The Effect of Language Use on Emotional Expression and Autobiographical Memory Retrieval in Bilingual Therapy

by

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Abstract

The purpose of this study was to gain understanding into the mechanism of autobiographical story telling process in bilingual therapy by examining language independence, language specificity and code-switching phenomenon. Specially, the study assessed relations among language usage (Chinese & English), emotional expression and memory retrieval features. The study found language usage significantly related to emotional expression and memory recalling features; and these relations were also modulated by participants' language proficiency level and perceived intensity of the memory. Thus, language appeared to play an important role in emotional expression and autobiographical memory recall process.

Acknowledgement

This dissertation started in 2017 when I had many Chinese friends reaching out to me and asked me if I can help support their friends emotionally because they all know I studied Counseling Psychology. Of course I did not provide counseling due to ethical considerations but helped to give some referrals or brief "consultation." I am deeply thankful to my Chinese community; they gave me this first idea in starting my doctoral dissertation on bilingual therapy. Thanks to all the people participating in my study, sharing their stories with me. I am impressed by their vulnerability, thoughtfulness and all the emotions showing up in my interviews with them. I truly care about my community and my people's well-being.

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Table of Contents

Chapter 1

Background: bilingual population & need of culturally appropriate services

The United States is a linguistically diverse country (Softas-Nall, Cardona, & Barritt, 2015; U.S. Census Bureau, 2013) with a minimum of 55 different languages officially identified spoken (U.S. Census Bureau, 2003a). Corresponding to the linguistic diversity are populations coming from various cultural backgrounds, for example, Latinos make up 15% of the country's population and 47% of this population are bilingual (Suro & Passel, 2003). In a national census data achieved in 2015, 75.5% of Asian American who were 5 years or older were also bilingual, and spoke a language other than English at home (U.S. Department of Health & Human Services, 2015).

Bilingual individuals experience various distress and difficulties at work, in school, and in their lives (Cheung, Leung, & Cheung, 2011; Chung, Bemak, Ortiz, & Sandoval-Perez, 2008; Li, 2014). However, there is a lack of culturally and linguistically appropriate services for bilingual population (U.S. Department of Health & Human Services, 2001; Sue & Sue, 2003; Willerton, Dankoski, & Sevilla, 2008). In the context of a dominant English-speaking cultural environment, clinicians may lack awareness or understanding of the importance of the language of origin of a client (Softas-Nall et al., 2015; Ballesteros, 1970). Bilinguals speaking non-dominant languages also tend to perceive their counselors as relatively unfavorable and feel themselves to be less intelligent, less friendly and less self-confident (Marcos & Urcuyo, 1979). Utilizing a second language also brings other difficulties to the counseling environment, including lack of understanding and awareness when clients switch languages (Bernal Y Del Rio, 1989), miscommunications between clients and therapists (Torres-Rivera, West-Olatunji,

Conwill, Garrett, & Phan, 2008), underestimation of clients' problems (Sabin, 1975), as well as difficulty expressing emotions in therapy (Foster, 1998).

In the 1990s, the American Psychological Association and the American Counseling Association began to address the issue of therapy with non-English-speaking clients. Specifically, APA guidelines for Providers of Psychological Services to Ethnic, Linguistic, and Culturally Diverse Populations (APA, 1993) stated, "Psychologists interact in the language requested by the client and, if this is not feasible, make an appropriate referral (p. 47)." As such, a client's choice of language usage in terms of wording and expression are worthy of discussion in therapy (Kapasi, & Melluish, 2015; Kramsch, 1998; Risager, 2007), with therapists showing respect and understandings to their clients' cultural backgrounds and their language of origin.

Language acquisition & its relations to social and cultural contexts

As part of the culture, language is closely associated with many aspects of an individual's cultural background (Sharifian, 2014; Palmer, 1996): ways of socializing with others (Vygotsky, 1962), the identity development (Bossard, 1945; Diebold, 1967; Espín, 2013; Greenson, 1950; Grinberg & Grinberg, 1984, p. 109; Gushue & Sciarra, 1995; Haugen, 1961; Marcos, Eisma, & Guimon, 1977; Schrauf, 2000; Softas-Nall et al., 2015; Weich, 1968; Weinreich, 1953), emotional expressions (Muhlhausler, Dutton, & Romaine, 2003; Sharifian, 2014; Siahaan, 2008) and one's memory formation (Aragno & Schlachet, 1996; Buxbaum, 1949).

In the following chapter, different psycholinguistic theories were discussed to see how language serves as a tool to present human cognitive activities (Chomsky, 1980); as the determinant of one's thought process through acquisition contexts or association with the social-cultural constructs of a society (Sapir, 1949; Vygotsky, 1962; & Whorf, 1956); and as the

relative and interpretive reality which integrates human experiences (Sapir, 1949). How we tell a story and what we use to describe this reality depends on the language we learned, the culture we resided in and the social contacts of these settings (Sapir, 1949). Thus, language does not only "serve as an instrument of thought," but also helps people build awareness and understandings of things (Vygotsky, 1962). Vice versa, the way of thinking and the way of expression in different cultures can also be revealed from their language use (Muhlhausler et al.; Sapir, 1949; Sharifian, 2014; Siahaan, 2008, 2003; Whorf, 1956). Across theories of language, the importance of the social and cultural influences of learning and using language; and the belief that language provides a structure of how we relate to our inner world and to understand the outside world as well as to describe these human experiences was consistent (Palmer, 1996).

These theories provided the theoretical foundation of this dissertation. Thus, we believe that speaking a language can evoke memories and feelings resided in the acquisition contexts and those pertaining to the special attachments in the first language (Espín, 2013; Foster, 1996 & 1998; Frie, R., 2013; Pattanayak, 1998). Language is the organization of how an individual identifies, operates and expresses one's emotional experiences (Pattanayak, 1998; Sharifian, 2014; Yu, 2009b); and the mechanism of how an individual interprets the world (de Zulueta, 1995; Kluckholn, 1964; Sapir, 1949).

Bilingualism

When we use the term "bilingual", we often refer to people who can speak two languages in a broader sense that they could speak either same level of fluency in both languages, or showing different levels of proficiency (Francis, 1999). Researchers have different opinions when it comes to defining bilingualism/bilinguals. Depending on the standards they used, bilingualism could be defined as *subordinate* (people who have different levels of

competence in the two languages they speak) and *proficient bilinguals* (people use both languages as a native speaker; Marcos, 1976a) using proficiency level, which are also referred to as *dominant bilingual* (people who are more fluent in one language) and *balanced bilingual* (those who have native ability to use both languages; Albert & Obler, 1978; Zulueta, 1995). There is controversy as whether people who have different proficiencies in the two languages they speak could be seen as bilinguals only if they use both languages as native speakers (Bloomfield, 1935). In this study, we borrowed what most scholars believed and considering people who can use and speak fluently in two languages as bilinguals considering there are few people who speak two languages in the same level of proficiency as native speakers (Abudarham, 1987, p.5; Diebold, 1961; Selinker, 1972). We are also aware the within group differences in this broader group that subordinate/dominant bilinguals compared with proficient/balanced bilinguals take extra cognitive and attentional efforts to express thoughts, ideas and feelings using a second language (Marcos, 1976b).

Targeted Population, Implications & Limitations of the Study

To exclude the confound variables of proficiency level and to decrease the within group variance, this study is specifically interested in learning the emotional expression experiences among international Chinese students using Chinese Mandarin and English in a situation mimicking psychotherapy where clients are asked to describe their autobiographical memories involving some type of negative emotions. Since there has been limited research done in such area, this study contributed and provided more evidence of emotional experiences in psychotherapy among bilingual populations. However, findings from this study only applied to Chinese populations, which limited the generalizability of the results.

Different Emotion Arousal Using Two Languages: Language Independence Phenomenon

In experimental settings and research studies, bilinguals seem to present different streams of associations of their life experiences using different languages (Marcos, 1976b). It also appeared that people organize and categorize events in two spate linguistic systems because of the distinct cultural contexts of acquisition (Foster, 1992; Javier, 1989; Kanno, 2003; Marcos & Alpert, 1976; Martinovic & Altarriba, 2013; Pavlenko, 2005). For example, bilingual individuals' responses to identical questionnaires differed significantly in emotional and thematic content depending on the language they used (Ervin-Tripp, 1964, 1967). Not only they show different emotionality in using two languages, but also, bilinguals seemed to feel more distant with their emotions when using a second language (Dewaele & Pavlenko, 2001–2003). Especially when with expressing specific feelings, such as using taboo words, first language generated the maximum anxiety (González-Reigosa, 1976).

In addition, physiological indicators also showed that people had greater autonomic arousal to taboo words and childhood reprimands in their native language (Harris, Aycicegi, & Gleason, 2003). While in another study done by Caldwell-Harris and colleagues found that first language and second language elicited similar physiological responses among Chinese-English bilinguals. However, it is interesting to note that participants self-reported feeling their first language contained stronger emotions (Caldwell-Harris, Tong, Lung, & Poo, 2010). These results found from research studies tend to be consistent what case studies or therapy anecdotes in several literatures (Altarriba, 2003; Santiago-Rivera & Altarriba, 2002).

Concerning the different and sometimes conflicted results from previous studies [In another study, researchers found that regardless of which language was the first language, participants expressed more emotions using Spanish than English (Guttfreud, 1990), we concluded that language usage and emotional expression/arousal had different correlations

depending on the specific language acquisition context, one's developmental stage as well as the nature of these autobiographical events. Since we studied bilinguals who identify as international Chinese students, we controlled some of the confounding variables such as developmental stage and learning contexts. Demographic information as the age of acquiring each language, and the time and contexts of the events recalled were also included in data analysis and results section.

Different Autobiographical Memory Features Using Two Languages: Language Specificity

Language serves a strong function as a retrieval cue to elicit memories for past life experiences (Altarriba, 2003; Schrauf, Pavlenko & Dewale, 2003). Research have shown that memories and personal events are linguistically organized differently among bilingual due to different associations between these events and the the linguistic contexts they resided in (Javier, Barroso, & Muñoz, 1993). This special link between memory and language is called *language specificity* (Pavlenko, 2005). According to encoding specificity theory, memories can be recalled if the properties of the event are sufficiently similar to the properties of the retrieval situation; and language seems to be one of those properties that can create a sufficiently similar emotional experience (Tulving, 1983).

Pavlenko believed that memories are likely to be activated and recollected in the language in which emotional events occurred (Marian & Neisser, 2000; Larsen et al. 2002). In addition, memories contain a higher level of emotional intensity with more details when recalled in the language in which events occurred (Marian & Kaushanskaya, 2004), according to Pavlenko's *language congruity* rule. This is evident in other studies as well: more memories and early memories were activated and retrieved when participants were cued by first language (Matsumoto & Stanny, 2006; Otoya, 1987). Additionally, words in first language also elicited significantly larger number of memory details (Matsumoto et al., 2006). Such phenomenon was

also found in therapy cases as well as in experimental studies across languages (Aragno et al., 1996; Buxbaum, 1949). Patients using English as a second langue may feel remote and distant from their early experiences acquired during primary use of their native language; and they were able to connect to these emotional experiences and articulate the meanings of these memories when they are encouraged to use their language of origin to express them (Aragno et al., 1996).Thus, we believe that memories from childhood retrieved in the native tongue revealed more details and were experienced with greater emotionality (Schrauf, 2000).

Purpose

The purpose of this study was to understand the impact of language usage on emotional expression and emotional arousal during an autobiographical memory recall. This study was particularly useful to build greater understanding in psychotherapy interactions and outcomes with bilingual individuals as retrieving autobiographical memories is a key component of the therapeutic process.

Significance of Research

There is a lack of literature examining relationships among language use, emotional processing and memory retrieval in psychotherapy. However, there are some case studies and examples from the literature showing that language use may affect client's memory recall (Aragno et al., 1996) and perceived emotions strength, or emotional arousal (Altarriba, 2003; Santiago-Rivera et al., 2002). In this study, emotional expressions were examined that is representative of the psychotherapy process; specifically, in that clients voluntarily recalled autobiographical memories and described these experiences. This study served to fill the gap in research related to language phenomena and bilingual psychotherapy; as well as provided preliminary evidence for future research in similar areas. Studying emotional expression among

bilinguals gave empirical support for clinicians to provide more effective counseling services in doing emotional work and to enhance the counseling experiences and quality of care for bilingual populations. Future research suggestions and clinical implications were also provided in Chapter 5.

Operational Definitions

1. Bilinguals: An individual who self-reports fluency in two or more languages (Francis, 1999) as evidenced by marking 5 or higher on the language fluency scales.
2. First language: the language which an individual learned and acquired first or earlier in life (Abudarham, 1987; Weinreich, 1970). If both languages are learned the same time, then first language refers to the native tongue, the one that was used (most) among early caregivers.
3. Second language: the language which an individual learned and acquired later in life (Abudarham, 1987; Weinreich, 1970); or the one that is not shared among early care-givers.
4. Emotional expression: Emotions can be expressed in four ways: verbally, behaviorally, nonverbally and physiological arousal (Brody,1993). In this study, we will use verbal expression as a way to measure emotional expression. We used ANEW-S and ANCE-S to count the numbers of the emotional words expressed in each transcripts of autobiography. Specifically, the proportion of the number of emotional words compared to the total number of words in each transcript was calculated as the indicator of verbal emotional expression for each condition (Chinese versus English) (Guttfreud, 1990; Kai-ming Shen, 1981).

5. Features of autobiographical memory: The quality of the autobiography recalled can be revealed from various dimensions. Previous research has used vividness as a way to show its quality (Matsumoto et al., 2006). We used ratings on the scales of vividness, emotional intensity, distancing and valence as indicators of the memory quality of autobiography using Memory Experiences Questionnaire ---- Short Form (MEQ-SF).
6. Emotional Arousal Intensity: According to Pleasure-Arousal Theory (Reisenzein, 1994), the intensity of emotion is defined using two dimensions on the level of pleasure and arousal using a 10 – point Likert scale. In this study, we only examined negative emotions, therefore, emotional intensity was assessed using a single dimension on the arousal (Emotion Rating Survey, Appendix C). Means of the arousal will be calculated for the three emotions identified. Scores higher than 5 will be categorized as "higher intensity," and scores lower than 5 will be considered as "lower intensity."

Research Questions and Hypotheses

Considering previous research studies on bilingualism, emotional expression and autobiographical recall, the following research questions and hypotheses were examined:

Question 1: Do bilingual international Chinese students express more emotional words when using first language to describe a same event in autobiography than using a second language?

According to Marcos (1976b)'s theory of language independence phenomenon, coordinate bilinguals manage two different systems of operation based on the languages they use that they form two different associations between their mental activities and their life

experiences through different languages. Based on previous research findings (Altarriba, 2003; Dewaele et al., 2001–2003; Ervin-Tripp, 1964, 1967; González-Reigosa, 1976; Guttfreud, 1990; Harris, Ayçiçeĝi, & Gleason, 2003; Otoya, 1987; Putoni et al., 2009; Santiago-Rivera et al., 2002), within our population of study, we believed that first language is loaded with more emotions and is perceived as being more emotional among bilingual international Chinese students. This study will try to focus on these two areas using both objective measures (e.g. ANEW-SR & ANCW - TS) and subjective measure (e.g. self-reported ratings for perceived emotional intensity & therapist's ratings on emotional intensity). Thus, our hypothesis is as follows:

> Hypothesis 1: First language would predict the proportion of emotional words utilized in a negative autobiographical memory recall condition, such that Chinese usage (first language) would generate higher proportion of more emotional words on Affective Norm of Chinese Words – Translate Short (ANCW - TS) than Affective Norm of English Word – Short Revised (ANEW-SR).

> Question 2: Would the negative autobiographical memory be more vivid, more emotional intense, with a lower valence while feeling less distant in first language than the one expressed in second language?

Previous studies have either focused on emotional arousal in different language use conditions, or examining how language usage affects memory recall process. In this study, we took a more holistic view as to see how emotional expression in autobiography memory recall would be affected by different languages since emotional expressions and autobiographical memory recalling are so closely intertwined in a psychotherapeutic process. According to

language specificity and memory retrieval theories (Pavlenko, 2005; Schrauf et al., 2003), memories are more likely to be recalled in the language in which emotional events occurred, and that memories have higher emotional intensity with more vivid details in the language in which emotional events occurred. We hypothesized that bilinguals, especially the participants in our study (who used first language heavily in their daily activities and in personal life) would express more vivid memory details when using first language and these feelings may show higher emotional intensity.

Hypothesis 2: First language would predict the vividness, emotional intensity, distancing and valence of a negative autobiographical memory, such that Chinese (first language) will generate more vividness, higher emotional intensity, less distancing and lower valence than the second language use on Memory Experiences Questionnaire ---- Short Form (MEQ – SF).

Question 3: When bilingual international Chinese students recall stronger feelings in autobiography memories, would using first language generate less emotional words than the second language use?

