, the data indicate that the experimental tasks were not judged to be distressing.

Additional analyses were conducted to determine if the type of observation and type of interview had an influence on the participants' stress compared to the stress they experienced prior to beginning the experiment. The data indicated that there was no difference between the participants' stress measured before the experiment compared to their stress after any of the experimental conditions. This suggests that the participants did not judge any of the experimental manipulations to cause more stress than that experienced prior to the experiment. This may have occurred because the participants were aware of the task demands before the experiment began given that they received materials to study and memorize ahead of time.

Type of Observation and Stress. As predicted, participants judged the active observation conditions to be more stressful and they reported feeling greater task engagement and worry after active observations. This finding supports the transactional theory of stress (Matthews, 2001) and suggests the participants judged timesharing the portrayal and assessment tasks to require more resources than they had available.

Therefore, the participants appraised timesharing these tasks as more stressful than performing the observation task alone.

Improvisations and Stress. The results failed to support the hypothesis that participants would indicate higher levels of stress after improvisational interviews. The participants' stress did not vary as a function of improvisations. This finding suggests that the participants felt that they were able to meet the task demands associated with improvising (Matthews, 2001).

Summary of findings from study 1. The results from the first study showed that undergraduate participants were less observant and less accurate in their ratings when multitasking and also when improvising. This is consistent with past research in WM (Baddeley, 1986, 1990) and the MRT (Wickens, 1984, 2002) that suggests people have limited attentional resources to devote to observing another person when they are focused on internally on improvising and also when having to timeshare two or more tasks. The results also demonstrated that participants experienced increased MWL when multitasking, particularly while improvising. However, participants only experienced higher levels of stress when they timeshared the portrayal and assessment tasks.

Study 2

The purpose of the second study was to investigate the effect of experience, timesharing multiple communication tasks, and the act of improvising on SPs' abilities to perceive NV information and rate an interviewer's communication skills and also obtain measures of their subjective MWL and stress. It was important to investigate if experienced SPs, those who have extensive training in assessment, are able to effectively timeshare the portrayal and assessment tasks, especially during periods of improvisations.

As noted earlier, many SPs were inappropriately classified as novice or experienced; therefore, correlations with the number of encounters completed by the SPs and the number of months in the program were performed in lieu of the experience factor in the original design. None of the correlations with the ratings or observed NV behaviors were significant, so only results for MWL and stress are discussed below.

Type of Observation and Encounter on the Assessment and Observation Performance. It was hypothesized that participants would produce the poorest observing performance and least accurate ratings after active observations and more so in the improvisational condition. These predictions are based on Patterson's (1995, 2006) theory that states there are limited cognitive resources that can be divided among encoding and decoding NV communication. Similarly, the MRT (Wickens, 1984, 2002) and Baddeley's (1986, 1990) WM model suggest that people have limited attentional resources that can be divided among multiple tasks. In an SP encounter, it is likely that the attentional resources needed to observe another's NV behaviors are the same as those needed to select and portray the most appropriate behavior for the patient case. Therefore, participants would detect fewer NV behaviors and provide less accurate ratings during active observations because they would be timesharing the portrayal and observation tasks. Further, both Baddeley's (1986, 1990) WM model and Wickens' (1984, 2002) MRT suggest the participants' attention would be divided among generating a response and observing the learner during improvisational encounters.

The results did not reveal a significant interaction between type of observation and encounter for either the assessment or observation data. These interactions may not have reached significance because of the small sample available for the second study as

evidenced by the lack of observed power for the interactions. The small sample size may account for the lack of significance particularly because the results showed the predicted trend. Participants correctly identified the fewest NV behaviors after active improvisational encounters and they missed nearly every behavior that occurred while they improvised a response, including conspicuous behaviors such as crossing of the arms.

However, the data for the assessment task did not show the predicted trend. Again, this suggests that the participants may have employed a task switching strategy rather than dividing their attention (Monsell, 2003; Rubinstein, Meyer & Evans, 2001). One participant indicated that she routinely switches between the tasks of observing the learner and portraying the case. She mentioned that she "mentally flags" different points throughout the encounter that specifically relate to a MIRS item. She said that she quickly diverts her attention inward to make "mental notes" and then switches her attention back to the learner.

It also appears that improvisations had little effect on the participants' performance, particularly their ability to assess the SL. One explanation for the absence of these effects is that improvisations did not have a strong negative affect on the SPs ability to assess the learner. Based on Baddeley's (1986, 1990) WM model, it may be possible that SPs have sufficient information stored in their LTM so they can rely on this when improvising. Therefore, they would place fewer demands on the CE. Specifically, the CE would not be tasked with creating a response by integrating information from the current situation with information in stored in LTM. Instead, the SPs would draw information directly from LTM without the need for controlled processing. The same SP

said that improvisations have little influence on her ability to observe the learner because she also switches between response generating and observing tasks. When asked an unanticipated question, she focuses on creating a response, checks this response against the case details to ensure that it is plausible, and then quickly focuses her attention on the learner. She indicated that she often relies on general responses that are "safe to say" during many encounters; therefore, she relies on her past experiences when confronted with an "out-of-the-box" question.

Type of Observation and Assessment and Observation Performance. As predicted, the participants observed fewer of the SL's NV behaviors during active observations. This is consistent with the MRT (Wickens, 1984, 2002), Patterson's (1995, 2006) and Baddeley's (1986, 1990) WM model, both of which suggest that there are limited cognitive resources to divide among portrayal and assessment tasks. The most commonly missed behaviors during active observations included shaking of the foot and excessive eye blinking. Overall, participants missed a significant number of behaviors during active observations across all different categories but particularly subtle eye expressions such as excessive eye blinking and raising eyebrows.

Inconsistent with the hypotheses, the results did not indicate that participants provided less accurate ratings after active observations. This may be due to the ability of the participants to task switch between the assessment and portrayal tasks (Monsell, 2003; Rubinstein, et al., 2001). As mentioned earlier, one SP described her ability to "mentally flag" specific interactions that were relevant to rate the learner's communication skills. This SP indicated that she quickly made mental notes and then focused her attention back on the learner. This task switching behavior was mentioned by

several of the SPs.

Improvisations and Assessment and Observation Performance. The results partially support the hypothesis that participants would provide less accurate ratings and observe fewer NV behaviors after improvisational encounters. The results showed that participants observed fewer behaviors during improvisational interviews including the SL crossing his arms and rubbing his mouth. Yet, improvisations had no influence on the participants' ability to rate the SL. This suggests that improvising may have distracted participants from observing NV behaviors, but did not have a negative effect on their ability to rate the SL. These findings may indicate that improvising did not significantly strain CE resources because the participants had previous experience with improvisations (Baddeley, 1986, 1990). Participants may also have been able to task switch between improvising and observing the learner during improvisational encounters (Monsell, 2003; Rubinstein, et al., 2001).

Similar to the first study, additional analyses were conducted on the falsely observed NV behaviors. The results indicated that there was no influence of the type of observation or type of encounter on the number of falsely observed behaviors. The participants most commonly falsely observed the SL lean back and speak softly.

Comparing Participants' and an Expert's Ratings. Similar to the first study, the participants' ratings of the SL's communication skills were compared to an expert's ratings. Again, only the ratings of the passive observations were compared. The results indicated that there was little agreement between the participants' and the expert's ratings. There are a few explanations for the discrepancy between the SPs and the expert rater. One possibility is that the MIRS items are designed for encounters lasting

approximately 15 to 20 minutes. However, the encounters in the experiment lasted approximately two to eight minutes which significantly reduced the amount of time for the SPs to observe the SL. Also, some participants said they found it difficult to rate the SL using the MIRS because the SL's responses were scripted. The expert rater indicated that this would seem abnormal to the SPs, especially when the SL would be unable to ask follow up questions or respond to the SP's questions. From the SP's perspective, the SL would need remediation because he was not engaging with the SP. Further, because the SL followed a script, the SL's communication skills could be considered either very good or very poor depending on the context. For example, when considering the second item of the MIRS, verbal facilitation skills and encouragement, the SL's responses and questions could be considered poor if the SP provided an opportunity for the SL to elicit more information by saying something like, "Well I do have other health issues that could be causing my sore throat." In this situation the SL was unable to elicit more information because he had to follow the script and he would receive a poor rating. These reasons may explain the lack of agreement between the SPs' and the expert's ratings.

Type of Observation and Encounter on Mental Workload. The results partially supported the hypothesis that participants would experience the highest MWL during active improvisational encounters because they would be timesharing the observation and portrayal tasks with the additional demand of improvising (Baddeley, 1986, 1990; Wickens, 1984, 2008). Participants indicated higher mental demand after active encounters with the highest level of mental demand after active improvisational encounters. The results suggest that improvising while timesharing the portrayal and assessment tasks required a great amount of mental effort. It is also possible that these

tasks demanded similar cognitive resources and this resulted in experiencing higher mental demands (Wickens, 1984, 2008; O'Donnell & Eggemeier, 1986). The results of the overall MWL score and the scores on all other subscales did not show a significant interaction between type of observation and encounter; although, the subscales for overall MWL and temporal demand did reflect the predicted trend. Again, the absence of expected effects may be explained by the small sample of participants for the second study as evidenced by a lack of statistical power.

The results of the correlations between the number of encounters and the number of months as an SP indicated that the experience of the SP was related to their subjective MWL. Participants with greater experience as an SP reported less overall MWL and temporal demand during active improvisational encounters. More experienced participants also reported lower overall MWL, effort and frustration after active encounters without improvisations. This is consistent with research concerning skill acquisition (Fitts. 1964) and automaticity (Schneider & Shiffrin, 1977) suggesting that as people continue practicing a task, skills can become more automatic enabling them to perform the task more easily and without draining limited cognitive resources.

The results of the correlations for the performance subscale indicate a different trend. Participants with greater experience indicated higher ratings on the performance subscale after passive improvisational encounters. Again, it appears that the SP participants misinterpreted the performance subscale the same way the undergraduates did in the first study. This is supported by comments offered by some participants after the experiment. They believed the performance subscale measured how *well* they performed rather than the workload *required* to perform. Therefore, it may be beneficial

to reword the performance item on the NASA TLX to say the following: How much workload was required to achieve and maintain your level of performance on the task?

Type of Observation and Mental Workload. The results partially supported the hypothesis that participants would experience greater MWL during active observations. As predicted, participants experienced greater physical and temporal demand after active observations. This is not surprising given the nature of the active observation conditions. Several SPs said that portraying a patient can be physically draining and they often feel pressure to respond quickly. However, the type of observation had little influence on the participants' overall MWL, mental demand, effort, frustration or their ratings on the performance subscale. The absence of these effects may be due to the participants having practiced multitasking the portrayal and assessment tasks.

Improvisations and Mental Workload. The results partially supported the hypothesis that participants would experience greater MWL after improvisational encounters. As predicted, participants experienced higher mental demand after improvisational interviews. However, improvisations had little or no effect on the participants' overall MWL and all the subscales except for mental demand, although the results showed the expected trend for temporal demand. There are a few possible explanations for these findings. As mentioned earlier, all SPs are trained to respond to unanticipated questions. Also, participants observe someone else improvising only during passive observations; therefore, the improvisations are only expected to be demanding during active improvisational encounters.

Type of Observation and Encounter on Stress. The results did not support the hypothesis that participants would experience the highest stress during active

observations particularly during improvisational encounters. This suggests that the participants did not judge the task demands to exceed their available resources when required to multitask while improvising (Matthews, 2001). After completing the study, the experimenter asked the participants if the experimental manipulations caused them to experience stress. Several experienced participants said they did not judge the encounters to be stressful. Only those participants with less than one year of experience found the active observations to be stressful particularly after active improvisational conditions. This may suggest that only very inexperienced SPs consider the need to improvise stressful. Also, the participants indicated that they did not experience a great amount of stress while watching the videotaped encounters. It is also possible that all participants did not experience a high level of stress because they were not required to provide feedback to the SL after the encounters.

The results of the correlations between the number of encounters performed and the number of months in the SP program did indicate that the experience of the SP was negatively related to their subjective stress. Participants with greater experience reported less overall stress and worry during active improvisational encounters. Again this is consistent with research concerning skill acquisition (Fitts, 1964) and automaticity (Schneider & Shiffrin, 1977) that would suggest that participants with more experience would perform the tasks with fewer demands on their cognitive resources. Therefore, those with more experience would not experience high levels of stress because their evaluation of the task demands would be within the limits of their available resources (Matthews, 2001).

Further, the participants did not judge their stress to be significantly different

during any of the experimental conditions compared to their stress at the beginning the experiment. One possible explanation for this lack of difference between the stress score prior to the experiment and the score after each encounter was that the participants were already prepared for portraying another person and had spent considerable time memorizing case details. Therefore, their stress state prior to the experiment may have been affected by their expectations of the experimental tasks. Also, the participants' distress was relatively low for the each condition which may reflect that the participants did not experience high levels of tension throughout the study.

Type of Observation on Stress. As predicted, participants experienced higher overall stress and task engagement during active observations. This is consistent with research that suggests timesharing multiple tasks would be judged as more stressful than performing only the observation task.

Type of Encounter on Stress. Inconsistent with the hypotheses, the results showed that the participants' stress did not vary as a function of improvisations. Again, the majority of participants indicated that they did not experience increased stress during improvisational encounters because they felt they were experienced in handling unexpected questions.

Summary of findings from study 2. The results from the second study demonstrated that the SP participants were less observant of the SL when they were required to improvise and also when they had to multitask portraying the patient and assessing the learner. However, the SP participants' ratings of the SL's communication skills were unaffected by the experimental manipulations. Yet, there was little agreement between the participants assessments and the expert's. The results regarding MWL were

mixed, but overall, the SP participants exhibited higher mental demand when they had to improvise while timesharing the portrayal and assessment tasks. The SP participants only experienced high overall stress and task engagement when required to multitask.

Comparison of Studies

Assessment Performance. In the first study, undergraduates demonstrated poorer assessments after both active observations and improvisational encounters; yet, these results were not found for the second study. Improvisations seemed to have little effect on the assessment performance for the participants in the second study. This may have occurred because all SPs receive training to handle unexpected questions. This suggests that SPs acquire experience in improvising so that they can rely on this information stored in their LTM with minimal impact on the CE resources necessary to generate a response on the spot. All SPs also have experience managing the portrayal and assessment tasks concurrently.

Observation Performance. In both studies, the participants' ability to detect NV behaviors suffered during both active observations and improvisational encounters. These findings demonstrate that the attentional demands of portraying and assessing negatively affect the ability to observe another person's NV cues for both inexperienced undergraduates and SPs.

The analysis of the falsely observed behaviors indicated that undergraduate participants falsely observed more behaviors during both passive observations and improvisational interviews. The results of the second study showed a similar trend for passive observations although there were no significant findings. On average, SPs falsely observed more behaviors after passive observations. There was a very small sample for

the second study and this may have resulted in a lack of significant difference for type of observation on the falsely observed behaviors. This may have occurred because of a lack of statistical power as evidenced by the data. Again, improvisations had little effect on the SP's falsely observed behaviors. These findings support comments that some participants made suggesting they were likely to falsely observe behaviors only when performing the observation task because they are driven to be more liberal in indicating all possible NV behaviors. This may also be an artifact due to participants knowing that they were participating in an experiment. Also, the participants in the second study often said that they felt motivated to perform well in the experiment.

Comparing Participants' and an Expert's Ratings. The results of both studies indicated little agreement between an expert rater and the participant's ratings of the interviewer's communication skills. It was expected that undergraduates and novice SPs would provide inaccurate ratings. Surprisingly, the same trend was found for all SPs. Again, further analysis of the SPs indicated that some of these participants did not meet all the criteria to be considered experienced and this may explain the discrepancy. These findings indicate that achieving high reliability in the ability to rate others is difficult and likely requires substantial practice.

