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# EFFECTS OF SPEAKER'S ACCENT IN A MULTIMEDIA TUTORIAL ON NON- NATIVE STUDENTS' LEARNING AND ATTITUDES

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EFFECTS OF SPEAKER'S ACCENT IN A MULTIMEDIA TUTORIAL ON NON-NATIVE  
STUDENTS' LEARNING AND ATTITUDES

by

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B.A., Hochiminh City University of Education, 2003  
M.A., Southern Illinois University Carbondale, 2009

A Dissertation  
Submitted in Partial Fulfillment of the Requirements for the  
Doctor of Philosophy Degree

Department of Curriculum and Instruction  
in the Graduate School  
Southern Illinois University Carbondale  
May 2014

DISSERTATION APPROVAL  
EFFECTS OF SPEAKER'S ACCENT IN A MULTIMEDIA TUTORIAL ON NON-NATIVE  
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By

Lam Vien Cao Ngoc

A Dissertation Submitted in Partial  
Fulfillment of the Requirements  
for the Degree of  
Doctor of Philosophy in Education  
in the Field of Curriculum and Instruction

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Graduate School  
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April 2, 2014

## AN ABSTRACT OF THE DISSERTATION OF

LAM VIEN CAO NGOC, for the Doctor of Philosophy degree in Education in the field of Learning Systems Design and Technology, presented on April 2, 2014 at Southern Illinois University Carbondale.

TITLE: EFFECTS OF SPEAKER'S ACCENT IN A MULTIMEDIA TUTORIAL ON NON-NATIVE STUDENTS' LEARNING AND ATTITUDES

MAJOR PROFESSORS: Dr. Peter J. Fadde and Dr. Sharon A. Shrock

Research in the field of multimedia learning has yielded principles for the design of effective multimedia instructional messages including Mayer's (2005) principles regarding voice. According to the voice principle, students learn more deeply when the narration in a multimedia lesson is spoken by a native voice rather than a non-native voice. The generalizability of the voice principle has been demonstrated when applied to multimedia users who are native speakers of the language used in narration. However, three out of four English users are non-native speakers of English, and the vast majority of verbal exchanges in English do not involve any native speakers of the language at all (Crystal, 2003a). By focusing on non-native users, this study clarifies the applicability of the voice principle to a broader target audience.

The study investigated whether the accent of the narrator in a multimedia tutorial about money management affected participants' learning and attitudes toward the narrator. Sixty-five Chinese participants at a Midwestern university in the United States were randomly assigned to one of two groups in this experimental design. One group heard an American narrator speaking English in the tutorial, and the other group heard a Chinese narrator speaking English. Data to test the dependent variables were collected through a learning achievement test including both recall and above-recall level questions and an attitude survey. Data analyses revealed that there

was no significant difference in overall learning and recall level learning between the two accent groups. However, the group of Chinese students who heard the narration spoken with the American English accent had significantly more positive attitudes toward their narrator than the group of Chinese students who heard the narration spoken with a Chinese accent.

The study qualifies the voice principle by establishing its generalizability among non-native English speakers. The study suggests to instructional designers that the use of a non-native shared accent (e.g., Chinese speaker of English and Chinese learner) should not affect Chinese students' learning negatively although it may affect their attitudes toward the speaker.

## DEDICATION

To Vivien Cecilia and William Sa. You know I love you!

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## CHAPTER 1

### THE PROBLEM

#### **Introduction**

English has spread to become an international language (Widdowson, 1997). Indeed, the term “English as a lingua franca” (Seidlhofer, 2005, p. 339) has emerged in recent years to refer to communication in English between speakers from different native language backgrounds. According to Crystal (2003a), since only one out of every four users of English in the world is a native speaker of the language, most “English as a lingua franca” interactions take place among non-native speakers of English, and the vast majority of verbal exchanges in English do not involve any native speakers of the language at all. Interestingly, in most cases, English is often “a ‘contact language’ between persons who share neither a common native tongue nor a common (national) culture, and for whom English is the chosen foreign language of communication” (Firth, 1996, p. 240). Because of the large number of non-native English users, researchers should consider these users in their studies of instructional strategies and systems.

As the global use of English increases, so does the variation of accented English. As listed in the *New Oxford American Dictionary*, an accent is “a distinctive mode of pronunciation of a language, especially one associated with a particular nation, locality, or social class” (Angus & Lindberg, 2010, p. 8). According to *A Dictionary of Linguistics and Phonetics* (Crystal, 2003b), an accent is identified as “the cumulative auditory effect of those features of pronunciation which identify where a person is from, regionally or socially” (p. 3). Indeed, an accent can identify the locality in which its speakers reside (a geographical or regional accent) and the socio-economic status of its speakers (Lippi-Green, 1997). Regardless of different

annotations of accent, in this study, accent was limited to a mode of pronunciation which can identify whether a language is a speaker's native language or not.

As more and more people speak English as a second language, there are more and more English accents. Adjusting to and accommodating various accents has become an essential ability for effective and respectful communication (Cheng, 1999). A question we now face in education is, "How might accents impact a student's learning?" In particular, given the rapid expansion of multimedia instruction, "What are the effects of accented narration in multimedia instruction on the learning of second language learners?" Note that the interest in this study is non-native students learning academic content *in* English, not their learning of English. Consideration of effects of speaker's accent on learning and attitude toward the speaker draws from two academic areas, Instructional Design and English as a Second Language (ESL)/English as a Foreign Language (EFL).

Research in the field of multimedia has yielded principles for the design of effective multimedia instructional messages including principles regarding voice (Mayer, 2005). According to the voice principle, students learn more deeply when the narration in a multimedia lesson is spoken by a native voice rather than a non-native voice or a machine voice. Voice attributes include, but are not limited to, gender, age, pitch, volume, pace, and accent. As Mayer described native and non-native, it can be concluded that the voice principle includes accent. In the context of this study, the voice attribute of interest is accent.

The voice principle can be explained from the viewpoint of cognitive load theory (CLT) (Chandler & Sweller, 1991; Sweller, 1998). CLT maintains that our working memory is limited with respect to the amount of information it can hold and the number of operations it can perform on that information (Van Gerven, Paas, van Merriënboer, Hendriks, & Schmidt, 2003).

That means a learner should be encouraged to use his or her limited working memory efficiently, especially when learning a difficult task (Van Gerven et al., 2003). Thus, instructional designers need to find ways to help optimize the working memory by developing quality instruction and limiting extraneous cognitive load, potentially including accents of narration, which can distract learners.

Mayer, Sobko, and Mautone (2003) found that an unusual accent, which was identified as a foreign accent in their study, may create more extraneous cognitive load for the students. Under the theory of cognitive load, Mayer and his colleagues also assumed that performance during knowledge acquisition depends on the cognitive resources available for information processing. As a result, when learners use more cognitive resources trying to understand an unfamiliar accent, they have less cognitive resources available to process the information. Their performance may not be as good as that of learners who interact with a native accent. However, it is a different question to ask if the voice principle applies to non-native tutorial users who share their first language with a non-native speaker. For example, does the voice principle apply when an English narration is not in the native language of the speaker or the tutorial users, and the speaker and the users share the same first language? In this case, the speaker and the tutorial users speak English with a shared foreign accent. The accent of the speaker, though classified as foreign or non-native, is not unusual to the non-native tutorial users. Therefore, in this situation the voice principle cannot be used to predict performance of non-native users. Because the generalizability of the voice principle beyond native speakers is unknown, there is a rationale to investigate the effects of accent on non-native speakers.

In the literature of English as a Second Language, instructors from English speaking countries are classified as native instructors, and instructors of English whose first language is

not English are identified as non-native instructors (Cao, 2009; Medgyes, 1983, 1992, 1994). In addition, the accent of native English speakers is considered native, while the accent of non-native language learners is classified as non-native. When the speaker of a multimedia message and the listeners share the same non-native accent, then the accent is classified as a non-native shared accent. In this study, in line with the scholarship of the field, an American English accent was classified as a native accent, and English spoken by a native Chinese speaker was considered to be a non-native accent. As Chinese learners listen to instruction delivered in Chinese-accented English, this accent is non-native shared. For the purposes of this study, the term ‘native’ will be used to refer to American-accented English, and ‘non-native shared’ will refer to Chinese-accented English.

### **Statement of the Problem**

Although there are numerous design and implementation considerations involved in implementing multimedia instruction, the focus of this study is on the accent of the speaker in computer-based tutorials because of the popularity of multimedia tutorials, especially in online learning. Multimedia instruction can be produced by institutions or individuals. “Homemade” tutorials can be produced by teachers or trainers, for example, by using screencasting software to add narration to *PowerPoint* presentations subsequently posted online. This study results inform instructional designers and teachers how to select, design, and implement tutorials most effectively based on the speaker’s accent. Specifically, the study investigates effects of the English speaker’s voice in a tutorial, across two different accents: native American-accented English and non-native shared Chinese-accented English. A multimedia tutorial regarding money

management was used to investigate the effects of the speaker's accent on participants' learning and on their attitudes toward the speakers.

### **Research Questions**

The research questions addressed by the research were:

1. Does tutorial narrator accent (native American-accented English versus non-native shared Chinese-accented English) differentially affect learning?
2. Does tutorial narrator accent (native American-accented English versus non-native shared Chinese-accented English) differentially affect attitudes toward the narrator?

### **Significance of the Study**

This research will qualify the voice principle, an accepted multimedia principle regarding the greater effectiveness of a native accent in instructional narration. The generalizability of the voice principle has been demonstrated when applied to multimedia users who are native speakers of the language used in narration. However, as mentioned above, three out of four English users are non-native speakers of English and the vast majority of verbal exchanges in English do not involve any native speakers of the language at all (Crystal, 2003a). By focusing on non-native users, the results of this study should clarify the applicability of the voice principle to a broader target audience. The findings can inform the decisions that teachers and tutorial designers have to make regarding the speaker's accent when they need to select and design tutorials for such learners. Tutorial producers should opt for the narration that generates the least extraneous cognitive load, enhances learning outcomes, and creates the most positive attitudes in learners.



In addition, based on the learning benefits from listening to a native English accent or a non-native shared English accent, the study results can guide decisions regarding cost/benefit issues in designing interactive multimedia to be used by learners in different cultures. Is it worth the extra time, trouble, and money to have English narration recorded by a native English narrator, rather than simply allowing a non-native instructor who shares a first language with the target learners to use his or her voice to record the English narration?

### **Study Delimitations**

First, it should be noted that the treatment and dependent variables – learning outcomes and attitudes – of this study do not fall into the category of Computer Assisted Language Learning (CALL) where the multimedia is used to help students learn a language. Instead, the multimedia treatment might best be described as a multimedia tutorial format (Alessi & Trollip, 2001) designed to teach concepts and principles at the comprehension level. While research and theory related to language learning have some applicability and will be reviewed as literature, it is important to note that the study investigates learning *in* a second language rather than learning a second language.

Second, the non-native narrator of the tutorial used in this study was highly intelligible and spoke English with a light foreign accent. The study did not investigate how differently heavy and light foreign accents affect participants' learning and attitudes. The results of the study do not apply to situations wherein a tutorial narrator speaks English with a heavy accent and tutorial users have difficulty understanding him or her.

Finally, the study was delimited to examine the accent of a voice reading the narration of a multimedia tutorial, not the accent of a voice of an instructor in a traditional classroom. The

results of the study should not be taken to evaluate the instructional effectiveness of instructors of native or foreign accents. No face-to-face interaction and non-verbal communication, such as mannerism or physical appearance, are considered in this study.

### **Definitions**

This study utilizes several technical terms. The following definitions are provided to clarify the meaning of these terms.

*Accent.* According to Crystal (2003b), an accent is identified as “the cumulative auditory effect of those features of pronunciation which identify where a person is from, regionally or socially” (p. 3).

*Cognitive load theory* is concerned with techniques for reducing working memory load in order to facilitate the changes in long-term memory associated with schema acquisition (Sweller, 1998). Sweller (2005) identifies three different types of cognitive load: extraneous, intrinsic, and germane cognitive load. Extraneous cognitive load happens when an ineffective or unnecessary instruction is presented. Intrinsic cognitive load is the natural complexity of the instruction or task information. Germane cognitive load is the mental effort invested by learners to comprehend the instructional material.

*Cognitive processing* involves the encoding, organization, storage, and retrieval of information (Dillon & Pellegrino, 1991).

*Intelligibility* is “the overall assessment of how well a speaker can make himself or herself understood” (Subtelny, Whitehead, & Orlando, 1980, p. 87). According to Fletcher (1929), intelligibility is the recognition of meaningful sounds.

*Long-term memory* refers to a large and effectively unlimited capacity of the human mind to store information (Mousavi, Low, & Sweller, 1995).

*Multimedia* refers to the flexible combination of more than one content format or external representation in a single document or in computer applications (Mayer, 2009). Some examples of different kinds of formats are image, graphic, video, text, animation, and sound.

*Multimedia Learning Theory* is based on dual-coding theory (Clark & Paivio, 1991) and working memory theory (Baddely & Hitch, 1974). The basic assumption of multimedia learning theory is that by reducing unnecessary cognitive load, learners will be able to use more of their cognitive capacity to promote meaningful learning. Mayer (2009) specifies eight principles. Each principle has been developed to optimize the instructional learning environment. This study builds upon the voice principle.

*Native.* A native language is the first language of a speaker.

*Non-native.* A non-native language is not the first language of a speaker. A non-native accent is a perceivable entity which is differentiated from the native speaker's way of speaking.

*Recall* is equivalent to knowledge, the first level of Bloom's taxonomy (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956). Recall entails the ability to remember or recognize specific facts and concepts.

*Tutorial.* In computer assisted instruction, a tutorial is a computer-based tool whose purpose is to assist users in learning. According to Alessi and Trollip (2001), a good tutorial should present information or model skills and guide the learner through the initial use of information or skills. Tutorials can be produced by institutions or by individuals.

*Working memory* refers to the very limited structures and processes used for temporarily storing and manipulating only a few items of information at a time (Mousavi et al., 1995).

According to Baddeley and Hitch's (1974) working memory model, the working memory has two perception channels, one for visual information and the other for auditory information. Each channel has a limited capacity.

This chapter has addressed the statement of the problem, significance of the study, research questions, delimitations of the study, and definitions of terms. The next chapter will review literature that provides theoretical and empirical foundations for this study.

## CHAPTER 2

### REVIEW OF THE LITERATURE

Two distinct bodies of research and theory provide a foundation for this study: multimedia instruction and English as a second language (ESL) or English as a foreign language (EFL). The first section of this chapter, multimedia instruction, reviews cognitive load theory and the voice principle. The second body of research, ESL/EFL, is directly related to the issue of native versus non-native accent. The section on native versus non-native accent consists of two subcategories of interest to ESL/EFL research: 1) the relationship between accent and listening comprehension and 2) the effects of accent on attitudes of listeners toward speakers.

#### **Multimedia Instruction**

##### **Cognitive Load Theory**

Sweller (1999) defined cognitive load theory as a capacity theory that describes how information processing and knowledge construction are executed under the constraints of limited working memory resources. The importance of cognitive load theory is that working memory has limited resources to process information (Baddeley, 1986). As a result, reducing unnecessary cognitive load is an important issue in learning and training (Baddeley, 2002; Sweller, 2005).

Sweller identifies three different types of cognitive load: extraneous, intrinsic, and germane.

**Extraneous cognitive load.** Extraneous cognitive load relates directly to instructional design because it is created when ineffective or unnecessary instruction is presented to learners. Extraneous cognitive load can also come from sources other than instruction. However, badly-

designed instruction increases learners' cognitive load unnecessarily. The extraneous cognitive load overloads the capacity of working memory, which then reduces learning (Sweller, 2003, 2005). Extraneous cognitive load becomes a significant problem when learning material is difficult (Paas, Renkl, & Sweller, 2003).