Clinicians found that in clinical work bilingual clients switch languages (Aragno, & Schlachet, 1996; Frie, R., 2013, Rozensky, & Gomez, 1983). This phenomenon often happens when clients have difficulty in expressing certain emotions in first language (Amati-Mehler, 1993; Buxbaum, 1949; Gomez et al., 1985); when they have related trauma in their first language learning environment (Aragno et al., 1996; Kokaliari et al., 2013); or when they feel anxious or socially constraint using first language (Tesone, 1996). Research had suggested the code-switching serves as a distancing function and allows people to express ideas in the second

language which could be emotionally difficult in first language (Bond & Lai, 2001; Gumperz & Hernandez, 1971; Javier & Marcos, 1989). There has been little research done on the effect of emotional intensity's effect on emotional expression and arousal in bilingual therapy. So we proposed that when emotional intensity of an autobiographical memory is elevating, people would like to use their second language to describe them because of the protective/defensive mechanism of feeling distant from these difficult emotions. This means that emotional words would show up more in their second language memory transcripts when the rating of emotional intensity is increasing.

Hypothesis 3: The rating of emotional intensity would moderate the relationship between first language use and number of emotional words, such that English use (second language) will generate higher proportion of emotional words on ANEW-SR when emotional intensity ratings are stronger (after controlling for individual differences in memory recall).

Chapter 2

Background: Current Issues with Bilingual Therapy

Bilingual populations in the U.S.

The United States continues to become linguistically more diverse every year, with 21% of the population speaking a language other than English in the home (Softas-Nall et al., 2015; U.S. Census Bureau, 2013). Census 2000 officially identified a minimum of 55 different languages spoken in the United States (U.S. Census Bureau, 2003a). More specifically, 62% speak Spanish in the home, 18% Indo- European languages such as German, Yiddish, and Dutch, 15% Asian and Pacific Island languages such as Chinese, Korean, Japanese, and Vietnamese, and 5% other languages such as Arabic, Hebrew, and languages of Africa (Softas-Nall et al., 2015). In 2015, 75.5% of Asian Americans who were 5 years or older spoke a language other than English at home (U.S. Department of Health & Human Services, 2015). The United States is the fifth largest Spanish-speaking country in the world (Sciarra, & Ponterotto, 1991).

As a nation of immigrants, over 9.9 million people who reside in the United States are foreign-born and they constitute 12.9% of the total U.S. population (Organisation for Economic Co-operation and Development [OECD], 2011; Guo & Cheng, 2017). For example, according to the U.S. Census Bureau, from the year of 2006 and 2008, Latinos make up 15% of the country's population and are growing at a speed more than three times that of the general population, of which 47% are bilingual (Suro et al., 2003). 40% of Latinos in the United States are foreign-born (U.S. Census Bureau, 2006). Among those coming to the U.S., International students also contribute a large proportion to the bilingual population; for example, those from Asian countries consist of more than half the total international student population in the U.S. (Institute of International Education, 2014; Wang, Wong & Chung, 2017). The rising population of

immigrants may experience many difficulties in the new immigrant country, such as: historical trauma in country of origin, family separation, fear associated with undocumented entry, lack of secure employment, acculturation stress, difficulty accessing resources, and language barriers (Cheung et al., 2011; Chung et al., 2008; Li, 2014). What's more, a lack of culturally appropriate and bilingual services are also barriers for them to receive mental health services (Sue et al., 2003; Willerton et al., 2008), indicating that there is a need to enlarge clinics and train bilingual counselors to address such issues (Paynter, & Estrada, 2009).

Significant health care inequalities have been found between foreign-born adults and U.S.-born adults in America (Dey & Lucas, 2006; Singh, Rodriguez-Lainz, & Kogan, 2013). About 50% of Asian Americans are estimated to lack accesses to mental health care services because of their lack of English proficiency as well as the shortage of providers who possess appropriate language skills (U.S. Department of Health & Human Services, 2001). As immigration from South and Central American countries increase at a rapid pace, it is expected that the realities of bilingualism in the United States will become more imminent; and the mental health profession will be increasingly called upon to provide effective, culturally relevant bilingual services (Ponterotto & Casas, 1991).

The Complexities of Language Use in Psychotherapy

Despite the fact that, However, in the United States, bilingualism is often perceived as an inferior or associated with lower social status; for instance, schools may perceive parents as "ignorant" if they lack fluency in English (Espin, 2013). In the US, people who use non-accented English are perceived as well Americanized (Portes & Rumbaut, 1996, p. 194). Under such socio-political context, language or bilingualism may not be well considered or respected in a dominant, English-speaking culture (Garcia-Preto, 2005). Ballesteros (1970) stated that it is the

"Anglo-point-of-view-problem" that devalues the racial, cultural and language richness of the society in the U.S. At the same time, monolingual counselors may be influenced by such cultural values of promoting English as a superior language, and they may not be aware that ''language use intersects with unequal power relationships of colonialism and international relations (Burck, 2011, p. 363)." Given that the counselor is viewed as having a position of power, this can increase the client's anxiety about being fully understood (Torres-Rivera et al., 2008). Learning English and assimilation become the priority while speaking other languages is discouraged or stigmatized (Softas-Nall et al., 2015). Bilinguals perceive their interviewer as more unfavorable and felt themselves being less intelligent and less confident (Marcos et al., 1979). Using two case histories of Spanish-speaking clients, Sabin (1975) found that the patients' emotional problems were selectively underestimated and that their anxiety was inadequately translated to the clinicians.

Espín (2013) proposed the idea that language used in therapy is more than a tool of communication, but also has cultural meanings and involves the acquisition context behind those conversations, which to some extent determines the way of life. In an earlier study, Bernal Y Del Rio (1989) outlined words and analyzed bilingual/bicultural patients and found that there is an underlying meaning when patients rapidly switch languages. Clinicians need to pay closer attention to these phenomena. Language as a fundamental aspect of therapeutic intervention (Anderson, 1997; Clauss, 1998; Espín, 2013), the exploration of a client's experiences, thoughts, feelings and behaviors, their choices of words and expressions often give valuable information in counseling (Kapasi et al., 2015; Kramsch, 1998; Risager, 2007).

In the 1990s, the American Psychological Association and the American Counseling Association began to address the issue of therapy with non-English-speaking clients.

Specifically, APA guidelines for Providers of Psychological Services to Ethnic, Linguistic, and Culturally Diverse Populations (APA, 1993) stated, "Psychologists interact in the language requested by the client and, if this is not feasible, make an appropriate referral (p. 47)." More recently, the Guidelines on Multicultural Education, Training, Research, Practice, and Organizational Change for Psychologists (APA, 2002) further illustrates the importance of language by considering a client's "fluency in standard English (and other languages or dialects)" (p.46). It is also found that the match of language and ethnic background between client and mental service provider predicts greater treatment retention and outcome (Akutsu, Tsuru, & Chu, 2004; Flicker, Waldron, Turner, Brody, & Hops, 2008; Paynter & Estrada, 2009). We are interested in knowing how factors relating to language determines the different outcomes of psychotherapy, whether it is cultural context, individual preference, or the acculturation distress, pressures, and anxiety of speaking English. Among all these factors, this paper will discuss how language use and emotional processing interplay with each other and whether using different languages would generate different results in expressing emotions.

Psycholinguistic theories on the Nature of Language

To explain and support the evidence on how language use could affect emotional expressions in therapy, I will discuss language acquisition using a psycholinguistic perspective to present a theoretical framework for language development, cognitive aspects of language acquisition, as well as language's role in memory formation; and how these factors affect memory retrieval and emotional expression in therapy.

There were debates on the nature of language, and theorists hold different philosophies. Some linguistics believe that language is a tool to present human thoughts with symbols (Chomsky, 1980). Some believe the idea that language is more than a tool or symbols;

but serves as the determinant of human cognitive activities (Sapir, 1949; Vygotsky, 1962; & Whorf, 1956). Sapir, Vygotsky & Whorf were the pioneers building the link between language and the cultural and psychological aspects of one's development through a psycholinguistic lens. Vygotsky (1962) believed that language determines the way people think and organize their mental activities; while Sapir (1949) and Whorf (1956) think that prior to language (which is just symbol), thought and mental content grant the meaning to each word through associations between the symbol and the context. In both these two stances, they believed that language and thought have interactions and language is either acquired through context or is associated with certain context, meanings and thoughts. When people learn a language, they are not only learning how to use the symbols, words, syntax, or grammar, but also the way of thinking and feeling in certain ways, which are the cultural and social aspects of the language learned from the environment when acquiring such language, as well as the emotional and memorial aspects through relationships in different contexts and environments. Therefore, there are different memories and emotions loaded on different languages.

Vygotsky: Thought and Speech

Vygotsky (1934/1962) explored the relationship between thought and speech. He believed that speech creates thought. "It is through language that reality and other impression become organized into unities of systems, concepts, or categories (Vygotsky, 1962)." Unlike traditional linguistics, trying to study languages through small units such as: sound and meaning, Vygotsky shed great importance on the psychological aspects of human speech that it conveys emotions with meanings, "generalizing thoughts" and "social interchange" (P8-9). He opposed the approach of linguistic and psychological methods of studying thought, emotion and language separately. "It makes the thought process appear as an autonomous flow of thoughts thinking

themselves, segregated from the fullness of life, from the personal needs and interests, the inclinations and impulses, of the thinker (Vygotsky, 1962).” He also proposed the idea that language is the mediator to connect reality to thought. Through language, our knowledge and observations of the world are transformed to inner concepts and categories. In addition, he suggested that language not only “serves as an instrument of thought,” but also helps people build awareness and understandings of things. There even exists “pre-intellectual roots of speech” during child development that serve for emotional and social purpose (p.81).

His theories also impact later scholars in viewing the importance of social and cultural context in language acquisition. He also had an influence on how people study bilingualism and the cognitive aspects of language development. Thus speaking one’s native tongue also evokes early memories of social interactive experiences and of the sociocultural environment, which may also influence an individual’s development of identity (Frie, R., 2013). Different languages may also be used and learned through different environments (home, family or neighborhood vs school and work), which may result in different emotional provoking (intimacy vs distancing) using different languages (Espín, 2013; Pattanayak, 1998). It appeared that different languages form different attachments with certain memories, people, and surroundings through different associations, memory recollections, and relational experiences (Foster, 1996, 1998). Thus, a language is the way an individual identifies, organizes, operates and expresses one’s emotional experiences (Pattanayak, 1998). These special meanings and functions of a language sometimes is an unconscious process which becomes the way people interpret and relate to the world (de Zulueta, 1995; Kluckholn, 1964).

Sapir: the heuristic language

When it comes to the nature of language, Sapir proposed the idea that even without pre-

experience and knowledge of an object, language has the power and ability to help people generate "common understandings" which "constitutes culture" and to "create a world" that integrates human experiences. Sapir argues that language is "heuristic;" and that it "predetermines" how we observe and interpret things. Both these theories tried to explain the psychological meanings and functions of language, rather than focusing on one micro-level aspect of language (behaviors, sounds, vocals). Even language looks like a "symbolic system", it contains ("reports, or refers to or otherwise substitutes for") "direct experience." According to Sapir, experiences are "completely interpenetrates" with language. Thus, it is difficult to separate language with each corresponding reality associated to it, as well as the relating feelings (1949, p.11). "For the normal person every experience, real or potential, is saturated with verbalism." He also argued that not until people gain the ability to use language to describe their feelings, they could fully feel them. For instance, he gave the example of lovers "not truly in touch" with their affection until they mastered ways to describe their love. "The reality was a verbal one and as though one could not get close to nature unless one first mastered the terminology which somehow magically expresses it." He raised the idea that our perceived reality and the world is determined by how we describe it and what we use to describe it. For example, when discussing dialects, he found that bilingual Germans speak standardized German for formal purposes but employ the local dialect for more familiar uses (p.85). So "language is a great force of socialization." It is shared by a group of people, (e.g., families, undergraduates of a college, a labor union, friends, city members, etc) holding same cultures. The same time personal experiences, special meanings, and unique memories are also loaded on the language an individual speaks (p.15).

Whorf: the linguistic reality

Following Sapir, Whorf also raised the idea of the relativity of reality and its relation to language. He believed that different language reveals different ways of thinking in different cultures; and that language comes before thinking and behaviors. According to Whorf, our understandings of the world also depends on the linguistic system people built in that culture. Whorf used the example of spatial and mathematical understandings, and he found that the temporal order and linear perspective in time and history used in western cultures and sciences is not well accepted by the Hopi (a native American tribe) people. He proposed the reason was that western science and their understandings of the world were built on the language they generate, including: records, diaries, books, calendars, chronology and histories. He gave an example comparing western culture of SAE (standard average European, including English, French, German, or other European languages with the possible exception of Balto-Slavic and non-Indo-European) and Hopi (Indian American) culture and found that English-speaking people make real spatial gestures to reference things mentioned in a conversation; while Hopi people do very little gestures. Whorf also highlighted the differences of these two groups of culture and their influence on language expression. He stated that European art such as painting and sculpture excels from movement and body motion, and the dance highlights and expresses "motion rather than symbolism or ceremony. Whereas Hopi culture emphasizes on endurance and intensity and their dancing is very symbolic and has little movement or swing. As the language evolves, these non-spatial experience and spatial consciousness then were organized into the language realm and into the metaphorical system of the language. Thus, Whorf believed that language is not only the revenue or the medium thoughts rely upon as a reflection; but rather itself consists of rules and structures as determinants of thoughts or even one's mental activity. As long as an individual learns how to use a language, the person broadens the worldview and synthetize the knowledge

associated to the language. “It was found that the background linguistic system of each language is not merely a reproducing instrument for voicing ideas but rather is itself the shaper of ideas, the program and guide for the individual’s mental activity, for his analysis of impressions, for his synthesis of his mental stock in trade (p.212).” Under such circumstance proposed by Whorf, people who use different languages may show different pattern of thinking habits, or even experience different mental representations through a similar situation. There are things specific to one culture and might be expressed widely in one culture that is not expressed or has a different way of expression in another due to the uniqueness of the language.

Vygotsky, Sapir and Whorf all see the importance of the emotional, social and cultural aspects of language and how language serves as a fatal function of thinking and feeling. Vygotsky started to study language from psychological, philosophical and cultural perspectives, which were also revealed from Sapir and Whorf’s theories; though Vygotsky did not address the chronological order between thought and language, it appears that Vygotsky was more interested in using a holistic view to study the functionality of language. He believed that language has a universal function which is to serve for social and emotional purposes. Sapir raised the relativity of realities: the world is a verbal reality. What was similar to Vygotsky’s theory is that Sapir also found language and experiences “interpenetrate” with each other and only taking other aspects of language acquisition would the theory explain its nature and functionality. Language helps us gain knowledge and learn cultures and traditions from the environment. Language helps us feel deeper genuine emotions and to make them more obvious to us when we can verbalize such feelings. Whorf also held the same idea that how one uses language would influence the way an individual understands the environment. In conclusion, we found that these theories can be summarized as raising the following psycholinguistic arguments: 1) Language serves for social

and emotional purposes; 2) Experiences and cultures contribute to language acquisition and development; 3) Memories, emotions and cultures are loaded on language; 4) Perceived reality, thoughts and feelings are determined by language; 5) Language can influence the way a person thinks and understands the environment.

The importance of languages' role on the formation of emotion and memories

Following the intersection among language, cognition and culture raised from Vygotsky, Sapir and Whorf, scholars proposed that language are embedded in certain cultural context, "all native knowledge of language and culture belongs to cultural schemas" and "the speaking of language consist of schemas in action (Palmer, 1996, p.63)." And this cultural schema also provides lexical terms and pragmatic meanings for language use. "Our basic understanding of ourselves and our surroundings is mediated by conceptual metaphors." (Sharifian, 2014, p.107) In different cultures, language represents different conceptual metaphors that support our understandings of the world. For example, in Indonesian liver is associated with love, rather than the heart and belly is the root of emotional experiences (Muhlhausler et al., 2003; Sharifian, 2014, p.110; Siahaan, 2008). Here the meaning of love is expressed using different words in different cultures. Also, in Chinese expression, heart appears to be the "ruler of the body" and "regarded as the central faculty of cognition and the site of both affective and cognitive activities in ancient Chinese philosophy." (Sharifian, 2014, p.110; Yu, 2009b)

Based on these theories, language development and acquisition can be particularly related to one's growing environments, different contexts that is loaded with different memories and emotions. Not only due to the special nature and functions of language itself of preserving these elements and being a tool of reconstructing our experiences and feelings; but also the special meanings, bonds and attachments people may develop with each language, whether it is

mother tongue, or the second language learned through relationships built in school environment. We proposed here that different languages people speak may associated with certain feelings through those contexts during language acquisition of such language. Therefore, I proposed that language has a special role and function in serving how people interpret the world due to its nature as the way of generating thoughts and organizing experiences. Also, as a conscious or subconscious process, language generates strong associations and attachments with the socio-cultural-relational context through its acquisition; so it appears that these factors contribute to the expression of emotional experiences; and certain expressions may have different results using different languages.

Bilingualism & Language Acquisition

Bilingualism has been defined as "1. the ability to speak two languages; 2. the frequent use (as a community) of two languages; 3. the political or institutional recognition of two languages (p.)" by Merriam-Webster Dictionary (2004). When it comes to bilinguals, the term has been referred to diverse populations, from people who speak two languages with different levels of fluency to those who are fluent in both languages (Francis, 1999).