Mental Workload. There were some discrepancies between the two studies regarding MWL. The results of the first study indicated significant interactions between type of observation and interview so that active improvisational interviews resulted in higher overall MWL, mental, physical demand and temporal demand, effort and frustration, but only one significant interaction, for mental demand, was found in the second study. Unlike the first study, there was not a significant increase in overall MWL,

mental demand, effort and frustration after active observations in the second study. Also, participants in the second study did not experience higher physical demands and frustration during improvisations. Participants in the first study indicated lower scores on the performance subscale after active observations, but these results were not found in the second study. One possible explanation for the divergent findings between the studies may be due to limitations of the NASA TLX. A common criticism of the instrument is that people may not use the full range of the scale or they may indicate a level of workload based on personnel past experiences (Hart, 2006). Therefore, the SP population may have used the instrument differently than the undergraduate students.

There were also some similarities for the MWL results between the two studies. Participants in both studies indicated the highest mental demand after active improvisational encounters. The results of both studies also indicated an increase in physical and temporal demand after active observations. Further, participants in both studies indicated an increase in mental demand after improvisational interviews. Both studies showed no significant effect of improvisations on overall MWL, temporal demand, effort and performance. Overall, the comparison of the MWL results indicates that the undergraduates were more susceptible to timesharing tasks and improvising. Yet, SPs did experience higher mental demand when timesharing the portrayal and assessment tasks.

Stress. It was important to measure subjective stress to determine if SPs experienced greater stress when multitasking the portrayal and assessment activities particularly when improvising. The results for stress data were similar in the first and second studies. In both studies participants experienced higher overall stress and task

engagement after active observations, although participants in the second study did not experience higher worry after active observations. Participants also experienced relatively low distress. There was also no difference in the participants' stress prior to the experiment when compared to their stress after any of the experimental manipulations. Again, the participants were aware of the experimental task demands before they began the experiment so it is unlikely that their stress before the experiment would differ from their stress during the study.

Theoretical Implications

The results of the first study have theoretical implications for understanding the cognitive resources needed to simultaneously produce and interpret NV communication. Specifically, the MRT (Wickens, 1984, 2002) and the multicomponent WM model (Baddeley & Hitch, 1974) provide a theoretical basis to understand how the need to portray and observe as well as the need to improvise responses may exceed one's limited attentional resources and negatively impact the ability to observe another's NV communication behaviors.

The results indicated that multitasking the production and interpretation of NV communication can impair one's ability to observe and assess another's communication behaviors and can also result in increased MWL and stress. These findings support the PPM (Patterson, 1995, 2006) that predicts people have limited cognitive resources to devote to sending (encoding) and interpreting (decoding) NV communication. Therefore, encoding and decoding can be effectively timeshared only when task demands do not exceed the available resources. The findings from the first study suggest that there are limited cognitive resources for these communication tasks. The dual processes of

assessment and portrayal can exceed available resources and impair a person's ability to decode another's NV communication.

The MRT (Wickens, 1984, 2002) suggests similar attentional resource limitations. The present study is the first attempt to apply the MRT to predict performance decrements when timesharing concurrent communication tasks. The results suggest that there are limited cognitive and perceptual resources that can be divided among communication production, observing and assessing another's communication behaviors. These communication tasks compete for similar resources. Therefore, the MRT successfully predicted performance decrements in assessment and observation when timesharing communication tasks. Further, the findings suggest that improvising is a demanding cognitive task that may also rely on similar cognitive resources. The act of improvising diverted the participant's attention away from the observation tasks so that they could generate a plausible response. Finally, the MRT was successful in predicting an increase in MWL due to the increased demands resulting from the need to simultaneously perform the improvisation, assessment, and portrayal tasks.

The MRT was useful in understanding the demands of portraying and assessing NV communication, but this study could be extended to investigate the verbal component of communication. Based on the MRT, it is possible that observing NV communication would rely on the visual processing modality and listening to the verbal component would use the resources in the auditory processing modality. This separation of attentional resources would be expected to be timeshared effectively in normal communication. However, the assessment and observation tasks examined in the present study are more demanding than normal communication interactions. Thus, it is possible

that observing and assessing the verbal communication of another may also use perceptual and cognitive resources. It is likely that the same assessment and observation decrements found for NV communication would also be present in verbal communication when multitasking and improvising. More research is needed to investigate the influence of multitasking and improvisations on the SP's ability to observe and assess the verbal communication component.

The multicomponent WM model (Baddeley & Hitch, 1974) was also useful in predicting the impact of portraying and observing NV communication on limited and shared cognitive resources. The findings of the present study support past research that suggests social and facial decoding is a cognitive task that relies on WM resources (Philips, Channon, Tunstall, Hedenstrom & Lyons, 2008). Much of social decoding is automatic and does not rely on WM resources (Ambady & Rosenthal, 1992). However, concentrated and purposeful emotional decoding involved in the process of indentifying and labeling another person's emotions is demanding on WM resources (Philips et al., 2008). This process of emotional labeling is similar to the observation and assessment tasks required when one evaluates another's communication skills. Therefore, the present results suggest that observing and assessing another person's communication behaviors may indeed rely heavily on WM resources. The results from the present study suggest that focused and purposeful assessment of NV communication is demanding on CE resources.

These results support the multicomponent WM model (Baddeley & Hitch, 1974) which predicts that improvisation requires additional CE resources to generate a plausible response. Improvisations required participants to integrate information from LTM with

information from the current situation to create a response. In contrast, during rote interviews participants were able to rely on information drawn primarily from LTM (Baddeley, 2002).

Further, the results showed that the need to improvise responses during interpersonal communication can result in greater MWL particularly when required to multitask portrayal and assessment tasks. This finding supports past research (O'Donnell & Eggemeier, 1986; Wickens, 1984, 2002) that an individual's experience of MWL is a function of the task demands and their available resources. Therefore, people often experience increased MWL when task demands increase.

The findings of the present study also provide support for the transactional theory of stress (Matthews, 2001). This theory suggests that the experience of stress depends on one's appraisal of the task demands and their coping strategies. After the study, many participants indicated that they felt overwhelmed with the demands of being interviewed while observing the interviewer. This suggests the participants judged the active observation conditions as more stressful because they appraised the task demands to exceed their available resources.

The purpose of the second study was to apply the same theories of attention (Wickens, 1984, 2002) and WM (Baddeley & Hitch, 1974) and communication (Patterson, 1995, 2006) to attempt to understand the unique mental demands of an SP. Again, the results indicated that these theories were useful in predicting performance decrements of observing the learner when the SPs were required to multitask. All three theories suggested that portraying a patient case and observing the learner required shared and limited cognitive resources. Therefore, SPs experienced difficulty observing the

learner when required to multitask. These theoretical models also predicted that participants would experience greater stress and MWL because the task demands exceeded the SPs' available resources. These theories suggest that improvisations do divert attention away from observing the learner. The SPs were less observant of the learner and experienced higher MWL during improvisations. Again, the WM (Baddeley & Hitch, 1974) model would suggest that improvising requires additional CE resources. Overall, the theoretical models were useful in predicting that SPs are susceptible to performance decrements when required to multitask and also during periods of improvisations. The theories of attention and WM both suggest that SPs have limited cognitive resources and that the portrayal and assessment tasks draw on shared resources. Further, the theories were useful in predicting higher MWL when participants were required to improvise while multitasking. The findings suggest that these theories are applicable to observing and assessing communication behaviors and can be used to understand the unique cognitive demands of SPs.

Practical Implications

The findings from the two studies have important practical implications for the use of SPs. The SPs were more consistent in their ratings and more observant of the SL when performing only the assessment task. These results support a current practice in the EVMS SP program. For every high stakes encounter, another SP watches a video of the encounter and scores the learner on the MIRS. This score is then compared to the score given by the SP who participated in the encounter. This practice is beneficial to the learner because the findings from the current studies suggest that SPs are more observant and provide more accurate assessments when assessing the learner without the additional

burden of portraying a patient. Yet, this practice is difficult to do for every encounter because it is very resource intensive for the Skills Center.

The results produced a surprising finding about the reliability of the SPs' ratings; the SPs' ratings were inconsistent to an expert's. This suggests that extensive training and experience are needed to achieve highly reliable ratings among different SPs. In the future standardized encounters could be used during the training process to calibrate the SP's ratings on the MIRS. Much like the present study, a SL could follow a scripted encounter and interact with several SPs. These SPs would then rate the SL and compare and discuss their ratings with an SP trainer.

The results also suggest that SPs would benefit from focused training on improvisations. The SPs with greater experience indicated that they relied on their extensive experience to quickly retrieve a generic response from their LTM. Standardized patients would improve their ability to handle unanticipated questions if they practiced developing answers on the spot to out-of-the-box questions. Another current practice in some SP programs supports this idea. Currently, the SPs are trained to think like the character and explore different facets of this person. The SP trainer often asks, "what do you think is her favorite flavor of ice cream?" This process teaches the SPs to think about the character in detail so they are better prepared for unanticipated questions. Increased training with improvisations may alleviate attentional and WM demands so that the SPs will have more spare resources to devote to observing the learner.

Overall, the results showed that SPs miss at least half of the learner's NV behaviors when passively watching encounters and nearly 75% when the SP is participating in the interaction and they miss even more when they are required to

improvise. Surprisingly, many SPs missed conspicuous behaviors such as crossing their arms. These findings suggest that the ability of SPs to detect and recall NV behaviors may be compromised during their encounters. This may occur because the SPs either did not perceive the behaviors initially or because they did perceive them, but could not recall them after the session. In either case, the SPs are typically required to provide a global rating of their interaction with the learner after their encounter, based in part in their perception of NV behaviors. The present findings suggest the attentional demands of the portrayal task may impair the ability of SPs to notice and/or recall important aspects of a learner's NV behavior that could potentially impact how they rate the learner's communication skills.

Moreover, the results of these studies have important implications for any scenario that requires the assessor to play an active role in the training. For example, in military aviation training, the trainer is often an active participant in the scenario who is required to interact with the learner and afterward provide feedback and a performance evaluation. Unlike an SP, a military aviation trainer does not have to pretend to be someone else; yet, it is possible that important information may be lost in any scenario when the trainer must both participate and assess the learner.

Even more surprising, the SPs' ratings for the SL were inconsistent with an expert rater's. This may have occurred because the encounters appeared artificial; however, the lack of agreement suggests achieving consistency among raters is a difficult process.

Finally, the results showed that SPs did experience higher levels of MWL, particularly mental demand, when improvising responses. The SPs also experienced increased physical and temporal demand when multitasking the portrayal and assessment

tasks. Timesharing these tasks also resulted in the SPs feeling greater overall stress and task engagement. These findings demonstrate that the SPs perform a mentally and even physically demanding job that requires intensive attentional focus.

Limitations and Future Research

Although the results generally supported the hypotheses, there were some limitations to the studies. First, the NV behavior query relied on the participants' ability to remember all of the NV behaviors that they observed during the interview. It is possible that the participants observed more behaviors than they remembered after the interviews. This retrospective query was chosen instead of allowing the participants to indicate the behaviors they observed in real time because selecting the behaviors in real time would draw the participants' attention away from the encounter and the participants might miss more NV behaviors because they were attending to the checklist. In the future, it would be useful to explore other methods of assessing the participants' ability to observe the interviewer. One option is to pause the interview and have observers note the NV behaviors in real time as the interview unfolds; however, SPs are unable to pause the clinical interview during actual encounters.

It will also be important to consider the level of improvisation in future studies. One possible limitation to both studies was that the level of improvisation required may have varied depending on the learner's questioning For example, it may be more difficult to improvise about what the patient had to eat that day compared to improvising about a past blood pressure reading. Therefore, the complexity of the improvisation may impact the ability of the SP to simultaneously improvise and observe.

One obvious limitation to the first study was that the participants had little experience observing and assessing an interviewer even though they watched a short instructional video about the MIRS items. Therefore, the participants may have missed more NV behaviors overall and had difficulty assessing the interviewer's communication skills than someone trained to observe people such as an SP.

The primary limitation in the second study was that the experience levels of the SPs did not completely meet the criteria for novice and experienced. This occurred for two reasons. Again, the novices gained additional experience after volunteering for the study and an updated computer system provided incomplete information about the experience levels for all the participants. Further, SPs who were true novices often did not have enough experience at the Skills Center to have established the inter-rater reliabilities needed to be selected for the study. Therefore, the participants classified as novices often had more experience than was desired so that their inter-rater reliability information could be used to determine their eligibility for the study. In the future it would be useful to consider alternative criteria for selecting participants. Other possible measures that could be used to classify the experience level of SPs include the number of cases they have performed or the average number of encounters performed per month. Experienced SPs should have performed a variety of cases and consistently work as an SP on a regular basis to maintain their skills. Another possible indicator of experience is the complexity of the cases performed. Currently, there is no measure of complexity for cases; but, there are several factors that could determine complexity. These may include the number of MIRS items required for the case or the amount of information to be memorized.

There were two other limitations in the second study. First, the sample of participants in the second study was small. It is possible the some results failed to reach significance because of the low number of participants, particularly novice SPs. In the future, it would be useful to examine the effects of experience with a larger sample of participants and to classify participants into categories based on their current experience level and more information than was available at the time of the present studies.

Second, the participants also had varying levels of experience with the two cases that they portrayed in the active observation conditions. It was impossible to ensure that all participants had no experience with the cases they portrayed. Some participants had no experience and others had extensive experience, although every effort was made to select cases that the participants had not portrayed extensively. In the future, it would be useful to create novel cases that had never been used in the Skills Center.

In the future, it will be useful to extend the study to include verbal behaviors as this is a key component in communication. The methodology of the present studies could also be used to assess the SP's standardization of portrayal. The use of a SL who follows a script for his portion of the encounter would provide consistency so that the SP's presentation of the case could be compared.

Finally, these psychological theories were useful in predicting the limitations of SPs to observe a learner when assessing and portraying; yet, the same could be true for the learners. Indeed, learners have a mentally demanding job that requires them to portray empathy and good communication skills while listening to the patient's concerns. At the same time, the learner must observe the SP's NV communication to determine how they are feeling and if they are withholding information. For example, consider a SP

portraying the case of a patient seeking narcotics. The SP will may seem to say the right things but the learner must pay attention to SP's NV communication to determine if they are lying. Theories of attention and WM may be useful in understanding the demands of the learner's component in a clinical interview.

Conclusion

Theories of attention and working memory were applied to understand the attentional limitations of undergraduates and SPs. In conclusion, the simultaneous need to portray a character and assess a learner may negatively affect one's ability to accurately observe the learner's nonverbal behaviors and rate the learner's communication skills. The observation task is made particularly more difficult when one is required to improvise responses on the spot. Further, individuals often experience greater mental workload and task engagement when timesharing these tasks and often when required to improvise. The present studies demonstrate the strengths and limitations associated with applying theories of attention that are traditionally used in human factors psychology, to explain how SPs perform their unique and demanding job.

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APPENDIX A

STUDY 1 INFORMED CONSENT DOCUMENT
OLD DOMINION UNIVERSITY

PROJECT TITLE: THE EFFECT OF IMPROVISATIONS AND OBSERVATIONS ON STANDARDIZED PATIENT ENCOUNTERS AND SUBJECTIVE WORKLOAD AND STRESS

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. Your participation in the study titled: The effect of improvisations and observations on standardized patient encounters and subjective workload and stress (located in the Engineering and Computational Sciences Bldg, Room # 2100) is completely voluntary. It is your right and responsibility to inform the researcher if you wish to cease participation at any time.

RESEARCHERS

Mark W. Scerbo, Ph.D., Professor, College of Sciences, Psychology Department, Old Dominion University, Responsible Project Investigator
Elizabeth T. Newlin-Canzone, M. S.,Graduate Student, College of Sciences, Psychology Department, Old Dominion University

DESCRIPTION OF RESEARCH STUDY

The purpose of this study is to assess the skills needed to observe communication styles and to determine if this activity increases mental effort and perceived stress.

If you decide to participate, then you will join a study involving undergraduates at Old Dominion University. In this study you will be video taped while you participate in 2 job interviews. Each interview will last approximately 10 minutes. In one interview you will answer questions based on your own personal experiences. For the other interview you will be given a script with details about a character and some scripted responses. You will memorize the scripted responses and answer some questions with these responses and other questions you will have to improvise a response based on the character's information. You will also observe another participant complete two similar interviews. You will answer questionnaires about your stress, mental demand and about the interviewer's behavior.