**Intrinsic cognitive load.** Sweller (2005) defines intrinsic load as “the natural complexity of the information” (p. 27). It is impossible to reduce intrinsic cognitive load through instructional design techniques because the nature of material to be learned cannot be manipulated (Paas et al., 2003). Therefore, when intrinsic cognitive load is high, indicating difficult material, reducing unnecessary stimulus in presentation methods or instruction – extrinsic cognitive load – is a primary objective for developing instruction. However, when intrinsic cognitive load is low, indicating uncomplicated material, then reducing extrinsic cognitive load becomes a secondary goal.

**Germane cognitive load.** According to Sweller (2005), germane cognitive load is defined as the mental effort invested by learners to comprehend the material. Therefore, a high germane cognitive load means that learning is occurring actively, which means that the learner is building cognitive schemas. However, this assertion does not mean that a lower germane cognitive load indicates that learning is not occurring. When a learner has already built or automated a pertinent schema, learning consonant material does not require high germane load effort.

In conclusion, instruction needs to control and reduce extraneous cognitive load, especially when germane cognitive load is high, because intrinsic cognitive load cannot be manipulated. As was examined in this study, a non-native accent used in a tutorial narration can potentially introduce extraneous cognitive load for tutorial users who shared the same non-native

accent. Mayer et al. (2003) pointed out that when students process a human voice speaking with a native accent, they use fewer cognitive resources than when they listen to a human voice speaking with a foreign accent or a machine-synthesized voice. Therefore, more cognitive resources are available for students to deep process the instructional message when they are listening to a native speaker. The extraneous cognitive load results because the accents have not been incorporated into the students' prior knowledge. When trying to process words spoken in a foreign accent, students allocate more time in understanding words separately, rather than processing the relationships of the words in the sentence as a whole. Listeners may miss subsequent words while trying to figure out earlier words. Cognitive load theory predicts better performance on a transfer test for learners who were instructed by a native-accented voice than for learners who listened to a machine voice or a foreign-accented voice, as found in Mayer et al. (2003). However, cognitive load theory does not make any predictions concerning learners' attitudes toward the speakers.

### **Voice Principle**

Mayer (2005) has articulated and investigated the voice principle for the design of multimedia instructional messages. According to the voice principle, people assumed to be native speakers learn more deeply when the words in a multimedia module are spoken by a native-accented human voice speaking their native language rather than a foreign-accented human voice or a machine voice (Atkinson, Mayer, & Merrill, 2005; Mayer, Sobko, & Mautone, 2003). Mayer et al. (2003) conducted an experiment to examine the idea that the speaker's voice in multimedia lessons carries important social cues that can influence the process and outcome of learning. The narrator's voice in the tutorial was either a native speaker of American English or a non-native English speaker with a Russian accent, i.e., native-accented speech vs. foreign-

accented speech. In the experiment, learners who were seated at a computer workstation received a narrated animation about lightning formation. They then took a retention test, took a transfer test, and finally completed a speaker-rating survey. The retention test asked participants to list the main steps in lightning formation. This test required participants to recall what was presented in the computer-based instructional material. The transfer test consisted of four problem-solving questions. These questions required participants to go beyond simply recalling the explanation presented in the lesson. The answers to the transfer questions were not presented in the lesson. The speaker-rating survey, a 15-item instrument, was intended to detect the “social characteristics attributed to speakers” (Mayer et al., 2003, p. 421). Mayer et al. adapted the instrument from Zahn and Hopper’s (1985) *Speech Evaluation Instrument* because of its “effectiveness in detecting the social characteristics attributed to speakers” (Mayer et al., 2003, p. 421). The original *Speech Evaluation Instrument* by Zahn and Hopper consisted of 30 bipolar adjective pairs while Mayer et al. used only 15 pairs of *literate-illiterate; unkind-kind; active-passive; intelligent-unintelligent; cold-warm; talkative-shy; uneducated-educated; friendly-unfriendly; unaggressive-aggressive; fluent-not fluent; unpleasant-pleasant; confident-unsure; inexperienced-experienced; unlikeable-likeable; and energetic-lazy* . There were three subscales – Superiority, Attractiveness, and Dynamism – in the speaker-rating survey. Each subscale consisted of five pairs of bipolar adjectives.

Overall, there was a voice effect, in which the native human voice group learned more and was better able to apply what was learned to solve new problems. The participants in the native accented group scored better on the learning transfer test than the participants in the foreign accented condition, resulting in a Cohen’s *d* statistic of .80 (a large effect). However, the students who received a narrated animation with the Russian-accented voice performed as well



on the retention test as the students who received a narrated animation with a native American accent. Learners in the two accent groups made different social judgments about their respective speakers. The participants who listened to the native American-accented voice rated the narrator more positively than the participants in the other group rated the speaker with the foreign accent.

The study, however, did not provide clear information on the criteria for choosing the participants. The participants were reported to be college students recruited from the Psychology Subject Pool at the University of California, Santa Barbara. The researchers did not mention if American English was the first language of the participants or if these students could speak a language other than English. It is not known whether the study would yield the same results if the students spoke a language other than American English as their first language, in particular if the students' first language was Russian.

It is possible that Mayer (2009) recognized the limitation of the literature addressing the voice principle. Thus, he considered the voice principle to be in its preliminary stage and called for additional experiments. In particular, Mayer cited the work of Nass and Brave (2005) to recommend future research to investigate how the effects of voice cues in multimedia instructional messages may be different for different kinds of learners. Particularly, future research was recommended to figure out whether people learn better when they perceive that the instructor's voice comes from someone like themselves. Nass and Brave (2005) also suggested that people may be more convinced by online spoken messages when they perceive the speaker's voice to be coming from someone like themselves in terms of gender, race, ethnicity, or emotional state.

The conclusions by Mayer (2005) as well as those by Nass and Brave (2005) helped to define the current study in which Chinese students listened to a multimedia message in English

that was spoken either in an American accent or in a Chinese accent. This study was conducted to investigate whether Chinese students exposed to the Chinese-accented English treatment had different learning outcomes or different attitudes toward the narrator than did Chinese students exposed to the native American-accented English narrator.

### **English as a Second Language (ESL)/English as a Foreign Language (EFL)**

In the field of ESL/EFL, research has been conducted to examine the effects of accent on listening comprehension and attitudes toward speakers with native and non-native accents. It should be noticed that in ESL/EFL, listening comprehension involves two steps. According to Zhang (2001), the first step “encompasses receiving, memorizing, and repeating the sounds whereas the second, comprehension, entails the ability to explain the content of the message to which the listener is exposed” (in Al-Alman, Asassfeh, & Al-Shboul, 2013). Indeed, questions in listening comprehension tests consist of recall cognitive level questions and above-recall cognitive level questions.

### **Native versus Non-native Accent**

Research regarding the issue of native and non-native speakers is widely conducted in the field of language learning. Such studies can be classified into two sub-categories: 1) studies that investigate the effects of accent on comprehension and 2) studies that examine attitudes toward speakers with native and non-native accents.

**Accent and comprehension.** A question that is of recurring interest to language teachers is the effect of the speaker’s accent on the comprehension of the listener. After reviewing research of relevance to second language comprehension, Flowerdew (1994) claimed that learners have an advantage in listening comprehension when the speaker shares the listener’s

accent. Several studies have produced evidence that the local variety of English is the most easily comprehended for non-native English speakers. Brown (1968) tested how well native speakers of Twi and Ewe comprehended English when spoken by a) native speakers of British English, b) native speakers of Twi, and c) native speakers of Ewe. His findings were that the native speakers of Twi understood English best when the speaker was also a native speaker of Twi. Similarly, the native speakers of Ewe understood best when the speaker was a native speaker of Ewe.

Flowerdew's hypothesis is consistent with Wilcox (1978), who concluded that Singaporean learners of English found speakers of English in their own accent easier to understand than speakers with different accents such as British, Australian, and American accents. The study, however, failed to control the speed of the speakers. The Singaporean speaker – who was understood best – spoke most slowly, while the speaker of native American accent – who was least understood – spoke fastest. It is possible that the difference in comprehension was due to speed, rather than accent. Another study that supports Flowerdew's position is Ekong (1982). The researcher found that Nigerian participants understood English better when the speaker of English was a native speaker of their own dialect, Yoruba or Igbo. Even though some researchers agree that listening to a speaker sharing the same variety of language with the listener enhances listening comprehension, there seems to be no consensus as to why that advantage exists or how significant its impact is (Mayor, Fitzmaurice, Bunta, & Balasubramanian, 2005).

Not all studies into the effects of accent on listening comprehension support the position that the accent which is best understood for learners of English as a second language is the accent of a good local speaker of English who shares the listener's accent, rather than the accent of a native speaker. Smith and Bisazza (1982) tested the comprehensibility of one native and two

non-native varieties of English (American versus Indian and Japanese English accents) with native and non-native users of English in seven countries (the U.S., India, the Philippines, Hong Kong, Japan, Taiwan, and Thailand). The researchers used both local, non-native speakers of English and native speakers of English in two countries: Japan and India. It was found that Japanese participants understood Japanese speakers of English the best (with American speakers second and Indian speakers third). In contrast, for Indian speakers, American English was best comprehended (with Indian second and Japanese third).

Ortmeyer and Boyle (1985) found that the accents of native English speakers (British and American) were understood better than that of local Chinese speakers of English. In the study, 228 Chinese students were rank ordered according to their scores on a series of proficiency tests. Four equal-proficiency groups were drawn up, with 57 in each group. These four groups were given two tests, a listening test and a dictation test. On the listening test, participants listened to two passages and answered some questions about the passages. On the dictation test, participants wrote down the words as they were spoken. Each of these groups took the same tests, and the only difference between groups was that each group heard the test spoken in a different accent: one American, one British, one “clear” Chinese and one “unclear” Chinese. The “clear” Chinese-accented speaker had a strong Chinese accent while the “unclear” Chinese speaker had a mild Chinese accent. During the tests, the variables of speed and gender of the speakers were controlled.

The mean total scores on both tests for the American accent group were significantly better than for the two Chinese accent groups. The two Chinese accent groups were not significantly different from each other. For the listening test, the mean score of the American accent group was significantly better than that of the “unclear” Chinese accent group. Apart from

this, no significant difference between the four mean scores of the four groups was found. On the dictation test, the scores of the groups who listened to the American and British speakers were significantly better than those of the groups who listened to the Chinese speakers. It should be noted that there was no significant difference between the scores of the two Chinese accent groups.

A study which found that sharing the same accent between the speaker and listeners is not necessarily an advantage was carried out by Mayor, Fitzmaurice, Bunta, and Balasubramanian (2002). The research question of the study was, “Do listeners perform significantly better on a test of listening comprehension in English when the speaker shares the listener’s native language?” In their study, four groups of Chinese, Japanese, Spanish, and American English speakers listened to brief lectures presented in English by speakers of Chinese, Japanese, Spanish, and American English and then answered questions based on the lectures. Each group consisted of 100 participants. The 100 native English speakers were undergraduate and graduate students in Arizona, the United States. The non-native participants were potential TOEFL takers living in their home countries, that is, 100 participants in China, Japan, and Columbia. No further information regarding age and English language ability of the non-native participants was presented which, uncontrolled, could have been threats to the validity of the study.

Eight speakers, one male and one female native speaker of Chinese, Japanese, Spanish, and American English, were involved in the study. Each speaker recorded eight lectures of similar difficulty, so altogether, 64 lectures were used in the study. Comprehension of each lecture was assessed by four questions.

Each group of 100 participants was divided into two, for a total of 8 smaller groups. Participants listened to 8 lectures in total: 2 lectures for each accent with one by a male speaker and the other female. As 64 lectures were recorded and presented to 8 small groups, the study participants listened to different lectures and answered different questions across 8 small groups. This is a limitation of the design of the study. Even though all 64 lectures and their associated questions were of similar difficulty, the results might be attributable to the familiarity or difficulty of the topics and the difficulty of the questions rather than the accents of the speakers.

A two factor (four-by-four) ANOVA was performed with one between-subjects factor (four values) and one within-subjects factor (four values). The between-subjects factor was the native language of participants with four values: Chinese, Japanese, Spanish, and American English. The within-subjects factor (four values) was the accent of the speakers with four values: Chinese, Japanese, Spanish, and American English. To address the potential problem of Type I error, the significance level was adjusted to .0004 (.05/12) as there were 12 contrasts. The dependent variable of the study was comprehension as measured by the scores on questions pertinent to the lectures.

Generally, the native American English speaker participants outperformed the non-native speakers. As for the non-native participants, the results of the statistical analysis revealed mixed answers to the research question. When listeners shared the speaker's language, only one group showed an advantage: native speakers of Spanish scored significantly higher when listening to Spanish-accented speech. For native speakers of Chinese, however, shared accent was a disadvantage. They scored significantly lower when listening to speakers with a Chinese accent. The Japanese participants' performance did not differ significantly across different conditions.

In conclusion, research on the effects of accents on comprehension has had mixed results. On the one hand, some studies report that sharing the speaker's accent is an advantage to listeners. In addition, some studies show different advantages for speakers and listeners of different languages. On the other hand, some studies refute this advantage or even show that the shared accent is a disadvantage. It should be noted, however, that basic differences exist between a listening text and a tutorial. In the studies regarding listening comprehension in the field of ESL/EFL reviewed above, participants were asked to listen to a particular text, and no visual aids were used. In addition, participants did not have control over the text; for example, they could not skip over some parts or play back. On the contrary, tutorial learners are exposed to both visuals and narration. In addition, tutorial learners often have a certain degree of control over the tutorial in that they can pause, skip, or go back, all of which depends on the tutorial designer. Regardless of these differences, the findings of studies mentioned in this section can be referential for the designers of tutorials used by non-native learners. The next section reviews studies examining how accent influences attitudes of listeners toward the speaker.

**Accent and attitudes.** The study of language-based attitudes has a rich history that stretches across several decades and social science disciplines (Cargile, Giles, Ryan, & Bradac, 1994). A number of researchers looking into attitudes toward accented English have involved both native and non-native speakers. In terms of native English speakers' attitudes toward accented English, Nesdale and Rooney (1996) reported that speakers were often stereotyped based solely on their accents. In their study, Australian children assigned lower status rankings to speakers of Italian- and Vietnamese-accented Australian English than to native speakers of Australian English. The researchers claimed that once the participants recognized an accent, they

categorized the speaker as having lower status regardless of the degree of that accent. The external validity of the study, however, is limited only to preadolescent children.

Podberesky, Deluty, and Feldstein (1990) focused on the issue of attitudes of native English speakers toward both native and non-native English accents. The researchers investigated whether accented speech affected native speakers' judgments of native and non-native speakers' traits. One of the hypotheses of the study was that non-native accented speakers would have less positive traits ascribed to them in comparison with those speaking with unaccented English.

One hundred and thirty-four American college students (60 male and 74 female) participated in the study. The participants consisted of 104 non-Hispanic Caucasians, 14 African Americans, 12 Asian Americans, and 4 Hispanics. Six audio files recorded in English were used in the study. Two files were recorded by two native English speakers, two were read by two speakers with Spanish-accented English, and two were recorded by two speakers with Oriental-accented English. Each participant was randomly assigned to one of the six treatment conditions. Each participant listened to one randomly-assigned recording and was asked for his/her attitudes toward the respective speaker, using a questionnaire. The questionnaire consisted of sixteen items, mostly adjectives, portraying personal characteristics or personal traits. The participants rated their respective speakers on a scale from 1 to 7, with "1" meaning that the speaker possessed very little of that trait or characteristic and "7" meaning that the speaker possessed a great deal of it. The sixteen items were categorized into three scales. The Competence scale included *intelligent, ambitious, self-confident, courageous, and a leader*. The Personal Integrity scale included *sincere, dependable, of good character, conscientious, kind, and honest*. The Social Attractiveness scale consisted of *good-looking, sociable, likeable, affectionate* and



*entertaining*. The statistical analysis revealed that the study hypothesis was not supported, i.e., the accented speech of non-native speakers was not associated with less positive traits.

The researchers noted that the study was conducted at a relatively small university which had a significant number of foreign-born or accented students and faculty. In addition, the university was located very near two big cities with large Hispanic and Asian American populations. Because of these two factors, the participants in the study might have been familiar with the non-native Hispanic and Oriental accents.