Proficiency as A Standard

Previous psychological studies have helped us understand language proficiency and people's language preference by calculating their response time in experimental settings (Lambert, Havelka, & Gardner,1959). Several scholars have defined bilinguals in their work and studies. According to Marcos (1976a), bilinguals are classified as *subordinate* and *proficient bilinguals*: subordinate bilinguals have a different level of competence in the two languages they speak, whereas proficient bilinguals display a native speaker's level of both languages. Using the same standard of proficiency, bilinguals have also been classified as *balanced bilingual* and

dominant bilingual (Albert et al., 1978; de Zulueta, 1995): a balanced bilingual has a native ability to use both languages and a dominant bilingual is more fluent in one language versus the other. Marcos illustrated that compared with proficient bilinguals, subordinate bilinguals take extra cognitive and attentional efforts to translate their thoughts, feelings and ideas into the second language, which happened in clinical settings among patients (Marcos, *1976b,* p. 554). "For the subordinate bilinguals, the verbalization of feelings in his/her second language is more of an intellectual task and they paid more attention in organizing the language (Marcos, *1976b*)." Bloomfield (1935) believed that 'bilingualism' was referred to those who use two languages both in a native speaking proficiency (Abudarham, 1987, p.5). However, scholars hold different ideas of whether bilinguals could be defined as being fluent in both languages as native speakers in reality since there will be few of these people (Abudarham. 1987; Diebold, 1961; Selinker, 1972). Macnamara (1969) believed that bilinguals could be those who can manage to use a second language to a minimal degree (Abudarham, 1987). All in all, it appears that 'bilingual' can be a term that applies to a wide range of people depending on the proficiency and fluency (Abudarham. 1987; Muller, 1984); however, it is important to acknowledge and specify the extent of an individual's knowledge about a second language (Jakobovits, 1971, p.85).

Developmental Stage as A Standard

Bilingualism can also be defined based on the developmental stage of when an individual gets contact with a second language (Abudarham, 1987). The earliest stage identified by Haugen was *infantile bilingualism* when an infant learned both languages simultaneously either from same parents or each from different people in the family (Haugen, 1961; Abudarham, 1987, p.6). Because the learning process for both languages occurred at the same, *infantile bilingualism* is also called *simultaneous bilingualism* (Abudarham, 1987) This term has been referred to as *first-*

language bilingualism (Swain, 1972) and *ascribed bilingualism* (Abudarham, 1987; Adler, 1977), *incipient bilingualism* by Diebold (1967; Abudarham, 1987, p.6) as well. Tesone (1996) defines individuals who acquired using different languages during childhood as *polyglot*; and those who acquired a second language in later life stage as *plurilingual* (Abudarham, 1987). The term *simultaneous bilingualism* has also been referred to as coordinate bilingualism if two languages are acquired at the same time during childhood or at a later life stage; and *subordinate bilingualism* refers to learning languages in different life time (Abudarham, 1987). Under such context, "first/primary" language is the native language or the language learned earlier; and "secondary" language is the one learned later; and that preferred language is not always the native tongue, and bilinguals may often use their second language as a dominant language (Abudarham, 1987; Weinreich, 1970).

Acquisition Context as A Standard

Depending on the language usage and the environment of using languages, Marcos (1976b) categorized bilinguals into *specialized bilinguals* and *unspecialized bilinguals*. Specialized bilinguals utilize one language exclusively in specific settings, such as in work setting, family life, certain relationships or intellectual matters. *Unspecialized bilinguals* use both languages interchangeably regardless of the situation. They can speak either two compatible languages or two incompatible languages. Bilinguals can also be classified as *compound bilinguals* (learned to speak both languages in the same cultural environment) and *coordinate bilinguals* (learned to speak each language in separate cultural settings) depending on how they acquire each language. He believed that coordinate bilinguals have two operation systems to manage languages independently because they learned each language through different contexts and environments. Thus, they have different sets of words to refer to objects and experiences and

they form different associations between languages and their experiences (Marcos, 1976, p.348-349).

Lambert, Havelka and Crosby (1958) examined two contexts where individuals learn languages: fused (compound) or separate (coordinate). They found that coordinate bilinguals had independent experiences associated with each language and that this distinction of these life experiences was increased when bilingual individuals were also bicultural. So the more distinct and separate the context in which they acquire each language, the more independent individuals' experiences are associated with each language. This has been supported by evidence of cognitive psychology. Ervin and Osgood (1954) found that in *compound bilinguals* a word in one language and its translation in another language are associated with the same internal neural event, representing the meaning of the two words; while in *coordinate bilinguals* there exist separate meanings for each of the word in the two languages; meaning that there are two different ways of how words are associated with meanings in the brain of bilinguals.

It also seems that cultural factors and language factors are interacted and they both affect how an individual expresses his/her own memories and experiences. However, not all bilingual individuals are bicultural. Caution is advised when considering cultural factors under the context of bilingualism. Biculturalism is defined as: "a functioning awareness and participation in two contrasting socio-cultures (p.59)" by Marrero (1983). Marrero gives some examples in which an individual's bilingual ability may mislead the therapist. For example, a client who speaks "broken English" may in fact be more acculturated than one who speaks English fluently. Soffietti (1955) lists four different types of situations involving language and culture, bicultural-bilingual, bicultural- monolingual, monocultural-bilingual, monocultural-monolingual. Edgerton and Karno (1971) reported that English-dominant Hispanics were very

different from Spanish-dominant Hispanics in responding to psychiatric vignettes. Spanish-dominant Hispanics expressed more Hispanic cultural themes of fatalism, familialism, attachment to spiritualism, and patriarchal authoritarianism. And these expressions are often interpreted as pathological by non-Hispanic clinicians.

All in all, it seems that not only proficiency and developmental stage of learning languages would affect one's expression; but also the learning context of acquiring a language has impacts on verbal expression. It appears that there are different attachments and associations between the language and the experiences including memories and feelings gained through that attachment when learning different languages in different contexts. This theme seems to be revealed from multiple case studies and personal experiences in the literatures that there is a special meaning and feeling embedded in the mother tongue that is not replaceable compared to other languages. Foster (1998) called this phenomenon as having "deep transference to each of the idioms" she speaks. She sees each language representing a relationship to family or to the special meanings in different cultural settings, such as: Spanish for early trauma and English for defense. It looks like the language is rooted in historical and cultural context with certain feelings (Habermas, 1989). Medeiros-Ducharme (2000) stated that using different languages is more than translation. Each language elicits different associations, different affects and different defensive mechanisms. However, we have not yet known how this special attachment will affect one's emotional expression.

Language Independence Phenomenon

Marcos (1986) first raised this phenomenon to refer to the capacity among coordinate bilinguals of maintaining and operating two separate systems of language, and that they hold two "streams of associations according to the language." Javier (1989) later describes the language

independence phenomenon which he defined as the separate categorization and organization of events and experiences of both languages that is commonly experienced by bilinguals (Foster, 1992; Javier, 1989; Kanno, 2003; Marcos et al., 1976; Martinovic et al., 2013; Pavlenko, 2005).

> "The phenomenon of language independence refers to a condition in which an individual acquires and maintains two separate representational mediation processes, each with its own lexical, syntactical, phonemic, semantic, and ideational components. Thus, the two languages are assumed to maintain independence from one another in terms of linguistic organization. Different Cognitive and emotional activities can be activated by, and are associated with, the two languages (Javier, 1989)."

The explanation he gave was that based on the different developmental stage and the contexts of acquiring each language, people gained fundamental emotions from early interactions with caretakers. First language becomes how people feel and identify with the things they learned during that time (Marcos, 1986). Based on their theories, we will discuss how such phenomenon might contribute to different emotional expressions and autobiographical memory recall based on different language use.

Language & Identity

These separate associations of feelings and experiences to languages may also lead to different development of self and identity. Each language may be associated with different personality structures, especially if the individual learned the languages at a time when his or her personality structures were forming (Weich, 1968). Hoffmann (1991) points out in her work on linguistic and social aspects of bilingualism, that language is the most powerful means of expressing separateness. National identity as well as self-identity can be very strongly rooted in the maintenance of a particular language. Bilingual experience has major effects on individual's

personality formation and integration (Bossard, 1945; Diebold, 1967; Haugen, 1961; Weinreich, 1953). For instance, bilingual patients engaged in psychoanalytic treatment often report the experience of a language-specific sense of self (Marcos et al., 1977). Thus, the habit and ways of expressing emotions may vary using different languages, which might be due to the different associations to the old memories and the feelings recalled in different language acquisition situations; while could also be contributed to the different identity structure built through learning different languages.

"Language determines one's knowledge of the world, of others, and of oneself. It provides a basis of support for one's identity (Grinberg et al., 1984, p. 109)." One's preference to use one language over another is deeply related to identity (Espín, O. M., 2013). Bilingual persons have a dual sense of self accompanied by two worldviews and two sets of "object relatedness (Gushue et al., 1995; Marcos, Eisman, & Guiman, 1977)." Foster (1998) stated, "This duality is a unique characteristic of bilingual individuals. It is a fundamental factor that affects their lives and must surely impact on how they go about narrating their life story in the treatment process (p. 62)."

This phenomenon of a dual sense of self was also discovered in several therapy case studies. Greenson (1950) observed that bilinguals in psychoanalytic treatment often report experiencing different identities, based on which language they were using at the time during therapy. Greenson described how one of his patients told him that when she spoke German she was a "scared, dirty child", but that in English she was a "nervous, refined woman." Edith Buxbaum (1949) proposed that the use of a second language may facilitate treatment through "circumventing the superego" and allowing more to be discussed. She used two German immigrant boys as an example and their heavy accent as the attempt to hold on to the past and to

their parents. When they resolved their identifications with their fathers and with the new country, they lost their accents. Whereas in another case two women resist to speak in their mother tongue because they want to form their new identities and to cling to the new language. Buxbaum believed that a second language is free of the emotional charge that burdens the use of the native language. Antinucci-Mark (1990) believed that taboo words in another language may not be understood by the superego. For instance, a Chinese woman in counseling stated that she would use English to communicate with her husband because she felt herself being more assertive and that using Chinese made her feel more timid with him considering traditional Chinese cultural expectations on gender (Softas-Nall et al., 2015).

Schrauf (2000) explained this phenomenon as "language-specific self" among bilingual individuals. This language-specific self acts as a filter through which memories are encoded and retrieved. "Even in the contrivance of psychological experiment, autobiographical memories involve the 'narrated self' (Ochs & Capps, 1996; Polkinghorne, 1991) because memories are most often stories."

Language & Emotionality

Previous studies have examined how using different languages, especially foreign languages affect decision making process (Caldwell-Harris 2014; Costa et al. 2014; Geipel et al. 2015; Keysar et al. 2012; Putoni et al. 2009). People tend to make more utilitarian decisions in foreign language (with more quick decisions, more emotional distance and less mental sophistication) than in their native language, which suggested reduced emotionality in the foreign language (Shin, & Kim, 2017). For example, Putoni et al. (2009) showed that marketing slogans expressed in bilingual consumers' native language tended to be perceived as more emotional than messages expressed in their second language. More rational behaviors (i.e., fewer

heuristic biased) reported in nonnative communication contexts (Costa et al., 2014). We are not to make an inference or generalization here from foreign language to second language since the proficiency level and language acquisition environment are not comparable. Foreign language might be a different realm as a second language of a bilingual; however, it provides some hints for us to suggest an underlying mechanism as how people express thoughts and feelings differently. We are interested in knowing whether this phenomenon could also exist in emotional expression among bilinguals. What is interesting is that Marcos in the 1976 article also proposed similar ideas: for subordinate bilinguals who have different levels of proficiency of first and second language, expressing their feelings in the second language is "more of an intellectual task" that they paid more attention in organizing the language. Similar results were also revealed from previous studies: when administering identical questionnaires to bilingual individuals on separate occasions, participants' responses were significantly different in emotional and thematic content using different languages (Ervin-Tripp, 1964, 1967). Dewaele and Pavlenko's (2001–2003) interviews with multilingual parents indicate similar phenomena in family interactions and suggest that the emotional distance associated with the use of a second language can also be experienced as emotional inauthenticity. Pavlenko (2005) gave an example of how a native German speaker reported feeling "wrong" to express endearment in English (his second language); and another individual also expressing similar feeling as having "false action" when using English to express endearment. (Pavlenko, 2005, p. 134).

Research has indicated that a client's first or native language is often the language that is considered more emotional (Altarriba, 2003; Santiago-Rivera et al., 2002). Also, the recall of words can be influenced by emotionality (Rubin & Friendly, 1986). Previous research has used word recall test, skin conductance response test and autobiography and memory recall test to

show evidence of how different language provokes emotional reactions among bilingual individuals differently. González-Reigosa (1976) has demonstrated that taboo words in the language of origin elicit maximum anxiety. 32 Turkish–English bilinguals rated a variety of stimuli for pleasantness in Turkish (first language) and English (second language) while skin conductance was monitored via fingertip electrodes. Participants demonstrated greater autonomic arousal to taboo words and childhood reprimands ("Shame on you!") in Turkish compared to English after controlling for translation equivalent issues and cultural-emotional connotations (Harris et al., 2003). Anooshian and Hertel (1994) found that Spanish-English and English-Spanish bilinguals who acquired their second language after the age of 8, recall emotional words (such as 'mother' or 'church') more frequently than neutral words ('table' or 'chair') following their presentation in the native language. It seems that words in the first language have greater emotional resonance than words in the second language.

However, there has been inconsistency of such findings and researchers also found that using different languages may not generate different responses of emotionality. In a study conducted with 80 Spanish and English, coordinate bilinguals (some Hispanic individuals whose mother tongue was Spanish while others were Anglo-Saxon individuals whose mother tongue was English, with all subjects acquiring their second language English or Spanish after the age of 5), researchers found that for both groups more emotions were expressed when the Spanish language was used (Guttfreud, 1990). Chinese–English bilinguals residing in the US were interviewed about their experience of using emotional expressions. They judged Mandarin (first language) expressions as feeling stronger than English (second language) expressions. Electrodermal monitoring was conducted on a similar sample of Chinese–English bilinguals in order to determine how physiological reactivity corresponds to self-reports. For those who had

both good Mandarin and good self- reported English ability, English and Mandarin emotional expressions elicited similar magnitude skin conductance responses (Caldwell-Harris et al., 2010). Using a sample of Spanish-English bilinguals who had grown up in the USA (early learners) or those who were first exposed to English during middle childhood while residing in a Latin American country (late learners), Harris (2004) found that emotional expressions (taboo words, sexual terms, & childhood reprimands: "Go to your room!") presented in the first language elicited larger skin conductance response than comparable expressions in the second language among late learners. For early learners, no such difference was obtained, indicating that age of acquisition of the second language and proficiency also modulate speakers' physiological reaction to emotional language (Harris, 2004).

Code-switching, Emotion Intensity & Emotion Distancing

Research has suggested how the code-switching phenomenon of a change to the second language often serves a distancing function (Gumperz et al., 1971; Javier et al., 1989). 48 Chinese undergraduates interviewed one another in Cantonese and English to answer questions on embarrassing topics; and that answers were at greater length in their second language. The result suggested that code-switching may serve a distancing function, permitting bilinguals to express ideas in their second language that would be too disturbing in their first (Bond et al., 2001). Multilingual speakers also rate expressions of negative emotion (e.g., swear words, reprimands) in their second language as being less emotionally arousing than their first language equivalents (Caldwell-Harris et al., 2011; Dewaele, 2004). Caldwell-Harris and colleagues (2009) indicated that bilingual participants showed lower physiological responses to negative emotional phrases presented in their second language than to those presented in a language acquired earlier in life (Caldwell- Harris & Aycicegi-Dinn, 2009; Harris et al., 2003; Harris,

Gleason, & Aycicegi, 2006). In another study, Chinese–English bilinguals living in the US were interviewed about their experience of using emotional expressions. Caldwell-Harris et al. (2010) suggested that English-speaking societies and cultures encourage more open expression of positive emotions than do Chinese culture; hearing English endearments may have led to easy retrieval of memories with strong emotional resonances which later resulted in increased affect and skin conductance responses among participants (Caldwell-Harris et al., 2010).

There have been anecdotes and case studies in counseling regarding language phenomenon in clinical work. Frie (2013) cited the famous case of Anna O studied by Breuer and Freud (1895), after the death of her father, she only spoke English as a way to distant herself from the pain and all complicated emotions she was unware of. Such switching also happens in therapy and may serve for a certain purpose of emotional processing. Gomez (et al., 1985) using an example of bilingual Spanish-speaking client and argued that when the client worked with a bilingual therapist with a dominance in English, a switch to Spanish may be a form of resistance, which could also be a signal of the desire to remember this cultural conflict behind language usage. And The affective component of such phenomenon seems to be worthy to be explored (Gomez et al., 1985). In another clinical case, a Puerto Rican-born student seeking counseling, the dream of a bear and the recall of the Spanish word of "bear," "Orso," which was his nickname for his father revealed his previous trauma and his anxiety attached to the history. In another clinical case example, switching language from English to Spanish seemed to help the client connect to her feeling of hurt and anger in marriage and brought therapy in a deeper level of processing (Aragno et al., 1996). In a case described by Rozensky & Gomez (1983), the therapist helping clients name concerns in first language opened up discussions for her fear of death, fear of losing contact or being rejected by her children and ultimately her therapist. "The

affective experiences were modeled in the native Spanish and thus not available for exploration in the alternative model of the second language used in therapy. (Rozensky, & Gomez, 1983)" Therapists reported that their clients switched from English to Spanish when recounting experiences that involved certain emotions (e.g., anger) and represented themselves differently depending on the language they were speaking. Therapists also reported that their clients switched from English to Spanish to improve communication and to connect with them (Santiago-Rivera, Altarriba, Poll, Gonzalez-Miller, 2009). It appears that speaking a second language also provides a space help client feel safely to disclose emotions when native language is closely associated to the feelings buried in the past experiences (Amati-Mehler, 1995).