If you say YES, then your participation will last for approximately 2 hours in the in the Engineering and Computational Sciences Bldg, Room # 2100. Approximately 64 ODU undergraduates will be participating in this study.

EXCLUSIONARY CRITERIA

To the best of your knowledge, you should not have any diagnosed vision or hearing deficits that would keep you from participating in this study. If you do have any of these deficits, you must wear the required corrective lenses or hearing aids. You must be at least 18 years of age to participate.

RISKS AND BENEFITS

RISKS: If you decide to participate in this study, then you may face a risk of common problems associated with being interviewed that may include feeling embarrassed or uncomfortable. The researcher tried to reduce these risks by limiting the amount of time you will be interviewed And, as with any research, there is some possibility that you may be subject to risks that have not yet been identified.

BENEFITS: An indirect benefit to you for participating in this study is that you will gain knowledge about how people perform during interviews.

COSTS AND PAYMENTS
The researchers want your decision about participating in this study to be absolutely voluntary. Yet they recognize that your participation may pose some inconvenience. The researchers are unable to give you any payment for participating in this study. If you decide to participate in this study, you will receive 2 Psychology Department research credits, which may be applied to course requirements or extra credit in certain Psychology courses. Equivalent credits may be obtained in other ways. 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 video/audio recording confidential. The researcher will remove identifiers from the information and store information in a locked filing cabinet prior to its processing. 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. Your decision will not affect your relationship with Old Dominion University, or otherwise cause a loss of benefits to which you might otherwise be entitled. The researchers reserve the right to withdraw your participation in this study, at any time, if they observe potential problems with your continued participation.

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 harm, 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 Dr. Mark W. Scerbo at 757-683-4217 or Dr. George Maihafer the current IRB chair at 757-683-4520 at Old Dominion University or at the Office of Research at 757-683-3460, 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:
Dr. Mark W. Scerbo at 757-683-4217
Elizabeth T. Newlin-Canzone 713-898-6012

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. The researcher should give you a copy of this form for your records.

Subject's Printed Name & Signature	Date

INVESTIGATOR'S STATEMENT

I certify that I have explained to this subject the nature and purpose of this research, including benefits, risks, costs, and any experimental procedures. I have described the rights and protections afforded to human subjects and have done nothing to pressure, coerce, or falsely entice this subject into participating. I am aware of my obligations under state and federal laws, and promise compliance. I have answered the subject's questions and have encouraged him/her to ask additional questions at any time during the course of this study. I have witnessed the above signature(s) on this consent form.

Investigator's Printed Name & Signature	Date

APPENDIX B

INFORMED CONSENT DOCUMENT FOR USE OF PHOTO/VIDEO MATERIALS

STUDY TITLE: THE EFFECT OF IMPROVISATIONS AND OBSERVATIONS ON STANDARDIZED PATIENT ENCOUNTERS AND SUBJECTIVE WORKLOAD AND STRESS

DESCRIPTION:

The researchers would also like to take photographs or videotapes of you performing interviews in order to illustrate the research in teaching, presentations, and/or or publications.

CONFIDENTIALITY:

The researcher will remove identifiers from the videos and store them in a locked filing cabinet prior to its processing. Only the principal investigator and the researcher will have access to the videos.

The videos will be stored for no longer than two years, after which the videos will be destroyed or deleted. Some videos may be used in demonstrations but you would not be identified by name in any use of the photographs or videotapes. Even if you agree to be in the study, no photographs or videotapes will be taken of you unless you specifically agree to this.

VOLUNTARY CONSENT

By signing below, you are granting to the researchers the right to use your likeness, image, appearance and performance - whether recorded on or transferred to videotape, film, slides, photographs - for presenting or publishing this research. No use of photos or video images will be made other than for professional presentations or publications. The researchers are unable to provide any monetary compensation for use of these materials. You can withdraw your voluntary consent at any time.

If you have any questions later on, then the researchers should be able to answer them:

Dr. Mark W. Scerbo at 757-683-4217
Elizabeth T. Newlin-Canzone 713-898-6012

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.

Subject's Printed Name & Signature	**Date**

APPENDIX C

STUDY 1 PARTICIPANT INSTRUCTIONS

1. INTRODUCTION

Today you will participate in 2 interviews and you will observe 2 interviews. The entire experiment will last approximately 2 hours. In one interview you will answer as yourself and in the other, you will answer as a character, much like acting. After participating in the interviews you will observe another person complete similar interviews.

During the experiment you will be asked to assess the interviewer's interpersonal communication style both during the interview and after. You will also complete questionnaires about your mental workload and stress immediately following the interviews.

First you will complete a questionnaire about your current stress state.

Now, let me explain to you your responsibilities for today's experiment.

2. INTERVIEW PARTICIPATION TASK:

Today, you will be completing two interviews, each lasting approximately 10 minutes. Your primary objectives are to answer the interviewer's questions to the best of your ability and observe the interviewer's communication style.

Rote Interview:
One of these interviews will require you to answer all the questions verbatim based on your own experiences. You will be given the interview questions in advance so that you can write out your responses before the interview. These will be the answers that you must use during the interview. They do not have to be exactly the same but as similar as possible to your original answer.

Character Interview:
The other interview will have you answer a different set of questions based on a character that I will provide you. This type of interview will be called the character interview. We will provide you with information about a character as well as some scripted responses to the interview questions. You will have to memorize these responses to the interview questions. However, some of the interview questions may not be included in the script and this will require you to make up a plausible response based on what you know about the character. Again, during the character interview you are to make up a response based on the character, not on your own personal experiences. There is no right or wrong response, the responses just need to fit the character's information.

Throughout each interview you must remain aware of the interviewer, specifically their communication style and abilities. After the interviews you will be prompted to indicate how the interviewer behaved. Please answer these questions as accurately as possible.

Now we will begin a 5 minute practice session that incorporates both the observation and interviewing tasks. Please use this time to become familiar with your responsibilities. If you have any questions feel free to ask.

3. PRACTICE SESSION:

4. INTERVIEW OBSERVATION TASK:

Now you will observe another participant complete two interviews similar to those you completed. Pay attention to the interviewer. Your objective is to observe the interviewer's communication style, you don't need to pay attention to the interviewee.

Similar to the first phase of the study, you will complete the same questionnaires after each interview.

APPENDIX D

STUDY 1 PARTICIPANT INTERVIEW SCRIPTS

Instructions for the rote condition: You will participate in a job interview for a summer internship in your field of study. This interview will last approximately 10 minutes. You will answer the interview questions based on your own personal experiences. First you will answer the questions in complete sentences before beginning the interview. You will then use the answers you have written during the interview.

Interview 1 (Rote)

INTERVIEWER: Tell me about yourself.

PARTICIPANT:

_____

_____

INTERVIEWER: What subject areas do you believe are strongest and why?
PARTICIPANT:

_____

_____

INTERVIEWER: Tell me about a time that you were challenged and how you dealt with that challenge.
PARTICIPANT:

_____

_____

INTERVIEWER: What would you do if you had to deal with a difficult co-worker? For example, what if you were paired to work with someone on a project and they wanted to let you do all the work.
PARTICIPANT:

_____

_____

INTERVIEWER: What do you think your co-workers or classmates would say about you?
PARTICIPANT:

_____

_____

INTERVIEWER: What is your philosophy towards work?

PARTICIPANT:

INTERVIEWER: Describe your ultimate career ambitions.
PARTICIPANT:

INTERVIEWER: What kind of person would you refuse to work with?
PARTICIPANT:

INTERVIEWER: What lead you to choose your career path?
PARTICIPANT:

INTERVIEWER: How do you respond to high pressure situations such as tight deadlines?
PARTICIPANT:

Instructions for the rote condition: You will participate in a job interview for a summer internship in your field of study. This interview will last approximately 10 minutes. You will answer the interview questions based on your own personal experiences. First you will answer the questions in complete sentences before beginning the interview. You will then use the answers you have written during the interview.

Interview 2: (Rote)

INTERVIEWER: What motivates you to do the best you can at a job?
PARTICIPANT:

_____

_____

INTERVIEWER: What qualities do you look for in a boss?
PARTICIPANT:

_____

_____

INTERVIEWER: Do you like doing group projects? Why or why not?
PARTICIPANT:

_____

_____

INTERVIEWER: Tell me about a time that you helped resolve a problem between other people?
PARTICIPANT:

_____

_____

INTERVIEWER: Describe your work ethic.
PARTICIPANT:

_____

_____

INTERVIEWER: Can you tell me about a time that you performed in a team?
PARTICIPANT:

_____

_____

INTERVIEWER: How do you establish a working relationship with new people?
PARTICIPANT:

_____

_____

INTERVIEWER: Tell me about an achievement of yours that you are proud of.

PARTICIPANT:

_____

_____

INTERVIEWER: What have you been doing to prepare for a job after graduating from college?
PARTICIPANT:

_____

_____

INTERVIEWER: Tell me about your best personal attribute.
PARTICIPANT:

_____

_____

Instructions for the character condition: You will participate in a job interview for a position as a junior high Spanish teacher. This interview will last approximately 10-15 minutes. You will answer the interview questions as if you are the person described in the materials including the resume, cover letter, character description and course work information. If you are asked any questions not in the script, try to improvise questions based on this character and NOT on your own personal experiences. Remember there are no wrong answers, but it is more important that you remain in character for the entire interview and answer the questions based on the information provided. You will not be required to answer in Spanish.

Interview 3: Character (Teacher)

INTERVIEWER: If I walked into your classroom while you were practicing conversational skills, what would I see?

- PARTICIPANT: "I would break the students up into pairs and give them a topic to discuss while I walk around the room."

INTERVIEWER: Give me an example of a rule or procedure you would use in your classroom.

- PARTICIPANT: "I don't allow students to speak in English once they enter the classroom."

INTERVIEWER: I see that you spent some time teaching abroad. Can you tell me more about that?

- PARTICIPANT: "I taught English to young children in a rural area of Chile. It was challenging but I loved it."

INTERVIEWER: What do you believe is your biggest strength as a teacher and what do you believe is your biggest weakness?

- PARTICIPANT: "My strength is that I give extra attention to struggling students and my weakness is that I have a hard time motivating difficult students."

Instructions for the character condition: You will participate in a job interview for a position as a business manager for a sports club. This interview will last approximately 10-15 minutes. You will answer the interview questions as if you are the person described in the materials including the resume, cover letter, character description and course work information. If you are asked any questions not in the script, try to improvise questions based on this character and NOT on your own personal experiences. Remember there are no wrong answers, but it is more important that you remain in character for the entire interview and answer the questions based on the information provided.

Interview 4: Character (Business)

INTERVIEWER: You mentioned that you and your family have a lot of passion for fitness can you tell me how they inspired you to pursue this as a career?

- PARTICIPANT: "My parents encouraged us to be athletic and I always wanted to go into business so this is a combination of my passions."

INTERVIEWER: What upper level business courses did you find the most useful?

- PARTICIPANT: "My business strategy and policy class taught me to create solid business plans."

INTERVIEWER: One of our company's primary concerns is to gain new members each month, do you have any suggestions for accomplishing this goal?

- PARTICIPANT: "I would suggest developing packages to entice people to join such as a few free personal training sessions or a discounted joining fee."

INTERVIEWER: What about you as a person will add to our work culture?

- PARTICIPANT: "I think I would try to build connections with my co-workers and foster a sense of unity."

APPENDIX E

STUDY 1 PARTICIPANT RESUMES

Taylor Glendall
726 Graydon Ave, Norfolk, VA 23507
CELL (757)-877-5692 • EMAIL tglendall@gmail.com

Objective

A manager position for a health and fitness club will utilize my professional training in business management. My personal philosophy of management is to develop a structured business plan that includes maintaining customer satisfaction and increasing new membership contracts. My objectives are to provide a wide reaching ad campaign to increase the number of new members and to further increase revenues by developing a personal training program. I will especially focus on reducing maintenance costs and improving customer service through training. I am passionate about heath and fitness as my parents and I are avid athletes committed to healthy living. I studied both business management in college and I believe my professional and personal experiences make an excellent candidate for a manager of a fitness facility.

Education

Old Dominion University, Norfolk, VA — Projected May 2010 **Bachelor of Arts**
Major: Business Management

Work Experience

Marketing and Sales Intern — May-July 2009
Old Dominion University Athletics Marketing — Norfolk, VA

- Facilitated university athletic event ticket sales.
- Assisted with advertising campaigns.

Group Fitness Instructor — October 2007-present
YMCA Family Branch — Norfolk, VA

- Lead group exercise classes including Step, Yoga and Toning classes.
- Helped train other fitness instructors.

Sales Associate — May 2007-April 2009
Sports Authority — Virginia Beach, VA

- Sold sports equipment and attended additional trainings in customer service.

Tennis Instructor — May-August, 2005-09
Norfolk Collegiate Summer Program — Norfolk, VA

- Instructed local students ages 12-18 in intermediate and advanced tennis.

Additional training

- ACE certified professional trainer (projected June 2010)
- Improving Customer Service (Sports Authority training seminars)
- Group Fitness Workshop

Skills

- Familiar with Microsoft Word, Excel and PowerPoint
- Speaks proficient French

Morgan Calloway
726 Graydon Ave, Norfolk, VA 23507
CELL (757)-877-5692 • EMAIL mcalloway@gmail.com

Objective

A junior high foreign language teaching position will utilize my professional training in teaching Spanish and French. My personal educational philosophy is to develop the whole child and inspire a sense of curiosity and learning so they will be motivated to continue their foreign language education. My teaching objectives are to provide a solid foundation of a foreign language and to foster the development of language learning. I will especially focus on developing my students' ability to converse and write in a foreign language. I grew up in a bilingual household; my mother was from Spain and I learned at an early age to appreciate other languages and cultures. I studied both Spanish and French in school and my family travels abroad to Spain at least once a year to visit family. I believe immersion is the best method to learn a language.

Education

Old Dominion University, Norfolk, VA — Projected May 2010 **Bachelor of Arts**
Major: Education (Spanish)

Professional Experience

Student Teaching — August 2009-present
Norfolk Collegiate Middle School, Mrs. Emily Dawson — Norfolk, VA

- Classroom assistant for Spanish and French classes (grades 6-8)
- Prepared and taught class lessons

English Teacher in a Teach Abroad Program — May-July 2009
Language Corps, Andres Gomez — Curepto, Chile

- Lived abroad in a rural Chilean town and taught local elementary school children English

Foreign Language Tutor — June 2007-present
Park Place, Andrea Mason — Norfolk, VA

- Volunteered at local afterschool program for underprivileged youths to tutor local students ages 9-18 in Spanish and French.
- Practiced conversational Spanish and French.
- Reviewed student's homework and helped prepare them for school exams.

Certifications

- Generalist Grades EC-4
- ESL Supplemental grades
- Gifted and Talented

Skills

- Speaks proficient French and fluent Spanish
- Familiar with Microsoft Word, Excel and PowerPoint

Additional Training

- Attended a seminar on dealing with problem students.