Besides empirical research on native speakers' attitudes toward different English accents, some studies have examined the attitudes of non-native speakers toward native and non-native accents as well. Such studies reveal that non-native speakers of English have a more positive attitude toward those with native accents. In Chiba, Matsuura, and Yamamoto (1995), a group of Japanese college students were asked to listen to six speech samples in English created by speakers with a variety of accents (Japanese, Hong Kong Cantonese, Sri Lankan, Malaysian, British, and American English). After that, they were asked to complete a questionnaire to indicate their impression of each speaker. The questionnaire consisted of 10 bipolar adjective pairs of *clear – unclear; with accent – without accent; not confident – confident; friendly – unfriendly; elegant – not elegant, not fluent – fluent; skilled – unskilled; unintelligent – intelligent; not sophisticated – sophisticated; careful – not careful*. The researchers found that the students showed more positive responses toward American- and British- accented English, followed by Japanese-accented English, and finally other accented varieties of English.

Another study that yielded the same findings was a mixed methods study conducted by Dalton-Puffer, Kaltenboeck, and Smit (1997) to analyze Austrian students' attitudes toward varieties of English. The study took place in Austria in an academic setting and involved a pool

of five university educated female stimulus providers between 30 and 40 years old, respectively native speakers of General American English, British English, near British English, Austrian British English, and Austrian American English. The participants were 132 non-native students of English between 19 and 22 years of age from Austria. This research primarily examined whether the variety of English spoken influenced participants' judgments of accented speech. The students listened to the five speakers reading the same passage. After listening to each speaker, the students were asked to fill in a questionnaire according to their perceptions of the speaker. The questionnaire was a list of 12 attributes reflecting status and solidarity values. The participants were asked to indicate to what extent the attributes applied to the speakers on the scale of 0 – *Does not apply to the speaker* to 5 – *I agree totally*. The attributes listed on the questionnaire were *likeable, intelligent, educated, selfish, successful, sense of humour, kind, organized, rude, determined, honest, and ambitious*.

The findings clearly revealed a distinct preference for so-called native English accents. More specifically, native accents such as General American English and British English were rated the highest. Among native accents, they most favored the accent with which they were the most familiar, namely, British English. In contrast, the non-native variety and more specifically the Austrian British English (which they perceived to be a foreign accent) was rated poorly.

In summary, this review of ESL/EFL literature has examined some research of relevance to the effects of accent on comprehension and attitudes. Related to attitudes, non-native speakers have frequently been reported to show a preference for native English accents over non-native English accents, sometimes including a shared non-native English accent. To some extent, this conclusion is different from those of some studies of the relationship between accents and comprehension where listeners' comprehension was higher when they shared the speaker's

accent. This difference in outcomes reflects the difference between performance (comprehension tests) and perception (attitude surveys). Non-native participants rather consistently had more positive attitudes toward speakers with a native accent; however, they often, though not always, performed better in comprehension tests under the condition of a speaker with a non-native accent that was similar to their accents.

With advances in computer and digital technologies, more and more students rely on multimedia learning including learning from tutorials voiced in English by non-native speakers of English. However, the field of second language learning has not provided much research on the role of voice in supporting learning (as opposed to understanding) from multimedia lessons (as opposed to spoken words alone). The current study was undertaken to investigate the cognitive and affective roles of a speaker's English voice in a tutorial presented to Chinese participants. The tutorial narration was spoken in two different accents: American-accented English and Chinese-accented English. Specifically, the dependent variables were participants' learning outcomes and their attitudes toward native American and non-native Chinese speakers of English. The next chapter will present the research methodology of the study.

## CHAPTER 3

### RESEARCH METHODOLOGY

This study investigated the effect of speaker's accent in a money management tutorial on non-native English students' learning and attitudes toward the speakers. The instructional material was a multimedia tutorial created by Nancy Woinoski of Pinch Head and featured on Articulate Community Showcase (Articulate, 2013). The tutorial originally featured English narration by an American, female announcer. For purposes of the current study, the original narrator was replaced by comparable narrators speaking in English with different accents. One version featured a non-professional, male announcer with a native American English accent. The other version was re-recorded by a similarly non-professional male announcer speaking Chinese-accented English.

A quantitative design was used to explore the research questions. Participants in this study were Chinese students in the United States. Participants were randomly assigned to the native accent or non-native shared accent condition. This independent variable (the speaker's accent) was manipulated to determine its effects on two dependent variables (participants' learning and their attitudes toward the speakers). The learning variable was measured through a learning achievement test consisting of multiple-choice questions. An attitude survey examined the attitudes of participants toward the speakers through speaker-rating items. In addition, the survey included several scaled questions to investigate participants' attitudes toward money management and open-ended questions to examine participants' opinions of the tutorial message and the speaker.

This chapter describes the research design used in the study. The following components of the study will be described: experimental design, experimental variables, instruments, research participants, instructional materials, research procedure, data analysis, and instrument reliability.

## **Research Design**

### **Experimental Design**

The quantitative design of the study falls into the category of experimental research since each participant was randomly assigned to the native American-accented English (AAE) group or non-native shared Chinese-accented English (CAE) group, and one variable (English accent) was manipulated to determine its effect on the two dependent variables of participants' learning and their attitudes toward the speakers (Isaac & Michael, 1995).

Sixty-five Chinese students at a mid-sized university in the Midwest of the United States participated in the study during the 2014 Spring semester. Each participant was randomly assigned to the AAE or CAE condition. After reading the consent form (see Appendix A) and answering the demographics questionnaire (see Appendix B), the participants assigned to the AAE group watched the tutorial that featured an American accent while the participants who were assigned to the CAE group watched the tutorial with a Chinese accent. Participants then took a learning achievement test (see Appendix C). Finally, they completed an attitude survey (see Appendix D). The experimental design is shown in Table 1.

Table 1

*Summary of Experimental Design*

	Design		
	Before treatment	Treatment	After treatment
AAE (R)	DQ	American accent	LAT, AS
CAE (R)	DQ	Chinese accent	LAT, AS

*Note.* AAE group = American-accented English group; CAE = Chinese-accented English group; R = random assignment; DQ = demographics questionnaire; LAT = learning achievement test; AS = attitude survey.

**Experimental Variables**

The data required for this research were collected to assess the following variables.

**Independent variables.** Speaker's accent was the independent variables; there were two values: AAE (American-accented English) and CAE (Chinese-accented English).

**AAE.** The narration of the study tutorial was recorded in English by a male narrator with an American accent. The speaker was born and raised in the United States. He had a Master's Degree in Teaching English to Speakers of Other Languages. He was an ESL instructor. The speaker was in his early thirties.

**CAE.** The narration of the study tutorial was recorded in English by a male narrator with a Chinese accent. The speaker was born and raised in China. His native language was Mandarin. He studied English in China for 15 years. He had not studied English in any English-speaking countries. At the time of recording the narration, he was enrolled in his second semester in the United States as a Master's student in Engineering. The speaker was in his mid-twenties.

**Dependent variables.** The dependent variables of the study were defined as the participants' learning and their attitudes toward the narrator. Participants' learning was measured

through a paper-based learning achievement test. Participants' attitudes toward the narrator were measured through a paper-based attitude survey.

### **Instruments**

To examine the effects of American-accented English and Chinese-accented English on participants' learning and their attitudes toward the speakers, two instruments were used in data analysis: the learning achievement test and the attitude survey. In addition, a demographics questionnaire was used to assure that the randomly assigned groups were essentially equivalent on potentially confounding variables such as English proficiency. All three data collection instruments were paper-based.

**Demographics questionnaire.** This instrument was developed by the researcher in consultation with three specialists in learning systems design and technology, research methods, and ESL/EFL. The questionnaire was used to collect data on the participants' age, gender, dialect of their native language, English proficiency score, and self-ratings of their English skills (Appendix B).

**Learning achievement test.** The learning achievement test was developed by the researcher in consultation with two experts in finance to assure content validity. The test consisted of 30 multiple-choice questions at recall and above-recall cognitive levels: 15 at the recall level and 15 at above-recall. Two experts in testing watched the tutorial, read each question, and classified each question into the recall or above-recall cognitive levels. Recall level questions were intended to verify whether the participants remembered the concepts and details delivered in the tutorial. The answers to these recall level questions were mentioned directly in the tutorial. Two examples of recall level questions are as follows.

1. According to the video lesson you viewed, when is it best to prepare your spending plan?
  - a. Three months in advance
  - b. One month in advance
  - c. Fifteen days before the month starts
  - d. The first of each month
2. Any type of borrowing from persons or banks is called \_\_\_\_\_.
  - a. Cash flow
  - b. Expense
  - c. Income
  - d. Liability

The above-recall level questions were multiple-choice questions about previously unseen financial situations. The participants had to respond by applying what they had learned from the tutorial. These previously unseen situations were at the same level of complexity as those portrayed during the treatment tutorial. The answers to these above-recall questions were not given in the tutorial. Examples of such a scenario and two above-recall level questions are as follows.

Jennifer has a job with a take-home pay of \$2,000 per month. She must pay \$800 for rent and \$200 for groceries each month. She spends \$100 per month on personal care, \$100 on restaurants, and \$100 on entertainment. She also budgets \$100 each month for transportation, \$100 for utility bills, and \$100 for everything else. She has built her emergency funds up to \$700.



1. What is Jennifer's cash flow?
  - a. -\$200
  - b. \$400
  - c. \$500
  - d. \$700
  
2. Which of the following can you conclude about Jennifer?
  - a. She should buy a brand new car.
  - b. She is living beyond her means.
  - c. She needs to create a positive cash flow.
  - d. She has a spending plan

Recall and above-recall level questions were related to each other hierarchically; answers to recall level questions were a prerequisite to answers to above-recall level questions. The recall and above-recall level questions were not separated into different sections on the test. Instead, they were mixed together (Appendix C).

All the questions posed four optional answers, one of which was correct. The instructions for the test asked the participants to choose the best overall answer to each question. The learning achievement test was scored by the researcher. Responses to all items on the test were recorded and analyzed using Statistical Package for the Social Sciences (SPSS) version 16. One point was given for each correct answer. Wrong answers were given a zero point. A total score on the recall items was computed by SPSS as the sum of all those recall level items answered correctly. Similarly, a total score on the above-recall level questions was computed. An overall learning score was computed as the sum of the total recall score and the total above-recall score. Each participant had a whole-number score from 0 to 15 for the recall level part; a whole-number

score from 0 to 15 for the above-recall level part; and another whole-number score from 0 to 30 for the overall learning variable.

**Attitude survey.** The attitude survey was intended to investigate the participants' attitudes toward their respective speakers. The attitude survey consisted of 15 semantic differential items. The semantic differential tool was introduced by Osgood, Suci, and Tannenbaum (1957). This scaling tool is often used to measure social attitudes through "ratings on bipolar scales defined with contrasting adjectives at each end" (Heise, 1970, p. 235).

The 15-item instrument was used in Mayer et al. (2003). Mayer et al. adapted the instrument from the *Speech Evaluation Instrument* by Zahn and Hopper (1985). Zahn and Hopper identified and pooled 152 items from previous instruments used to measure listeners' evaluation of spoken language. Among these items, the researchers removed 31 items because they were not directly related to attitude-based evaluation. Next, 65 items were discarded because of redundancy and unclear meaning. A factor analysis was conducted on the data from the 56 items, and three factors were found and labelled as Superiority, Attractiveness, and Dynamism. They accounted for 64.5% of the variance in the participants' ratings. The Superiority factor included 12 items, the Attractiveness factor consisted of 11 items, and the Dynamism factor comprised of 7 items.

The modified instrument in Mayer et al. and in this study maintained the three subscales: Superiority, Attractiveness, and Dynamism. The Superiority subscale consisted of five pairs of adjectives: *illiterate–literate*, *uneducated–educated*, *inexperienced–experienced*, *not fluent–fluent*, and *unintelligent–intelligent*. The Attractiveness subscale included five pairs of adjectives: *cold–warm*, *unkind–kind*, *unpleasant–pleasant*, *unlikable–likeable*, and *unfriendly–*

*friendly*. Lastly, the Dynamism subscale involved five pairs of adjectives: *passive–active*, *shy–talkative*, *unaggressive–aggressive*, *unsure–confident*, and *lazy–energetic*.

Instructions at the top of the page asked the participants to circle a number from 1 to 8 indicating how the speaker sounded along the continuum in each of the 15 items. For each item, the numbers 1 through 8 were printed along a line with one adjective above the 1 and an opposite adjective above the 8 (See Appendix D). In general, the number 1 indicated the most negative rating and 8 the most positive rating. However, seven pairs represented reverse coding. The position of these seven bipolar pairs were reversed to counter-balance them for positive/negative aspect and to prevent response set in the participants. Items from the three subscales were not separated into three different sections on the survey. Instead, they were mixed together. Three examples of the speaker-rating items appear in Figure 1.

illiterate								literate
1	2	3	4	5	6	7	8	
warm								cold
1	2	3	4	5	6	7	8	
unsure								confident
1	2	3	4	5	6	7	8	

Figure 1. Examples of the speaker-rating items in the attitude survey.

The three pairs in the figure were from the three subscales of Superiority, Attractiveness, and Dynamism respectively. The pair of *warm* and *cold* represented reverse coding.

Each participant had a whole number score for each item. An average score for each participant was computed for each of the three subscales (Superiority, Attractiveness, and

Dynamism) and across all items for a holistic measure of overall attitude. Each participant had a 2-decimal number for each subscale and for the overall attitude variable.

The attitude survey also included five scaled items asking for participants' attitudes toward money management. The response format was a five-point-Likert-type scale with "not at all" and "absolutely" at the two ends of the question spectrum. The questions and scale were taken from the instrument used by Funfgeld and Wang (2008) designed to measure attitudes and behaviors in a comprehensive range of daily financial affairs. Two examples of these items are "*I am anxious about financial and money affairs.*" (Funfgeld & Wang, 2008, p. 113), and "*Even on large purchases, I tend to spend spontaneously.*" (Funfgeld & Wang, 2008, p. 113).

The survey also included two scaled items asking for participants' opinions about the tutorial and the speaker's voice. The first question asked the participants to rate the difficulty of the tutorial: *How easy or difficult was it for you to learn about money management from the video lesson you just saw?* This item was adapted from the question used in Mayer et al. (2003) to evaluate participants' perceived cognitive load during learning. This question presented the ratings of *very easy, easy, difficult, and very difficult*. Participants had a score of 1 (*very easy*) to 4 (*very difficult*) based on which rating they chose. The second question was intended to measure the participants' perceived difficulty in sensory processing of the narration: *Apart from the content of the video lesson, how easy or difficult was it to understand the speaker's voice?* This question was also adapted from Mayer et al. (2003) and had the same rating scale and scoring scheme as the previous one. These two items allowed a comparison of participants' perceptions of their learning ease or difficulty with their measured learning achievement.

Additionally, the attitude survey included two open-ended questions and one multiple-choice question. The open-ended questions asked participants what they liked or did not like

about the tutorial. The multiple-choice item asked the students to identify from what nation or continent the narrator came (Appendix D).

In summary, three different research instruments were used to collect data: the demographics questionnaire, the learning achievement test, and the attitude survey.

### **Research Participants**

Human Subjects Approval to conduct this study was obtained in the fall semester of the 2013 – 2014 school year. The researcher requested and received an email list of registered students from China released by the Center for International Education at the university where the research took place. Two research request email messages were sent to all Chinese students in the email list within a two week time period, and potential participants were asked to email the researcher. In addition, a flyer requesting participation was distributed across campus, and interested participants were asked to contact the researcher via email. The researcher screened the respondents to select 65 participants for the study. The participants met the following three criteria: 1) being from China; 2) being a registered student at the university during the spring semester of the 2013-2014 school year; and 3) having never taken any Finance courses. Data collection took place in January, 2014.