According to Foster, many clinicians have reported an increase in the emotional control (or the ability for clients to avoid their emotional experience) for clients who use their second language; and clients have expressed similar reports of emotional disconnect in the counseling process. This implies a distance between the subjective experience of the client's life and their second language (Foster, 1998). Constant self-initiated switching may be a form of resistance as it provides an escape valve to avoid therapeutic work (Marcos et al., 1979). Buxbaum (1949) proposed that a patient in bilingual analysis might use a later learned language as an unconscious defense against the re-emergence of repressed fantasies and memories experienced in the primary language. Krapf (1955) described cases in which clients switched from one language to another to reduce anxiety, elaborating on the notion that the choice of a language may serve to strengthen the ego and hence be used as "a positive rather than a negative defense" (p. 354). Tesone (1996) reports that when a bilingual patient uses a second language, he is increasing the distance between his verbalizations and the actual experience. In effect a patient would choose to speak in a second language because he fears the more direct and shortened route of the mother

tongue to his experiences. Martinovic and Altarriba (2013) highlighted more recent research representing a variety of languages in the U.S. that concurs with Guttfreud's findings (1990) and demonstrates language-switching as particularly useful in facilitating expressions of more intense emotions such as love or repressed emotions in addition to those which may be linked to trauma (Kokaliari et al., 2013). Rosenblum (2003) suggests that talking about trauma in second language can be beneficial that it provides distance and a safe space for client to be able to tolerate strong feelings. In psychodynamic psychotherapy, Iannaco (2009) considered language usage and client's choice of using different languages as a task to identify the unconscious motivations behind the use. It is important to know the purposes that each language services in therapy and to find client's affective attachment to each language (Iannaco, 2009 & 2014). Thus, therapist ability to switch language and to understand client's experiences is beneficial in helping client in increasing self-disclosure and emotional expression, as well as in building therapeutic alliance (Kapasi & Melluish, 2015). In addition, Santiago-Rivera et al. (2009) suggested that language switching enables therapists to consider the bicultural aspects and will generate a greater understanding of self- identify and self-image (Clauss, 1998; Grosjean, 1996, 2010; Huynh et al., 2011; Santiago-Rivera, 1995).

Language & Memory

"The retrieval of information from memory is both activated and constrained by language" (Schrauf et al., 2003, p. 228). Language is a retrieval cue when recalling past memories because it is closely connected to the memories; and memories are represented or remarked by language (Altarriba, 2003). For bilinguals, memories are organized in different linguistic systems (Javier et al., 1993, p. 336). Experiences reside in the linguistic context in which these events occurred (Javier et al., 1993, p. 335)

Pavlenko (2005) refers to two key links between memory and language as: *language specificity* and *language congruity*. *Language specificity* is that memories are likely to be recollected and elicited in the language in which the emotional event occurred (Marian et al., 2000; Larsen et al. 2002). *Language congruity* adds another layer to the language specificity phenomenon that memories have higher emotional intensity with more details in the language they occurred and will lose the intensity and details in translation to another language (Marian et al., 2004). Thus, memories from childhood, when retrieved in the mother tongue may be more detailed and more emotional than when retrieved in the second language (Schrauf, 2000). Greenson (1950), from a psychoanalytic perspective, suggested that first language created conditions to allow people retrieve specific memories that were not available in the second language. And second language often services as a way to defend against early fantasies and memoires.

In therapy, when memories are expressed using the language of the period when these events happened, such memories become alive; because the emotions and memories are loaded and contained in the language and the cultural context of origin (Buxbaum, 1949). Aragno and Schlachet (1996) also found that patients using English as a second langue may feel remote and distant from their early experiences during when they acquire their native language. They were able to connect to these emotional experiences and articulate the meanings of these memories when they are encouraged to use their language of origin to express them. They believed that certain experiences are intimately connected to the first language due to the special psychological developmental stage. And even an individual becomes very proficient and cognitively adept in a second language, these experiences are not retrievable.

These evidence was found in experimental studies as well across languages and settings.

Otoya (1987) tested 40 Spanish–English university students. These were split into two groups based on age at immigration. Thus, 20 were simultaneous bilinguals who learned to speak Spanish and English both from birth. The other 20 participants emigrated between the ages of 7 and 18 and subsequently learned English. For both groups (i.e. irrespective of age at immigration), Spanish words evoked earlier memories than their English equivalents, though only three of the six pairs reached statistical significance. It appears that first-language cues preferentially activate memories from earlier in life than do second-language cues. In another study done among Japanese bilinguals revealed that more memories and earlier memories were retrieved when participants were cued with Japanese words. They also retrieved more memoires when the cue language matched the language of memory encoding or the language of first thought. English cues elicited equivalent numbers of English and Japanese memories in the more fluent speakers of English. Japanese words elicited significantly larger numbers of Japanese memories in all Japanese ± English bilinguals (Matsumoto et al., 2006). Similarly, in another memory recall test (Marian, & Fausey, 2006), Spanish-English bilinguals were taught academic-type information on History, Biology, Chemistry and Mythology in Spanish and English. Upon testing, memory was more accurate and was retrieved faster when the language of retrieval and the language of encoding matched than when they did not match. This pattern was also influenced by participants' language proficiency and for those have similar high level of proficiency in both languages showed similar results in the recall test for each condition.

Again, evidence from case studies and experiment tests seem to be consistent with the *language specificity* phenomenon, which is echoing the principle of *encoding specificity* (Tulving, 1983; Tulving & Thompson, 1973), suggesting that memories can be recalled if the properties of the event are sufficiently similar to the properties of the retrieval situation (Tulving,

1983, p. 223), and language seems to be one of the properties of the event as well as the medium to build memories and expressions. As a property of the event, if the language cue matches the linguistic elements of the memory, then there will be more vivid memories with more details being recalled. Schrauf & Rubin proposed that it does not need to be the exact word, as a property of the event, it could be "the rhythm, body movement, sound pattern" or some "aspects of the language" (Schrauf & Rubin, 2000, p. 454).

Bilingualism, Emotional processing & Autobiographical Memory Recall

Rozensky, & Gomez (1983) believed that even words can be translated into another language, the emotional associations with the early experiences and culture of origin will still remain in the first language. Thus, using first language can help to approach the unconscious thought, early memories and the emotions while second language can help when working with clients on defenses. Burck (2011) noted that the 'naturalness' of using the first language helped prepare people to express the affection and vulnerability. So instead of saying the first language may elicit more emotional reactions or detailed memories, it also seems that the emotional expression of previous events using a different language depends on when and where the language is acquired; and whether there is a match between the verbal expression of an emotional events during memorial retrieval and the development of that type of language in the same period of time.

For example, when recalling childhood memories, bilingual participants (whose first language being Spanish) who use Spanish to write down these memories are more likely to experience a match between the language encoding these memories (Spanish vs. English) and the one they used to recall these memoires (Spanish). And participants who were asked to use English to write down childhood memories reported having fewer memory details than those

who use Spanish to write down memories, with lower proportion of nouns in the contexts. (Marsh, Kanaya, & Pezdek, 2015). Javier, Alpert, and Marcos (1983) & Javier and Alpert (1986) found that the greater the intensity of stress, the more likely it was for this experience to be more accessible in the language in which the experience took place. Caldwell-Harris (2014) explained such phenomenon and said that different levels of emotionality between first language and second language depend on the social contexts in which they gained these experiences and how frequently they had these contexts. Due to childhood's critical role in human development in which native language was acquired and frequently used, emotions closely connect to the learning environment as well as to the first language. Taking this phenomenon in therapy application, it seemed that processing emotions in the preferred language could open up conversations with more sophistication and depth. Participants reported that the possibility of retelling a story in the language in which the event was lived helped the clients make more connections and elicited more emotions, which facilitated the therapeutic process (Verdinelli & Biever, 2009).

Chapter 3

Previous research suggests that the use of an individual's first language (compared with their second language) is loaded with more emotions and is perceived as being more emotional by others (Altarriba, 2003; Dewaele et al., 2001–2003; Ervin-Tripp, 1964, 1967; González-Reigosa, 1976; Guttfreud, 1990; Harris et al., 2003; Otoya, 1987; Putoni et al., 2009; Santiago-Rivera et al., 2002;). In addition, studies suggest that using a second language allows people to distance themselves from the strong emotional arousal in emotional memories created in their first language (Bond et al., 2001; Caldwell- Harris et al., 2009; Caldwell-Harris et al., 2010; Dewaele, 2004; Harris et al., 2003; Harris et al., 2006; Harris, 2014; Javier & Alpert, 1986). The study utilized a within-subjects design to examine the phenomena of using different languages on emotional expression.

Research Questions

In this study, we were interested in answering these questions:

1. Do bilingual international Chinese students have more emotional expressions when using first language to describe a same event in autobiography than using a second language?
2. Would the negative autobiographical memory be more vivid, more emotional intense, with a lower valence and less distant in first language than the one expressed in second language?
3. When participants experience stronger feelings with a higher level of intensity recalling autobiography memories, would using second language generate more emotional expressions than the first language use?

Research Hypotheses

Based on the research questions, it was hypothesized that:

1. First language would predict the proportion of numbers of emotional words utilized in a negative autobiographical memory recall condition, such that Chinese usage (first language) would generate a higher proportion of emotional words on Affective Norm of Chinese Words – Translate Short (ANCW - TS) than Affective Norm of English Word – Short Revised (ANEW-SR).
2. First language would predict the vividness, emotional intensity, distancing and valence of a negative autobiographical memory, such that Chinese (first language) would generate more vividness, higher emotional intensity, less distancing and lower valence than the second language use on Memory Experiences Questionnaire ---- Short Form (MEQ – SF).
3. The rating on the emotional arousal intensity of the autobiographical memory would moderate the relationship between language use and proportion of emotional expressions, such that such that English use would generate higher proportion of emotional words on ANEW-SR when emotional intensity ratings are stronger (after controlling for individual differences in memory recall).

Independent Variable (IV): Independent variable was categorical: first/second language (Chinese/English).

Dependent Variables (DV):

1. Proportion of emotional words using ANEW-SR and ANCW-S was the dependent variable in the analysis testing the first hypothesis.
2. Features of autobiographical memory included: vividness, emotional intensity, distancing and valence on Memory Experiences Questionnaire (MEQ) will serve as

multiple dependent variables in the analysis testing the second hypothesis.

3. Proportion of emotional words using ANEW-SR and ANCW-S was the dependent variable in the analysis testing the moderation hypothesis.

Moderator:

Moderator was self-reported emotional arousal intensity (Emotional Rating Scale) of the autobiographical memory.

Design

This study utilized a within-subject cross-sectional design to examine whether there are differences in emotional expression (number of words and arousal) and autobiographical memory recall when using different languages during an autobiographical memory recall condition.

Participants

Sampling size and statistical power. Based on previous research studying autobiographical memory recall among bilinguals, the estimated effect size is .39 (Marsh et al., 2015). We utilized a more conservative effect size (.30) and the probability level at $p < .05$. Using G-Power (Faul, Erdfelder, Lang, & Buchner, 2007) with a power of .8, a minimum of 60 participants were recruited for this study. 64 participants signed up for interview and consented to participate. Only 60 participants were included in the data analysis with completion of interview of story telling task, followed by Qualtrics surveys, including: MEQ – SF (Luchetti, & Sutin, 2016) on autobiographical memory features (vividness, intensity, distancing and valence), and BEQ (Dewaele et al., 2001/03) on language background contexts, and EIRS (created based on the Reisenzein's Likert type scale) on aroused intensity of the story itself.

Inclusion/exclusion criteria. Within this sample, participants who identify as bilingual

international Chinese students and who are 19 or older, fluent in English and Mandarin Chinese are eligible for the study. Participants need to identity a clear distinction between their first language and their second language. Before participating in the study, they were asked to provide information on their fluency in speaking English and Mandarin Chinese with a rating from 1- 10 (see Appendix D), time period of learning and using both languages. Participants ratings under 5 on speaking English and/or Mandarin Chinese were excluded from the study.

Sampling methods. Adults (19 or older) who self-identified as bilinguals Chinese international students and can speak English and Mandarin Chinese fluently were invited to participate in the study via snowball and convenience sampling from Auburn University and local community. Flyers were posted on social media and emails were sent to APA Division 17 listserve to recruit Chinese international students living in the U.S. Participants were given a $20 gift card upon completing the study.

Procedures

Upon receiving University Institutional Review Board (IRB) approval, surveys were set up on Qualtrics and interview times were posted on Calendly. Participants registered interview time using Calendly; a private Zoom meeting link was generated for the interview when they signed up for interview time. Reminders of interview time and an informed consent letter (Appendix H) was provided to participants with purposes of the study requesting for their consent and permission to use their voice recordings in the data analyses, purposes of using this information as well as ways to protect the data were sent to participants before their interview. They were given information on instructions of how to complete the study in both English and Chinese (Appendix A & B) at the beginning of Zoom interview meeting.

Participants were asked to identify a first language and a second language depending on

which one they learned first. If they acquired two languages at the same time period, they were then asked which one they used most of the time with family, which would be considered as the first language. The one that was not used by most of the care takers in early life then was identified as the second language (Abudarham, 1987, p.6; Haugen, 1961). It turned out in our sample, all participants identified Chinese as their first language compared with English, which was considered as second language.

Video were recorded on secured Zoom cloud after confirming with participants' consent about video recording and purposes of using such recordings.

Autobiographical Memory Recall Task Involving Negative Emotions

Participants were asked to describe an emotional event that they remembered from their past most vividly, which involved feelings/emotions that they perceived as negatively concerning previous studies done on such areas as well as taking out the complexity of emotional valence in determining emotional arousal. Participants were warned not to give any history relating to trauma; if they wanted to do so, they would be not eligible to participate in the study. And they would be given a debriefing form if they would like to do so. Participants were given one minute to prepare before they started telling the story. Instructions were provided in both English and Chinese, with reminder asking participants to only use the language that was assigned in each condition. They could start as soon as they felt ready. After given consent, recording started on Zoom.

Each participant was given five minutes to complete telling the story using one language each at a time. The order of the language usage was randomized using an online randomizer for each participant to counterbalance the impact of language usage order on emotional expression.

Participants were given about another one minute to prepare before they used the second

assigned language to describe the same event. A timer rang when five minutes was up and participants were reminded to stop the first task of autobiography story-telling. There was a brief pause after finishing the initial autobiographical memory recall task. They started when they felt ready and Zoom recording continued when they told the same story using the secondly assigned language.

Emotion Intensity Rating Task

After participants completed autobiographical memory recall task using both languages, they were asked to identify up to three major emotion(s) for the memory they recalled. They then gave each emotion a rating on the intensity from 1 -10, and the difficulty of expressing these feelings from 1 -10. Participants will wrote down each emotion on a separate survey questionnaire, with each one followed by a rating scale from 1 – 10. They were also be asked to give a rating on the difficulty of expressing these emotions separately using two languages (see Appendix C).

Memory Experiences Questionnaire

Upon participant completed autobiographical memory recall story telling in each language, they were given a memory experiences questionnaire to examine their experiences recalling these memories using different languages respectively (MEQ, Appendix G). Scores on these measures were used as the outcomes during the analyses. In addition, participants were asked to provide information as when and where these memories were formed to check out the covariance.

Demographic and Linguistic Background Survey

After participants completed all recordings and ratings on emotional intensity, they were then asked to complete a survey inquiring their background information, including demographic

information as well as information on the history of language acquisition, language preference and attitudes towards each language and the emotionality attached to each language using questionnaire: Bilingualism and Emotions- Revised version (BE-R, Dewaele et al., 2001-2003; Appendix D).

Ethical Issues

When recalling negative memories, participants may re-experience some of the discomfort and unpleasant feelings. However, they were asked not to share, or be discouraged to share experiences that was related to traumatic events. Participating in the study was completely voluntary. They can stop the study at any time if they find themselves uncomfortable or unpleasant during the test. They were also provided a debriefing form (Appendix I) with mental health services and resources to utilize if any participant find him/herself need such support.