APPENDIX F

STUDY 1 TRANSCRIPTS

Taylor Glendall

Business Management Core Courses

Course #	Course Title	Semester	Grade	Credits
340	Human Resources Management	Fall 2006	B	3
325	Contemporary Organizations Mgmt	Spring 2007	C	3
350	Employee Relations	Fall 2007	B-	3
360	Labor Management Relations	Spring 2008	B-	3
385	Business Strategy and Policy	Spring 2008	B-	3
360	Management Internship	Fall 2008	B	3
361	International Business Operations	Spring 2009	B-	3
417	Employment Law	Fall 2009	C	3
495	Contemporary Issues in Leadership	Fall 2009	C	3

Elective Courses

Course #	Course Title	Semester	Grade	Credits
104	United States in World Setting	Fall 2006	B	3
291	Ecology	Fall 2006	B	3
112	Introduction to Literature	Fall 2006	B	3
356	Virginia History	Spring 2007	B	3
050	Basic Writing	Spring 2007	A	3
200	Basic Economics	Spring 2007	B-	3
301	Managerial Economics	Fall 2007	B-	3
310	Introductory Data Analyses	Fall 2007	B-	3
101	Beginning Spanish I	Spring 2008	B	3
201	Introduction to Sociology	Spring 2008	B	3
102	Beginning Spanish II	Fall 2008	B	3
201	Introduction to Psychology	Fall 2008	A	3
320	Spanish Civilization and Culture	Spring 2009	C	3

Structural Program of Study

Morgan Calloway

Language Arts Education Core Courses

Course #	Course Title	Semester	Grade	Credits
301	Foundations & Assessment of Ed	Fall 2006	A	3
360	Classroom Mgmt and Discipline	Fall 2006	A	3
408	Reading/Writing Content Areas	Spring 2007	A	3
432	Instructional Strategies Language	Spring 2007	A	3
455	Instructional Strategies Middle Schl	Fall 2007	A	3
311	Language Acquisition/ Reading	Spring 2008	A	3
560	Seminar in Student Teaching	Fall 2008	A	3
555	Design Effective Instruction	Spring 2009	A	3
495	Dynamic Assessment and Teaching	Fall 2009	A	3

Elective Courses

Course #	Course Title	Semester	Grade	Credits
201	Intermediate Spanish I	Fall 2006	A	3
201	Intermediate French I	Fall 2006	A	3
201	Intermediate Spanish II	Spring 2007	A	3
201	Intermediate French II	Spring 2007	A	3
320	Spanish Civilization and Culture	Fall 2007	A	3
104	United States in World Setting	Fall 2007	A-	3
291	Ecology	Spring 2008	A	3
311	Spanish Communication	Spring 2008	A	3
127	Honors English Composition	Fall 2008	A	3
201	Introduction to Sociology	Fall 2008	B	3
356	Virginia History	Spring 2009	B	3
320	Spanish Civilization and Culture	Spring 2009	A	3
352	Phonetics	Fall 2009	A	3

APPENDIX G

STUDY 1 PRACTICE INTERVIEWS

FOR THE INTERVIEWER

Study 1 Practice Session Rote Interview Questions

For the interviewer:

Below is the practice interview script with the questions and corresponding nonverbal behaviors.

INTERVIEWER: Tell me about who inspired you to pursue a certain career.

INTERVIEWER: What would you like to accomplish in your career within the next 10 years? *(turning away from the participant to get a sheet of paper)*

INTERVIEWER: Tell me about someone in your life that has been a mentor to you.

Study 1 Practice Session Character Interview Questions

For the interviewer:

Below is the practice interview script with the questions and corresponding nonverbal behaviors.

INTERVIEWER: How have your parents and friends helped you achieve your career ambitions? *(cock your head to one side and tap your fingers on your knee)*

INTERVIEWER: How have your personal experiences prepared you for the type of job that you want? *(cross legs)*

INTERVIEWER: What type of work environment best suits you?

FOR THE PARTICIPANT

Study 1 Practice Session Rote Interview Questions

For the participant:

Below is the practice interview script with the questions and corresponding scripted responses. The interviewer may ask you some questions that are not included below and you must answer on the spot.

INTERVIEWER: Tell me about who inspired you to pursue a certain career.

PARTICIPANT:

_____

_____

INTERVIEWER: What would you like to accomplish in your career within the next 10 years?

PARTICIPANT:

_____

_____

INTERVIEWER: Tell me about someone in your life that has been a mentor to you.

PARTICIPANT:

_____

_____

Study 1 Practice Session Character Interview Questions

For the participant:

Below is the practice interview script with the questions and corresponding scripted responses. The interviewer may ask you some questions that are not included below and you must answer on the spot.

Background on the applicant.

Major: Psychology

Has taken a lot of upper level Psychology courses about counseling and psychological disorders.

Career Aspirations: Wants to be a high school counselor.

This person is the first in their family to go to college and they want to go on to graduate school to get their masters in counseling psychology. They realized they wanted to be a counselor while they were volunteering at a local afterschool program for troubled teens. This person was mentored themselves at this same organization.

Questions to be memorized:

INTERVIEWER: How have your parents and friends helped you achieve your career ambitions?

- PARTICIPANT: "My parents didn't go to college so they have really encouraged me to get my degree."

INTERVIEWER: What type of work environment best suits you?

- PARTICIPANT: "I'm not really sure because I haven't had a serious job before. But I like working with other people"

APPENDIX H

STUDY 1 CONFEDERATE SCRIPTS

Interview 1 (Rote)

INTERVIEWER: Tell me about yourself. *(scratch your face and appear like you are very interested....raise right shoulder)*

INTERVIEWER: What subject areas do you believe are your strongest and why? (*move hands and fingers)*

INTERVIEWER: Tell me about a time that you were challenged and how you dealt with that challenge. *(move in your chair, talk with your hands.....look to the left)*

INTERVIEWER: What would you do if you had to deal with a difficult co-worker? *(start to let them answer and then raise your right hand and cut them off by saying...).* For example, what if you were paired to work with someone on a project and they wanted to let you do all the work. *(cock your head to on side....look to the right)*

INTERVIEWER: What do you think your co-workers or classmates would say about you? *(tap your pen)*

INTERVIEWER: What is your philosophy towards work?

INTERVIEWER: Describe your ultimate career ambitions. *(run your fingers through your hair)*

INTERVIEWER: What kind of person would you refuse to work with?

INTERVIEWER: What lead you to choose your career path? *(Purse lips)*

INTERVIEWER: How do you respond to high pressure situations such as tight deadlines? *(appear impressed with their answer and lean forward)*

Interview 2: (Rote)

INTERVIEWER: What motivates you to do the best you can at a job?*(look at the floor when they respond)*

INTERVIEWER: What qualities do you look for in a boss? *(move glasses and rub your eyes and appear tired)*

INTERVIEWER: Do you like doing group projects? Why or why not? *(raise right shoulder)*

INTERVIEWER: Tell me about a time that you helped resolve a problem between other people? *(cover mouth and yawn)*

INTERVIEWER: Describe your work ethic. *(turn away and look at your watch)*

INTERVIEWER: Can you tell me about a time that you performed in a team? *(shift to the other side in your seat)*

INTERVIEWER: How do you establish a working relationship with new people? *(talk with your hands)*

INTERVIEWER: Tell me about an achievement of yours that you are proud of.

INTERVIEWER: What have you been doing to prepare for a job after graduating from college?

INTERVIEWER: Tell me about your best personal attribute. *(drum your fingers)*

Example 3: Character (Teaching)

INTERVIEWER: Can you tell me more about your personal teaching philosophy? *(extra eye blinks)*

INTERVIEWER: If I walked into your classroom while you were practicing conversational skills, what would I see? *(purse lips)*

INTERVIEWER: I see that you have some tutoring experience. Can you tell me more about that and anything you learned from it?

INTERVIEWER: I see that you have some additional training and certifications. What impact has this had on your teaching? *(lean to the side and furrow your brow)*

INTERVIEWER: (*move in your chair to return to sitting straight*) Give me an example of a rule or procedure you would use in your classroom. *(rub your mouth and appear interested and cock your head to one side)*

INTERVIEWER: I see that you spent some time teaching abroad. Can you tell me more about that? *(lift your paper)*

INTERVIEWER: Being a teacher is also being a role model. Do you have a facebook account and are there any compromising pictures on there that would be considered inappropriate for one of your students to see.

INTERVIEWER: What drew you to become a teacher in the first place? *(smile.... a little nod and then raise your eyebrows)*

INTERVIEWER: What do you believe is your biggest strength as a teacher and what do you believe is your biggest weakness? *(nod your head)*

INTERVIEWER: What would you do if you caught someone cheating? (*Bite your lips and lean forward and fold hands.....raise eyebrows*)

Example 4: Character (Business)

INTERVIEWER: You mentioned in your resume that you and your family have a lot of passion for fitness can you tell me how they inspired you to pursue this as a career? *(rub your ears)*

INTERVIEWER: Can you tell me about your personal philosophy of management? *(cross your arms)*

INTERVIEWER: What about your experience at the Sports Authority and the ODU athletics marketing team has prepared you for this job? *(tighten fist)*

INTERVIEWER: I see that you have some additional skills training; can you tell me about that? *(cough)*

INTERVIEWER: As a manager, part of your job will be to train new hires, can you tell me about your experience with training other people?

INTERVIEWER: I see that you received mostly B's in your classes, we were looking for someone with a higher GPA. What courses did you find the most challenging?

INTERVIEWER: What upper level business courses did you find the most useful?

INTERVIEWER: One of our company's primary concerns is to gain new members each month, do you have any suggestions for accomplishing this goal? *(tap hands)*

INTERVIEWER: If I asked some of your former co-workers to describe you what do you think they would say?

INTERVIEWER: What about you as a person will add to our work culture? *(adjust your glasses)*

APPENDIX I

SHORT STRESS STATE QUESTIONNARE

Part. #: _____ Date:_____ Observation Type:_____ Interview Type:_____ Character:_____

TASK QUESTIONNAIRE

(Helton, 2004)

General Instructions. This questionnaire is concerned with your feelings and thoughts at the moment. Answer **every** question, even if you find it difficult. Answer, as honestly as you can, what is true of you **now**, not what you feel on most occasions.

Not at all = 1 A little bit = 2 Somewhat = 3 Very much = 4 Extremely = 5

1. Dissatisfied _____ 4. Sad _____ 7. Annoyed _____ 10. Grouchy _____

2. Alert _____ 5. Active _____ 8. Angry _____

3. Depressed _____ 6. Impatient _____ 9. Irritated _____

Please indicate how true each statement is of your thoughts **DURING THE PAST 10 MIN.**

Not at all = 1 A little bit = 2 Somewhat = 3 Very much = 4 Extremely = 5

11. I am committed to attaining my performance goals. _____

12. I want to succeed on the task. _____

13. I am motivated to do the task. _____

14. I'm trying to figure myself out. _____

15. I'm reflecting about myself. _____

16. I'm daydreaming about myself. _____

17. I feel confident about my abilities. _____

18. I feel self-conscious. _____

19. I am worried about what other people think of me. _____

20. I feel concerned about the impression I am making. _____

21. I expect to perform proficiently on this task. _____

22. Generally, I feel in control of things. _____

23. I thought about how others will do on this task. _____

24. I thought about how I would feel if I were told how I performed. _____

Participant #:_____ Group:_____

END OF THE TASK QUESTIONNAIRE

APPENDIX J

MODIFIED MASTER INTERVIEW RATING SCALE

Part # _____ Date _____ Observation Type _____ Interview Type _____ Character _____

EASTERN VIRGINIA MEDICAL SCHOOL

ITEM 1 – STYLE OF CONVERSATION

[5]	[4]	[3]	[2]	[1]
The interviewer's style of conversation was natural, relaxed and genuine It was responsive to the interviewee while maintaining control of the session		The style of conversation varied between a natural and genuine to forced/directive to overly friendly		The conversation style was overly controlled, highly charged (fast-talking) or made no attempt to control the conversation

ITEM 2 - TYPES OF QUESTIONS/STATEMENTS

[5]	[4]	[3]	[2]	[1]
The interviewer consistently used open-ended statements and questions to elicit verbal associations from the client Direct and specific statements and questions were used appropriately to follow-up as indicated by interviewee responses		The interviewer occasionally used open-ended statements and questions to elicit verbal associations from the interviewee The interviewer used a few leading "why", "or multiple questions/statements		The interviewer employed mostly direct methods to elicit verbal associations The interviewer used many leading "why" or multiple questions/statements

ITEM 3- VERIFICATION OF CLIENT INFORMATION

[5]	[4]	[3]	[2]	[1]
The Interviewer consistently sought clarification, verification and specificity of the interviewee's responses when needed		The Interviewer occasionally sought clarification, verification and specificity of the interviewee's responses		The Interviewer never attempted to clarify or verify the interviewee's responses

ITEM 4 – VERBAL FACILITATION SKILLS & ENCOURAGEMENT

[5]	[4]	[3]	[2]	[1]
The Interviewer used facilitation skills throughout the interview, when appropriate, which included use of short statements, reflection, echoing, and praise Verbal encouragement was used effectively		The Interviewer used some facilitative skills but not consistently or at appropriate times Verbal encouragement could have been used more effectively		The Interviewer did not employ facilitation skills

ITEM 5 - VERBAL SKILLS - TONE OF VOICE

[5]	[4]	[3]	[2]	[1]
The Interviewer consistently used a supportive and genuine tone of voice during the session		The Interviewer's tone of voice was occasionally expressive At times, could be interpreted by interviewee as cold, judgmental, or ingratiating and patronizing, etc		The Interviewer's tone of voice was overly expressive or robotic and affected the interviewee's performance

ITEM 6- PACING OF SESSION

[5]	[4]	[3]	[2]	[1]
The Interviewer was attentive to the interviewee's responses and observed without unnecessary interruption Strategically used pauses to elicit information		The pace of the interview was comfortable most of the time, but the Interviewer occasionally interrupted the interviewee and/or allowed awkward pauses to break the flow of the session		The Interviewer frequently interrupted the interviewee and there were awkward pauses, which broke the flow of the session

ITEM 7 – GUIDE FOR INTERVIEW AND QUESTIONS

[5]	[4]	[3]	[2]	[1]
The Interviewer verbally responded to conversational cues as a method to navigate the conversation		The interviewer occasionally missed conversational cues in conversation		The interviewer did not respond to conversational cues

ITEM 8 – INTERVIEWEE'S PERSPECTIVE (BELIEFS)

[5]	[4]	[3]	[2]	[1]
The Interviewer elicited the interviewee's perspective, including related feelings and beliefs		The Interviewer elicited some of the interviewee's perspective		The Interviewer failed to elicit the interviewee's perspective

ITEM 9 – NON-VERBAL FACILITATION SKILLS

[5]	[4]	[3]	[2]	[1]
The Interviewer consistently put the interviewee at ease and facilitated communication by using Appropriate eye contact, relaxed, open body language, and appropriate facial expressions There were no physical barriers		The interviewer made some use of facilitative techniques but could be more consistent in that one or two techniques were not used effectively A physical barrier was present		The Interviewer made no attempt to put the interviewee at ease The Interviewer's body language was consistently negative, closed, or overly friendly OR Unproductive mannerisms (foot or pencil tapping, hair twirling, etc) consistently intruded on the session Eye contact was not attempted or was uncomfortable

APPENDIX K

POST-INTERVIEW QUERY

LIST OF NONVBERBAL BEHAVIORS

Part. #: _____ Date:_____ Observation Type:_____ Interview Type:_____ Character:_____

Gestures

Head

___Head nod ___Head shake ___Turning head away
___Head lean to one side

Hand/arm

___Tapping fingers ___Tapping hand ___Tapping pen
___Twirl pen in fingers ___Raising hands ___Thumbs up ___Rubbing eyes
___Rubbing ears ___Rubbing mouth ___Hand shake ___Rubs nose
___Scratches nose ___Scratches face ___Flexes hand ___Covers mouth
___Move hand ___Folded hands ___Tightening fist ___Pointing finger
___Move finger ___Drums fingers ___Hand brush off ___Moves pen
___Lifts paper ___Adjusts glasses ___Crossing arms ___Stretching arms
___Raise shoulder ___Covering face ___Running fingers through hair
___Talking with hands

Torso/Posture

___Slouching ___Sitting up straight ___Lean forward ___Lean back
___Lean to the side ___Swaying ___Moving in chair ___Turning away

Feet/Legs

___Tapping feet ___Shaking foot ___Crossing legs ___Uncrossing legs

Facial Expressions and eye behavior

___Smile ___Frown ___Eye rolling ___Bites lip
___Pursed lip ___Raised upper lip ___Open mouth ___Yawn
___Press lips together ___Run tongue over teeth ___Furrowed Brow
___Squinting eyes ___Raising eyebrows ___Glaring ___Staring
___Looking up ___Looking at watch ___Wide eyed ___Good eye contact
___Lack of eye contact ___Looking to the side
___Looking down at the floor ___Looking down at the paper
___Excessive eye blinking

Vocal behavior

___High pitch ___Low pitch ___Rapid speech ___Slow speech
___Loud speech ___Soft speech ___Whispering ___Accent
___Dialect ___Cough ___Clear throat ___Uh hmmm
___Hmmm ___Ok ___Uh ___Um

Space

___Sitting far ___Sitting close ___Standing far ___Standing close
___Placing objects between you

Physical Appearance

___Tall ___Short ___Average height ___Thin
___Overweight ___Average weight ___Facial hair ___Bald
___Fair skin ___Dark skin ___Intermediate skin

Others

_____
_____

Attitudes

___Tired ___Happy ___Sad ___Anxious
___Interested ___Disinterested ___Bored ___Impressed
___Indifferent ___Hyper ___Lazy ___Sympathetic
___Unsympathetic ___Proud ___Self conscious ___Arrogant

___Peaceful ___Satisfied ___Contented ___Cheerful
___Pleasant ___Indignant ___Puzzled ___Curious
___Sharp ___Severe ___Cutting ___Hateful
___Unsociable ___Pitiful ___Meek ___Shy
___Humble ___Docile ___Ashamed ___Modest
___Timid ___Hurried

Others

_____
_____
_____

APPENDIX L

NASA-TLX FORM

Part. #: _____ Date:_____ Observation Type:_____ Interview Type:_____ Character:_____

Below is a list of statements for evaluating your perception of workload associated with the interview task. Please mark an "X" on each line at the point which best describes your perception for that particular aspect of workload.