On average, the participants in the study had studied English in China for more than 11 years and for approximately 6 months in an English speaking country. They had been in the United States for approximately one and a half years. At the time of data collection, the participants, on average, were enrolled in their fourth semester in the United States. The students had rarely used multimedia tutorials for school-related work. All participants had never taken any Finance course. The treatment groups were identical in mean age of research participants. The questionnaire responses also showed that the participants were majors in a variety of

academic areas such as education, engineering, fashion design, and music. In terms of gender distribution, there were more female (58%) than male (42%) participants (Table 2).

The participants were randomly assigned to one of the two treatment groups. Thirty-three students served in the American-accented English (AAE) group and thirty-two in the Chinese-accented English (CAE) group. The participants' demographic information including gender, age, and English Language Proficiency scores was collected through the demographics questionnaire (Appendix B) and is summarized in Table 2. It should be noted that because participants were non-native speakers of English, they were asked for their scores on an international standardized test of English language proficiency such as TOEFL iBT (Test of English as a Foreign Language Internet-Based Test) or IELTS (International English Language Testing System). Almost all participants reported their TOEFL iBT scores, and only a few students provided IELTS scores. Therefore, the researcher converted the IELTS scores to TOEFL iBT scores using the conversion chart issued by Educational Testing Service (ETS, 2014).

Table 2

*Participant Demographic Information*

	n	Age	Gender		English Proficiency Scores		
		Mean	Male # (%)	Female # (%)	Mean	Min	Max
Group AAE	33	24	12 (36)	21 (64)	86	68	108
CAE	32	24	15 (47)	17 (53)	86	68	104
Total sample	65	24	27 (42)	38 (58)	86	68	108

*Note.* AAE = American-accented English group; CAE = Chinese-accented English group; Min = minimum score; Max = maximum score.

Both treatment groups were also equivalent in their mean English proficiency scores. At the university where the research took place, international students were required to earn a

minimum iBT score of 68 out of 120 for undergraduate programs and a minimum iBT score of 80 out of 120 for graduate programs. (Some programs asked for higher minimum scores). The participants were randomly assigned to one of the two treatment groups, and the researcher did not have access to their English proficiency scores until after they were assigned in groups and completed the demographics questionnaire. As all the participants were registered students, they had met the English language requirement.

One question in the demographics questionnaire asked the students for their Chinese dialects. However, it was found that many students did not understand the question, and they were not aware of Chinese dialects. The students believed that they spoke “normal” Chinese. Therefore, the data collected regarding dialects were not analyzed in this study.

The last two questions in the demographics questionnaire asked the participants to self-rate their English abilities in general and in each skill of English (Reading, Speaking, Listening, and Writing). The two questions were found to be invalid because the participants did not report their ability levels consistently with their iBT test scores. Some participants told the researcher that they were modest and that they could not rate their English abilities highly while their iBT test scores were high (above 100 out of 120). As a result, the data collected from the two questions were not analyzed in this study. Instead, the researcher used the participants’ English proficiency scores to identify if the two treatment groups were equivalent in their English ability as previously reported.

## **Instructional Materials**

**Selection of the tutorial topic.** The topic of the multimedia tutorial used in the study is money management. The tutorial, entitled *What Your Teachers Never Told You about Managing*

*Your Money*, was produced as a part of a course on money management and budgeting. This course was produced for people who want a better understanding of how to manage their personal finances. The topic of personal finance was selected because it was assumed to be of interest to college students, which was confirmed by more than two-thirds of study participants remarking that they liked the content of the tutorial on an open-ended post-intervention survey question that asked participants what they liked or did not like about the tutorial.

**Selection of the tutorial narrators.** Three native English speakers and three Chinese speakers read the English narration of the tutorial. All of them were male. The researcher sent a recording sample of each of the six speakers to one expert in ESL/EFL and two experts in Testing and Instructional Design/Technology. The experts were asked to choose and rank two comparable pairs of a native English speaker and a Chinese speaker in each pair on the criterion of intelligibility. Most importantly, the voices of speakers had to be clear and understandable. The experts were also asked to consider other voice attributes such as age and pitch. The researcher and all the experts chose the same pair of narrators as the most comparable pair. This pair of a native English speaker and a Chinese speaker was chosen as the narrators of the two versions of the tutorial used in this study. The researcher used Audacity (Version 2.0.5) to make sure that the narrations of the speakers were matched for volume and pace.

In conclusion, the instructional materials consisted of two versions of a money management tutorial. Except for accent (AAE or CAE), the narrations of the two versions were matched for such voice attributes as intelligibility, gender, age, pitch, volume, and pace. The tutorial lasted for 14 minutes. The two versions of the tutorial were installed on the computers at the computer lab where the experiment took place. All participants wore headphones and were



not aware of which version of the tutorial other participants were using. Below in Figure 2 are two screenshots from the tutorial.

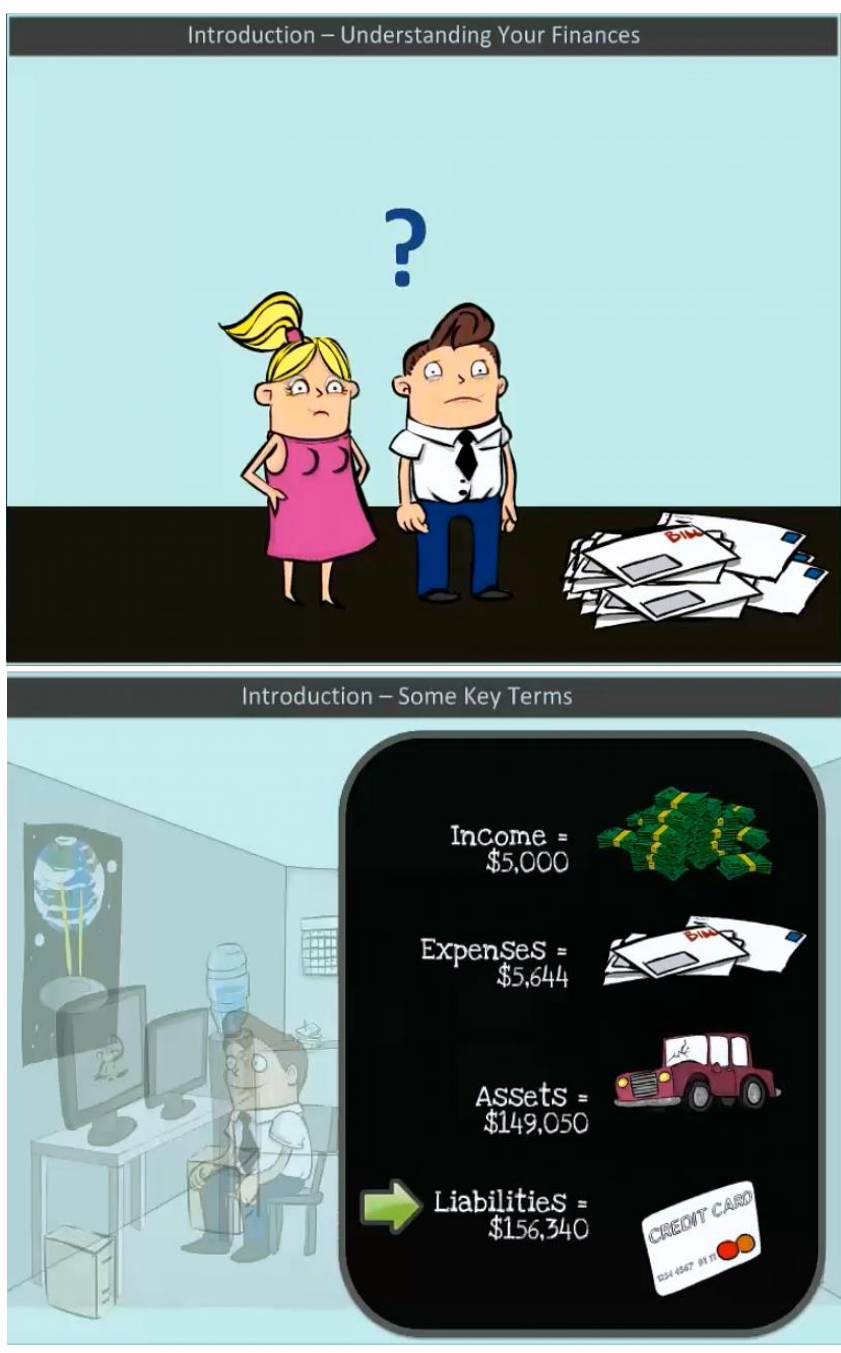


Figure 2. Screenshots from the tutorial. In the screenshot above, the two characters of the tutorial and their personal finance problem were introduced. In the screenshot below, some key finance terms were explained.

## Research Procedure

The experiment took place in a computer lab of 25 computers with headphones. Participants were scheduled into sessions according to their availabilities. The earliest time to start a session was 10 a.m., and the latest time to end a session was 5 p.m. The number of participants in each session varied from four to eight. Data collection for each participant was completed within each session of 70 minutes. Each participant was seated and assigned an individual computer with a headphone.

Each student was randomly assigned to one of the two versions of the tutorial. As students entered a session, they were alternately assigned to either the AAE or the CAE group. First, the researcher gave instructions to participants (Appendix E). The researcher reinforced that their participation was voluntary, that they might withdraw anytime without hesitation, that all their responses were confidential, and that their completion of the study indicated their voluntary consent to participate. The participants were also instructed to answer all questions on the three instruments. After that, the participants read the consent form (Appendix A). The participants, then, completed the participant demographics questionnaire (Appendix B). Next, they individually watched the tutorial on money management. They then took the learning achievement test (Appendix C). On the test given to the participants, the title of the test was *Personal Finance Test*. After that, they completed the attitude survey, which was entitled *Video Lesson Survey* on the survey distributed to participants (Appendix D). Finally, after completing the attitude survey, each participant received \$10 as a thank-you gift in appreciation for his/her voluntary participation.

Due to the limited number of participants, special attention was given to the process of filling out the research instruments. In order to avoid discarding incomplete instruments, the

researcher instructed the participants not to leave any item unanswered. As a result, all 65 participants who participated in the study answered all the questions in the demographics questionnaire, the learning achievement test, and the attitude survey.

### **Data Analysis**

All instruments were scored by the researcher. Responses to all items on the three instruments, except the two open-ended questions on the attitude survey, were recorded and analyzed using SPSS version 16. Responses to the two open-ended questions on the attitude survey were typed into a Word Document. Cronbach's Alpha was used to estimate the reliability of the items in the learning achievement test and attitude survey. Independent-samples t-tests were used to compare the participants' performance on the learning achievement test and their attitudes toward the speakers through the attitude survey. In order to draw maximum meaning of the statistics and their associated  $p$  values for inferential procedures, the effect size should also be obtained (Cohen, 1992). Therefore, Cohen's  $d$  was also calculated to describe the size of effect of narrator accent on participants' learning and attitudes.

One reliability test was carried out to estimate the reliability of the 30 items in the learning achievement test. One independent-samples t-test was conducted with overall learning as the test variable (dependent variable), and speaker accent as the grouping variable (independent variable) with two values: American-accented English (AAE) and Chinese-accented English (CAE). The significance level was set at the standard level of  $p \leq .05$ . To analyze the attitude survey data, the researcher first conducted one reliability test to calculate the reliability of the 15 items in the attitude survey. One independent-samples t-test was conducted with the overall attitude score as the dependent variable and narrator accent as the independent variable with two values: AAE and CAE. The significance level was set at  $p \leq .05$ .

## Secondary Analysis

**Learning achievement subtests.** Because the learning achievement test consisted of questions at recall and above-recall cognitive levels, further analysis was conducted to see if narrator accent differentially affected learning achievement at each cognitive level. One reliability test was calculated to determine the internal consistency of the 15 questions at the recall cognitive level (called the recall subtest). One independent-samples t-test was conducted with score on the recall subtest as the test variable (dependent variable), and speaker accent as the grouping variable (independent variable) with two values: AAE and CAE. One reliability test was calculated to determine the internal consistency of the 15 questions at the above-recall cognitive level (called the above-recall subtest). One independent-samples t-test was carried out with total score on the above-recall subtest as the test variable (dependent variable), and speaker accent as the grouping variable (independent variable) with two values: AAE and CAE. To adjust for the potential inflation of the overall Type I error, the significance level was adjusted to .025 for the two t-tests performed on the two learning achievement subtest scores. Cohen's *d* was calculated to identify the size of effect of narrator's accent on each learning achievement subscale.

**Attitude rating subscales.** Because the attitude ratings were comprised by three subscales (Superiority, Attractiveness, and Dynamism), further analyses were conducted to see if narrator accent differentially affected participants' perceptions of the narrators' superiority, attractiveness, and dynamism. Reliability tests were carried out to examine the internal consistency of the 5 bipolar pairs of adjectives constituting each subscale. The researcher conducted three independent-samples t-tests, one for each of the three subscales, wherein the ratings on each subscale constituted the dependent variable and speaker's accent was the

independent variable with two values: AAE and CAE. To avoid Type I error, the significance level was adjusted to  $p \leq .0167$  for each of the three t-tests conducted on Superiority, Attractiveness, and Dynamism subscales. Cohen's  $d$  was also calculated to identify the size of effect of narrator's accent on each attitude rating subscale.

Finally, the open-ended answers were reviewed for possible explanations of the quantitative results. The researcher read participants' responses and classified these responses into categories. Categorizing the qualitative data followed the definition by Weber (1990): "A category is a group of words with similar meaning or connotations" (p. 37) and the principle by the General Accounting Office (1996): "Categories must be mutually exclusive and exhaustive" (p. 20). In the end, two lists of categories were generated: 1) what participants liked about the tutorial and 2) what participants did not like about the tutorial.

### **Instrument Reliability**

After collecting all research instruments completed by the 65 participants, the researcher entered all answers for each participant into SPSS version 16. Cronbach's alpha was calculated to measure internal consistency of the learning achievement test and the attitude survey. Internal consistency coefficients indicate the extent to which "all items within the instrument measure the same thing" (George & Mallery, 2011, p. 231).

**Learning achievement test.** Cronbach's alpha calculated on all 30 items on the learning achievement test was .67. Item-total statistics were calculated to measure the relationship of performance mean of individual test item to total score on the learning achievement test (see Table 3 below). The values in the *Corrected Item-Total Correlation* column are the correlations between performance on each item and total score on the learning achievement test (Field, 2005). The item-total statistics revealed that items 9, 10, 23, and 24 had negative item-total correlations.

Table 3

*Item-total Statistics for the Learning Achievement Test*

Question	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1.	16.85	14.88	.34	.65
2.	16.54	14.82	.54	.64
3.	16.80	14.60	.43	.64
4.	16.51	15.63	.12	.67
5.	16.58	15.34	.30	.65
6.	16.62	15.02	.38	.64
7.	16.42	16.31	.09	.67
8.	17.00	15.59	.16	.66
<b>9.</b>	<b>17.34</b>	<b>16.92</b>	<b>-.29</b>	<b>.68</b>
<b>10.</b>	<b>17.23</b>	<b>16.43</b>	<b>-.04</b>	<b>.68</b>
11.	16.58	15.37	.29	.65
12.	16.82	14.72	.39	.64
13.	16.72	15.33	.24	.66
14.	16.66	15.04	.35	.65
15.	17.02	15.64	.15	.66
16.	17.05	16.14	.02	.68
17.	16.72	14.95	.48	.63
18.	16.65	15.83	.12	.67
19.	16.85	15.01	.31	.65
20.	16.75	15.38	.22	.66
21.	16.48	15.54	.37	.61
22.	17.08	15.60	.17	.61
<b>23.</b>	<b>16.75</b>	<b>16.50</b>	<b>-.07</b>	<b>.68</b>
<b>24.</b>	<b>16.92</b>	<b>16.29</b>	<b>-.02</b>	<b>.68</b>
25.	16.75	15.41	.21	.66
26.	16.55	15.75	.19	.66
27.	17.22	16.14	.05	.67
28.	16.62	15.12	.35	.65
29.	16.92	15.98	.06	.67
30.	17.17	15.92	.11	.67

Items 9 and 10 were above the recall cognitive level, and items 23 and 24 were at the recall level. Because of their negative correlations with other questions, these questions were

removed from further analysis (Gerber & Finn, 2005). Subsequently, the learning achievement test included 26 items: 13 items at the recall cognitive level and 13 items above the recall cognitive level. The maximum score on the recall subtest was 13, on the above-recall subtest was 13, and on the learning achievement test was 26. After items 9, 10, 23, and 24 were deleted, Cronbach's alpha increased to .72, indicating acceptable reliability for the learning achievement test (George & Mallery, 2011).