Measures

Affective Norms for English Words (ANEW). In order to see how expressive an individual could be using first and second language during memory recall, transcripts of audios were used to analyze the emotional content of the stories. Affective Norms for English Words was used to count the numbers of emotional words in the audio transcripts in English. The ANEW has been developed by NIMH Center for Emotion and Attention in order to provide standardized materials for researchers in studies of emotion and attention (Bradley & Lang, 1999). The measure and the translated version has been widely used by researchers in related field; and the number of words provided by the ANEW appeared to be sufficient for small-scale factorial experiments (Warriner, Kuperman, & Brysbaert, 2013). In a study done more recent found relatively high split-half reliabilities on rating across valence (.914), arousal (.689) and dominance (.770) as well as U-shape correlations between arousal and valence (words that are

very positive or negative are more arousing) using ANEW (Warriner et al., 2013). They also compared ratings with previous studies and found that Valence also appeared to generalize well across studies and translations/languages with higher correlations (e.g. .953 with English, .847 with Dutch, .924 with Spanish, .924 with Portuguese, .956 with Finnish) (Bradley et al., 1999; Eilola & Havelka, 2010; Kloumann, Danforth, Harris, Bliss, & Dodds, 2012; Redondo, Fraga, Padrón, & Comesaña, 2007; Soares, Comesaña, Pinheiro, Simões, & Frade, 2012; Warriner et al., 2013)

It consists of 1,034 English words considered as normative emotional expressions, which developed by Bradley and Lang (1999). Each word was assessed by psychology students using Self-Assessment Manikin (SAM) (Lang, 1980), a measure used to give affective ratings to words from three dimensions: arousal, valence and dominance. On the list, each word has a mean rating gathered from all subjects based on emotional valence, arousal and dominance on a 9-point Likert scale. Redondo has used the same method to generate 1,034 Spanish words translated from the words in ANEW and giving each word a mean score on valence, arousal and dominance using 720 subjects' ratings. In this study, we will use similar method to select emotional words set that will be used for later data analyses. Based on the ratings of arousal, 370 words were selected using the cut off score of 5.5 (out of 9), which consist almost 35% of all 1,034 words on ANEW. Adding those words might not be very strongly aroused, but have either very positive valence (>7) or negative valence (<2), another 117 words were added to the list. Given that we are interested in learning people's emotional expressions on experiences they perceive negatively, we added those words consisting a negative valence (<4). 153 words were added to the list. We generated 640 words in total as our measure: Affective norms for English words – Short Revised (ANEW- SR) in order to count on emotional expressions in English audio

transcripts (see Appendix E). These words were used as the emotional word checklist for audio transcripts to count for emotional words number. The numbers of English emotional words were compared with the total number of each transcript to separate individual differences on emotional expression. And the numbers of words were compared with the number of Chinese emotional words in the statistical analyses as an outcome variable.

Affective norms for Chinese words – Translation Short (ANCW- TS). Compared with the measure created for English emotion words and research done in this field (Bradley et al., 1999; Lin & Yao, 2016; Nabi, 2002; Strauss & Allen, 2008), there has been little done to create such measures in other languages, and there has not been any formal method to set up ways in determining or measuring Chinese emotional expressions or words. It seems that the translation version of ANEW to other languages generates high correlations on valence ratings and good reliability (Warriner et al., 2013). Wei, Wu and Lin (2011) have examined whether translation would be appropriate to generate the same emotional expression to Chinese using ANEW. They proposed a new approach to obtain affective ratings for each 1,034 Chinese words to tease apart the cultural differences in understanding emotional expressions across languages. Instead of rating each words on 3 dimensions of arousal, valence and dominance respectively; they clustered words into different quadrants according to their values of arousal and valence and then distribute words into different clusters using a suggested upper merged ontology method. They also provided ways to give ratings to the new generated Chinese words by calculating the correlation of a randomly selected set of English words and the translation of these words and later use the correlation coefficient to indicate ratings for all other words in the same quadrants and clusters.

Given the previous research, we translated ANEW to Chinese words as part of our

measurement to count emotional expression in Chinese audio transcripts. Two researchers translated the 640 English words in the ANEW-SR individually and separately (see Appendix F) using Oxford Advanced Learner's English-Chinese Dictionary (2009, 7th edition). These two researchers picked up one translation meanings from the dictionary and added to the Chinese measure emotional wordlists. Considering different acronyms (written language versus verbal language) were used to describe the same English word; based on the translations given in the dictionary, two acronyms could be given to one English word as long as the participant used either of those to describe the emotions.

Two researchers met after they completed translation to establish agreement on meanings for each words. When they did not agree upon a word, the word was added to a list that was translated by a third researcher. Only if the translations by the third researcher matched one of the two, the word was added to the list as a formal normative emotional word in Chinese. When there was no agreement, the word was dropped from the list completed. And the English word was deleted from the ANEW- SR as well. Tow researchers then discussed and decided to consider whether the translated words are commonly expressed in Chinese culture as well as considering whether the emotional connotation of each word matches the English word. If there is a mismatch or an uncommon use of a Chinese word, then both Chinese word and the corresponding English word were deleted from the measure (see Appendix F). After comparing these words, only one word dropped out from the ANEW-SR (hooker). With both measures containing 639 emotional word expressions.

Subjective Measure of Counting Emotional Words on Chinese Transcripts-secondary analysis. A third coder coded on Chinese transcripts independently apart from ANCW-TS using own judgment to decide the number of emotional words in autobiography text.

This was also used as a way to check the validity of ANCW-TS.

Memory Experiences Questionnaire ---- Short Form (MEQ - SF). Memory Experiences Questionnaire – Short Form (Luchetti et al., 2016) is a short version of the measure of Memory Experiences Questionnaire (Sutin, & Robins, 2007) to examine phenomenology of autobiographical memory. It consists of 31 items with 10 phenomenological dimensions that were generated from the original form, which are: vividness (3 items), coherence (4 items), accessibility (3 items), time perspective (3 items), sensory details (4 items), visual perspective (3 items), emotional intensity (3 items), sharing (3 items), distancing (3 items) and valence (2 items). Each scale has an acceptable internal consistency with the median alpha = .79, and each was highly correlated (median r = .95) with its corresponding long-form scale.

MEQ-SF was used to measure the quality of the autobiographical memories as the outcome variable on vividness, emotional intensity, distancing and valence (see Appendix G). Mean scores were generated on each dimension of the measure on a 5-point scale.

Bilingualism and Emotions Questionnaire (BEQ). The Bilingualism and Emotions questionnaire (BEQ) (Dewaele et al., 2001/03) is a web-based questionnaire, originally to study bilingualism and emotionality to language use. During the two years of open-access survey data collection, researchers have collected about 1800 responses with 1579 valid data. It consists of 13 questions relating to participants' gender, age, education level, ethnicity, occupation, dominant language, language acquisition context and language proficiency. It also includes 13 Likert-type questions in language choice for emotional expressions, code-switching behaviors, emotionality attached to language and attitudes towards each language. Information on participant preference of using language, environment, and development of language acquisition and language proficiency were achieved using BEQ as supplemental qualitative data for our

study to further explain the results (see Appendix C).

Emotion Intensity Rating Scale (EIRS). Based on Pleasure-Arousal Theory, intensity of emotions has been rated from two dimensions: level of pleasure and level of arousal. Reisenzein has used a 7-point Likert type scale to measure the emotion arousal intensity. Based on the Pleasure-Arousal Theory and their measure (Reisenzein, 1994), we created an Emotion Rating Survey for participants to fill, inquiring about their subjective ratings on the intensity of the arousal of the main emotions being described in their autobiography (Appendix C). Participants were asked to identify three major emotions they expressed in their stories for each language condition. They were asked to give a rating from 0 (least intense) – 10 (most intense) for each of the emotion they listed on the survey. Means of arousal intensity of these three emotions were calculated as an indicator to represent the emotion intensity level of the autobiographical memory in each language. We calculated mean scores of arousal intensity of stories expressed in Chinese and English as the general arousal intensity of the story itself. Scores higher than 5 were categorized as "high intensity;" scores lower than 5 were categorized as "low intensity."

Subjective Measure of Therapist Rating on Emotional Intensity – validity check. Based upon observations on video, a third coder also gave an overall rating on the emotional intensity of the autobiography from 0 (least intense) – 10 (most intense), and the most prominent emotion identified in the video clip as a validity check on participants' rating on their emotional intensity on both memories.

Analyses

Sample characteristics. Demographic and linguistic background information was analyzed as descriptives of the sample participating in the study, including language proficiency,

language preference, years of learning and using each language, preference on languages, contexts and attached feelings of using both languages for each participant.

Analysis 1: Test of Language Effect on Emotional Expression. Multivariate Analysis of Variance (MANOVA) was used to compare first and second language impact on emotional words expressed. It is expected that there would be significant univariate effects for language use (first or second) on emotional words used, such that there would be different proportion of emotional words in the transcript for the first language condition as compared to the second language condition.

Analysis 2: Test of Language Effect on Autobiographical Memory Recall. Multivariate Analysis of Variance (MANOVA) was also be used to compare first and second language impact on the vividness, emotional intensity, distancing and valence of the autobiographical memory. It is expected that there would be significant univariate effects of language use (first or second) on autobiographical memory recall characteristics, such that there would be higher means for the first language condition as compared to the second language condition on vividness and emotional intensity; and lower means for the first language condition as compared to the second language condition on distancing and valence.

Analysis 3: Test of Effect of Emotion Intensity on the Relation between Language Use and Emotional Expression. The same MANOVA model was used to examine the main and interaction effects of emotional arousal ratings on the relationship between language use and emotional words expressed.

Analysis 4: Test of reliability and validity of ANCW-TS. Correlational analysis was used to test the reliability of ANCW-TS using forward and back-translation. In addition, the

validity of this measure was examined using a separate coder on emotional words to compare numbers of words generated on ANCW-TS.

Summary

To summarize, this study analyzed 4 research questions regarding language use, emotional words expressed, and emotional arousal during memory recall. Participant recruitment primarily focused on bilinguals who speak both English and Chinese. The author used a nested design with Multivariate Analysis of Variance (MANOVA) with moderation analyzed the results.

Chapter 4

Overview

The purpose of this quantitative within-subject study was to examine whether using different languages, specifically one's first language (Chinese) and second language (English) has different impacts on emotion expression and memory recall process; and whether Chinese international students would express more emotional words when using their first language when controlling for their language proficiency. In addition, the interaction effect between the intensity of the story itself and language usage on emotional expression was also examined. We want to know whether participants would shift their language usage and express more emotional words in their second language (English) when the story itself was perceived as more emotionally intensive.

Data Preparation and Interview Transcription.

Participants were asked to share a memory they remembered most vividly in the past both in Chinese and English (language order was randomized) and all interviews were video-taped. These video clips were transcribed in both English and Chinese for each participant. Total words of each transcript were counted using Affective norms for English words – Short Revised (ANEW- SR) and Affective norms for Chinese words – Translation Short (ANCW- TS) created by the writer using Bradley & Lang's ANEW. Ratio of emotional words divided by the total number of words in each transcript was calculated for comparison between Chinese transcript and English transcript.

Participants were asked to write down 3 major feelings in the stories expressed both in Chinese and English. Descriptions of these identified feelings were compared to approve consistency of the story they shared in Chinese version and English version. All 60 sets of data

were remained in the data analysis. Intensity of each story was calculated by using mean of the added intensity ratings of Chinese and English transcripts. Intensity higher than 5 are coded as "2" ("high intensity" with 55 data sets) and scores lower than 5 were coded as "1" ("low intensity" with 5 data sets).

Sample Characteristics.

We first gathered preliminary information on our bilingual international Chinese participants' (subordinate bilinguals, Marcos, 1976a) demographics and language background, including: age, gender & education background, years spent in the U.S., language proficiency on each language (Chinese & English) they speak, ways acquiring each language, age starting to learn and acquire second language, as well as preference of emotional expression in both languages using Dewaele and Pavlenko's Bilingualism and Emotions' questionnaire.

Demographics. Among the 60 participants who identified as Chinese international students living in the U.S. (female 63.3%, male 36.7%), the interval range for age was from 21 – 46 (M = 27.05, SD = 3.97). The average year they spent in the U.S. was 4.24 years (SD = 2.70, with a range of 1 – 13 years. All 60 participants reported their current education level, 8 were undergraduate college students, 37 were master students and 15 were doctoral students. 55% of the participants reported their major related to bilingualism/language major or help with their language fluency, with 45% reported major unrelated or not affecting bilingualism or language fluency (see Table 1).

Table 1

Demographic Characteristics of Participants

Characteristics		*Frequency*	*Percent*
Gender	Male	22	36.7
	Female	38	63.3
Education Level	Undergraduate College Student	8	13.3
	Master Student	37	61.7
	Doctoral Student	15	25.0
Major Relatedness	Relate to Bilingualism/Language Major	33	55.0
	Unrelated	27	45.0
Chinese Acquisition	Instructed	1	1.7
	Naturalistic	14	23.3
	Both	45	75.0
English Acquisition	Instructed	43	71.7
	Naturalistic	0	0.0
	Both	17	28.3

Descriptive Statistics	*M*	*SD*	*Min*	*Max*	*n*
Age	27.05	3.972	21	46	60
Years in the U.S.	4.24	2.700	1	13	59
Chinese Fluency	9.34	0.701	7.5	10	60
Chinese Speaking Fluency	9.42	0.743	8	10	60
English Fluency	7.62	1.210	5	10	60
English Speaking Fluency	7.43	1.500	3	10	60
Age Starting Learning English	9.36	3.372	3	21	59

Language Fluency and Acquisition Context. On a scale of 1 -10 measuring their English fluency, the average English-Speaking fluency was 7.43 (*SD* = 1.50); and the average general English fluency (including writing, reading and comprehension) was 7.62 (*SD* = 1.21). Mean age participants started learning English was 9.36 (*SD* = 3.37) with a range from 3- 21 (see Table 1). 23.3% reported acquiring Chinese naturalistically (outside of school/in family); 1.7% of participant's Chinese acquisition was instructed (at school); and 75% acquired Chinese in both ways. No participants acquired English naturalistically; 71.7% of them acquired English only at

school (instructed) and 28.3% of them acquired English in both ways (see Table 1).

It appears that participants in our study are *subordinate bilinguals* (Abudarham, 1987) who acquired Chinese earlier in life either naturalistically at home or instructed at school; versus none of the participants learned English at home naturalistically and instead learning it at a different time later in school. There also appears to be a significant difference of the proficiency level between their first language and second languages both in general language fluency level (t = 13.472, p = .000, M = 1.721, SD = .989, 95% CI [1.465, 1.976]), and with their speaking fluency (t = 11.005, p = .000, M = 1.983, SD = 1.396, 95% CI [1.623, 2.344]) in a paired-sample t-test (see Table 6). Although our participants overall fluency on spoken English is considered to be great (7.43 out of 10), they acquired languages in different contexts and at different life stages. Thus, our participants can be considered as subordinate bilinguals who have a different level of competence in the two languages they speak and coordinate bilinguals who acquired languages in different contexts and separately (Lambert et al., 1958; Marcos, 1976).

Table 6

Paired Sample T-Test on Chinese and English General & Speaking Proficiency

	M	*SD*	*SEM*	*95% CI of the Difference*		*t*	*df*	*p*
Category				Lower	Upper			
General Fluency (Ch-Eng)	1.72	0.989	0.128	1.465	1.976	13.472	59	0.000
Speaking Fluency (Ch-Eng)	1.98	1.396	0.180	1.623	2.344	11.005	59	0.000

Emotion Expression Context. When asking about their emotion expression using Chinese and English, 38.3% participants reported using Chinese to express anger “All the time” whereas 5% using English with the same level of frequency (41.7% “Frequently” in Chinese & 28.3% in English, 13.3% “Sometimes” in Chinese & 36.7% in English, 6.7% “Rarely” in Chinese and 26.7% in English), with 1.7% “Never” express anger in English and 1.7% said this is not

applicable in English. 28.3% of the participants said they would swear in Chinese "All the time" with 8.3% of them would do the same in English (35.5% "Frequently" in Chinese & 18.3% in English, 18.3% "Sometimes" in Chinese and 41.7% in English, 18.3% "Rarely" in Chinese and 21.7% in English, 8.3% "Never" in English and none in Chinese). 41.7% of participants said they said they would express their deepest emotions "All the time" in Chinese and 5% would do the same in English (35.0% "Frequently" in Chinese & 20.0% in English, 16.7% "Sometimes" in Chinese and 41.7% in English, 6.7% "Rarely" in Chinese and 26.7% in English, 6.7% "Never" in English and none in Chinese).

Analyses 1 & 2: Tests of Multivariate Effect of Language Usage on Emotional Expression & Autobiographical Memory Recall.

A repeated measure MANOVA was conducted to assess if there was a difference in the ratio of emotional words expressed in the paired story transcripts in Chinese and English version; and whether there was difference in memory retrieval index features (e.g., vividness, intensity, distancing & valence) among 60 Chinese international bilinguals (Chinese as first language & English as second language).

The assumption was met. There was a significant multivariate main within-subject effect, $F(5, 55) = 9.123$, *Wilks'* $\Lambda = .547$, $p = .000$, Pillai's Trace = 0.453, partial $\eta^2 = .453$, demonstrated statistically significant differences between Chinese usage and English usage on emotion expression and perceived memory features. Specifically, there was a significant univariate with-in subject effect of language usage on emotional words expressed in stories, F (1, 59) = 40.909, $MSE = 1.220$, $p = .000$; and a significant univariate within-in subject effect on memory vividness, F (1, 59) = 9.789, $MSE = .266$, $p = .003$ (see Table 2).