MENTAL DEMAND
How much mental and perceptual activity was required (e.g., thinking, deciding, calculating, remembering, looking, searching, etc.)? Was the task easy or demanding, simple or complex, exacting or forgiving?

Low--------+--------+--------+--------+--------+--------+--------+--------+--------+--------High
0 2 4 6 8 10 12 14 16 18 20

PHYSICAL DEMAND
How much physical activity was required (e.g., pushing, pulling, turning, controlling, activating, etc.)? Was the task easy or demanding, slow or brisk, slack or strenuous, restful or laborious?

Low--------+--------+--------+--------+--------+--------+--------+--------+--------+--------High
0 2 4 6 8 10 12 14 16 18 20

TEMPORAL DEMAND
How much time pressure did you feel due to the rate or pace at which the tasks or task elements occurred? Was the pace slow and leisurely or rapid and frantic?

Low--------+--------+--------+--------+--------+--------+--------+--------+--------+--------High
0 2 4 6 8 10 12 14 16 18 20

EFFORT
How hard did you have to work (mentally and physically) to accomplish your level of performance?

Low--------+--------+--------+--------+--------+--------+--------+--------+--------+--------High
0 2 4 6 8 10 12 14 16 18 20

PERFORMANCE
Good/Poor
How successful do you think you were in accomplishing the goals of the task set by the experimenter (or yourself)? How satisfied were you with your performance in accomplishing these goals?

Low--------+--------+--------+--------+--------+--------+--------+--------+--------+--------High
0 2 4 6 8 10 12 14 16 18 20

FRUSTRATION LEVEL
How insecure, discouraged, irritated, stressed and annoyed versus secure, gratified, content, relaxed and complacent did you feel during the task?

Low--------+--------+--------+--------+--------+--------+--------+--------+--------+--------High
0 2 4 6 8 10 12 14 16 18 20

APPENDIX M

STUDY 1 PROJECT INTERVIEW DEBRIEFING FORM

Thank you for participating in this study, titled "The effect of improvisations and observations on standardized patient encounters and subjective workload and stress." The purpose of this research is to understand how people are able to timeshare multiple tasks in an interview. This research is also useful for understanding how standardized patients (SPs) are able to perform their multiple tasks. A SP is a well person trained to present a medical case in a standardized way for the purpose of training and assessing physicians. Your participation in this study is helping to further understand the cognitive demands SPs face.

Again, thank you for participating!

Elizabeth T Newlin-Canzone and Dr. Mark W. Scerbo

Old Dominion University

Department of Psychology

Emails: enewlin@odu.edu and mscerbo@odu.edu

APPENDIX N

STUDY 2 INFORMED CONSENT DOCUMENT
OLD DOMINION UNIVERSITY

PROJECT TITLE: THE EFFECT OF IMPROVISATIONS AND OBSERVATIONS ON STANDARDIZED PATIENT ENCOUNTERS AND SUBJECTIVE WORKLOAD AND STRESS

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. Your participation in the study titled: The effect of improvisations and observations on standardized patient encounters and subjective workload and stress (located at the Theresa Thomas Skills Center at EVMS, Andrews Hall rooms 400-428) is completely voluntary. It is your right and responsibility to inform the researcher if you wish to cease participation at any time.

RESEARCHERS

Mark W. Scerbo, Ph.D., Professor, College of Sciences, Psychology Department, Old Dominion University, Responsible Project Investigator
Gayle Gliva-McConvey, Director of Theresa A Thomas Professional Skills Teaching & Assessment Center, Eastern Virginia Medical School
Elizabeth T. Newlin-Canzone, M. S.,Graduate Student, College of Sciences, Psychology Department, Old Dominion University

DESCRIPTION OF RESEARCH STUDY

The purpose of this study is to assess the skills needed to observe communication styles and to determine if this activity increases mental effort and perceived stress.

If you decide to participate, then you will join a study involving undergraduates at Old Dominion University and standardized patients (SPs) at EVMS. In this study you will be video taped while you participate in 2 encounters involving a clinical interview. Each encounter will last approximately 10 to 15 minutes. You will be given a case details for both encounters. You will also observe another participant complete two similar encounters. You will answer questionnaires about your stress, mental demand and about the learner's behavior.

If you say YES, then your participation will last for approximately 2 hours in Fairfax Hall, Rooms 400-428. Approximately 64 ODU undergraduates and 40 SPs will be participating in this study.

EXCLUSIONARY CRITERIA

To the best of your knowledge, you should not have any diagnosed vision or hearing deficits that would keep you from participating in this study. If you do have any of these deficits, you must wear the required corrective lenses or hearing aids. You must be at least 18 years of age to participate.

RISKS AND BENEFITS

RISKS: If you decide to participate in this study, then you may face a risk of common problems associated with being interviewed that may include feeling embarrassed or uncomfortable. The researcher tried to reduce these risks by limiting the amount of time you will be interviewed And, as with any research, there is some possibility that you may be subject to risks that have not yet been identified.

BENEFITS: An indirect benefit to you for participating in this study is that you will gain knowledge about how SPs perform during encounters.

COSTS AND PAYMENTS

The researchers want your decision about participating in this study to be absolutely voluntary; yet, they recognize that your participation may pose some inconvenience. The researchers are unable to give you any payment for participating in this study.

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

CONFIDENTIALITY
The researchers will take reasonable steps to keep private information, such as questionnaires, and video/audio recording confidential. The researcher will remove identifiers from the information and store information in a locked filing cabinet prior to its processing. 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. Your decision will not affect your relationship with Old Dominion University or Eastern Virginia Medical School or otherwise cause a loss of benefits to which you might otherwise be entitled. The researchers reserve the right to withdraw your participation in this study, at any time, if they observe potential problems with your continued participation.

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 harm, 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 Dr. Mark W. Scerbo at 757-683-4217 or Dr. George Maihafer the current IRB chair at 757-683-4520 at Old Dominion University or at the Office of Research at 757-683-3460, 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:
Dr. Mark W. Scerbo at 757-683-4217
Elizabeth T. Newlin-Canzone 713-898-6012

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. The researcher should give you a copy of this form for your records.

Subject's Printed Name & Signature	**Date**

INVESTIGATOR'S STATEMENT

I certify that I have explained to this subject the nature and purpose of this research, including benefits, risks, costs, and any experimental procedures. I have described the rights and protections afforded to human subjects and have done nothing to pressure, coerce, or falsely entice this subject into participating. I am aware of my obligations under state and federal laws, and promise compliance. I have answered the subject's questions and have encouraged him/her to ask additional questions at any time during the course of this study. I have witnessed the above signature(s) on this consent form.

Investigator's Printed Name & Signature	**Date**

APPENDIX O

STUDY 2 INFORMED CONSENT DOCUMENT
EASTERN VIRGINIA MEDICAL SCHOOL

Employee/Student Addendum Consent Form

Eastern Virginia Medical School (EVMS) Institutional Review Board

Study Title:	THE EFFECT OF IMPROVISATIONS AND OBSERVATIONS ON STANDARDIZED PATIENT ENCOUNTERS AND SUBJECTIVE WORKLOAD AND STRESS
Name of Investigator:	**Mark. W. Scerbo, Ph.D.**
Sponsor:	
Name of Subject:	For participants less than 18 years old, all references to "you" in this consent form are referring to "you", "your child" or a "minor for whom you are a legally appointed representative" [1]

You are being asked to participate in the above research study, which is being conducted at Eastern Virginia Medical School (EVMS), where you are an employee or student. The research study has been described to you, in writing, on the attached consent form. You have also had the opportunity to ask the investigators conducting this study any questions that you may have regarding participation in this study.

The purpose of this addendum consent form is to inform you that you have the right to choose not to participate in this research study. If you choose not to participate, or to withdraw at any time, it will not affect your standing as an employee or student.

If you are an employee, your participation will not place you in good favor with the investigator, your supervisor, or EVMS (e.g., increase in salary, promotion, extra vacation, or the like). Not participating will not adversely affect your employment with EVMS, in particular the position that you currently hold. If you are a student, your participation will not place you in good favor with the investigator or other faculty (e.g., receiving better grades, recommendations, employment). Also, not participating in this study will not adversely affect your relationship with the investigator or other faculty.

If you suffer a physical injury or illness as a result of participating in this research study, you will not receive a financial payment. Treatment for such injury or illness is not covered under Workmen's Compensation. Any immediate emergency medical treatment you may need as a result of participating in this study will be provided as outlined in the attached consent form. Eastern Virginia Medical School provides no compensation plan or free medical care plan to compensate you for such injuries. If you believe you have suffered an injury as a result of your participation in this study, you should contact the principal investigator, Mark W. Scerbo, at (757) 683-4217. You may also contact Dr. Robert Williams, an employee of Eastern Virginia Medical School, at (757) 446-8423. If you have any questions pertaining to your rights as a research subject you may contact a member of the Institutional Review Board through the Institutional Review Board office at (757) 446-8423.

- For studies involving children, provide two lines for parents/guardians signatures. If the risk to the child in the study is greater than minimal risk and provides no prospect of direct benefit to the child participant, it is expected that both custodial parents will sign the consent. Otherwise in cases where either risk is minimal or the child benefits directly, one parent may authorize the child's participation. One parent's signature is also acceptable in cases where one parent is deceased, unknown, incompetent, or not reasonably available, or, when only one parent has legal responsibility for the care and custody of the child.
- A "LAR" is a Legally Authorized Representative.

SIGNATURE

You will get a copy of this signed form. You may also request information from the investigator. By signing your name on the line below, you agree to take part in this study and accept the risks. *A child who is a ward of the state cannot be enrolled until the IRB has assigned an individual advocate, relative to this potential enrollment, to act on behalf of the child in addition to the guardian or in loco parentis.*

Signature of Participant/LAR	Typed or Printed Name	Relationship to Subject	MM/ DD/ YY
Optional (Delete this entire block if Sponsor/PI is not requesting; or, if not required by IRB) Signature of Witness ☐ Witnessed Signature Only ☐ Witnessed Consent Process		Typed or Printed Name	MM/ DD/ YY

WITNESS (required for oral presentations)

This signature must be present if the consent was presented orally to a subject in any manner. The witness may not be an individual named as an investigator or a person authorized to negotiate informed consent.

Signature of Witness ☐ Witnessed Consent Process	Typed or Printed Name	MM/ DD/ YY

STATEMENT OF THE INVESTIGATOR OR APPROVED DESIGNEE

I certify that I have explained to the above individual the nature and purpose of the study, potential benefits, and possible risks associated with participation in this study. I have answered any questions that have been raised and have witnessed the above signature. I have explained the above to the volunteer on the date stated on this consent form.

Signature of Investigator or Approved Designee	MM/ DD/ YY

Sufficient space for the IRB stamp should be included on the 1st page or on the last page of the consent form.

APPENDIX P

STUDY 2 PARTICIPANT BACKGROUND INFORMATION FORM

Participant #_____Date:_____ Time:_____

The purpose of this questionnaire is to collect background information for participants in this experiment. This information will be used strictly for this experiment and for research purposes only. Please complete each item to the best of your ability.

1. Age _____

2. Gender _____ (M/F)?

3. Do you have any acting experience? _____ (Yes/No).

4. If yes, please indicate the type and duration of your experience in the space provided

Type of experience	Duration
□ acting classes in school	_____
□ professional acting classes	_____
□ acting in plays	_____
□ acting in musicals	_____
□ improvisational classes	_____
□ commercial or TV acting	_____
□ other _____	_____

5. Have you ever been diagnosed as having a deficiency in your vision?_____ (Yes/No).

6. If yes, do you have correction with you? (i.e. glasses, contact lenses, etc.)?

7. Have you ever been diagnosed as having a deficiency in your hearing?_____ (Yes/No).

8. If yes, do you have correction with you? (i.e. hearing aid, cochlear implant, etc.)?

9. How long have you been an SP?_____(provide answer in months)

10. How many hours do you work as an SP per month?_____

11. Have you received special training as an SP to be a physical teaching assistant? _____ (Yes/No).

12. Have you received special training as an SP to be a SP trainer? _____ (Yes/No).

13. If yes, how long have you been an SP trainer? _____(provide answer in months)

APPENDIX Q

STUDY 2 PARTICIPANT INSTRUCTIONS

1. INTRODUCTION

Today you will participate in 2 encounters and you will observe 2 encounters. The entire experiment will last approximately 2 hours. One encounter will be very predictable and the other will be unpredictable. After participating in the encounters you will observe another SP complete two similar encounters.

During the experiment you will be asked to assess the learner's communication style after each encounter. You will also complete questionnaires about your mental workload and stress immediately following the encounters.

First you will complete a questionnaire about your current stress state.

Now, let me explain to you your responsibilities for today's experiment.

2. INTERVIEW PARTICIPATION TASK:

Today, you will be completing two encounters, each lasting approximately 10 to 15 minutes. Your primary objectives are to answer the learner's questions to the best of your ability and observe their communication style. Like a typical encounter, we will provide you with case details and you must learn and practice this information. You may have to improvise responses at different times and you must improvise a plausible response based on the case details. There is no right or wrong response, the responses just need to fit the character's information.

Throughout each interview you must remain aware of the interviewer, specifically their communication style and abilities. After the interviews you will be prompted to indicate how the interviewer behaved. Please answer these questions as accurately as possible.

Now we will begin a 5 minute practice session that incorporates both the observation and interviewing tasks. Please use this time to become familiar with your responsibilities. If you have any questions feel free to ask.

3. INTERVIEW OBSERVATION TASK:

Now you will observe another participant complete two encounters similar to those you completed. Your objective is to observe the learner's communication style, you don't need to pay attention to the other SP. Similar to the first phase of the study, you will complete the same questionnaires after each interview.

APPENDIX R

STUDY 2 CASE DETAILS

STANDARDIZED PATIENT PROTOCOL

Proposed Cases: Basic Interviewing

Case Title: **Sore Throat**
HPI Case #1

SUMMARY OF CASE

Opening Statement:
"I've got an awful sore throat."

Patient Expectations of Visit:
Tell me what it is and how to make it go away.

Chief Complaint/Agenda:
1. Sore throat and cough
2. Fever
3. Need a written excuse to miss work

Duration: 3 weeks

Onset: Sudden, one evening with fever. State that cough developed next day

Quality: Sore, scratchy throat, mild pain with swallowing

Severity: Fever greater than 101.3 at highest. States pain rates 5/10

Timing: fever worse at night. Stated worse in AM

Location: throat/ear

History of Present Illness:
The patient has had a sore throat and cough for 3 weeks. The fever was pretty bad at first but now seems to come and go. The patient has also noticed some ear pain, "inside my head" at times. A "Flu" has been going around work but everyone else got over it quickly. The patient has noticed a decrease in appetite, but no weight loss. The patient has also had some pain in his/her upper middle stomach (epigastric area) but no nausea or vomiting. The pain is described as a dull ache. The patient has been taking Echinacea and Ginseng for the past week, hoping to stop the sore throat.