**Attitude survey.** Although the 15 speaker-rating items in the attitude survey were used in Mayer et al. (2003), Mayer and colleagues did not report the reliability of the instrument. In this study, the internal consistency reliability of the 15 items in the attitude survey was .82. However, item-total correlation of item 4 was negative. Table 4 below reports the item analysis of all 15 items in the attitude survey.

Table 4

*Item-total Analysis of the Attitude Survey*

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1.	76.28	167.70	.16	.82
2.	77.20	157.44	.42	.81
3.	76.69	157.65	.53	.80
<b>4.</b>	<b>78.92</b>	<b>184.26</b>	<b>-.21</b>	<b>.85</b>
5.	76.18	151.93	.59	.80
6.	76.34	154.92	.38	.81
7.	76.25	155.06	.55	.80
8.	76.35	149.05	.68	.79
9.	76.05	150.92	.49	.80
10.	76.37	151.11	.65	.79
11.	76.51	150.82	.52	.80
12.	76.46	150.66	.57	.80
13.	76.72	152.83	.48	.80
14.	77.35	155.01	.38	.81
15.	76.91	151.96	.56	.80

Item 4 asked the participants to rate the narrator on the scale of *aggressive-unaggressive*. *Aggressive* was considered positive and *unaggressive* negative in Zahn and Hopper (1985) and Mayer et al. (2003), similarly to other pairs such as *confident-unsure* or *active-passive*. However, the *New Oxford American English Dictionary* listed two entries for *aggressive*: 1) “ready and likely to attack or confront” (Angus & Lindberg, 2010, p. 31) and 2) “pursuing one’s aims and interests forcefully” (Angus & Lindberg, 2010, p. 31). It is possible that when creating the *Speech Evaluation Instrument*, Zahn and Hopper used *aggressive-unaggressive* in the second meaning - *pursuing one’s aims and interests forcefully*. Therefore, they considered *aggressive* to convey a positive meaning and classified *aggressive-unaggressive* into the Dynamism subscale with *confident-unsure*, *active-passive*, or *energetic-lazy*. The participants in the study might have taken *aggressive* as its first meaning – *ready and likely to attack or confront*, which has some negative connotation. This bipolar pair of *aggressive* and *unaggressive* seemed ambiguous. Therefore, this pair was removed from further data analysis as suggested by Gerber and Finn (2005). Subsequently, the attitude survey consisted of 14 items. The Superiority and Attractiveness subscales included five adjective pairs. The Dynamism subscale included four bipolar pairs of adjectives instead of five. After removal of Item 4, the reliability of the attitude survey increased to .85 which, according to George and Mallery (2011), indicates good reliability.

**Secondary analysis.** Cronbach’s alpha was also used to determine the internal consistency reliability of the learning achievement subtests and the attitude subscales.

**Learning achievement subtests.** When Cronbach’s alpha was calculated for the recall and above-recall subtests, it was found that their reliabilities were below the acceptable threshold of .70 suggested by George and Mallery (2011) (see Table 5).



Table 5

*Cronbach's Alpha Values of the Learning Achievement Test and Its Subtests*

Instrument	Cronbach's alpha	Number of items
Recall subtest	.66	13
Above-recall subtest	.52	13
Learning achievement test	.72	26

Cronbach's alpha is usually expected to be .70 or larger to provide support for internal consistency reliability (George & Mallery, 2011; Morgan, Leech, Gloeckner, & Barrett, 2012). However, Morgan et al. added that alpha approaching .70 is acceptable. The reliability of the recall subtest was marginally acceptable while that of the above-recall subtest was substandard.

*Attitude subscales.* Cronbach's alpha was used to examine the internal consistency of the bipolar pairs in each subscale of the attitude survey. According to the standards recommended by Morgan et al. (2012), the reliabilities of the Superiority and Dynamism subscales were acceptable. The Attractiveness subscale of the attitude survey appeared to have good internal consistency.

Table 6

*Cronbach's Alpha Values of the Attitude Survey and Its Subscales*

Instrument	Cronbach's alpha	Number of items
Superiority subscale	.69	5
Attractiveness subscale	.84	5
Dynamism subscale	.74	4
Attitude survey	.85	14

This chapter described the research design, variables, data collection instruments, research participants, instructional materials, procedures, data analysis, and instrument reliability pertinent to the study. The next chapter presents the results and findings.

## CHAPTER 4

### RESULTS

This study investigated the effects of narrator accent in a multimedia tutorial on the participants' learning outcomes and their attitudes toward the speakers. This chapter presents the results of the data analyses pertinent to the research questions that focused the study. The findings are separated into three sections: 1) learning achievement test results, 2) attitude survey results, and 3) summary of results.

#### **Learning Achievement Test Results**

The learning achievement test was used to answer the first research question: Does tutorial narrator accent (native American-accented English versus non-native shared Chinese-accented English) differentially affect learning? The test assessed how well participants recalled the content of the tutorial and used the knowledge covered in the tutorial to solve comprehension and application level, scenario questions.

#### **Overall Learning**

Each participant received a whole number score, ranging from 0 to 26, measuring his/her performance on the learning variable. This whole number was the total number of questions on the learning achievement test that were answered correctly. Table 7 below reports the descriptive statistics for the learning achievement test.

Table 7

*Descriptive Statistics for the Learning Achievement Test*

		n	Min	Max	Mean (%)	SD
Group	AAE	33	6	23	16.36 (62.92)	4.33
	CAE	32	6	22	15.81 (60.81)	3.90
Total sample		65	6	23	16.09 (61.88)	4.10

*Note.* AAE = American-accented English group; CAE = Chinese-accented English group; Min = minimum score; Max = maximum score.

The group listening to the native American-accented English (ACE) narrator had a mean score of 16.36, higher than that of the group listening to the non-native shared Chinese-accented English (CAE) narrator ( $M = 15.81$ ). The mean difference between the two groups was 0.55. An independent-samples t-test was conducted to compare the means of the two groups at a significance level of  $p \leq .05$ .

Table 8

*Results of the Independent-samples t-test for the Learning Achievement Test*

<b>t-test for Equality of Means</b>				<b>95% Confidence Interval of the Difference</b>	
<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>	Lower	Upper
0.54	63	.59	0.13	-1.49	2.60

The two treatment groups did not differ in their scores on the learning achievement test,  $t(63) = 0.54$ ,  $p = .59$ ,  $d = 0.13$ . We can conclude that the accent of the narrator in the tutorial did not affect the performance of the participants on the learning achievement test.

Because the learning achievement test consisted of recall level and above-recall level items, further analyses were conducted to identify if the two treatment groups scored significantly differently on these two subtests. Two independent-samples t-tests were conducted

with accent as the grouping variable and recall item score and above-recall item score as the test variables. To control the overall Type I error, the significance level was set at .025 for both tests.

### Recall Subtest

The recall subtest measured how well the participants recalled the information mentioned in the tutorial, for example, definitions of money management terms explained in the tutorial such as *take-home pay* and *cash flow*. A t-test was calculated to see if the accent of the narrator affected the participants' recall scores. The maximum score of this recall subtest was 13. On average, participants scored 8.52 out of 13. The mean scores of the recall subtests of participants in the American English accent group ( $M = 8.73$ ) did not differ from that of participants in the non-native shared Chinese accent group ( $M = 8.31$ ),  $t(63) = 0.65$ ,  $p = .52$ ,  $d = 0.17$ . Tables 9 and 10 summarize the descriptive statistics and t-test results of the analyses of recall subtest scores.

Table 9

#### *Descriptive Statistics for the Recall Subtest*

		n	Min	Max	Mean (%)	SD
Group	AAE	33	1	13	8.73 (67.15)	2.59
	CAE	32	2	12	8.31 (63.92)	2.50
Total sample		65	1	13	8.52 (65.54)	2.55

*Note.* AAE = American-accented English group; CAE = Chinese-accented English group; Min = minimum score; Max = maximum score.

Table 10

*Results of the Independent-samples t-test for the Recall Subtest*

<b>t-test for Equality of Means</b>				<b>95% Confidence Interval of the Difference</b>	
<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>	Lower	Upper
0.65	63	.52	0.17	-0.86	1.69

Data analysis of the independent-samples t-test yielded no significant differences between the two accent groups in regard to their recall level learning. The narrator's accent did not affect the participants' scores on the recall subtest.

#### **Above-recall Subtest**

Participants did not see or hear in the tutorial the answers to the above-recall cognitive level questions that appeared in the learning achievement test. Instead, they had to use the information given in the tutorial to answer previously unseen scenario questions. It was assumed that performance on the recall level questions and performance on the above-recall level questions were related to each other hierarchically; that is, recall level cognition was a prerequisite to above-recall level cognition.

In order to test the effects of accent on participants' above-recall level learning, an independent-samples t-test was conducted. This t-test did not indicate a statistically significant difference between the performance of the AAE group and that of the CAE group,  $t(63) = 0.24$ ,  $p = .81$ ,  $d = 0.06$ . Tables 11 and 12 below report the descriptive statistics of the above-recall questions.

Table 11

*Descriptive Statistics for the Above-recall Subtest*

		n	Min	Max	Mean (%)	SD
Group	AAE	33	2	11	7.64 (58.77)	2.43
	CAE	32	3	10	7.50 (57.69)	2.06
Total sample		65	2	11	7.57 (58.23)	2.24

*Note.* AAE = American-accented English group; CAE = Chinese-accented English group; Min = minimum score; Max = maximum score.

Table 12

*Results of the Independent-samples t-test for the Above-recall Subtest*

<b>t-test for Equality of Means</b>				<b>95% Confidence Interval of the Difference</b>	
<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>	Lower	Upper
0.24	63	.81	0.06	-0.98	1.26

The statistical results indicated that individuals in the AAE group ( $M = 7.64$ ) did not differ in above-recall level learning from individuals in the CAE group ( $M = 7.50$ ). However, as the reliability of the above-recall subtest was substandard ( $\alpha = .52$ ), the conclusion regarding the effect of narrator's accent on above-recall learning was not solid.

The non-significant results obtained from the analysis of learning achievement test scores were consistent with the answers to the two scaled questions asking how easy or difficult it was for the participants to learn about money management and to understand the speaker's voice. Two independent-samples t-tests were carried out (one for each question) to compare the two groups' ratings. The significance level was adjusted to .025 for each test to control the overall Type I error.

### Perceived Difficulty in Learning from the Tutorial

The first question asked the participants how easy or difficult it was for them to learn about money management from the tutorial they had seen. Participants were asked to choose 1-very easy; 2-easy; 3-difficult; or 4-very difficult in answer to this question. Each participant received a score of 1 to 4 according to his/her rating. A smaller score indicates less perceived difficulty in learning from the tutorial. Data analysis revealed that participants in the AAE group did not differ in their perceived difficulty in learning from the tutorial ( $M = 1.97$ ) from participants in the non-native shared Chinese accent treatment ( $M = 2.00$ ),  $t(63) = -0.19$ ,  $p = .85$ ,  $d = -0.05$  (see Tables 13 and 14).

Table 13

#### *Descriptive Statistics for Participants' Perceived Difficulty in Learning from the Tutorial*

		n	Min	Max	Mean	SD
Group	AAE	33	1	3	1.97	0.64
	CAE	32	1	3	2.00	0.62
Total sample		65	1	3	1.98	0.63

*Note.* AAE = American-accented English group; CAE = Chinese-accented English group; Min = minimum rating; Max = maximum rating.

Table 14

#### *Results of the t-test for the Participants' Perceived Difficulty in Learning from the Tutorial*

<b>t-test for Equality of Means</b>				<b>95% Confidence Interval of the Difference</b>	
<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>	Lower	Upper
-0.19	63	.85	0.05	-0.34	0.28



The participants in the two accent groups perceived the tutorial as *easy*. No participant considered the tutorial *very difficult*. The statistically non-significant difference between the two groups suggested that the two accent groups did not perceive a difference in cognitive load.

### Perceived Difficulty in Understanding the Narrator

This item evaluated the participants' perceived difficulty with sensory processing of the narration by asking them how easy or difficult it was for them to understand the narrator's voice. This question presented the same 4 point scale from *very easy* to *very difficult* as did the previous question. Responses were also scored and analyzed using the same procedures. Tables 15 and 16 below summarize the descriptive statistics and t-test results for the data regarding participants' perceived difficulty in understanding the narrator.

Table 15

#### *Descriptive Statistics for Participants' Perceived Difficulty in Understanding the Narrator*

		n	Min	Max	Mean	SD
Group	AAE	33	1	3	1.70	.59
	CAE	32	1	3	1.84	.68
Total sample		65	1	3	1.77	.63

*Note.* AAE = American-accented English group; CAE = Chinese-accented English group; Min = minimum rating; Max = maximum rating.

Table 16

#### *Results of t-test for Participants' Perceived Difficulty in Understanding the Narrator*

t-test for Equality of Means				95% Confidence Interval of the Difference	
<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>	Lower	Upper
-0.94	63	.35	0.14	-0.46	0.17

Both treatment groups reported that it was easy for them to understand the narrator. Comparison of mean levels of perceived difficulty in understanding the narrator for the AAE group ( $M = 1.70$ ) and the CAE group ( $M = 1.84$ ) revealed no significant difference between the two accent groups,  $t(63) = -0.94$ ,  $p = .35$ ,  $d = -0.22$ .

In conclusion, the two treatment groups did not differ significantly in overall learning or recall level learning based on whether the narrator was a native English speaker or shared a Chinese accent with the participants when speaking English. Participants listening to the tutorial narration with the non-native shared Chinese accented English performed as well as students exposed to the tutorial with the native American accent. The results from the learning achievement test agreed with the participants' self-reported ratings of their perceived difficulty in learning from the tutorial and understanding the narrator. The results do not suggest that non-native Chinese accent caused extraneous cognitive load when participants shared the narrator's accent.

### **Attitude Survey Results**

The attitude survey was administered to examine the effect of the narrator's accent on subsequent participant ratings of the narrator's attributes. The participants were asked to rate from 1 to 8, with 1 indicating the most negative rating and 8 the most positive rating, their impressions of the narrator on 14 different attributes defined by bipolar adjective pairs. The 14 adjective pairs were classified into three subscales, Superiority, Attractiveness, and Dynamism. Each subscale consisted of five adjective pairs, except for the Dynamism subscale from which the *aggressive-unaggressive* pair was removed because of its negative item-total correlation and

high potential for misunderstanding. Among the 14 pairs, seven pairs were reverse-coded to maintain consistency in scoring.

### Overall Attitude

The descriptive statistics for the attitude survey responses revealed that the participants generally rated their respective speakers on the positive end of the rating scale, Mean = 5.64. The descriptive statistics are summarized in Table 17 below.

Table 17

#### *Descriptive Statistics for the Attitude Survey Ratings*

		n	Min	Max	Mean	SD
Group	AAE	33	4.50	7.50	5.87	.92
	CAE	32	3.50	7.36	5.39	.97
Total sample		65	3.50	7.50	5.64	.97

*Note.* AAE = American-accented English group; CAE = Chinese-accented English group; Min = minimum rating; Max = maximum rating.

An independent-samples t-test was conducted to identify if the difference in attitudes towards the narrators was statistically significant between the two groups. The significance level was set at  $p \leq .05$ . The analysis revealed that the two groups differed significantly in their attitudes toward the narrators,  $t(63) = 2.06$ ,  $p = .04$ ,  $d = 0.51$  (see Table 18). The AAE group had more positive attitudes toward the narrator ( $M = 5.87$ ) than CAE group ( $M = 5.39$ ).