Table 2

Repeated Measure MANOVA of Language Usage - Univariate Effect

Source	Measure	Sum of Squares	df	MS	F	p
Language	EmoRatio	49.893	1	49.893	40.909	.000**
	MemViv	2.601	1	2.601	9.789	.003**
	MemInt	1.070	1	1.070	2.894	.094
	MemDis	.008	1	.008	.037	.849
	MemVal	.008	1	.008	.041	.840
Error	EmoRatio	71.956	59	1.220		
	MemViv	15.677	59	.226		
	MemInt	21.819	59	.370		
	MemDis	13.381	59	.227		
	MemVal	11.992	59	.203		

** $p < .005$, * $p < .05$

Such multivariate main effect of language usage remained significant when we controlled for years past since the event has happened, $F(5, 54) = 5.950$, *Wilks'* $\Lambda = .645$, $p = .000$, Pillai's Trace = 0.355, partial $\eta^2 = .355$. Specifically, there was a significant univariate with-in subject effect of language usage on ratio of emotional words expressed in the paired transcripts, $F(1, 58) = 26.767$, $MSE = 1.237$, $p = .000$. However, there was no significant effect on memory vividness, instead there was a significant univariate within-in subject effect on memory intensity, $F(1, 58) = 5.379$, $MSE = .270$, $p = .024$ (see Table 3).

Table 3

Repeated Measure MANCOVA of Language Usage after controlling for Years after Event Happened- - Univariate Effect

Source	Measure	Sum of Squares	df	MS	F	p
Language	EmoRatio	33.122	1	33.122	26.767	0.000**
	MemViv	0.031	1	0.031	0.153	0.697
	MemInt	1.453	1	1.453	5.379	0.024**
	MemDis	0.08	1	0.08	0.219	0.641
	MemVal	0.014	1	0.014	0.06	0.807
Error	EmoRatio	71.771	58	1.237		

MemViv	11.837	58	0.204
MemInt	15.671	58	0.270
MemDis	21.137	58	0.364
MemVal	13.375	58	0.231

** p < .005, * p< .05

There was no significant multivariate main effect of language usage when we controlled English fluency; meaning when there were similar levels of proficiency between Chinese and English, such main effect of language usage on emotional expression and memory recalling disappeared. We do this respectively using both English speaking fluency score, F (5, 54) = .389, *Wilks'* Λ = .965, p = .854, and English general fluency score, F(5, 54) = .228, *Wilks'* Λ = .979, p = .949. Univariate effect on emotional words ratio (F (1, 58) = .002, MSE = 1.209, p = .960) and memory vividness (F (1, 58) = .769, MSE = ,207, p = .769) also became insignificant when controlling for English speaking fluency.

Analysis 3: Test of Effect of Emotion Intensity on the Relation between Language Use and Emotional Expression.

A mixed methods MANOVA was conducted to assess whether intensity of story itself moderates the relationship between different language usage and the ratio of emotional words expressed in the paired story transcripts in Chinese and English version.

The assumption was met. There was a significant multivariate interaction effect, F(1, 58) = 11.439, *Wilks'* Λ = .835, p = .001, MSE = 1.036, partial η^2 = .165, demonstrated statistically significant moderation effect of story intensity on the relation between different language usage and ratio of emotional words expressed in the paired story transcripts. It appears that 16.5% of the variability in the change of the relation between emotional words ratio and language usage can be accounted for by story intensity (see Table 4, Graph 1).

Graph 1

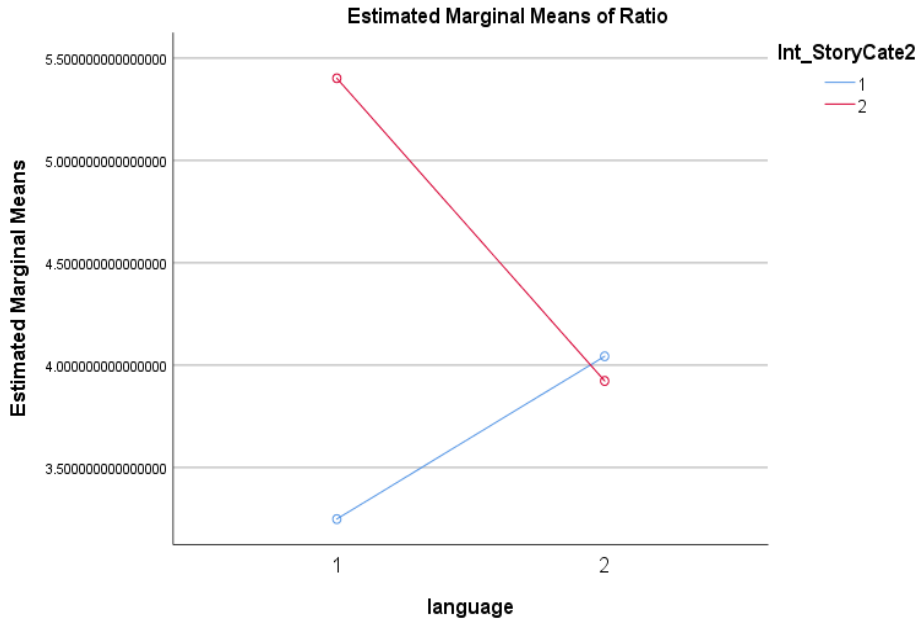

Table 4

One-Way MANOVA Moderation of Intensity of Story on Relationship between Language Usage and Emotional Word Ratio

Source	Sum of Sqaures	df	MS	F	p
Language	1.072	1	1.072	1.035	0.313
IntnStor	9.473	1	9.473	1.446	0.234
Language*IntnStor	11.854	1	11.854	11.439	0.001**
Error	60.103	58	1.036		

** p < .005, * p< .05

Such interaction effect remained the same when we controlled general English fluency, $F(1, 57) = 11.399$, *Wilks'* $\Lambda = .833$, $p = .001$, $MSE = 1.051$, partial $\eta^2 = .167$, demonstrated statistically significant moderation effect of story intensity on the relation between different language usage and ratio of emotional words expressed in the paired story transcripts. 16.7% of the variability in the change of the relation between emotional words ratio and language usage can be accounted for by story intensity after controlled English fluency level (see Table 5).

Table 5

One-Way MACOVA Moderation of Intensity of Story on Relationship between Language Usage and Emotional Word Ratio after Controlling for Language Proficiency

Source	Sum of Squares	df	MS	F	p
Language	0.539	1	0.539	0.513	0.477
IntnStor	5.389	1	5.389	0.830	0.366
Language*IntnStor	11.977	1	11.977	11.399	0.001**
Language*Fluen	0.213	1	0.213	0.203	0.654
Error	59.889	57	1.051		

** p < .005, * p< .05

Analysis 4: Test of Reliability and Validity of ANEW-TS.

Measure of ANCW-TS was translated from ANEW-SR to count on numbers of emotional words in transcripts. Researchers back-translated the ANCW-TS to English words again to compare with the original ANEW-TS to examine the reliability of ANCW-TS. Back translation of ANCW-TS generated 563 out of 638 exact same words comparing to the original ANEW-TS measure, resulting in 88% accuracy of the words. Emotional words in Chinese transcripts and English transcripts using ANCW-TW and ANEW-TS resulted in significant correlation coefficient, $r = .428$, $p = .001$, showing good consistency of ANCW-TS.

In addition, we asked a third person to subjectively select and count on emotional words in each Chinese transcript based on their own understandings of words either associated with a specific feeling/emotion or words indicative of emotions or having emotional connotation. We compare the number of emotional words counted by ANCW-TS with those selected by the research, resulted in significant correlation coefficient, $r = .661$, $p = .000$, demonstrating great validity of the ANCW-TS measure in capturing emotional words in Chinese. Since ANCW-TS is translated from ANEW which is capturing emotional words in the U.S. culture and the third researcher counting words on own understanding of Chinese emotional words; the correlation

coefficient of r = .661 suggested ANCW-TS capturing great amount of emotional words in Chinese language and cultural context.

Table 7

Repeated Measure MANCOVA of Main and Interaction Effects

Effect	*Wilks' Lambda*	*F*	*Hypothesis df*	*Error df*	*Sig.*	*Partial Eta Square*
Language	0.547	9.123	5	55	0.000	0.453
Language*YearMem	0.645	5.95	5	54	0.000	0.355
Language*InteStor	0.835	11.439	1	58	0.001	0.165
Language*InteStor*Fluen	0.833	11.399	1	57	0.001	0.167

Chapter 5

The purpose of this study is to understand the impact of language usage on emotional expression and emotional arousal during an autobiographical memory recall. By asking Chinese international students who identify their first language as Mandarin Chinese and second language as English to express an emotional event that they remember most vividly containing negative feelings or emotional responses, the study serves as an analogy to psychotherapy session when clients voluntarily recall and tell stories based on autobiographical memories that usually involving concerns or unpleasant feelings. This study will serve to fill the gap in research related to how language phenomena may manifest in psychotherapy; as well as provide preliminary evidence for future research in similar areas. Studying emotional expression among bilinguals will also give empirical support for clinicians to provide more effective counseling services in doing emotional work and to enhance the counseling experiences and quality of care for bilingual populations. It is expected that the results will give some scientific support and practical implications for clinicians working with bilingual clients.

Hypotheses & Results Interpretations

We believed that first and second language are loaded with emotions in different ways such that they will generate different proportions of emotional words in the transcripts; and that autobiographical memory will be perceived as more vivid and more emotionally intensive in the first language. The results confirmed our hypotheses. We found that there was a statistically significant difference in the ratio of emotional words in the paired transcripts in Chinese and English generated by our participants who acquired English and Chinese in different contexts and having different level of fluency in the two languages they were speaking (coordinate bilinguals).

Emotional Expression & Language Independence Phenomenon

Marcos (1976) proposed that bilinguals who have different levels of proficiency of first and second language express feelings in the second language as "an intellectual task" and that they pay more attention in organizing the language. These results support the psycho-linguistic theories of **language independence phenomenon** (Marcos, 1976b), that **Coordinate bilinguals** form two different associations between their mental activities and their life experiences through different languages. Although our participants overall fluency on spoken English is considered to be great (7.43 out of 10), they acquired languages in different contexts and at different life stages. In other words, they acquired Chinese earlier in life from birth both naturalistically at home and instructed at school; versus none of the participants learned English at home naturalistically but instructed later at school with the mean age starting learning English being 9.36. It is possible that because people organize and categorize events in two separate linguistic systems associated with the distinct cultural contexts of acquisition (Foster, 1992; Javier, 1989; Kanno, 2003; Marcos et al., 1976; Martinovic et al., 2013; Pavlenko, 2005), there are differences as how coordinate bilinguals express emotions when recalling such memories, which resulted the differences in our data.

Although there were some conflicted results from previous studies (e.g., more emotions expressed in Spanish regardless of which one is first language between English & Spanish, Guttfreud, 1990), our results still appear to be consistent with research findings among coordinate bilinguals examining emotional expression & arousal (e.g., skin conductance). Emotional expressions (taboo words, sexual terms & childhood reprimands) in first language elicited larger skin conductance response among Spanish-English coordinate bilinguals (Harris, 2004); Turkish-English coordinate bilinguals demonstrated great automatic arousal to taboo

words and childhood reprimands in Turkish (Harris et al., 2003). In addition, we found very similar results pattern with a previous study done among Chinese-English coordinate bilinguals, Mandarin speakers were perceived to be stronger than English expression using self-report; and for those who had good Mandarin and good English ability, there were similar magnitude skin conductance responses (Caldwell-Harris et al., 2010), showing that proficiency similarity of the two languages might be a indicator for emotional arousal or emotional expression among coordinate bilinguals.

Memory Recall & Language Congruity & Language Specificity Theories

Our results partially confirmed our 2nd hypothesis, that autobiographical memory will be perceived as more vivid and more emotionally intensive. There was statistically significant difference on perceived memory vividness of the same recalled story expressed in Chinese and English. We did not find any difference on other features of the memory in terms of intensity, distancing, or valence. However, when we controlled years past by since the event happened, perceived intensity of the memory became significantly different in the story expressed in Chinese and English, versus memory vividness became statistically insignificant. The time duration between when the event happened and when they told the story might impact how vividly they remember the memory and how intensely they were evoked when telling the story. If we controlled the time effect, these memories may not be remembered differently regarding vividness; but somehow might be perceived differently as how intense people felt evoked when recalling them.

There may not be a direct association between language usage and memory features which appeared to be a more complicated process revealed from previous research findings compared with its relation to emotion expression. Our findings partially supported *language*

specificity and *language congruity* (Pavlenko, 2005) theories believing that memories have higher emotional intensity with more details in the language they occurred (Marian et al., 2004); language as one of the memory properties of the event, similar language usage could elicit sufficient similar emotional experiences of the retrieval situation (Tulving, 1983). Thus, more memories and early memories were activated and retrieved when people were cued by first language (Matsumoto et al., 2006; Otoya, 1987); early experiences acquired during primary use of the native language may felt remote and distant using second language to express them (Aragno et al., 1996). Although we did not examine this match of the language as in which event occurred, previous theories partially explained our results and suggested that usage has some impacts on recalled memory features of vividness and when we controlled time effect, there seemed to be some relation between language with loaded emotional intensity of the memory. Because of the complexity within the memory recall process, future studies are needed to examine its features and their relation with language usage.

It also appears that the effect of language usage on perceived memory features only exists among coordinate bilinguals who have different levels of language proficiency. Little research has done on how language proficiency impacts or shifts this relationship. Similar findings on this pattern were discovered from a previous study using Japanese English bilinguals: more memories and earlier memories were retrieved when participants were cued with Japanese words. English cues elicited equivalent numbers of English and Japanese memories in the more fluent speakers of English (Matsumoto et al., 2006). Similarly, Marian & Fausey (2006) found that memory was more acute and retrieval was faster when the language of retrieval and the language of encoding matched than when it did not match, but this was only true for balanced bilinguals whose high proficiency levels were similar in both languages; the

pattern of response accuracy, latency and error rates for bilinguals having different levels of proficiency in Spanish and English was less stable. This could be of help in explaining our results. Besides the match of the retrieval language and encoding language, proficiency level may also affect how people recall memories as well as the autobiographical features of memories.

Mechanism of Code-Switching, Emotion Distancing & Emotion Intensity

Anecdotally, clinicians found that clients switch languages when they have difficulty in expressing certain emotions in their first language (Amati-Mehler, 1993; Buxbaum, 1949; Gomez et al., 1985); or when there is related trauma that happened in a context through a language acquisition phase (Aragno et al., 1996; Kokaliari et al., 2013); or when feeling socially anxious or constraint (Aragno et al., 1996; Kokaliari et al., 2013). With previous research suggesting that code-switching phenomenon often serves as a distancing functioning (Gumperz et al., 1971; Javier et al., 1989), such code-switching phenomena may happen depending on how emotionally aroused people feel about the autobiographical stories they tell (Gumperz et al., 1971; Javier et al., 1989).

Besides findings on how language usage affect emotional expression and autobiographical memory retrieval indices, we also found an interaction effect of event arousal intensity that would shift how people express their feelings in Chinese and English. There was a significant multivariate moderation effect of story intensity on the relation between different language usage and ratio of emotional words expressed in the paired story transcripts. The results indicated that perceived emotional arousal impacts the numbers of emotional words expressed in each language. It appears that with low intensity, coordinate bilinguals tend to express more emotional words in their first language and when there is a higher level of intensity with the

story they tell, they express more emotional words in their second language. It looks like switching-code permit bilinguals to express things in the second language that would be too disturbing in the first language (Bond et al., 2001) and suggested that this phenomenon is not so much affected by bilinguals' fluency level of their second language as long as they have generally high fluency.

Previous research findings have suggested that English-speaking societies and cultures encourage more open expression of positive emotions than do Chinese culture which resulted in stronger skin conductance responses in Chinese-English bilinguals when they heard English endearments (Caldwell-Harris et al., 2010). It is still unclear how cultural norms of emotional expression affect numbers of words expressed by Chinese-English bilinguals in our sample, which could be a direction for future research as examining cultural influences on emotional expression. However, in this study, by recalling negative emotional events without restraining to any specific feelings, the moderation effect in our findings showed that emotion expression and autobiographical story telling is such a dynamic process which may involve many different factors; yet still the arousal intensity of the memory itself is a determining factor in regards to the mechanism of emotion expression in memory recall.

Novel Study Findings

Previous research has studied either language usage and its relation with emotion expression or with memory retrieval. However, there is a lack of literature examining relationships among language use, emotional processing and memory retrieval in conjointly. This is the first analogy study to examine a mechanism similar to bilingual psychotherapy that combines all factors involving the process, including: emotional expression, memory retrieval features as well as arousal intensity of autobiographical stories. The writer did a thorough

literature review in discussing psycholinguistic theories (e.g., language independence phenomenon, Marcos, 1976b; language specificity and memory retrieval theories, Pavlenko, 2005, Schrauf et al., 2003; code switching, Gumperz et al., 1971, Javier et al., 1989) and examining previous research studies to provide a strong theoretical rationale to formulate the hypotheses examined in this study. Based on these theories, we are able to take a deeper look at the mechanism and bringing underlying factors (emotional arousal intensity of the event) to further understand the complicated process of emotion expression, memory recall and language usage and to know how they were regulated and connected to each other.