Meds: see above + Claritin for seasonal allergies

Allergies: seasonal (spring)
Tetracycline (leads to throat swelling)
Family History:
Mother - glaucoma
Father – died in car accident
Siblings – 2 sisters
Children – 2 children
Diseases/conditions that run in family – Mothers brother died of a HA @ 65
Married

Presentation:
Patient is very worried about the lingering effects of this sore throat. Three weeks seems like a very long time to be sick. People at work are starting to be annoyed with him/her feeling lousy all the time. The patient feels guilty for being sick

Standard Questions/Challenges to Interviewer:
Feelings: Worried about cause of something that's gone on so long. Feels guilty for being sick (people at work seem to be annoyed, maybe they think I'm malingering).
Ideas: Something wrong with me that I can't get over it? Something out of kilter? Also doesn't want to give it to the children.
Function: Doesn't feel well at work; isn't concentrating. Just goes home and sleeps, so getting behind at home, not much help with household.
Expectations: Tell me what it is and make it go away. Do you think I should take some time off work? Can you write me a note for the files so I won't get docked vacation time?"

Cues:
"worried that this is going on so long."
"feeling guilty about being sick for so long"

Cues:
"Wanted to make sure it wasn't something serious."

STANDARDIZED PATIENT PROTOCOL

Institution: FCM-VCU School of Medicine

Case Title: **Allergies, M1 (case 3)**

SUMMARY OF CASE

Opening Statement: *"I think I have allergies."*

Chief Complaint: The patient has been complaining of an annoying itch at the back of his throat and in his ears.

History of Present Illness:
The patient has had an itching sensation at the back of his throat and in his ears for the past three weeks, ever since the weather has been changing. The symptoms seem to come on after he has been outside or in rooms with the windows open. Severity is rating as annoying – level 7 out of 10. He has had similar symptoms in the past but they have never been this aggravating. He also complains of sneezing after being outside. He took Tylenol allergy/sinus for 3 days according to the directions, but it didn't provide any relief. He took some of his roommate's prescription allergy medicine yesterday (can't recall the name of it), which did provide relief.

Medications: Pepcid 20 mg tablet PO at bedtime for 2 years
Allergies: Penicillin (swelling of tongue, lips, if asked) – was told by his mother he has been allergic since a child.

Presentation:
Patient is cooperative. He is repeatedly clears his throat and rubs at his ears during the interview (2 times each).

Feelings: Worried that the symptoms are worse than they have been in the past. Wondering if he will develop asthma too. He has read that allergies are associated with asthma.
Ideas: He works for the National Park Service as a ranger and spends the majority of his days outside. Thinks he has allergies; his symptoms are exactly like his roommate's who has seasonal allergies and his roommate's medication made him feel better.
Function: Harder to work outdoors when sneezing. Thinks he may have to change his job if he can't get the symptoms under control.
Expectations: Wants prescription medication for allergies.

STANDARDIZED PATIENT PROTOCOL

Institution: Eastern Virginia Medical School, M3FM Class of 2011

Case Title: **Intimate Partner Violence, Hx X PE X**

SUMMARY OF CASE

PATIENT DEMOGRAPHICS: to be used for recruiting the Standardized Patient

a. **age range 20-40**
b. **gender ..... female**
c. **race ..... Asian, Filipino, Latin American, Hispanic**
d. **socioeconomic level ..... middle**
e. **educational background ..... high school**
f. **motivational level.....pre-contemplation**
g. **specific affect to be simulated ..... scared**

First visit

Opening Statement:

"I hurt my wrist and it hasn't gotten better so I had to come in."

Chief Complaint:

Hurt wrist

History of Present Illness:

Patient states she was "putting toys away in the toybox and my 5 year old slammed the lid down on my wrist" two days ago. She has had pain since. She describes her pain as constant and severe. The pain is located in her right wrist and does not radiate. It is worse with movement or lifting. There is no movement of the wrist at all and she will only slightly flex her fingers if asked. (Note: It is extremely painful to the touch.) She has tried wrapping it in an ace bandage to stop the swelling and to restrict movement. She states she is always "tripping over toys, clumsy". She has taken some pain killers (Percocet) that she had left over from previous injuries (if asked – the Percocet came from another clinic when she went in for stomach problems.) She had been taking 2 Percocet every 3-4 hours for the pain. She is almost out of them.

Over the past 2 days she has not "had complete relief" of her pain, even with the pain killers. Her husband thought it was only a sprain and "not that bad", but it hadn't gotten better. She has not been able to work at her husband's salon and he is starting to call her a baby and feels she is over-acting injury so as not to work. She decided to come to the Urgent Care Center near her home while he is at work.

Motivation to change: This patient wants medicine to relieve the pain. She is scared to open up about her relationship with her husband but will tell the doctor is asked.

Verbal Cueing:

1. Keep asking for pain medication because the pain is so intense you don't think you could stand it with out drugs.
2. Refuse to get a cast. You are terrified of getting a cast because then your husband would know you went to a clinic. You would rather wait until tomorrow after you ask his permission to get it looked at. Plead for something that will be removable when you get home.

Husband:

- Seen as a "good guy" by others
- Good at job, owns a nail salon since retiring from the military
- Tyrant: rigid gender role - owns her and the children
- Jealous: assumes she is having an affair with everyone therefore has her "clocked" when she is out of the house doing errands, appointments etc.
- He hits her to "get her back in line" – or when he has been very stressed at work and she adds to his anger, or if she makes a mistake at work and "looks stupid, which embarrasses him" , "He just can't help it…I don't think he realizes how strong he is."
- Checks up on her during the day if she is not working with him.
- He controls all the money, she has no savings or access to accounts
- She must keep all her receipts and show him where the money has been spent
- He has control of the medical card - therefore she is in an Urgent Care Center office today (he does not know she is here)
- Drinks regularly with the "boys" on the weekends
- Drug use – uses marijuana with his friends

Relationship:

- She believes it is her job to stay out of his way and keep him happy. She believes it is her fault, she must be doing something wrong to get him so mad that he would hit her.
- He has threatened to not let her work, take the kids, tell her parents lies about her (like sleeping around) if she even dares to think about leaving him.
- He intimidates her at every chance – and reminds her that his money and job has helped to support her family as well.
- After they have a fight he will take the kids in the car and tell her he won't be back
- She constantly minimizes: "he just doesn't remember" "he just put me against the wall"
- She has sexual intercourse with her husband at least every other day – even if she doesn't want to because it is her duty to be his wife.

If the interviewer specifically asks:

- Has your husband ever done anything that frightens you – Yes, he threatens to take the children away from me and tell lies about me and sometimes he hurts me
- How does your husband react when he has been drinking - he gets angry easily
- Has he ever kept you from leaving the house? -- no, but he needs to know where I am
- What does he do when he gets angry - he throws things and every once in a while he just "loses it."

- When did he start hurting you? - when I was pregnant with my first child
- When was the last time he hurt you, besides this injury? – 3 months ago
- Determines severity level of physical abuse – not life threatening but has sustained injuries (bruises) – this wrist is the worst injury
- Has there been a recent change of abuse - no
- How often does he lose his temper and physically hurt you? – about 3-4 times a year, and he is always very sorry afterwards to have to punish me, he really does love me and the kids.
- Are there weapons in the house - no
- Has your husband ever threatened to hurt the children? - no
- Have you ever had any suicidal thoughts? – no
- Have you ever had thoughts about hurting him? No

Past Medical History:
Her husband rarely wants her to see the doctor but any visits would include:
1. tension headaches,
2. GI tract symptoms, "spastic colon"
3. pelvic pain

She does not go to the same doctor/clinic more than once. Last GYN/Health maintenance exam 5 years ago.

Family History:
She was born in Guatemala. Raised in the environment that the Father is always head of the house and the wives/girls should be docile and caregivers to the family. Husbands often punish their wives if they do something wrong. She understands that this is old-fashioned, but it is part of her heritage. Recalls needing to be "disciplined" by her father as a child; was always getting in trouble for being outspoken. Husband was born in the US and is in the military. They met when he was overseas and married. He only speaks English, she has issues reading English.

Social History:
- 2 children (ages 17 & 5)
- They married early because she was pregnant with the daughter. Second child was also unplanned.
- Her husband is retired navy and now owns his own nail salon- she works with him and takes care of the books.
- Alcohol: she drinks 2 -4 drinks per evening
- The patient is very proud of her heritage and spends a lot of time with the family. Her husband uses this to reinforce the male-dominance in their marriage. Both of them grew up in households where the husband rules with an iron fist and slapping and abuse are normal. Divorce is not to be tolerated by the family.
- Religion – Roman Catholic – doesn't go unless with her husband. Husband does not allow her to see the priest without him present.
- No friends

Review of Systems:
She has difficulty sleeping, she feels "wiped out" all the time

Presentation:

Patient presentation is restless (anxiety level 5), checks watch frequently (husband believes she is at the bank), decreased eye contact, guarded, defensive. Increased startle response.

She is reluctant to admit to abuse, she does not want to get her husband in trouble because she is the one that will suffer.

She refuses to have a full physical examination if this is suggested, but will allow the student to inspect the wrist, check for pulses and sensation in extremity. The patient is unable to perform any ROM due to the pain.

Bruise is not congruent with the accident she reports. Is wearing long sleeves – but she pushes up her sleeves and more bruises become apparent – quickly pulls sleeves back down.

Standard Questions/Challenges to Interviewer:
"Please, you don't understand my culture, the best way to help me is to get me some medicine."

PROPS:
Bruises on wrist and up the forearm (these should all be visible when she shows her wrist at the beginning of the encounter)

Examination Findings
Bruises as noted
Active ROM more painful than passive ROM
Point tender metacarpal area

STANDARDIZED PATIENT PROTOCOL

Institution: Eastern Virginia Medical School, M3FM Class of 2011

Case Title: **Indigent in need of medicine, Hx X PE X**

SUMMARY OF CASE

Patient Demographics:

a) **Age range: 30 – 40**
b) **Gender: Male or Female**
c) **Race: Non specific**
d) **Socioeconomic/educational level: High School, poor, widowed**
e) **Background: Works in bakery**
f) **Case specifics: Poor, uninsured, history of high blood pressure, diabetes**
g) **Specific affect to be simulated: Anxious, HTN**

Opening Statement:

"I don't feel good at all."

[If encouraged to continue]:

Agenda #1:
I just haven't been feeling well I'm dizzy and have headaches.
Agenda #2:
I'm afraid I will lose my job if I miss any more days of work.
Agenda item #3:
I needed to see if I can get a refill, so I thought I'd come in and see what was wrong with me. [needing medicine refills].

Chief Complaint:

Patient has been experiencing dizziness and headaches. He is also tired for the past month. It is interfering with his work and can't afford to lose his job. Patient also is concerned about his frequent urination and thirst. This also is interfering with his job because he has to leave his station to go to the restroom.

If asked for "anything else?"/other reasons for coming:
He is running out of blood pressure medication and needs to get a refill.

History of Present Illness:

Over the past month:

1) Dizziness, "Just happens, especially when I go to stand up. I feel light headed. It happens mostly at work and once, maybe twice at home". [4-5 times a day]
2) Headaches, usually at work during times of stress. Pounding "all over" headaches. Headaches can last all day, severity 5/10 (if asked). Takes Advil or Tylenol if "somebody at work has some" with minimal relief.

3) He also reports difficulty sleeping at night due to urination (see "sleep patterns" in Social History) and has a hard time getting up in the morning. He finds he has a "short fuse" at work.
4) Frequent urination *("I have to pee a lot")*. 6-7 times a day, 2 times a night. No pain, just pressure. Color is yellow and volume is "seems like quite a lot".
5) Thirsty 8 to ten glasses a day

F – *"you know it's hard sometimes, but I've got to do what I've got to do."* Non-verbal cues indicate the stress that the patients feels about his/her situation (worries sometimes, the patient does not consider him/herself a priority)
I – the patient thinks maybe he/she needs the refill of the medicine
F – missing days of work, short fuse
E – something inexpensive that will make him/her feel better

Past Medical History:

1) Depression was diagnosed 3 and half years ago after wife's accident. He was prescribed Prozac, 20mg daily, took it for a few months but dropped it due to the cost and the nausea it caused.
2) High blood pressure was diagnosed two years ago when he was having headaches and dizziness.
3) Diabetes was diagnosed 5 years ago. He was losing weight, blurred vision, thirsty and urinating a lot. Physician prescribed pills and gave the patient information about healthier eating habits. He no longer has the prescription. *"Ran out a couple of years ago."* Does not know the name of the medication.

Family History:

- Parents dead. Mother, diabetic (died at age 60), Father, heart disease and high blood pressure (died at age 58)
- One sister lives in California and is healthy
- Health status of children (3 - ages 12, 7 and 5) is excellent
- Spouse died 2.5 years ago. She was in a car accident that left her in a coma for one year.

Social History:

The patient has worked in a bakery for the past 3 years. The symptoms he is experiencing are causing a loss of work. It is difficult for him to function, and he is always behind schedule. The patient can let work stress him and he finds himself yelling at his co-workers. He finds this is happening almost every day. The reasons he states are:

1) Not enough pay. Medical expenses with wife left him destitute. He did not have life insurance to cover the funeral either. He barely has enough money to pay rent and he juggles the utility bills paying late fees. He can't afford medical insurance for himself (kids have Medicaid under the state child health plan).
2) Boss getting on his back because of missed days.
3) Boss getting after him for always leaving his post to go to the restroom.

- He has completed high school, but has not furthered his education.
- His religious affiliation is Baptist. Does not attend regularly
- Patient does not drink alcohol, and has never had a drinking problem.
- Smokes cigarettes. Started when he was 15, 2 PPD, down to 1 PPD due to cost. Has tried to quit smoking twice. The longest he has gone without smoking was 2 months about a year ago but stress and co-workers who smoke got him smoking again. He does not want to quit now. But admits that he is afraid and doesn't think he can quit smoking.
  Children want him to quit smoking. Caught oldest child smoking a cigarette a month ago, upset because he feels he's a bad example. (cognitively not ready to change, emotionally ready)
- He has not used recreational drugs, sleeping pills, diet pills, or pain killers.
- He has never been dependent on prescription drugs or abuses over the counter (OTC) medicines.
- Patient has no specific diet. He eats, "*anything that I can afford.*" (No fresh fruit, vegetables. Mac and cheese, potato salad, sandwiches, spaghetti). Irregular meals, pastries. **when the patient *had* diabetes he/she tried a healthier diet, but it was too expensive and took too long to prepare.
- He is interested in gardening, but has limited time to enjoy it
- He is attracted to women but hasn't got much time for dating and tends to feel guilty toward spouse
- First became sexually active at 15 years old and has had 3 different lifetime partners. He has had two dates since his spouse's death but felt guilty and has not been sexually active. Can masturbate but cannot achieve full erection. No STD's.
- He is concerned about the frequent urination.
- Patient feels that he needs medication, but has no money to pay for Doctors and is scared of side effects.
- Sleep patterns: Goes to bed around 10pm; has no trouble falling asleep. Each time he wakes up to go to the bathroom, he has trouble falling back to sleep (worries about things, afraid he won't wake up on time). Gets up at 5am to be to work by 6am. Was getting 7 solid hrs per night; past month: 5-6 hrs. per night

Physical Examination Findings:
Raised blood pressure.
Standard Challenges: If students do not discuss -
"I don't think I can quit smoking"
"Do I have to take the medications everyday?"
"I thought my diabetes went away and now is it back?"
"What am I going to do when the pills you have given me run out?"
If student does not address relationship between symptoms and diagnosis:
"Will the pills for blood pressure and diabetes help with the headaches and dizziness?"
Presentation (patient is in a gown) and affect:

- Worried about symptoms
- Frustrated about lack of money and expenses of meds

Anxious about effect on job and life.

APPENDIX S

STUDY 2 CONFEDERATE SCRIPTS

Interview 1 (Rote)
Case Title: **Sore Throat HPI Case #1**

LEARNER: Hi, I'm student doctor Glendall. I see that you're not feeling well. Can you tell me about that.

LEARNER: And how long has this been going on? *(scratch your face and appear like you are very interested)*

LEARNER: Can you describe how your throat feels.