Table 18

#### *Results of the Independent-samples t-test for the Attitude Survey Ratings*

t-test for Equality of Means				95% Confidence Interval of the Difference	
<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>	Lower	Upper
2.06	63	.04	0.51	0.01	0.95

The two treatment groups differed significantly in their ratings of the narrator ( $p < .05$ ). Specifically, the AAE group rated their narrator significantly more positively than did the CAE group. Cohen's  $d$  was calculated to estimate the effect size, and its value was 0.51. Considering Cohen's criteria (1988) for the value of  $d$  ( $d = 0.20$ : small effect;  $d = 0.50$ : medium effect;  $d = 0.80$ : large effect), the  $d$  value of 0.51 indicated a medium effect size.

Because the attitude survey covered three aspects, Superiority, Attractiveness, and Dynamism, further analyses were conducted to identify if the two accent groups differed in their ratings on these more specific attributes. One independent-samples t-test was conducted for each subscale where narrator accent was the grouping variable and each subscale was the test variable. Because three t-tests were conducted, the alpha level was adjusted to .0167 for all three tests to adjust for the potential inflation of the overall Type I error.

### **Superiority Subscale**

Descriptive statistics for the Superiority subscale of the attitude survey ratings showed that the participants in the study generally had positive attitudes toward their respective narrators,  $M = 5.93$  (see Table 19).

Table 19

#### *Descriptive Statistics for the Superiority Subscale Ratings*

		n	Min	Max	Mean	SD
Group	AAE	33	4.40	8.00	6.14	1.16
	CAE	32	4.00	8.00	5.71	1.03
Total sample		65	4.00	8.00	5.93	1.11

*Note.* AAE = American-accented English group; CAE = Chinese-accented English group; Min = minimum rating; Max = maximum rating.

An independent-samples t-test was conducted to compare the mean ratings on the Superiority subscale between the two accent groups. It was found that narrator's accent did not differentially affect the participants' ratings on the Superiority subscale. The t-test results are reported in Table 20 below.

Table 20

*Results of the Independent-samples t-test for the Superiority Subscale Ratings*

<b>t-test for Equality of Means</b>				<b>95% Confidence Interval of the Difference</b>	
<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>	Lower	Upper
1.59	63	.12	0.39	-0.11	0.98

The mean difference in Superiority subscale ratings between the two accent groups was 0.43. The difference was found to be statistically non-significant,  $t(63) = 1.59$ ,  $p = .12$ ,  $d = 0.39$ . The size of 0.39 was close to a medium effect.

### **Attractiveness Subscale**

Similarly, descriptive statistics and an independent-samples t-test were conducted for the results on the Attractiveness subscale ratings. Both accent groups rated their respective narrators toward the positive end of the scales. The accent of the narrator did not affect how the participants evaluated the Attractiveness characteristics of their narrators (see Table 21 and 22).

Table 21

*Descriptive Statistics for the Attractiveness Subscale Ratings*

		n	Min	Max	Mean	SD
Group	AAC	33	2.80	8.00	5.76	1.38
	CAE	32	2.60	8.00	5.30	1.22
Total sample		65	2.60	8.00	5.54	1.31

*Note.* AAE = American-accented English group; CAE = Chinese-accented English group; Min = minimum rating; Max = maximum rating.

Table 22

*Results of the Independent-samples t-test for the Attractiveness Subscale Ratings*

<b>t-test for Equality of Means</b>				<b>95% Confidence Interval of the Difference</b>	
<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>	Lower	Upper
1.43	63	.16	0.35	-0.18	1.11

The difference in mean ratings of the Attractiveness subscale did not reach statistical significance,  $t(63) = 1.43$ ,  $p = .16$ ,  $d = 0.35$ . Cohen's  $d$  indicated a close-to-medium effect of narrator's accent on the participants' ratings of the Attractiveness subscale.

**Dynamism Subscale**

Finally, the Dynamism aspect of the narrators was examined. The participants in both accent groups had positive attitudes toward their respective narrators. The subsequent t-test was found to be statistically non-significant,  $t(63) = 1.90$ ,  $p = .06$ ,  $d = 0.47$  (see Tables 23 and 24). The accent of their respective narrators did not affect how the students in the two accent groups rated the Dynamism attribute of their narrators.

Table 23

*Descriptive Statistics for the Dynamism Subscale Ratings*

		n	Min	Max	Mean	SD
Group	AAE	33	3.50	8.00	5.67	1.16
	CAE	32	2.50	7.25	5.12	1.20
Total sample		65	2.50	8.00	5.40	1.21

*Note.* AAE = American-accented English group; CAE = Chinese-accented English group; Min = minimum rating; Max = maximum rating.

Table 24

*Results of the Independent-samples t-test for the Dynamism Subscale Ratings*

<b>t-test for Equality of Means</b>				<b>95% Confidence Interval of the Difference</b>	
<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>	Lower	Upper
1.90	63	.06	0.47	-0.03	1.14

The results of the independent-samples t-test suggested that accent did not bring about differences in how the participants in the two groups rated the Dynamism attribute of their respective narrators. However, the Cohen's *d* effect size of 0.47 indicated a medium effect size.

In conclusion, the data obtained from the attitude survey revealed that the Chinese students listening to English with the shared Chinese accent (CAE) rated the narrator significantly less positively overall than did the Chinese students listening to the tutorial narration spoken with an American accent (AAE). The effect was medium in size. Each subscale of Superiority, Attractiveness, and Dynamism was examined individually. The participants from the two groups did not rate their respective narrators significantly differently on any subscale.

However, it should be noted that the effect size of accent on each individual subscale was medium or close to medium.

### Qualitative Analysis

**What the participants liked about the tutorial.** The first open-ended question asked the students what they liked about the tutorial. Participants' responses to this question were found to fall into four categories: 1) content; 2) visuals; 3) speaker; and 4) others. A summary of participants' responses is illustrated in Figure 3.

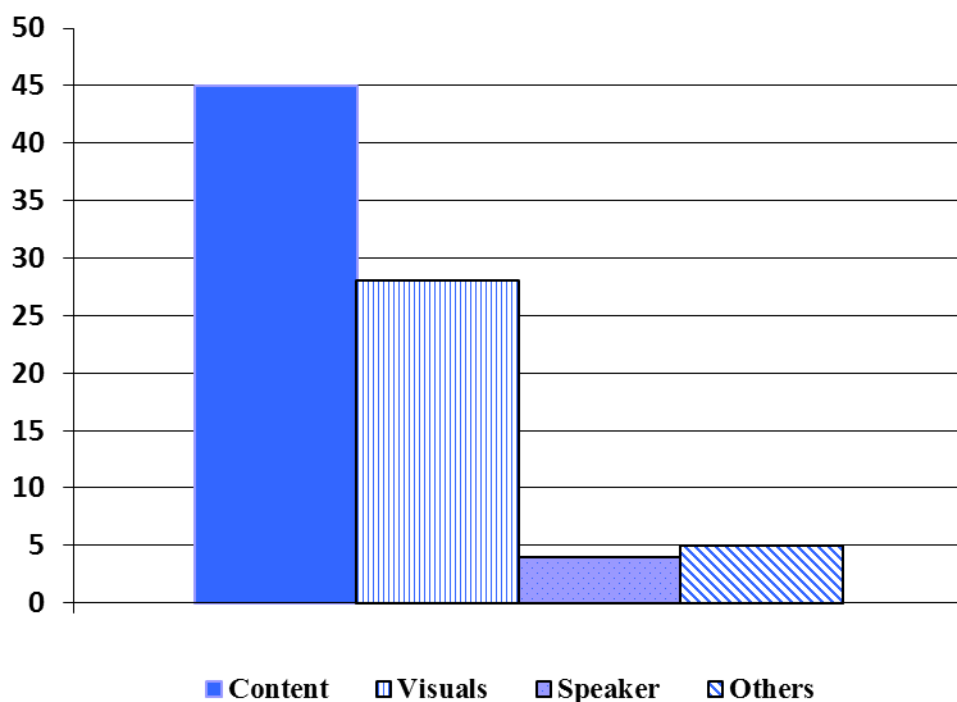


Figure 3. What participants liked about the tutorial.

Forty-five out of 65 participants (69%) commented that they liked the content of the tutorial. They found the topic of money management was interesting, useful, and easy to understand. Some examples of participants' comments are "very informative and helpful for managing money", "useful content", "taught me a lot about managing money, which is really helpful for me in my daily life", and "practical advice". The high number of participants who



liked the content of the tutorial confirmed the assumption that the topic of money management was interesting to the participants.

Twenty-eight out of 65 students (43%) mentioned the visual elements of the tutorial. These elements included colors, pictures, texts, animations, and bullet points. These participants commented that those visual aids helped them to stay focused and understand the tutorial. Further analysis revealed that the participants who liked the visual elements of the tutorial performed significantly better in the recall subtest than did the rest of the students,  $t(63) = 2.49$ ,  $p = .016$ ,  $d = 0.63$ . Cohen's  $d$  indicated a medium to large effect size. Because of the small sample size of the study, the t-test run on the data of the learning achievement test scores did not reach the significance level, but Cohen's  $d$  indicated an effect close to medium. Tables 25 and 26 below report the descriptive statistics and t-tests conducted to compare the mean scores of the learning achievement test and learning achievement subtests between the students who mentioned the visual elements (VE) and the students who did not (NVE).

Table 25

*Descriptive Statistics for Effects of Visual Elements on Learning*

Instrument	Group	N	Min	Max	Mean (%)	SD
Recall subtest	VE	28	4	13	9.39 (72.23)	2.18
	NVE	37	1	12	7.86 (60.46)	2.64
Above-recall subtest	VE	28	4	11	7.71 (59.31)	2.18
	NVE	37	2	11	7.46 (57.38)	2.32
Learning achievement test	VE	28	10	23	17.11 (65.81)	3.69
	NE	37	6	21	15.32 (58.92)	4.28

*Note.* VE = Group of participants who mentioned that they liked the visual elements of the tutorial; NVE = Group of participants who did not mention that they liked the visual elements of the tutorial; Min = minimum score; Max = maximum score.

Table 26

*Results of t-tests for Effects of Visual Elements on Learning*

Instrument	<i>T</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
Recall subtest	2.49	63	.016*	0.63
Above-recall subtest	0.45	63	.654	0.11
Learning achievement test	1.77	63	.082	0.45

*Note.* The significance level was set at .05 for the t-test performed on the learning achievement test scores; The significance level was adjusted to .025 for the two t-tests performed on the learning achievement subtest scores.

\* $p < .025$

The participants who found the visual features of the tutorial helpful had significantly more positive attitudes towards their speakers. They also rated the Superiority attribute of their narrators significantly more positively. Tables 27 and 28 below report the descriptive statistics and t-tests conducted to compare the mean ratings of the attitude survey and the attitude

subscales between the students who mentioned the visual elements (VE) and the students who did not (NVE).

Table 27

*Descriptive Statistics for Effects of Visual Elements on Attitudes toward the Speakers*

Instrument	Group	n	Min	Max	Mean	SD
Superiority subscale	VE	28	4.60	8.00	6.41	1.10
	NVE	37	4.00	8.00	5.56	0.99
Attractiveness subscale	VE	28	3.40	8.00	5.64	1.33
	NVE	37	2.60	8.00	5.50	1.32
Dynamism subscale	VE	28	2.75	8.00	5.66	1.36
	NE	37	2.50	7.25	5.30	1.05
Attitude survey	VE	28	4.21	7.50	5.92	0.98
	NE	37	3.35	7.36	5.42	0.91

*Note.* VE = Group of participants who mentioned that they liked the visual elements of the tutorial; NVE = Group of participants who did not mention that they liked the visual elements of the tutorial; Min = minimum rating; Max = maximum rating.

Table 28

*Results of t-tests for the Attitude Survey and Attitude Survey Subscale Ratings*

Instrument	<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
Superiority subscale	3.25	63	.002**	0.83
Attractive subscale	0.53	63	.596	0.14
Dynamism subscale	1.53	63	.130	0.38
Attitude survey	2.11	63	.039*	0.53

*Note.* The significance level was set at .05 for the t-test performed on the attitude survey ratings; The significance level was adjusted to .0167 for the three t-tests performed on the attitude survey subscale ratings.

\* $p < .05$ . \*\* $p < .0167$

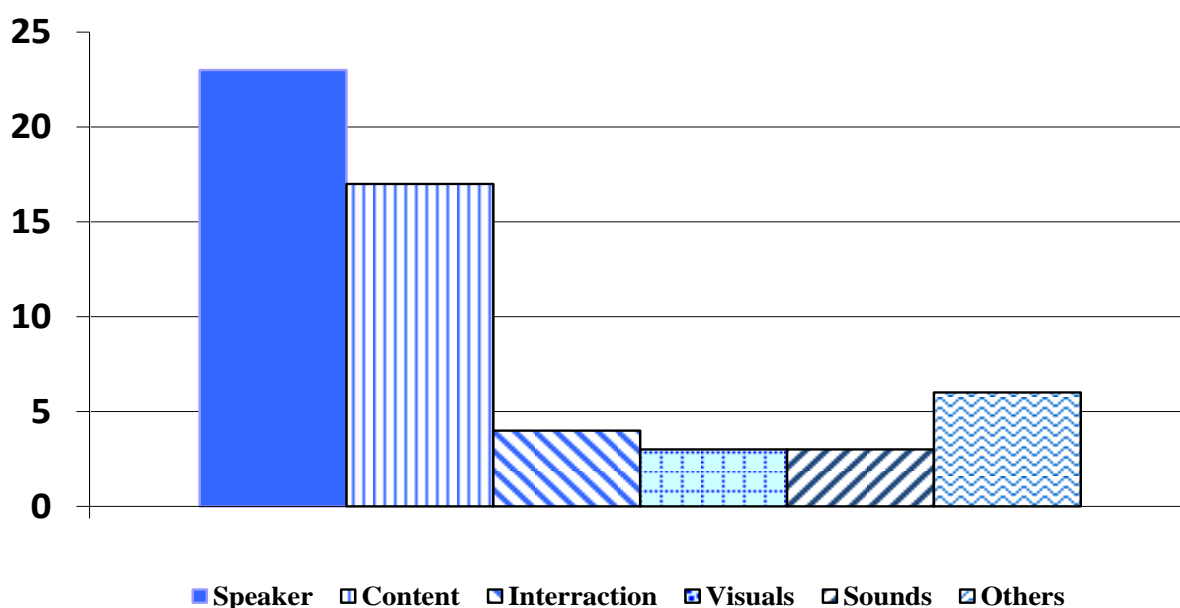
The content and visual aspects were the same across the two versions of the tutorial. The only variable that conveyed differences between the treatments of the two groups was tutorial speaker. Among the four participants (6%) who commented that they liked the narrators, one was from the CAE group and three were from the AAE group. According to the student in the CAE group, the Chinese narrator “*speaks slowly and clearly. It is easy to follow*”. The three students in the AAE groups liked the speaker because he spoke slowly and clearly and they could understand him. One student wrote that he/she liked “*the way the speaker points out each part very clearly and understandably*”. The participants’ opinions about their narrators supported the earlier assertion that the two narrators were both intelligible.

The students who completed the multimedia tutorial also mentioned other features of the tutorial that they liked. Two students stated that the tutorial had the right length. Two students mentioned the portability aspect of the tutorial. They wrote that “*I can take the lesson whenever and wherever I want*”. One student commented “*very good*” but he/she did not specify which aspects he/she liked about the tutorial.

In conclusion, participants’ responses to this open-ended question revealed that the content of the multimedia tutorial was interesting and useful. The approving comments regarding the visuals used in the tutorial were associated with a non-significant, close-to-medium effect on the participants’ overall learning and a medium to large effect on their recall level learning which was also statistically significant. The students who liked the visual features of the tutorial also had more positive attitudes toward their speakers. A significant, medium effect on these students’ ratings of their attitudes toward their speakers and a significant, large effect on their ratings of the Superiority attributes of their speakers were found in the follow-up analysis of their

open-ended comments. Participants from both groups stated that their narrators were easy to understand.