This study also generated significant results almost in all hypotheses we formulated: 1) there was statistically significant difference on ratio of emotional words expressed in same stories in Chinese and English; 2) this result and such phenomenon only existed in coordinate bilinguals and when language proficiency were in similar level, such results disappear; 3) autobiographical memories vividness was perceived differently in Chinese and English; 4) depending on the arousal intensity of the story, relation of ratio of emotion words numbers and language usage shifted; 5) this statistically significant moderation effect remained after controlling for English proficiency. These significant results showed evidence of our hypothesized theoretical framework of bilingual therapy and its process involving emotion expression, memory recall and language usage.

In addition, this study filled gap in the research area of bilingualism and bilingual therapy. First of all, this study among the first to provide operational definitions of bilinguals regarding language proficiency, developmental stage and language acquisition time. Specifically, we gathered information regarding language acquisition background and emotion expression preferences. The empirical evidence provided in this study also improves the definition of

coordinate bilinguals (Marcos, 1976b) by utilizing analyses to demonstrated clarity regarding complicated bilingualism phenomenon. Secondly, we created a new measure in Chinese based on the Affective Norm of English Word measure to help future researchers continue studying Chinese bilinguals as well as provide a more objective measure for emotion expression. In addition, the validity and reliability test of the new created Affective Norm of Chinese Word measure generated good indices and indicated good trans-cultural matching on emotion expression. All in all, this study provided future research theoretical framework and research method to replicate studies in bilingual therapy.

Lastly, the study has done in a time with arising use of tele-health. It happens that our study is done through zoom which serves more of the analogy as psychotherapy delivered through tele-health. Even with online format, we were still able to find significant results which also provided us empirical evidence for tele-psychotherapy implications, showing us the importance to integrate culturally and linguistically appropriate services in our field. There has not been much research done in such area studying bilingual therapy via tele-health. A previous pilot study using older Korean immigrants (Jang, et al, 2013) showed that tele-counseling program conducted in Korean resulted significant reduction in depressive symptom severity and overall satisfaction, addressing the critical needs of the linguistically isolated population and potential effectiveness of tele-health in providing culturally sensitive counseling services.

Limitations & Future Research Directions

Although this study provides important results in coordinate bilinguals, our sample is more representative for Chinese international students who acquired first and second languages at different ages and through different learning context having different proficiency levels of Chinese and English. Further studies still need to be done to establish if these results could be

generalized to other populations, for example international Chinese student having similar language proficiency level in both languages, or international students using other languages, and immigrants with or without similar language proficiency using same or other languages. Similarly, it is also worth to explore how these language phenomena would show up among bilinguals acquiring two languages during the same acquisition phase or through similar cultural acquisition context.

Our results also suggest that controlling for the time past since the event has happened reduces significance of memory vividness. This study would be strengthened by asking participants to recall a memory within a same time period. Additionally, exploring bilingual memory retrieval features controlling for factors such as match or mismatch of the time when emotional event has happened and when language acquired would be meaningful additions to future research. In addition, we only examined emotional events that were perceived as negative to mimic psychotherapy work; however, it is still unclear how the emotion expression and memory recall process would look when bilinguals are expressing positive or pleasant feelings/emotions.

Lastly, although we utilized both objective and subjective measures to help generate more accurate results, there are still some limitations with our measures. First, we created our own measure of ANCW-TS based on English measure of ANEW. Some of the words in ANEW are outdated to today's English cultural and language context in the U.S. (e.g., champ, maniac, blubber, jewel, infatuation) and there are words we rarely use in daily spoken English (e.g., scum, ace, luscious), likely because ANEW measure was created in 1999 (Bradley et al.). There are also words we might consider as suggesting feelings or emotions that are not represented in the measure (e.g., tear, worry, cry). In addition, there are synonyms in both English and Chinese

suggesting similar meanings with only one specific word included in the measure (e.g., rat but not mouse, quick but not fast, fatigued but not tired, pity but not sympathy, learn but not study). Although translating ANEW to use as a measure for counting Chinese emotional words generated good statistical validity and reliability, there are words that are relevant in U.S. culture (e.g., dollar, revolver), which may not be a familiar concept in Chinese culture, or further be considered as emotional words, or even a norm of emotional words. There are newly formed words that are widely used in modern Chinese society, or on media or social media (崩溃-very overwhelmed and frustrated that the world is almost collapsing; 渣 – person who is cheating or gas-lighting/abusive), suggesting similar meanings to emotional words in ANCW but may use different characters and words. Additional research is still needed to create measures of emotional word norms in other languages considering social expression norms in these cultures. Besides creating measures and surveys, future research could continue to explore different ways to measure emotion expressions or emotion arousal.

Clinical Implications

The United States is a linguistically diverse country (Softas-Nall et al., 2015; U.S. Census Bureau, 2013). Significant health care inequalities have been found between foreign-born adults and U.S.-born adults in America (Dey et al., 2006; Singh et al., 2013). However, there is a lack of culturally and linguistically appropriate services for bilingual population (U.S. Department of Health & Human Services, 2001; Sue et al., 2003; Willerton et al., 2008). Our study suggests that even with high English fluency among coordinate bilingual Chinese international students, there is still a difference when they express emotions using Chinese and English when there is difference in English and Chinese fluency. Students who come to the U.S. in early years when they are still improving language skills and experiencing acculturation stress, given the

vulnerable population, might be in need or benefit from the most linguistically responsive therapy. This study gave empirical evidence to show importance to provide linguistic responsive and appropriate therapy for international students or immigrants when they are less proficient with their second language as English or when they prefer to use their first language in therapy.

There is also a lack of understanding and awareness in psychotherapy practice as how language usage may affect client's communication with therapist (Torres-Rivera et al., 2008), their own emotion expression (Foster, 1998). These could also contribute to difficulty and additional barriers for bilingual international students in seeking for mental health services and support, and put these populations in higher risk for mental health distress (Lu, Dear, Johnston, Wootton & Titov, 2014; Ying, Lee, & Tsai, 2007). Bilingualism is also perceived as an inferior or perceived as "ignorant" if people lack fluency in English (Espin, 2013). When patients estimated their physician's language skill as being high for their own preferred language, patients also reported experiencing less pain (Itzhak, Vingron, Baum, & Titone, 2017; Mustajoki, Forsén, & Kauppila, 2015). Therapists reported anticipating difficulties developing rapport when clients spoke with foreign accents, and some were anxious about being able to communicate well with bilingual clients (Bowker & Richards, 2004). Learning English and assimilation become the priority while speaking other languages is discouraged or stigmatized (Softas-Nall et al., 2015). We hope to provide more knowledge and empirical evidence of bilingualism and the impacts of language on emotional expression, which is an important part of psychotherapy process and to shift from a biased stereotypical view on international students or immigrants saying they have language/cultural barriers and unwilling to engage in mental health services to a social justice lens to deepen understandings of the more complicated mechanism and relations among the different factors involving in this process. It is the "Anglo-point-of-view-problem" that devalues

the racial, cultural and language richness of the society in the U.S (Ballesteros, 1970). Unable to understand the phenomenon or the lack of cultural competence to be willing to provide culturally & linguistically appropriate service will persist biases clinicians hold in healthcare services. We hope to decrease the biases and stereotypes of bilingualism and bridge the gap of high need of linguistically responsive and culturally appropriate mental health services among marginalized populations such as international students and immigrants

At the same time, code-switching phenomenon shed importance on second language using in psychotherapy. Since arousal intensity of the event itself being recalled moderates the relationship between language usage and emotion expression, it indicates a potentially effective way to do trauma work or when working clients with anxiety or difficulty expressing emotions. This may be a defensive or protective/adaptive mechanism in retrieving memory details when expressing more intensive feelings. For bilingual clients, it might be easier to discuss certain topics in their second language before clients are ready to discuss details or further explore their emotional reactions that contain unpleasant or difficult feelings. In addition, it is possible that the underlying mechanism of code-switching phenomenon might be generalized to other therapeutic techniques such as play therapy, art therapy or other symbols or creative activities that help people express emotions when experiencing intense emotional arousal.

Lastly, we hope this study provides some faith in encouraging bilingual therapy and showing some effectiveness of emotional expression in autobiographical story telling process via tele-health. It happens that our research methodology shared some similarities in a most published paper (Ronen-Setter & Cohen, 2020) suggesting ways to make tele-therapy therapeutic borrowing an Accelerated Experimental Dynamic Psychotherapy (Fosha, 2000). They suggested the main means for creating change is to help client to be in contact with their emotional

experiences (Fosha, 2000); and the therapeutic process is to create affective changes and to work through defensiveness of avoiding emotions such as fear, anger, and sadness. Mechanisms drawn on in our study suggested that since more emotional words were expressed in Chinese, using first language could potentially help enhance affective changes; and if second language usage serves as a defensiveness or distancing from emotion when there is increased emotional intensity arousal, therapists need to pay attention to this code-switching phenomenon (tracking moment-by-moment process) and help create a safe environment for clients and engage them to be in more contact with their emotions (Ronen-Setter et al., 2020).

Conclusion

Emotional expression and memory retrieval in bilingual therapy are complicated processes. We attempted to understand how different language usage impacts bilinguals expressing their emotions when recalling autobiographical memory. We examined the mechanism of this process as well as the involving factors using both subjective and objective measures. It looks like coordinate bilingual Chinese international studies in our study generated different emotional expression in story-telling using Chinese and English, and such relation was also affected by English fluency level. Features of autobiographical memories also appeared to be different regarding vividness and aroused intensity expressed in the two languages. However, it is still unclear how these relations will remain same or different depending on the match/mismatch between the encoding language and retrieval language; and how proficiency level affects relations between language usage and recalled memory features. In addition, evoked emotional intensity of memory itself also served as a critical factor in emotion expression process.

We hope to provide more knowledge and research evidence to help understand bilingual

therapy as well as emotion expression and autobiographical memory recall process. We hope this study will help contribute to bring more equity of health care for marginalized groups of international students or immigrants as well as cultivate an environment and bring more effectiveness and outcomes of psychotherapy services.

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Appendix A
Autobiographical Memory Recall Task – Language A

In your [first or second] language, please describe an emotional event that you remember vividly. In this condition, you will describe an experience you had in the past that made you FEEL NEGATIVE ABOUT, including emotions, but are not limited to feelings, such as: anger, sadness, frustration, guilt, shame or fear. Please describe the event with as many details as you can recall. I will now give you one minute to recall the memory.

Please ONLY USE (Chinese or English) when you describe the event. You have five minutes in total to tell the story. Take your time. And please try your best to give many details as you can remember. When you finish the story, please show your hand to the researcher. Your voice will be recorded while you are telling the story. If you ever find recalling such memory makes you feel extremely uncomfortable, please feel free to stop at any point. Ready? Please start.

请使用你的（第一或第二）语言来描述一段让你印象深刻的有感触的事件。在这一情境中，你将描述一段发生在过去让你感到消极的经历， 包括但不限于以下这些感受，例如：愤怒，悲伤，沮丧，内疚，羞耻或者恐惧。请尽量多得去描述你能够想起来的细节。你有一分钟的时间去回忆这段记忆。

请只使用刚才第一个抽到的语言去描述这一经历。你总共有 5 分钟来描述这一事件。请花时间分享足够多的你记得的细节。当你结束讲述，请举手示意研究员。 你的声音以及所讲的故事会被记录下来。如果你感到唤起这些回忆令你感到非常不舒服，请及时停止。当你结束时，请举手示意研究员。 准备好了吗？请开始。

Appendix B

Autobiographical Memory Recall Task – Language B

In your [opposite] language, please RE-TELL the story you just shared. As with the first story, please describe the event with as many details as you can recall. I will now give you one minute to recall the memory.

Please ONLY USE (Chinese or English) when you describe the event. You have five minutes in total to tell the story. Take your time. And please try your best to give many details as you can remember. When you finish the story, please show your hand to the researcher. Your voice will be recorded while you are telling the story. If you ever find recalling such memory makes you feel extremely uncomfortable, please feel free to stop at any point. Ready? Please start.

在这一情境中，你将使用（另一）语言，重新讲述你刚才分享的故事。 同第一个故事相同，请尽量多描述你能够想到的相关细节。你有一分钟的时间去回忆这段记忆。

请只使用刚才抽到的第二个语言去描述这一经历。你总共有 5 分钟来描述这一事件。请花时间分享足够多的你记得的细节。当你结束讲述，请举手示意研究员。 你的声音以及所讲的故事会被记录下来。如果你感到唤起这些回忆令你感到非常不舒服，请及时停止。当你结束时，请举手示意研究员。 准备好了吗？请开始。

Appendix C
Emotion Intensity Rating Scale

1. Please identify up to three major emotion(s) you expressed in the story you told using Chinese/English. What are they/is it? Please list them/it.

   1) _____

   Please circle a rating on the intensity for each feeling you expressed from 1 (least intense) – 10 (most intense) as how strongly you felt about it.

   1 2 3 4 5 6 7

   2) _____

   Please circle a rating on the intensity for each feeling you expressed from 1 (least intense) – 10 (most intense) as how strongly you felt about it.

   1 2 3 4 5 6 7

   3) _____

   Please circle a rating on the intensity for each feeling you expressed from 1 (least intense) – 10 (most intense) as how strongly you felt about it.

   1 2 3 4 5 6 7

2. How difficult is it for you to express these emotions in English on a rating from 1 – 10? Please circle one.

   1 2 3 4 5 6 7 8 9 10

3. How difficult is it for you to express these emotions in Chinese on a rating from 1 – 10? Please circle one.

   1 2 3 4 5 6 7 8 9 10

Appendix D
Bilingualism and Emotion Questionnaire

A. Linguistic information

1. On the scale from 1 (least proficient) to 10 (fully fluent) how do you rate yourself in each of the scales in the two the languages you use?

	Speaking	Comprehension	Reading	Writing
Chinese				
English				

2. What order did you learn your first and second languages? Was acquisition naturalistic (outside of school/in family), instructed (at school), or both?

	Language	Age starting learning the language	Context of Acquisition
1st language L1			
2nd language L2			

3. Which do you consider to be your dominant language(s)?

B. Background Information

All information will be kept confidential.

4. Gender
5. Age
6. Ethnicity
7. Education level (highest diploma or degree)
8. Years in the U.S.
9. Occupation/Profession
10. Is your major/occupation related to your bilingualism or languages in any way

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C. Languages and Emotions

11. If you are angry, what language do you typically use to express your anger? Please circle one for each.

A. English Never Rarely Sometimes Frequently All the time Not applicable

B. Chinese Never Rarely Sometimes Frequently All the time Not applicable

12. If you swear in general, what language do you typically swear in? Please circle one for each.

A. English Never Rarely Sometimes Frequently All the time Not applicable

B. Chinese Never Rarely Sometimes Frequently All the time Not applicable

13. What language do you express your deepest feelings in? Please circle one for each.

A. English Never Rarely Sometimes Frequently All the time Not applicable

B. Chinese Never Rarely Sometimes Frequently All the time Not applicable

14. Is it easier or more difficult for you to talk about emotional topics in your second language? If there is a difference, could you tell us about that and perhaps provide some examples?