LEARNER: How would you rate your throat pain on a scale of 1 to 10, 10 being the worst?

LEARNER: Are you having other symptoms like a runny nose or cough?

LEARNER: Did the cough start with the sore throat?

LEARNER: Do you have any other symptoms like a fever? *(rub your nose)*

LEARNER: Are you experiencing any headaches or ear pain?

LEARNER: What is your temperature the last time you took it? *(fold your hands)*

LEARNER: Does your fever get worse during the day?

LEARNER: And the pain in your stomach, what does that feel like? *(clear throat)*

LEARNER: Have you experienced a loss of appetite, nausea or vomiting?

LEARNER: Are there any illnesses that run in your family?

LEARNER: Have you been taking any medications? *(run your fingers through your hair)*

LEARNER: Have you been exposed to anyone who was sick?

LEARNER: What concerns you the most about your sore throat? *(lean forward)*

LEARNER: And has this been an issue at work? *(cover mouth)*

LEARNER. Has this been a problem when you're at home with your family?

LEARNER: Are there any concerns that you have that we haven't addressed yet? *(tap your pen)*

LEARNER: Well I would like to do some tests to see if this is viral or bacterial. If it's viral I can give you a steroid shot to speed up the healing process otherwise, I'll prescribe you an antibiotic. I'm also going to give you a prescription spray to numb the back of your throat. That should help with the pain. Is there anything else I can do for you?

Interview 2 (Rote)
Case Title: **Allergies, M1 (case 3)**

LEARNER: Hi. How are you doing today? I'm student doctor Calloway. Tell me what brought you in today.

LEARNER: What makes you think you have allergies?

LEARNER: Are you outside often? *(drum fingers)*

LEARNER: How long have you been experiencing these symptoms? *(rub your eyes and appear tired)*

LEARNER: You have an itchy throat and ears. Anything else?

LEARNER: What do you do for a living?

LEARNER: You said this has been going on for three weeks. Is this continuous?

LEARNER: Have you ever experienced anything like this before? *(turn away)*

LEARNER: What makes it worse?

LEARNER: What makes it better? *(raise shoulder)*

LEARNER: Have you tried anything else for this? *(raise hand and move pen)*

LEARNER: How would you describe the severity of your symptoms on a scale of 1 to 10. 10 being the worst?

Interview 3 (Improvisational)
Case Title: Intimate Partner Violence

LEARNER: Hi I'm student doctor Calloway. Can you tell me what brought you in today?

LEARNER: How did you hurt your wrist?

LEARNER: Have you taken anything for the pain? *(rub your nose)*

LEARNER: I saw some more bruises up your arm have you had any other recent injuries? *(purse lips)*

LEARNER: Do you drink any alcohol or smoke?

LEARNER: What type of alcohol do you drink?

LEARNER: Is there a reason why you are drinking everyday? *(fold hands)*

LEARNER: What does your husband think about your drinking?

LEARNER: What do you do for a living?

LEARNER: The nurse mentioned you have children. What grades are your children in at school?

LEARNER: Who takes care of your children when you are at work? *(rub your mouth and appear interested)*

LEARNER: You said you work in a nail salon. Can you how this injury is affecting your ability to work?

LEARNER: What does your husband think about you working with this injury? *(lift your paper)*

LEARNER: I have to be honest. The bruise on your arm looks like someone grabbed you. I am concerned about your safety at home and I want you to know that I won't tell your family what we talk about but I have to ask: How is your relationship with your husband?

LEARNER: How do your husband's parents treat you?

LEARNER: What do your in-laws do for a living? *(lean forward)*

LEARNER: I want you to know that I won't tell your husband about anything that you say to me. The reason I'm telling you this is because I'm concerned about your injury and I need to ask: Has your husband ever been violent to you or your children? *(slouch*

LEARNER: How do your children react to the way your husband treats you?

LEARNER: What does your mother think about your relationship with your husband? *(wide eyed)*

LEARNER: I want you to know that there are options for you. I can give you some information about a local women's shelter that specializes in women in your situation. They can provide you and your children a safe place to go. Do you mind if I share some information with you?

Interview 4 (Improvisational) Case Title: Indigent in need of medicine

LEARNER: Hi I'm student doctor Glendall. What brings you in today?

LEARNER: You just don't feel good? What specifically brings you in?

LEARNER: Can you describe your dizziness? *(rub your ears)*

LEARNER: What makes the dizziness feel better?

LEARNER: How long has this been going on?

LEARNER: Are you experiencing any headaches? Can you tell me about that? *(looking to the side)*

LEARNER: I heard you work in a bakery. What types of things do you do in the bakery? *(tighten and flex fist)*

LEARNER: Are you experiencing any stress at work? *(cough)*

LEARNER: How do you get to work?

LEARNER: It says here that you have trouble with frequent urination. Can you tell me about that? Are you thirsty a lot?

LEARNER: What kinds of things are you drinking when you're thirsty? Do any of them make the problem worse? *(tap hands)*

LEARNER: It says here you have high blood pressure. What was your last blood pressure reading before today?

LEARNER: I see that you were diagnosed with diabetes a while ago. How have you been managing that?*(cover mouth)*

LEARNER: Can you tell me what you had to eat today?

LEARNER: Your medical records show that you were prescribed Prozac for depression. What were the circumstances that led you to take an antidepressant? *(scratch your nose)*

LEARNER: I'm sorry to hear that you lost your spouse. How many years were you married and how did you two meet?

LEARNER: How have you been coping with your loss?

LEARNER: I see that you have three children. Where are they in school? *(cross your arms)*

LEARNER: I want to go back to the Prozac you were taking. A lot of people experience withdrawal when they stop taking an antidepressant. How did you feel when you stopped taking it?

LEARNER: I'm going to go and discuss your dizziness and headaches with my attending. I'm concerned about this and I want to order some tests. I will get you a refill for your blood pressure medication prescription. Is there anything else that you want to talk about today?

APPENDIX T

ABBREVIATED MASTER INTERVIEW RATING SCALE

EASTERN VIRGINIA MEDICAL SCHOOL

ITEM 1 – TYPES OF QUESTIONS/STATEMENTS

[5]	[4]	[3]	[2]	[1]
The learner began the information gathering with an open ended question which was followed up by more specific or direct questions. Each major line of questioning was begun with an open ended question. No poor questions were asked		The learner often failed to begin a line of inquiry with open ended questions but rather employed specific or direct questions to gather information OR the learner used a few leading, why or multiple questions.		The learner asked many why questions, multiple questions or leading questions.

ITEM 2 - VERBAL FACILITATION SKILLS & ENCOURAGEMENT

[5]	[4]	[3]	[2]	[1]
The learner used facilitation skills throughout the interview, when appropriate, which included use of short statements, reflection, echoing, clarification and/or confrontation.		The learner used some facilitative skills but not consistently or at appropriate times. Verbal encouragement could have been used more effectively		The learner failed to use facilitative skills to encourage the patient to tell his story

ITEM 3- NON-VERBAL FACILITATION SKILLS

[5]	[4]	[3]	[2]	[1]
The learner put the patient at ease and facilitated communication by using good eye contact, relaxed, open body language, and appropriate facial expressions There were no physical barriers and appropriate physical contact was made with the patient		The learner made some use of facilitative techniques but could be more consistent in that one or two techniques were not used effectively A physical barrier was present		The learner made no attempt to put the patient at ease The learner's body language was negative or closed Annoying mannerisms (foot or pencil tapping) intruded on the interview Eye contact was not attempted or was uncomfortable

ITEM 4 – EMPATHY AND ACKNOWLEDGING PATIENT CUES

[5]	[4]	[3]	[2]	[1]
The learner used supportive comments regarding the patient's emotions and provided the patient with intermittent verbal encouragement, such as verbally praising the patient for proper health care techniques The learner used NURS (Naming, understanding, respecting and supporting) to convey encouragement		A few sympathetic statements were used and the learner was neutral neither overly positive nor negative in demonstrating empathy during the interview Verbal encouragement could have been used more effectively		No empathy was demonstrated by the learner The learner used a negative emphasis or openly criticized the patient The learner provided no encouragement

ITEM 5 – OVERALL INTERVIEW TECHNIQUE

[5]	[4]	[3]	[2]	[1]
The learner consistently used the patient-centered technique and mixed the patient-centered and physician-centered styles that promoted a collaborative partnership between the patient and doctor		The learner initially used a patient-centered style initially but reverted to physician-centered interview by the end of the interview (rarely returning the lead to the patient) OR The learner used all patient-centered interviewing techniques and failed to use any physician centered styles Therefore the learner did not accomplish a negotiated agenda		The learner did not follow the patient's lead and used only the physician centered technique thereby negating the collaborative partnership

ITEM 6- ORGANIZATION

[5]	[4]	[3]	[2]	[1]
Questions in the body of the interview followed a logical order for the patient		The learner seemed to follow a series of topics or agenda items, however there were a few minor disjointed questions		The learner asked questions that seemed disjointed and unorganized

APPENDIX U

STUDY 2 PROJECT INTERVIEW DEBRIEFING FORM

Thank you for participating in this study, titled "The effect of improvisations and observations on standardized patient encounters and subjective workload and stress." The purpose of this research is to understand how SPs are able to timeshare multiple tasks in a clinical interview especially when faced with unexpected events that require improvisations. Your participation in this study is helping to further understand the cognitive demands SPs face.

Again, thank you for participating!

Elizabeth T Newlin-Canzone and Dr. Mark W. Scerbo

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Department of Psychology

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APPENDIX V

STUDY 2 POST-EXPERIMENT INTERVIEW

1. What did you like about the experiment?
2. What did you not like the experiment?
3. Did you find it difficult to juggle the portrayal and assessment tasks during the active observation phase?
4. Did you find it difficult to improvise responses?
5. Will you describe how you typically improvise responses?
6. Do you think your experience level impacts your improvisational abilities? If so how?
7. Do you have any feedback about the questionnaires? Do you feel like they provided a good method for assessing your stress?.. mental effort?... your assessment of the interviewer?
8. Do you have any other thoughts, feelings, or comments about this experiment?

APPENDIX W

DESCRIPTIVES TABLES

Table 1

Means, Standard Deviation, Skewness and Kurtosis for Study 1

	Passive Observation								Active Observation							
	Rote Interview				Improvisational Interview				Rote Interview				Improvisational Interview			
Variable	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis
Inter-rater Reliability of Communication Ratings	21 59	5 12	14	-1 40	22 68	6 44	05	- 70	24 36	6 68	30	24	26 68	7 53	33	- 63
Proportion of Behaviors Correctly Identified	49	13	- 09	- 89	41	13	27	- 31	30	12	36	79	24	10	62	70
Number of Behaviors Incorrectly Identified	5 81	2 87	93	1 194	3 94	2 30	56	40	2 86	2 00	79	22	2 17	1 52	58	- 47
Overall Workload	41 61	16 16	24	- 62	38 41	13 67	47	38	48 72	17 34	29	- 62	58 19	16 13	11	03
Mental Demand	7 26	4 75	43	-1 08	7 10	4 33	51	- 30	9 33	4 64	10	-1 29	13 28	4 27	- 87	07
Physical Demand	1 52	1 68	1 42	1 39	1 31	1 52	1 47	1 21	1 94	1 87	1 19	33	3 48	4 53	1 64	1 81
Temporal Demand	5 64	5 03	74	- 53	4 25	3 49	63	- 50	6 62	4 20	58	- 58	7 74	5 02	06	-1 11
Effort	6 21	4 38	78	- 50	5 65	4 29	1 03	86	9 88	5 17	18	- 94	11 82	4 34	- 57	- 64
Performance	14 73	3 44	1 03	20	14 75	3 78	-1 32	1 68	14 21	3 61	-1 15	91	12 89	4 17	- 89	79
Frustration	5 59	5 37	1 04	32	5 01	4 71	1 10	40	6 19	5 31	86	- 35	9 12	5 46	- 09	-1 35

Table 2
Means, Standard Deviation, Skewness and Kurtosis for Study 1

	Prescore				Passive Observation								Active Observation							
					Rote Interview				Improvisational Interview				Rote Interview				Improvisational Interview			
Variable	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis
Overall Stress Score	2 40	22	- 04	- 92	2 30	27	- 15	- 07	2 27	29	23	- 11	2 47	32	72	08	2 44	30	22	84
Engagement Score	3 70	55	- 67	34	3 68	71	- 20	- 25	3 68	59	- 50	57	3 89	61	- 68	03	3 80	71	- 65	34
Distress Score	1 31	45	1 60	1 38	1 35	50	1 59	1 48	1 29	40	1 15	- 16	1 24	35	1 44	61	1 29	41	1 43	74
Worry Score	2 11	50	10	- 34	1 85	67	1 22	2 40	1 81	66	1 38	2 95	2 19	77	54	- 37	2 26	87	1 03	1 75

`able 3
Aeans, Standard Deviation, Skewness and Kurtosis for Study 2

	Passive Observation								Active Observation							
	Rote Interview				Improvisational Interview				Rote Interview				Improvisational Interview			
/ariable	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis
nter-rater Reliability of `ommunication Ratings	16 50	3 63	- 34	- 75	16 60	5 43	19	-1 02	19 50	6 48	- 35	- 95	16 95	5 29	- 52	- 47
'roportion of Behaviors `orrectly dentified	57	13	- 45	- 29	50	14	- 36	- 83	26	11	47	- 32	22	08	- 14	- 57
Number of Behaviors ncorrectly dentified	4 55	2 37	- 14	87	5 00	3 09	84	68	4 05	1 93	- 13	- 99	3 45	2 42	55	- 58
Overall Workload	50 38	16 29	- 15	-1 15	50 65	13 38	- 53	-1 00	55 11	16 38	- 41	-1 32	57 59	14 93	04	- 26
Mental Demand	11 39	4 50	- 56	- 62	11 06	5 07	- 52	-1 15	9 77	4 90	21	-1 27	13 08	3 57	- 69	- 57
Physical Demand	1 99	2 08	96	06	1 14	1 19	60	- 34	3 24	2 79	84	- 42	2 58	2 31	1 16	1 25
emporal Demand	6 70	4 54	23	- 92	7 95	3 89	- 19	- 36	8 68	5 08	02	- 73	9 93	4 37	47	- 32
:ffort	11 44	5 56	- 70	- 84	10 63	3 79	- 45	12	10 91	4 77	- 01	-1 09	11 61	4 30	- 52	- 49
Performance	12 60	3 69	- 03	- 41	12 74	4 39	- 33	42	14 49	3 42	- 43	-1 27	12 93	3 87	- 43	-1 12
rustration	6 26	5 58	52	-1 25	7 13	5 68	63	- 57	7 77	5 39	30	-1 09	6 73	4 61	18	-1 28

Table 4
Means Standard Deviation, Skewness and Kurtosis for Study 2

	Prescore				Passive Observation								Active Observation							
					Rote Interview				Improvisational Interview				Rote Interview				Improvisational Interview			
Variable	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis	*M*	*SD*	Skewness	Kurtosis
Overall Stress Score	2 60	44	1 00	1 03	2 50	43	40	80	2 50	44	36	- 81	2 59	42	67	35	2 61	40	60	60
Engagement Score	4 11	39	54	16	4 08	40	26	60	3 93	46	- 45	15	4 12	49	- 02	- 66	4 14	36	08	-1 03
Distress Score	1 11	14	97	- 42	1 21	21	45	-1 52	1 26	34	96	- 70	1 28	40	1 51	1 06	1 28	27	1 13	88
Worry Score	2 44	95	32	- 93	2 11	1 07	48	-1 52	2 22	1 11	31	-1 61	2 32	1 04	41	-1 47	2 31	1 03	18	-1 64

APPENDIX X

NONVERBAL BEHAVIOR FIGURES

Frequencies of Correctly Identified Nonverbal Behaviors in Study 1

		Passive Rote	Passive Improvisational	Active Rote	Active Improvisational
Head	Head nod	27	22	27	29
	Head shake	2			1
	Turning head away			20	
	Head lean to one side	27	4	11	6
Hand/arm	Tapping fingers	23		5	1
	Tapping hand	9	7		3
	Tapping pen	22	1	2	2
	Twirl pen in fingers				
	Raising hands	4	1	1	1
	Rubbing eyes	6		3	
	Rubbing ears		11		1
	Rubbing mouth		11		3
	Scratches face			3	
	Covers mouth	12	9	5	2
	Covering face			5	
	Move hand	20	14	12	6
	Folded hands		**6**		**2**
	Tightening fist		**4**	1	**1**
	Move finger	16	9	7	2
	Moves pen	28	10	8	11
	Lifts paper	10	6	5	10
	Adjusts glasses	14	15	5	5
	Crossing arms		**14**	2	**2**
	Raise shoulder	2			1
	Running fingers hair	12		5	1
	Talking with hands	12		3	1
Torso	Slouching	9	1	1	
	Sitting up straight	10	29	27	30
	Lean forward	14	**7**	9	**3**
	Lean back		3	3	1
	Lean to the side	14	**9**	5	**2**
	Swaying			1	
	Moving in chair	19	7	8	4

		Passive Rote	Passive Improvisational	Active Rote	Active Improvisational
	Turning away			2	
Feet/Legs	Tapping feet	23			
	Shaking foot	29			
	Crossing legs	4			
	Uncrossing legs	7			
Face	Smile	4	**9**	13	**14**
	Frown		10	5	8
	Bites lip				**1**
	Pursed lip	12	15	13	7
	Raised upper lip	1	3		
	Open mouth		1		
	Yawn	10		5	
	Furrowed Brow	7	8	6	3
	Squinting eyes	4	6	2	4
	Raising eyebrows	13	21	14	15
	Glaring	6	6	4	4
	Staring	17	13	7	7
	Looking up	14	5	1	
	Looking at watch		1	10	
	Excessive eye blinking		**6**		
	Lack of eye contact	24	2	1	
	Looking to the side	27	1	13	
	Looking at the floor	22		6	
	Looking at the paper	29	21	16	21
Vocal	Low pitch		2		
	Slow speech	1	15	12	11
	Loud speech	21			
	Soft speech		19	19	23
	Cough		**9**		
	Clear throat	2		1	1
	Uh hmmm	6	1	1	3
	Hmmm	3			
	Ok		9	2	3
Proxemics	Sitting close	22		2	1
	Placing objects	3	7	8	7

Note Values in bold indicate the behavior occurred during an improvisational response and underlined values indicate the behavior occurred during a memorized response

Figure 1. Frequencies of correctly identified nonverbal behaviors in study 1.