**What the participants did not like about the tutorial.** The second open-ended question in the attitude survey asked the participants to what they did not like about the tutorial. Among 65 participants, 13 students stated that they liked all aspects of the tutorial and that there was nothing that they did not like about the tutorial. Responses from the remaining 52 students were classified into six categories as 1) speaker; 2) content; 3) interaction; 4) visuals; 5) sounds; and 6) others. Figure 4 below summarizes the categories.



*Figure 4.* What participants did not like about the tutorial.

The most frequently-commented upon aspect of the tutorial was related to the speakers. Twenty-three students commented that they did not like their respective speakers. Six participants in the AAE group did not like the American speaker because 1) he spoke fast; and 2) he sounded cold and lazy. Seventeen participants in the CAE group did not like the Chinese

speaker because 1) he spoke fast; 2) he spoke slowly; 3) he sounded cold, lazy, and boring; 4) his voice was low; 5) he “*spoke with the same tone without any changes*”; and 6) he did not sound like a native English speaker. It should be noted that such voice attributes as pitch, volume, and pace were controlled and matched across the two versions of the tutorial. Interestingly, three participants in the CAE group did not like the speaker simply because he was a non-native speaker of English. One of these three students even wrote directly that he did not like the tutorial because the narrator spoke English with a Chinese accent. Generally speaking, the participants in the CAE group made more negative comments about their speaker. Their comments constituted 74% of the negative comments about the tutorial narrators.

The participants also commented on the lack of interaction between the tutorial and the tutorial users (4 participants). In this study, interactivity had been taken out of the multimedia tutorial for experimental purposes. Negative comments regarding the visual elements of the tutorial covered the text that appeared in the tutorial or the appearance of the characters (3 participants). In addition, some students did not like that there was only one voice of the speaker and that no sound effects were employed in the tutorial (3 participants). In the tutorial, there were two characters (see Figure 2), and the content of the tutorial was about the financial situations of these two characters. However, the characters were not voiced-over, and the voice the tutorial users could hear was spoken by the narrator.

Responses from 6 participants were classified as *others* because these responses were either too general for the researcher to categorize or unrelated to the tutorial. For example, one student wrote that the tutorial “*should be more professional.*” The researcher could not identify if the student was commenting on the voice of the speaker or the visual aspects of the tutorial.

Therefore, this response was listed in the category of *others*. Some responses were meaningless and unrelated to the tutorial.

In conclusion, data collected from the two open-ended questions revealed that participants liked the content of the tutorial. More participants in CAE group did not like their speaker than did the participants in the AAE group.

### **Summary of the Results**

In summary, data analysis revealed that the narrator accent did not have significant effects on the participants' overall learning and recall level learning. Taking into consideration of the substandard reliability of the above-recall subtest, no valid conclusion can be drawn regarding the effect of accents on the above-recall level learning. Regarding the participants' attitudes toward their respective narrators, the participants in the AAE group students had significantly more positive attitudes toward their narrator than did participants in the CAE group. The size of this effect was medium. The two groups did not differ significantly in their ratings of their respective narrators on the separate subscales of Superiority, Attractiveness, and Dynamism. For each individual subscale, the effect size was medium or close to medium.

Qualitative data analysis revealed that 45 of 65 participants liked the content of the tutorial. Twenty-eight participants found the visuals interesting and helpful. A follow-up quantitative analysis revealed that this group of 28 participants performed significantly better than other students on the recall learning subtest and the effect size was medium to large. The effect size on these participants' overall learning was close to medium but it was not statistically significant. The participants who commented that they liked the visuals used in the tutorial also had significantly more positive overall attitudes to their speakers. Furthermore, the effect size on

the Superiority dimension of the attitude assessment was large. The analysis of the qualitative data showed that more students who listened to the Chinese speaker did not like their respective speaker than did the students who listened to the American speaker.

The findings reported in this chapter will be further discussed in the next chapter.



## CHAPTER 5

### DISCUSSION AND CONCLUSIONS

This final chapter contains six sections. The first section briefly summarizes the previous chapters. The second section, which is organized according to the two research questions, discusses the findings of this study as well as presents the conclusions obtained from the statistical analysis. The third section discusses the implications of the findings. The fourth section reviews the limitations of the study. From these limitations, recommendations for future research will be presented. Lastly, the chapter ends with the conclusions drawn from the study.

#### **Summary of the Previous Chapters**

The study investigated whether the narrator accent in a multimedia tutorial affected participants' learning and attitudes toward the narrator. The independent variable of the study was accent with two levels: native accent and non-native shared accent. The dependent variables of the study were learning and attitudes toward the narrator.

Sixty-five Chinese participants were randomly assigned to one of two groups in this experimental design. Participants in the two randomly-assigned groups were equivalent in terms of age and English proficiency scores at the time of admission to the university. Data to test the dependent variables were collected through the learning achievement test and the attitude survey. Data analysis revealed that there was no significant difference in overall learning and recall level learning between the two accent groups. However, the group who heard the narration spoken with the native American English accent had significantly more positive attitudes toward the narrator than the group who heard the narration spoken with a non-native shared Chinese accent.

## Discussion and Conclusions

### Effects of Accent on Learning

The first question of the study was whether tutorial narrator accent (native American-accented English versus non-native shared Chinese-accented English) differentially affected learning. Indeed, accent of the narrator did not affect participants' learning. The data analysis found no statistically significant difference in overall learning between the students assigned to the AAE treatment group and those who were assigned to the CAE group,  $t(63) = 0.54$ ,  $p = .59$ ,  $d = 0.13$ . Further analysis also revealed that the performance of the two treatment groups did not differ significantly in their recall level learning. (Because the reliability of the above-recall level subtest was substandard, conclusions on the effect of narrator accent on above-recall level learning could not be made). The results suggest that the non-native shared Chinese English accent did not cause extraneous cognitive load to the tutorial learners. Such extraneous cognitive load could be a concern for designers of tutorials who are attempting to apply Mayer's (2005) voice principle for native speakers of English.

The target audience of the study was non-native English speakers while the voice principle by Mayer (2005) applies to native speakers of English. Therefore, the findings of the study do not directly contradict the results reported in Mayer et al. (2003) that native learners learned more deeply when the narration in a multimedia lesson was spoken by a native voice rather than a non-native voice. In fact, the study qualifies the voice principle by focusing on non-native English speakers and supports the conclusion that speaker's Chinese accent does not affect overall learning and recall level learning among Chinese participants who shared the speaker's accent but does affect their attitudes toward such speakers.

Mayer et al. (2003) explained that for native speakers of English, unfamiliar foreign English accents cause extraneous cognitive load because listeners must devote cognitive resources to understand such accents. However, in the case of non-native learners, when they share the narrator's non-native accent, they have an advantage in comprehension and intelligibility as explained by Flowerdew (1994) and Nass and Brave (2005) and reported in Brown (1968), Wilcox (1978), and Ekong (1982). According to these researchers, non-native learners do not encounter significantly extra cognitive load in order to understand a narrator who shares their accent.

The finding of this study regarding the effects of speaker accent on participants' learning contradicts the finding of Mayor et al. (2002). Data in Mayor et al. conveyed that native speakers of Chinese encountered disadvantages when the speaker was a Chinese speaker. The researchers reported that Chinese participants had significantly lower scores on a test of listening comprehension when they listened to the Chinese-accented speaker rather than to the American-, Spanish-, and Japanese-accented speakers. However, as pointed out in previous chapters, listening comprehension tests in ESL/EFL differ from multimedia instruction such as tutorials. In fact, the images and texts appearing in the tutorial used in this study helped the Chinese participants in answering questions in the learning achievement test. Therefore, instructional designers and tutorial producers should take advantage of visual cues to facilitate learning.

The lack of significant difference between the two accent groups in their learning outcomes may be because it was easy for the participants to understand the speaker. Participants' ratings of their perceived difficulty in learning from the tutorial and understanding the narrator did not reveal differences in ratings between the two accent groups. Even though the narrator of the non-native shared treatment spoke English with a Chinese accent, the Chinese

students who listened to his voice had the same perceived difficulty in learning from the tutorial and understanding the narrator as the Chinese students who listened to the native American English accent.

Another possible reason for the non-significant difference in the learning outcomes of the two groups is that the two narrators were both intelligible for the Chinese students. The study participants passed the English requirements at the university where they were enrolled. In addition, on average, they had been in the United States for more than one and a half years and they had been enrolled in four semesters in the United States. Therefore, the study participants in the AAE group were used to the American English accent. As mentioned in Chapter 3, the Chinese narrator was chosen from among three Chinese speakers because of his clear intelligibility. It is likely that the participants in the CAE group spoke English with a Chinese accent, and they were familiar with the accent of the speaker. As a result, they did not have difficulty understanding their narrator.

The students volunteered to participate in the study, and they were clearly informed that their responses did not affect their grades in any of their courses. Because their grades were not affected, it is assumed that they were not motivated to do their best on the learning achievement test. Their lack of motivation is one possible reason for the non-significant difference between the two treatment groups.

### **Effects of Accent on Attitudes towards the Narrator**

The second dependent variable of the study was the attitudes of the participants towards their narrator. The study was intended to identify whether tutorial narrator accent (native American-accented English versus non-native shared Chinese-accented English) differentially affect participants' attitudes toward the narrators. Data analysis revealed that the participants in

the native accent group rated the narrator significantly more positively than their counterparts in the non-native shared accent group rated their narrator. Cohen's  $d$  indicated a medium effect of narrator accent on participants' overall attitude. The results confirmed the findings of Chiba, Matsuura, and Yamamoto (1995) and Dalton-Puffer, Kaltenboeck, and Smit (1997) showing that non-native speakers had more positive attitudes toward native speakers.

In order to further investigate the observed difference in learners' attitudes toward the speakers based on accent, the researcher analyzed individual aspects of the attitude survey. The  $t$ -tests for the individual subscales – Superiority, Attractiveness, or Dynamism – did not show statistical significance for the mean difference between the accent groups. However, the effect sizes were close to medium in the analysis of the three subscales. The failure to reach statistical significance might be due to the small sample size of the study, resulting in Type II error.

Qualitative data analysis revealed that the number of participants who did not like their respective speakers was higher in the CAE group than in the AAE group. More students who listened to the Chinese speakers commented negatively about their Chinese speaker.

### **Implications**

The study helped to establish the limit of the voice principle's (Mayer et al., 2003) generalizability by including non-native English speaking learners. According to the voice principle, native English speakers' deep learning will be significantly better when the narration is spoken with a native English accent than with a foreign one (Mayer, 2005). However, for Chinese speakers, a shared Chinese accent in multimedia instruction will bring about the same overall learning (measured by a test requiring both recall and above-recall cognition) and recall level learning specifically as a native English accent. While Chinese speakers learning in English

appear to have a better attitude toward narrators with a native English accent, they do not learn better from such a narrator.

The findings of this study help instructional designers make decisions regarding which accent to use in multimedia instruction for Chinese learners. Since there is no significant difference in Chinese users' overall learning and recall level learning regardless of native English or shared Chinese accent, instructional designers can simply utilize an intelligible Chinese narrator unless attitude toward the speaker is considered important. For such learners, multimedia instruction with a shared Chinese accent does not cause extraneous cognitive load.

With the popularity of e-Learning and self-made multimedia instruction, the study helps assure Chinese instructors that they can use their own voices to record the English narration. Providing that narrators are intelligible, Chinese students will learn from tutorials with a Chinese-accented English narration as much as from a tutorial voiced with a native English accent.

Narrator's accent did not differentially affect the participants' learning. However, follow-up quantitative analysis of qualitative findings revealed that participants who commented that they liked the visuals in the tutorial scored significantly better on the recall learning subtest; the effect size was medium to large. The effect size on these participants' overall learning was close to medium but not statistically significant. This result supports the longstanding advice to instructional designers that they should utilize visuals in multimedia tutorials to enhance users' learning.

### Limitations

A limitation of the study is the substandard internal consistency of the above-recall subtest. As mentioned earlier, the learning achievement test was reviewed by experts in finance and testing. However, the learning achievement test was used for the first time in this study, and it had not been validated. Because of the low reliability of the above-recall subtest, conclusions regarding the effect of narrator accent on above-recall level learning could not be made.

There is also a limitation with the attitude survey. Zahn and Hopper (1985) recommended the items in the *Speech Evaluation Instrument* be subjected to factor analysis in each study of speech evaluation. However, because this study included only 65 participants, a factor analysis would not have produced reliable and stable results. Kline (1979) and Gorsuch (1983) recommended data from at least 100 participants for a factor analysis (in MacCallum, Widaman, Zhang, & Hong, 1999).

In addition, due to the small sample size, the validity of the inferences or conclusions might have been affected. The non-significant  $p$  and close-to-medium size effect  $d$  across the three attitude subscales suggest that Type II Error could be a problem in the study.

Furthermore, participants in the study were university students averaging 24 years of age. The findings of the study cannot be generalized to audiences of different age groups such as high school students or middle-aged students.

Lastly, the results of the study might be limited only to native Chinese speakers who listen to English with a Chinese accent. In the non-native shared accent group, the narrator and participants spoke Chinese as their first language. The narrator spoke English with a Chinese accent, and it was assumed that the participants spoke English with a shared Chinese accent. Therefore, the results of the study cannot be applied to a situation in which the first languages of

the narrator and tutorial users are not Chinese. Mayor, Fitzmaurice, Bunta, and Balasubramanian (2002) reported that non-native English speakers of different languages had different performances in comprehension when they listened to a shared accent. This study found that non-native shared Chinese accented English did not affect participants' learning. However, this finding cannot be generalized to non-native English speakers from other cultures such as Japan or Mexico.

### **Recommendations**

Below are some recommendations for future research based on the limitations and delimitations of this study.

1. Future research is recommended to replace the adjective pair of *aggressive* - *unaggressive* with a different bipolar adjective pair within the Dynamism subscale (see Zahn and Hopper (1985) for such pairs). Future research with an adequate sample size should include a factor analysis of the shortened version of the instrument developed by Zahn and Hopper used in this study. Future research might also use the complete *Speech Evaluation Instrument* by Zahn and Hopper because the reliability of the instrument has been established.

2. In addition, the sample size may have affected the validity of the inferences or conclusions, which could limit generalizability to the entire population. As such, the researcher suggests replicating the study with a larger sample to validate the instruments and to re-examine the findings of the study.

3. The Chinese participants in the Chinese-accented English group and their respective narrator shared the same first language. However, in reality non-native speakers of English communicate with other non-native English speakers with different first languages. The researcher suggests a study of non-native speakers wherein the narrator and participants do not



share the same mother tongue. For example, participants are Chinese and the narrator is Korean or Mexican. Future research, then, might compare the effects of non-native accent on the learning of non-native participants who share and non-native participants who do not share the narrator's first language. Such a study could ascertain if a non-native, shared accent brings about better learning and/or more positive attitudes toward the narrator than a non-native, non-shared accent. A series of such studies can determine the generalizability of accent effects on learning and attitudes toward the narrator among non-native learners.

4. In this study, participants were randomly assigned to either the American or Chinese accent group. A future experimental design should allow each participant to be exposed to both narrators of Chinese and American accents. By doing so, participants can report their comparisons between the native and non-native accent according to their own experience with the two accents.

5. The tutorial used in this study comprised complementary text and visuals such as images and graphs. It is possible that the participants used primarily the text in the tutorial to learn the content or used the text to comprehend the narration they did not understand. The non-significant difference between the two accent groups in learning outcomes might have resulted from the fact that the two groups had the same complementary text in the tutorial. Future research should use tutorials without supporting text. In such an instructional treatment, participants would have to rely on the narration to learn the content.

6. The topic of the tutorial in the study was money management. Even though the participants had never taken any finance courses prior to the study, they could have answered some questions according to their common sense. Germane cognitive load of the content might not have been high enough for any extraneous cognitive load introduced by the narrator's accent

to have an effect on learning. Therefore, future study should examine the effects of accent in a variety of content areas such as challenging science areas.

7. The narrators in the study were controlled for intelligibility. The Chinese speaker in the study was easily understood by the Chinese students. Further research should use a heavily-accented narrator or involve two narrators with different levels of intelligibility. Such studies can reveal if differences in intelligibility of non-native accents differentially affect participants' learning and attitudes.

8. Finally, the researcher did not ask the participants' scores in the listening section of TOEFL iBT or IELTS. Future research should include this question to identify if participants' listening abilities differentially affect their learning and attitudes when listening to native and non-native tutorial narrators.

### **Conclusions**

In spite of the limitations mentioned above, the study makes meaningful contributions to the literature in the field of instructional design and technology. The research qualifies the voice principle by establishing its generalizability among non-native English speakers, who constitute nearly 75% of English speakers in the world (Crystal, 2003a). The study also suggests to instructional designers that the use of a non-native shared accent should not affect students' learning negatively although it may affect their attitudes toward the speaker. In addition, the study also informs non-native instructors that they can record their own voices to use in multimedia instruction because their non-native students will learn as effectively as with a native English accent.

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## APPENDICES

## APPENDIX A

**Consent Form**

Dear participant,

My name is Vien Cao. I am a graduate student in the Department of Curriculum and Instruction at Southern Illinois University, Carbondale. I am currently conducting a study to complete my Ph.D. in Learning Systems Design and Technology. The purpose of my study is to examine the effectiveness of video lessons.

Your participation in this study is voluntary. If you change your mind, you may withdraw at any time without hesitation. If you choose to participate in the study, you will be asked to provide demographic information about yourselves such as gender, age, native language, and residence time in the U.S., but not your name. You will watch a video lesson and complete a quiz and a survey about the video lesson that you watch. The whole process will take approximately 70 minutes.

All reasonable steps will be taken to protect the identities of participants in this study. Personal information will not be included in any printed reports or articles. Access to records of your participation will be limited to me as the researcher and my dissertation advisor, Dr. Peter Fadde. After the study is completed, all questionnaire sheets will be destroyed.

For additional information, please contact me, Vien Cao, Project Researcher, at Wham 146, SIUC, Carbondale, IL 62901, Tel: (618) 434-0329, e-mail: [viencao@siu.edu](mailto:viencao@siu.edu), or Dr. Peter Fadde, Dissertation Committee Chair, Department of Curriculum and Instruction, Wham 146, SIUC, Carbondale, IL 62901, Office tel.: (618) 453-4019, e-mail: [fadde@siu.edu](mailto:fadde@siu.edu).

Thank you for assisting me in this research. If there is another person in your department or in the University you feel would be interested in participating in this study, please forward this message to that individual.

---

**I have read the material above, and any questions that I asked have been answered to my satisfaction. I understand a copy of this form will be made available to me for the relevant information and phone numbers upon request. I realize that I may withdraw without prejudice at anytime.**

**Completion of the study indicates voluntary consent to participate.**

---

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: [siuhsc@siu.edu](mailto:siuhsc@siu.edu)

## APPENDIX B

**Demographics Questionnaire**

This is NOT a test, and there are no RIGHT or WRONG answers. This questionnaire does not affect your grade in any of your courses. All the information is CONFIDENTIAL.

Number: \_\_\_\_\_

1. What is your age? \_\_\_\_\_
2. What is your gender?  Male  Female
3. What is your major? \_\_\_\_\_
4. What city are you from? \_\_\_\_\_
5. What is your first language? \_\_\_\_\_
6. If applicable, what dialect of your first language do you speak? \_\_\_\_\_
7. How many years of English classes did you have in your home country? \_\_\_\_\_ years
8. Have you taken any English classes in an English speaking country? If yes, for how long?  
 Never  Less than 1 year  1 – 3 years  More than 3 years
9. How long have you been in the United States? \_\_\_\_\_ years, \_\_\_\_\_ months
10. How many semesters have you been a registered university student in the United States?  
 \_\_\_\_\_ semesters
11. Have you taken any finance courses?  
 Yes  No
12. How often do you use video lessons for school-related work?  
 Never  Rarely  Occasionally  Often
13. What is your TOEFL or IELTS score? \_\_\_\_\_
14. Rate your English level in general.  
 Intermediate  Advanced  Superior
15. Using the scale from 1 to 4 below, rate your abilities in each skill of English.  
 (1 = needs work; 2 = good; 3 = very good; 4 = native speaker command)  
 Reading = \_\_\_\_\_ Speaking = \_\_\_\_\_ Listening = \_\_\_\_\_ Writing = \_\_\_\_\_

-----This is the end of the questionnaire. Thank you for your time!-----

## APPENDIX C

**Learning Achievement Test**

This test has no effect on your grade in any of your courses. All the information is **confidential**.

Number: \_\_\_\_\_

Circle the best overall choice.

1. The money you have left in your paycheck after taxes and deductions is called \_\_\_\_\_.
  - a. Investment
  - b. Liability
  - c. Possession
  - d. Take-home pay
2. Any type of borrowing from persons or banks is called \_\_\_\_\_.
  - a. Cash flow
  - b. Expense
  - c. Income
  - d. Liability
3. When should you start to invest your money?
  - a. After you create funds for special occasions
  - b. After you have enough emergency funds
  - c. After you receive your paychecks
  - d. After you cut back on spending
4. Which of the following is NOT an example of *possessions*?
  - a. Bonds
  - b. Credit cards
  - c. House
  - d. Money in the bank

5. The video lesson you viewed covered some tips to cut back on spending. Which of the following is NOT included?
- Create funds for special occasions.
  - Turn down credit line limit increases.
  - Leave your credit cards at home.
  - Invest to make your money grow.

Questions **6 to 10** are based on the following situation.

William works full time at Bookstop. His gross monthly paycheck is \$2,000 and that reduces to a net monthly paycheck of \$1,800. Last month he found a part-time position at the local Chicky's Chicken Restaurant earning \$1,000 gross monthly, which ends up amounting to \$900 net pay each month.

This is his spending plan for every month: Student loan is \$200. Rent is \$700. Gas, electricity, water, and sewage costs \$300. Unlimited Internet access is \$100 a month. Unlimited Cell phone plan is \$100 a month. Groceries cost \$200. Daily coffee is \$100. Take out lunches during the work week are \$300. He also budgets \$100 for clothing and \$100 for everything else.

6. What is William's income?
- \$1,800
  - \$2,000
  - \$2,700
  - \$3,000
7. What are his expenses?
- \$1,500
  - \$1,700
  - \$2,200
  - \$2,700
8. What are his mandatory expenses?
- \$1,000
  - \$1,200
  - \$1,400
  - \$1,500

9. How much does he have for discretionary spending?
- \$500
  - \$700
  - \$1,200
  - \$1,300
10. William wants to set up an emergency fund. How much should he aim for?
- \$644 a month
  - \$1,800
  - \$4,500
  - \$8,000 a year
11. According to the video lesson you viewed, which of the following is NOT necessary to do while tracking your spending?
- Buy a software package to track your spending.
  - Track your expenses as you go through your daily routine.
  - Track your expenses for a week or two.
  - Track every amount of money you spend.
12. Which of the following does NOT refer to *income*?
- Stock dividends
  - Net income
  - Payroll deductions
  - Bonus payments
13. According to the video lesson you viewed, when is it best to prepare your spending plan?
- Three months in advance
  - One month in advance
  - Fifteen days before the month starts
  - The first of each month

Questions **14 to 17** are based on the following situation.

Jennifer has a job with a take-home pay of \$2,000 per month. She must pay \$800 for rent and \$200 for groceries each month. She spends \$100 per month on personal care, \$100 on restaurants, and \$100 on entertainment. She also budgets \$100 each month for transportation, \$100 for utility bills, and \$100 for everything else. She has built her emergency funds up to \$700.

14. What is Jennifer's cash flow?
  - a. -\$200
  - b. \$400
  - c. \$500
  - d. \$700
15. How much are Jennifer's mandatory expenses?
  - a. \$1100
  - b. \$1200
  - c. \$1300
  - d. \$1400
16. Yesterday her car broke down unexpectedly, and the estimated repair cost is \$200. What should she do first to have money to get the car fixed?
  - a. Use her emergency funds
  - b. Use her discretionary budget
  - c. Use her credit cards
  - d. Borrow from her friends
17. Which of the following can you conclude about Jennifer?
  - a. She should buy a brand new car.
  - b. She is living beyond her means.
  - c. She needs to create a positive cash flow.
  - d. She has a spending plan.

Questions **18 to 20** are based on the following situation.

David is a holder of a research assistant award at Southern Hills University. Since the intent of the award is to provide sufficient financial support to him and enable him to be a full-time student, he may not hold any additional employment or awards, either from the university or elsewhere. The award stipend is \$1600/month. After taxes and deductions, he receives approximately \$1480/month. Every month he spends \$1500. He has two credit cards.

18. What can you say about David?
  - a. He does not pay bills on time.
  - b. He is losing wealth.
  - c. He does not have financial support from friends and family.
  - d. He misuses his two credit cards.
19. If David wants to improve his finances, what should he do first?
  - a. Make a monthly spending plan at the beginning of each month
  - b. Earn more money
  - c. Reduce his discretionary spending
  - d. Set aside some money for use in case of emergency
20. What would be the highest priority financial goal for David?
  - a. To create a positive cash flow.
  - b. To invest to make his money grow
  - c. To start saving.
  - d. To stick to the spending plan.



21. Cash flow is \_\_\_\_\_.
- The difference between the amount of money you take in and what you spend
  - The money you spend each month for things like food, shelter, and transportation
  - The value of your possessions
  - Any reliable sources of money coming into your household each month
22. As stated in the video lesson you viewed, Bob and Jane's financial security depends on \_\_\_\_\_.
- The amount of money they take in
  - Their expenses
  - Their ability to gain wealth
  - Their emergency funds
23. The difference between your income and your must-pay monthly bills is for \_\_\_\_\_.
- Savings
  - Discretionary spending
  - Emergency funds
  - Investments
24. In the video lesson you viewed, Jane has been cutting down on discretionary spending. However, she still can't free up enough money to repay her debt. Which of the following was NOT suggested for Jane to do next?
- Look for another job
  - Stick to her budget plan
  - Sell valuable belongings
  - Seek professional credit counseling
25. What should you do after meeting basic needs?
- Establish a spending plan
  - Invest to make your money grow
  - Stick to your spending plan
  - Start an emergency fund
26. Which of the following does NOT describe discretionary expenses?
- Expenses that you are most able to change
  - Expenses for things that you are most able to live without
  - Expenses that may change each month
  - Expenses that you owe to others

27. According to the video lesson you viewed, how much money should you set aside for emergency?
- a. 3 to 6 months' worth of living expenses
  - b. \$644 each month
  - c. \$8,000 a year
  - d. 6% of your income

Questions **28 to 30** are based on the following situation.

Selena lives in a wealthy suburb, where living costs are high. Every month, she brings home \$4500 a month, and she does not have savings. Her credit card company allows her to spend up to \$5000 a month on credit. Last month, she borrowed \$10,000 at an annual interest rate of 10% a year to buy a car.

28. After three years, how much would Selena owe if she did not pay her debt and interest charges?
- a. \$10,000
  - b. \$13,000
  - c. \$13,310
  - d. \$14,650
29. What is the number one cause of Selena's financial trouble?
- a. No savings
  - b. High credit card limit
  - c. Credit card debt
  - d. High costs of living
30. What can you conclude about Selena?
- a. She needs to build up her savings now.
  - b. Her income can support her credit card limit.
  - c. Interest charges are only a small part of Selena's debt problem.
  - d. Selena's shopping lands her in debt.

-----This is the end of the test. Thank you for your time! -----

## APPENDIX D

**Attitude Survey**

This survey does not affect your grade in any of your courses. All the information is **confidential**.

Number: \_\_\_\_\_

Part 1: Circle a number from 1 to 8 to indicate how the speaker in the video lesson sounded.

illiterate								literate
1	2	3	4	5	6	7	8	
warm								cold
1	2	3	4	5	6	7	8	
shy								talkative
1	2	3	4	5	6	7	8	
unaggressive								aggressive
1	2	3	4	5	6	7	8	
unsure								confident
1	2	3	4	5	6	7	8	
educated								uneducated
1	2	3	4	5	6	7	8	
unintelligent								intelligent
1	2	3	4	5	6	7	8	
likeable								unlikeable
1	2	3	4	5	6	7	8	
fluent								not fluent
1	2	3	4	5	6	7	8	
inexperienced								experienced
1	2	3	4	5	6	7	8	
kind								unkind
1	2	3	4	5	6	7	8	
friendly								unfriendly
1	2	3	4	5	6	7	8	
pleasant								unpleasant
1	2	3	4	5	6	7	8	
passive								active
1	2	3	4	5	6	7	8	
lazy								energetic
1	2	3	4	5	6	7	8	

## Part 2:

For each statement below please circle the rating that indicates how true the statement is of you.

	<b>not at all</b>	-----			<b>absolutely</b>
1. I am anxious about financial and money affairs.	1	2	3	4	5
2. Even on large purchases, I tend to spend spontaneously.	1	2	3	4	5
3. Special offers can entice me into buying.	1	2	3	4	5
4. I like to join conversations about financial matters.	1	2	3	4	5
5. To care for the future is essential for me.	1	2	3	4	5

Please circle the rating that expresses your answer to the following questions.

	<b>very easy</b>	<b>easy</b>	<b>difficult</b>	<b>very difficult</b>
6. How easy or difficult was it for you to learn about money management from the video lesson you just saw?	1	2	3	4
7. Apart from the content of the video lesson, how easy or difficult was it to understand the speaker's voice?	1	2	3	4

Answer the following questions.

8. What did you like about the video lesson?

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9. What didn't you like about the video lesson?

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10. Where do you think the speaker is from?

\_\_\_ Australia      \_\_\_ China      \_\_\_ Europe      \_\_\_ Latin America      \_\_\_ The U.S.

-----This is the end of the survey. Thank you for your time! -----

## APPENDIX E

**Instructions Given to Participants**

Thank you for agreeing to participate in my study. The purpose of my study is to examine the effectiveness of video lessons. The study has been reviewed and approved by the SIUC Human Subjects Committee.

Your participation in this study is voluntary. If you change your mind, you may withdraw at any time without hesitation. If you choose to participate in the study, first, you will read the consent form. You do not need to sign the form, but completion of the study indicates your voluntary consent to participate. Next, you will complete a demographics questionnaire about yourselves such as gender, age, and native language, but not your name. After that, you will watch a video lesson and complete a quiz about the video lesson that you watch. Next, you will complete a survey about the speaker and the video lesson that you watch. The whole process will take approximately 70 minutes. When you are finished, you will get \$10 as a thank-you gift in appreciation for your participation. Please make sure that you answer all the questions.

All your responses are confidential.

Thanks again for your help. If you know anyone in your department or in the university who would be interested in participating in the study, please spread the word about my study.

## VITA

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Fulbright Scholarship for Master's Program in the Department of Linguistics, Southern Illinois University Carbondale, 2007-2009

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## Dissertation Title:

Effects of Speaker's Accent in a Multimedia Tutorial on Non-Native Students' Learning and Attitudes

Major Professors: Dr. Peter J. Fadde and Dr. Sharon A. Shrock

## Publications:

Teixeira da Silva, J. A., & Cao, V. (2013). 1,116,629 or one million, one hundred and

sixteen thousand, six hundred and twenty-nine? More sensible rules for abbreviations and acronyms in the bio-medical sciences. *The Asian and Australasian Journal of Plant Science and Biotechnology*, 7(Special Issue 1), 118-121.

Vu, P., Vu, L., Cao, V., & Fadde, P. (2013). An exploratory study in an emerging approach to e-Learning: Massive Open Online Courses (MOOC). In M. Limbu & B. Gurung (Eds.) *Emerging pedagogies in the networked knowledge society: Practices integrating social media and globalization* (pp. 162-174). Hershey, PA: IGI Global.

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