Frequencies of Missed Nonverbal Behaviors in Study 1

		Passive Rote	Passive Improvisational	Active Rote	Active Improvisational
Head	Head nod	9	16	9	6
	Head shake	15		6	1
	Turning head away			12	1
	Head lean to one side	6	16	20	25
Hand/arm	Tapping fingers	13		15	8
	Tapping hand	9	13	1	13
	Tapping pen	14	**20**	15	**5**
	Raising hands	32	35	34	32
	Rubbing eyes	11		15	
	Rubbing ears		8		16
	Rubbing mouth		6		16
	Scratches face	18		16	**2**
	Covers mouth	6	2	12	30
	Covering face			12	6
	Move hand	15	20	24	30
	Folded hands		**12**	10	**19**
	Tightening fist		**28**	20	**29**
	Pointing finger			21	9
	Move finger	19	27	28	34
	Drums fingers	11		15	4
	Hand brush off				
	Moves pen	7	24	27	25
	Lifts paper	9	11	5	14
	Adjusts glasses	4	4	14	13
	Crossing arms		**5**	11	**16**
	Stretching arms				
	Raise shoulder	33		32	24
	Running fingers hair	6		13	**4**
	Talking with hands	24		30	6
Torso	Slouching	10			3
	Sitting up straight	25	6	9	6
	Lean forward	4	**8**	16	**23**
	Lean back		16	2	3
	Lean to the side	4	**6**	21	**24**
	Swaying			2	1
	Moving in chair	15	11	27	27
	Turning away			4	
Feet/Legs	Tapping feet	13			
	Shaking foot	6			
	Crossing legs				
	Uncrossing legs	6			

		Passive Rote	Passive Improvisational	Active Rote	Active Improvisational
Face	Smile	32	**8**	14	**11**
	Frown		8	22	21
	Eye rolling				2
	Bites lip		**17**	2	**18**
	Pursed lip	22	5	8	16
	Raised upper lip	36	14	37	33
	Open mouth		16	5	10
	Yawn	8		13	
	Run tongue over teeth			4	4
	Furrowed Brow	27	28	27	33
	Squinting eyes	32	11	25	24
	Raising eyebrows	23	16	21	20
	Glaring		30	13	16
	Staring	30	23	29	29
	Looking up	19	12	1	1
	Looking at watch	3		8	
	Excessive eye blinking		**30**	8	**20**
	Lack of eye contact	11			1
	Looking to the side	7		16	5
	Looking at the floor	13		18	1
	Looking at the paper	6	14	18	15
Vocal	Slow speech		18	22	23
	Soft speech	12	14	15	9
	Cough		**5**		**15**
	Clear throat	16		7	15
	Uh hmmm	8		1	2
	Hmmm			2	1
	Ok		7	5	7
	Uh			12	9
	Um			5	6
Proxemics	Sitting close	9			

Note. Values in bold indicate that the behavior occurred during an improvisational response and underlined values indicate the behavior occurred during a memorized response.

Figure 2. Frequencies of missed nonverbal behaviors in study 1

Frequencies of Incorrectly Identified Nonverbal Behaviors in Study 1

		Passive Rote	Passive Improvisational	Active Rote	Active Improvisational
Head	Head shake	2	4		3
	Turning head away	25	4		4
	Head lean to one side	2	9		
Hand/arm	Tapping fingers		9		1
	Tapping hand	8		2	
	Tapping pen			1	2
	Hand shake			1	
	Rubbing eyes				1
	Rubbing ears				1
	Rubbing mouth	3		4	
	Rubs nose		2	1	
	Scratches nose	1	1		
	Scratches face	1	2	3	2
	Covers mouth		12	1	
	Covering face	7	1	2	
	Folded hands	1	2	1	1
	Drums fingers	3	2		
	Hand brush off		1		
	Lifts paper	4	1	4	5
	Adjusts glasses	1		1	1
	Crossing arms	2	1	1	
	Stretching arms				1
	Raise shoulder		1		
	Running fingers hair		1	1	2
Torso	Slouching	5	1	2	2
	Lean forward	1	1		
	Lean back	21	2	1	1
	Lean to the side	6	1		
	Swaying	3		1	1
	Moving in chair		2		
	Turning away	7		3	4
Feet/Legs	Tapping feet			2	
	Shaking foot				1
	Crossing legs	24	1		
	Uncrossing legs		4	1	1
Face	Smile		1	1	2
	Frown	10	5		1
	Eye rolling	6	2	1	
	Bites lip	1		1	
	Pursed lip		6	7	4
	Open mouth	1			
	Yawn				3
	Squinting eyes		1	2	1
	Glaring	4			

		Passive Rote	Passive Improvisational	Active Rote	Active Improvisational
	Looking up		2	5	3
	Looking at watch		2		
	Wide eyed			2	1
	Excessive eye blinking	1			
	Lack of eye contact		5	6	1
	Looking to the side		1		2
	Looking at the floor		1	1	2
Vocal	Low pitch	7	4	2	1
	Rapid speech				1
	Slow speech	8			
	Loud speech	3	3	3	1
	Accent	2	2	1	1
	Dialect	1	1		
	Cough	1		2	1
	Clear throat		2	1	
	Uh hmmm	1	3	1	
	Hmmm	4	2	4	1
	Ok	5	2	6	3
Space	Sitting far	9	5	3	2
	Sitting close	11	22	28	21
	Standing far		1		
	Placing objects		2		

Note. Values in bold indicate that the behavior occurred during an improvisational response and underlined values indicate the behavior occurred during a memorized response.

Figure 3. Frequencies of incorrectly identified nonverbal behaviors in study 1

Frequencies of Correctly Identified Nonverbal Behaviors in Study 2

		Passive No Improvisations	Passive Improvisational	Active No Improvisations	Active Improvisational
Head	Head nod	2	6	6	5
	Head shake	1		1	
	Turning head away	10	7	4	5
	Head lean to one side		6	1	2
Hand/arm	Tapping fingers	1	1	2	1
	Tapping hand		**6**	1	
	Tapping pen	8			
	Twirl pen in fingers	10		3	
	Raising hands	2	1	1	1
	Rubbing eyes	7			
	Rubbing ears		2		
	Rubbing mouth		**6**		
	Rubs nose	4	**6** / 3	1	**1**
	Scratches face	7		1	
	Flexes hand		**4**		**1**
	Covers mouth	8	**4** / 7	1	1
	Covering face	3	1		
	Move hand	12	13	6	5
	Folded hands	8	**4**		1
	Tightening fist		**3**		**1**
	Move finger	15	8	6	
	Drums fingers	7		1	1
	Moves pen	16	10	7	3
	Lifts paper	9	10		1
	Crossing arms	8	**7**	6	**1**
	Raise shoulder	8		2	
	Running fingers hair	8		1	
	Talking with hands	2		1	
Torso	Slouching	6	10	7	1
	Sitting up straight	13	11	14	15
	Lean forward	9	**6**	5	**3**
	Lean back	6	3	1	4
	Lean to the side	7	2	1	1
	Moving in chair	5	7	4	1
	Turning away	2		1	
Feet/Legs	Tapping feet			2	
	Shaking foot	3		9	2
	Crossing legs	11	14		7
Face	Smile		**5**	3	1
	Pursed lip		4		1
	Yawn	4		1	
	Press lips together	5	**4**		
	Furrowed Brow	2	3		1

		Passive No Improvisations	Passive Improvisational	Active No Improvisations	Active Improvisational
	Wide eyed				**1**
	Excessive eye blinking	2	3	1	1
	Good eye contact	11	9	12	13
	Looking to the side	8	11	5	4
	Looking at the paper	17	19	17	15
Vocal	Rapid speech	4	1	1	2
	Cough	5	6		3
	Uh hmmm			1	2
	Ok	15	12	13	10
	Uh	4	1	1	1
	Um	1	2	1	1
Space	Sitting far			1	2
	Sitting close	7	6	6	5
	Placing objects	4	5	2	2

Note. Values in bold indicate that the behavior occurred during an improvisational response and underlined values indicate the behavior occurred during a memorized response.

Figure 4. Frequencies of correctly identified nonverbal behaviors in study 2

Frequencies of Missed Nonverbal Behaviors in Study 2

		Passive No Improvisations	Passive Improvisational	Active No Improvisations	Active Improvisational
Head	Head nod	8	6	16	17
	Head shake			7	6
	Turning head away			7	8
	Head lean to one side		12	13	18
Hand/arm	Tapping fingers			4	9
	Tapping hand		**1**		**6**
	Tapping pen	2		7	**2**
	Twirl pen in fingers			6	
	Raising hands	17	19	19	18
	Rubbing eyes	3		10	
	Rubbing ears		6		12
	Rubbing mouth		**7**	10	**12**
	Rubs nose	6	**3** / 7	6	**5** / 7
	Scratches nose			3	5
	Scratches face	3		9	1
	Flexes hand		**4**	1	**12**
	Covers mouth	2	**8** / 2	15	**7** / 12
	Covering face	7	11	19	17
	Move hand	8	7	13	13
	Folded hands	4		10	**4**
	Tightening fist		**6**	2	**11**
	Pointing finger			2	1
	Move finger	5	12	14	20
	Drums fingers	3		9	6
	Moves pen	4	10	6	4
	Lifts paper	12	10		7
	Crossing arms	2	**1**	14	**20**
	Raise shoulder	2		8	
	Running fingers hair	3		9	
	Talking with hands	7		12	**8**
Torso	Slouching	4	2	5	**1** / 5
	Sitting up straight	7	9	7	5
	Lean forward	11	**6**	7	**6**
	Lean back			1	1
	Lean to the side	13	6	9	3
	Moving in chair			4	6
	Turning away			1	1
Feet/Legs	Tapping feet			7	4
	Shaking foot	7		13	15
	Crossing legs	8	5	11	9
Face	Smile		**14**	8	11
	Bites lip			1	1
	Pursed lip		8		7

		Passive No Improvisations	Passive Improvisational	Active No Improvisations	Active Improvisational
	Yawn			4	
	Press lips together	15	**14**	12	15
	Furrowed Brow	18	9	5	5
	Squinting eyes				3
	Raising eyebrows		7	10	**11**
	Wide eyed		**3**	2	**7**
	Excessive eye blinking			16	18
	Good eye contact	9	**10**	8	**7**
	Looking to the side	2	7	6	7
	Looking at the floor			2	2
	Looking at the paper	2	1	3	6
Vocal	Cough	4	2	1	9
	Clear throat			8	
	Uh hmmm			5	8
	Hmmm			1	3
	Ok	5	10	7	10
	Uh	16	9	17	18
	Um	9	18	14	15
Space	Sitting close	7		1	1

Note. Values in bold indicate that the behavior occurred during an improvisational response and underlined values indicate the behavior occurred during a memorized response.

Figure 5. Frequencies of missed nonverbal behaviors in study 2

Frequencies of Incorrectly Identified Nonverbal Behaviors in Study 2

		Passive No Improvisations	Passive Improvisational	Active No Improvisations	Active Improvisational
Head	Head nod	1			
	Head shake		1		
	Turning head away	2	3	2	
	Head lean to one side	6			
Hand/arm	Tapping fingers	2	5	2	2
	Tapping hand	2		1	
	Tapping pen	2	2	2	
	Twirl pen in fingers	4	3		
	Rubbing eyes				1
	Rubbing ears	1		1	
	Rubbing mouth	6	4	1	
	Scratches nose	1	2	1	
	Scratches face	2	4		1
	Flexes hand	1	2	1	
	Covers mouth	1			
	Folded hands		1	2	1
	Tightening fist	2			
	Drums fingers	1	4	1	
	Moves pen	1		3	7
	Lifts paper	2		4	3
	Crossing arms	2			
	Running fingers hair	1	1		1
Torso	Slouching				1
	Lean forward		1		2
	Lean back	8	8	4	2
	Lean to the side		2	1	1
	Moving in chair	3	2		2
	Turning away	4	3	2	1
Feet/Legs	Tapping feet				
	Shaking foot	2			
	Uncrossing legs		2	2	1
Face	Smile	2		1	1
	Frown	2			1
	Bites lip	2		1	
	Pursed lip			2	
	Raised upper lip	1			
	Open mouth	1			
	Yawn		1		
	Press lips together			1	2
	Furrowed Brow		1	2	1
	Squinting eyes	1			2
	Raising eyebrows	1	4	1	
	Staring				1
	Looking up	1	4	5	5

		Passive No Improvisations	Passive Improvisational	Active No Improvisations	Active Improvisational
	Lack of eye contact	3	6	2	3
	Looking to the side	1			
	Looking at the floor	2	2		1
Vocal	High pitch	1			
	Low pitch	3	5	2	5
	Rapid speech	2	3	3	5
	Slow speech	2		2	1
	Loud speech	1	1	1	1
	Soft speech	4	5	7	4
	Cough	1	1		
	Clear throat	2	1	1	
	Uh hmmm		1	1	
	Hmmm			2	
	Uh			1	
Space	Sitting far	5	8	4	6
	Sitting close			1	1

Note. Values in bold indicate that the behavior occurred during an improvisational response and underlined values indicate the behavior occurred during a memorized response.

Figure 6. Frequencies of incorrectly identified nonverbal behaviors in study 2

VITA

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Old Dominion University, Norfolk, VA.,

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Background

Elizabeth Newlin-Canzone is Senior Multi-Discipline Systems Engineer at the MITRE Corporation in the Center for Transforming Health. Elizabeth's research interests are in alarm prioritization, distributed simulation training, aviation psychology and medical simulation. Since beginning her studies at ODU, Elizabeth has been involved in developing an integrated theory of after action review, distributed training, research on the prioritization of multiple alarms, training in a virtual operating room (VOR), a standardized patient program and nurse anesthesia training.

Selected Presentations/Publications

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