15. If you were to recall some bad or difficult memories, what language would you prefer to discuss them in and why?

Appendix E
Affective Norms for English Words – Short Revised (ANEW-SR)

A: abduction, abortion, absurd, abundance, abuse, acceptance, accident, ace, ache, achievement, addict, addicted, admired, adorable, adventure, affection, afraid, aggressive, agony, agreement, alcoholic, alert, alimony, alive, allergy, alone, ambition, ambulance, anger, angry, anguished, annoy, anxious, applause, aroused, arrogant, assassin, assault, astonished, athletics, avalanche, awed

B: Baby, bankrupt, bastard, bath, beach, beast, beautiful, bed, bees, betray, bird, birthday, blackmail, blasphemy, bless, blind, blister, bloody, blossom, blubber, body, bold, bomb, bored, bouquet, brave, bride, bright, broken, brother, brutal, bullet, bunny, burdened, burial, burn, butterfly

C: cake, cancer, cane, capable, car, carcass, carefree, caress, cash, casino, cell, cemetery, champ, champion, chaos, cheer, child, Christmas, circus, cliff, cockroach, coffin, color, comedy, comfort, confident, confused, controlling, corpse, corrupt, couple, coward, cozy, crash, crime, criminal, crisis, crucify, crude, cruel, crushed, crutch, cuddle, curious, cut, cute, cyclone

D: dagger, damage, dancer, danger, dazzle, dead, death, debt, deceit, defeated, defiant, deformed, delayed, delight, demon, dentist, depressed, depression, deserter, desire, despairing, despise, destroy, destruction, detached, detest, devil, devoted, diamond, dignified, dinner, diploma, dirty, disappoint, disaster, discomfort, discouraged, disdainful, disgusted, disloyal, displeased, distressed, disturb, divorce, doctor, dog, dollar, dreadful, dreary, drown, dummy, dump, dustpan

E: earth, easy, easygoing, eat, ecstasy, education, elated, elegant, embarrassed, engaged, enraged, enjoyment, erotic, evil, excellence, excitement, execution, exercise

F: failure, false, fame, family, famous, fantasy, fascinate, fat, father, fatigued, fault, fear, fearful, feeble, festive, fever, fight, filth, fire, fireworks, flabby, flirt, flood, food, foul, fraud, free, freedom, friend, friendly, frigid, frustrated, fun, funeral

G: game, gangrene, garbage, gentle, germs, gift, gloom, glory, God, gold, good, gossip, graduate, grateful, greed, grenade, grief, grime, grin, gripe, guillotine, guilty, gun

H: handicap, handsome, happy, hardship, hate, hatred, headache, heal, heart, heaven, hell, helpless, hinder, hit, holiday, home, honest, honor, hope, hopeful, horror, hospital, hostage, hostile, house, hug, humiliate, humor, hungry, hurricane, hurt

I: idea, idiot, ignorance, illness, imagine, immature, immoral, impair, impotent, impressed, improve, incentive, infatuation, infection, inferior, injury, insane, insecure, inspired, insult, intercourse, intimate, intruder, invader, irritate

J: jail, jealousy, jewel, joke, jolly, joy, joyful, justice

K: killer, kind, kindness, king, kiss, knife, knowledge
L: laughter, lawsuit, leader, learn, leprosy, liberty, lice, lie, life, lightning, lion, lively, loneliness, lonely, loser, lost, louse, love, loyal, lucky, luscious, lust, luxury

M: mad, madman, maggot, magical, mail, malaria, malice, mangle, maniac, manure, massacre, masterful, masturbate, measles, meek, melody, memories, menace, merry, messy, mighty, mildew, millionaire, miracle, mischief, misery, mistake, mold, money, moody, morbid, morgue, mosquito, mother, mucus, murderer, music, mutation, mutilate

N: naked, nasty, nature, needle, neglect, nervous, nightmare, nipple, noisy, noose, nude, nuisance

O: obesity, obnoxious, ocean, offend, outdoors, outrage, outstanding, overcast, overwhelmed

P: pain, palace, panic, paralysis, party, passion, peace, penalty, penis, penthouse, people, perfection, pervert, pest, pillow, pinch, pistol, pity, plane, pleasure, poison, politeness, pollute, poverty, power, powerful, pressure, prestige, pretty, prick, pride, prison, profit, progress, promotion, protected, proud, pungent, punishment, puppy, pus, putrid, python

Q: quarrel, quick

R: rabies, rage, rape, rat, refreshment, regretful, rejected, relaxed, rescue, resent, respect, respectful, reunion, revolver, reward, riches, ridicule, rifle, rigid, riot, roach, robber, rollercoaster, romantic, rotten, rude

S: sad, safe, sailboat, sapphire, satisfied, savior, scalding, scandal, scapegoat, scar, scared, scholar, scorching, scorn, scornful, scorpion, scream, scum, scurvy, seasick, secure, selfish, severe, sex, sexy, shamed, shark, shotgun, shriek, sick, sickness, silly, sin, sinful, sissy, ski-jump, sky, skyscraper, slap, slaughter, slave, sleep, slime, slow, slum, smallpox, snake, snob, snow, snuggle, soft, song, soothe, sour, spanking, spider, spirit, spouse, spring, star, startled, starving, stench, stink, storm, stress, strong, stupid, success, suffocate, sugar, suicide, sun, sunlight, sunrise, sunset, surgery, surprised, suspicious, sweetheart, syphilis

T: talent, tease, tense, termite, terrible, terrific, terrified, terrorist, thief, thorn, thoughtful, timid, tobacco, tomb, toothache, tornado, torture, toxic, toy, tragedy, traitor, trash, trauma, travel, treasure, triumph, triumphant, trophy, trouble, troubled, truth, tumor, twilight

U: ugly, ulcer, unfaithful, unhappy, untroubled, upset, urine, useful, useless

V: vacation, vagina, valentine, vampire, vandal, venom, victim, victory, vigorous, violent, virgin, volcano, vomit, voyage

W: war, warmth, wasp, waste, waterfall, wealthy, weapon, weary, wedding, whore, wicked, win, wise, wish, wit, wounds

Y: yacht, young, youth

Z: zest

Appendix F
Affective Norms for Chinese Words – Short Translation (ANEW-ST)

A： 癌症，爱，安全的，安慰(缓解)，傲慢的，懊恼，暗杀者

B： 白蚁，百万富翁，宝石，抱怨，暴风雨，暴乱，暴力的，暴怒(狂怒)，绑架，棒(极好的/绝妙的)，悲惨的，悲痛(伤心)，悲剧(悲惨的事)，背叛，被保护的，被打败的，被拒绝的， 笨蛋，崩溃(压垮)，鼻涕，匕首，鄙视，毕业，变异，簸箕，病，病态的，不安全的，不道德的，不满意的，不受欢迎的人，不受约束的，不舒服的，不幸福的，不忠诚的，不忠实(信实)， 步枪

C：财宝，财富，才思，嘲笑，吵闹(嘈杂)，残暴的，残缺(残废)， (较)差的(低等的)，车，成功，成就，惩罚，诚实，吃，痴迷(迷恋)，吃惊， 仇恨（憎恨），丑陋的，丑闻，臭气，(有)臭味的，充裕(丰盛)，处罚(惩处)，处女，处决，床，创伤，春天，刺鼻的，粗鲁，粗略的， 摧毁，错的，错误

D： 大胆的，大获全胜，打屁股，蛋糕，胆怯的，刀，敌对的，地球，地狱，订婚，丢弃，丢失(迷失)的，动物尸体，断头台，独自，妒忌的，毒药，毒性的(有毒的)，毒液，赌场，堕胎

E： 饿死了，噩梦，恶魔，恶意，恶心的，儿童(小孩子)

F： 发烧，帆船，烦恼的，反抗，犯罪活动，房子，放松的，肥料，肥胖的，肥胖症，坟墓，愤恨，愤慨，愤怒，疯狂，疯子，腐臭的， 腐烂的，腐蚀，负担，父亲，富裕，抚摸

G：改进，高潮，高兴，干扰(打扰)，尴尬的，感激的，感染，歌曲，宫殿，攻击性的(好斗的)，公正，狗，孤独，拐杖，棺材(棺椁)，冠军，过山车， 滚烫的，果断的，过错，过敏

H：海洋，害虫，害怕(担心)，寒冷的，豪华套房，好的，好奇的，航行，和平，洪水，忽略(忽视)，蝴蝶，户外，花朵，欢呼， 灰心丧气，喝彩鼓掌，火，火山，活力的，坏疽，坏血病，缓慢的，荒唐的，黄蜂，黄昏暮色，谎(说谎)，毁灭，毁坏的，幻想，婚礼，混蛋，混乱

J: 饥饿的， 激动，激励，激情， 击打，畸形(变形的)，疾病，棘刺，寂寞的，妓女，记忆，家，家庭，假的，假期(度假)，骄傲的，焦虑(忧虑)，交通事故(撞车)， 艰难，教育，叫声，尖叫，监狱，健壮， 奖杯，奖励，接纳(接受)，杰出，节假日，金，紧张的，(神经)紧绷，进展，精神(心灵)，精神错乱，精神压力，惊恐，惊讶的，惊吓，惊惧，警惕，敬佩，敬畏的，救护车， 救援，救主(拯救者)，巨大非凡的(大有能力的)，沮丧的，飓风，聚会，惧怕，绝招，绝望的，君主(国王)

K：凯旋，看守所，可爱的，可靠的，可疑的，可怕的，恐怖，恐惧，恐怖分子，(有)控制欲的，枯燥沉闷的，酷热的，快乐的，快速(迅速)，快艇，狂犬病，狂热分子，溃疡，困惑的

L： 垃圾，(生活)垃圾，老鼠，蓝宝石，浪费，浪漫的，乐趣，冷酷(残忍)，冷漠的，离婚，礼物，利润，咧嘴笑，猎枪，凌乱的，领导者(领袖)，令人作呕的，龙卷风，搂抱，裸露的，裸体的，旅行

M：麻烦，麻烦事，麻风，麻疹，马戏团，埋葬，满意的(满足的)，冒犯，冒险，蟒蛇，梅毒，霉菌，美丽的，美味可口的，没有烦恼的，蜜蜂，蔑视的，明亮的，名声，魔鬼，摩天大楼，模具，母亲，墓地(坟地)

N：难过(悲伤、哀伤)，难闻的，恼火，恼怒(烦人)，内疚的，能力(权利)，鸟，尿(小便)，年轻的，粘液，脓，奴隶，怒气(怒火)，虐待，疟疾，懦夫(胆小鬼)

O： 呕吐

P：拍打，叛徒，配偶，朋友，疲劳，疲倦，漂亮，贫穷，贫民窟，迫不及待，破产倒闭， 破坏公物者，破损的，瀑布

Q：(受)启发的，枪，强盗，强奸，强壮的，敲诈勒索，奇迹，奇妙有魔力的，欺骗，欺诈，起诉，掐，桥，钱，惬意的，切割，侵犯，侵略者，亲爱的，亲吻，亲密的， 青春，轻蔑，轻蔑的，情人，情绪多变，蛆，取笑，全心全意的

R： 燃烧，热情，人，仁慈的(和善的)，人质，日出，日落，容易的，荣幸(尊荣)，荣耀(荣誉/辉煌)，柔软，入侵者，乳头

S： 杀人犯(凶手)，鲨鱼，傻的，闪电， 沙滩，善良，伤疤，伤口，上帝(神)，色情的(情欲的)，蛇，奢侈，身体，深思的，生病，生活费，生气的，生理缺陷，生命，生机/生气勃勃的，生日，声望，圣诞节，胜利，狮子，虱子，失败，失望，尸体，食物，势利小人，手枪，手榴弹，手术，手淫，受害者，受伤，舒服，输家，舒适温暖的，水疱，睡，死板的，死的，死亡，松弛的，随和的，损坏，酸的

T： 太阳，太平间(停尸间)，瘫痪，贪婪，贪污腐败的，陶醉，套锁，逃兵，淘气，讨厌，讨人喜爱的，糖，疼，痛，疼痛，藤条，提升，替罪羊，调情，跳台滑雪，天赋(天资)，天花，天空，天堂，同情，(极度)痛楚，痛苦， 调皮， 头痛，屠杀，屠宰，兔子，团聚，

W：完美，玩笑，玩具，危机，危险，危险人物， 温暖，温柔的，温顺的，文凭，蚊子，污秽，污染，污垢， 侮辱，无能的，无知，无助的，无忧无虑的，无用的，舞者，武器

X： 杀人者(杀手)，希望，吸引，吸血鬼，喜爱，喜庆的(节日气氛的)，喜乐，喜悦的，喜剧，(满怀)希望的，洗澡，细胞，细菌，瞎眼的(失明/盲)，吓人的， 娴熟的，闲言碎语，现金，笑声，小狗，小偷(窃贼)，想象，蝎子，邪恶，亵渎(神明)，心，星，兴奋，兴高采烈，性，性感的，性交，幸运的，兄弟(弟兄)，羞耻的，羞辱，虚弱的，旋律，悬崖，削弱，旋风，学习，学者，血腥的，雪，雪崩(山崩)

Y：(心理)压力， 压碎，牙痛，牙医，淹(溺水)，烟蒂，烟草，烟花，严惩，严重恶劣的，延迟的，颜色，眼花目眩，厌倦的，厌恶，阳光，野兽，医生(大夫)，医院，遗憾(后悔)，音乐，阴道，阴茎，阴柔(柔弱)，阴郁，阴天的，饮料小吃，瘾君子，赢(胜)， 一对夫妻情侣，一致同意，依偎，意外事故(不测)，抑郁症， 婴儿(宝贝)，英俊的，拥抱，勇敢的，忧虑的，忧郁的，幽默，优秀的，优雅的，邮件，游戏，友好的，有才能的，有好印象的，有礼貌，有权势的，有用的，幼稚的(不成熟的)，愚蠢的，娱乐，愉快，愉悦的，欲望，元，晕船，运动

Z：灾难，糟糕的，脏的，葬礼，憎恶的，扎，炸弹，渣滓，着迷，战斗，战争，债务，蟑螂，折磨，针，真相，枕头，争吵，正餐，知识，蜘蛛，智慧的(明智的)，(鲸鱼/动物)脂肪，窒息， 志向抱负(雄心)，治愈，忠诚的，肿瘤，主意(想法)，祝福，祝愿(但愿)，著名的(出名的)，庄重的，子弹，自然，自杀，自私，自信的，自由，自由权，阻碍，罪，罪恶的，罪犯，尊敬的，尊严，尊重，钻石， 左轮手枪

Appendix G
Memory Experiences Questionnaire – Short Form (MEQ–SF)

Concerning contexts of these two memories,

1) When did the one in Chinese happened? Where did it happen?

2) When did the one in English happened? Where did it happen?

From 1 – 5 from least applicable (1) to most applicable (5), please give a rating on each of the following items based on your experiences and the memory you expressed earlier in the study.

VIVIDNESS

1. My memory for this event is very vivid.

2. My memory for this event is very detailed.

3. My memory for this event is dim.

EMOTIONAL INTENSITY DISTANCING

1. My emotions are very intense concerning this event.

2. The memory of this event evokes powerful emotions.

3. This memory does not evoke strong emotions in me.

DISTANCING

1. I feel like the person in this memory is a different person than who I am today.

2. When I recall this memory, I think, "that's not me anymore."

3. I feel like I am the same person in the memory as I am today.

VALENCE

4. The overall tone of the memory is positive.

5. The overall tone of the memory is negative.

Appendix H

Informed Consent to Video Taping & Information Letter

You are invited to participate in a research study to examine memory recall phenomenon among bilinguals. You are invited to participate because you self-identify as a bilingual. This study is conducted by Haidi Song for her doctoral dissertation.

What will be involved if you participate? Your participation is completely voluntary and anonymous. If you decide to participate in this research study, you will be asked to complete several surveys regarding bilingualism and memory recalling. You will also be asked to take video recordings and to complete two tasks by telling a story that involves some negative emotions. It will take approximately an hour to complete.

Are there any risks or discomforts? There might be a potential risk to break confidentiality since we are taking video recordings. However, we will take efforts to avoid such risks by securely store your data. Only IRB-approved researchers will get access to these documents. Data will be kept for 2 years upon completion of data analyses.

In addition, you might experience some psychological discomfort by recalling a memory that involves negative emotions. However, if the story involves trauma history, please let the researchers know and you are not eligible for this study. Also, you may feel free to stop whenever it is overwhelming for you to continue; and to use the resources provided on the debriefing form if you need.

Are there any benefits to yourself or others? You will get a $10 gift card for your participation. Your participation will also help us to better understand the relation between language use and memory recall.

Are there any costs? If you decide to participate, you will not have any costs other than your time.

If you change your mind about participating, you can withdraw at any time without penalty. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the Department of Special Education, Rehabilitation, and Counseling or the investigators involved in this study.

Any survey data obtained in connection with this study is anonymous. Your audios and the written information collected through your participation will be recorded and transcripts to be used in later data analysis and in Haidi Song's doctoral dissertation. This information may also be used to present at a professional meeting and/or published in a professional journal without any identifiable information.

If you have questions about this study, please contact Haidi Song via email at hzs0051@auburn.edu.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Research Compliance or the Institutional Review Board by phone at (334) 844-5966 or email at IRBadmin@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. YOU WILL BE GIVEN A COPY OF THIS FORM FOR YOUR RECORD.

Thank you.

The Auburn University Institutional Review Board has approved this document for use from _____ to _____. Protocol #_____

During your participation in this research project, you will be asked to complete a task using both Chinese and English to tell a same story happened to you. You will be video recorded. Your signature on this Consent Form gives us permission to do so.

Your signature on this document gives us permission to use video recording devices to record your images and voices as well as the information you give to us. The information you give through the experiment will be used to complete investigator's doctoral dissertation, and may potentially be used to present at professional conferences or in publications to help the field and the public better understand and learn such topic on bilingualism and memory recall. These data will be kept safely by the investigator at Auburn University for 2 years, only for the purpose of study of investigator's dissertation study.

Your permission:

I give my permission to be audio-taped during the study and I understand such information will be used for the purposes listed above, and to also be retained for 2 years.

_____	_____
Participant's Signature Date	Investigator's Signature Date
_____	_____
Participant's Printed Name	Investigator's Printed Name

Appendix I
Debriefing Form

Dear Participant;

During this interview, you were asked to answer questions regarding your language use and negative memory recall.

You are reminded that your original consent document included the following information:

1. Your video recordings and the information collected through your participation will be used to complete investigator's doctoral dissertation.
2. Information might also be used to present at a professional meeting and/or published in a professional journal with de-identification.

If you have any concerns about your participation or the data you provided in light of this disclosure, please discuss this with us. We will be happy to provide any information we can to help answer questions you have about this study.

If your concerns are such that you would now like to have your data withdrawn, we will do so.

If you have questions about your participation in the study, please contact Haidi Song via email at hzs0051@auburn.edu.If you have questions about your rights as a research participant, you may contact the Office of Research Compliance (334-844-5966, IRBadmin@auburn.edu or an Auburn University Institutional Review Board (IRBChair@auburn.edu).

If you experience distress as a result of your participation in this study, a referral list of mental health providers is attached to this document for your use. (**Please remember that any cost in seeking medical assistance is at your own expense**.)

Please again accept our appreciation for your participation in this study.

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Name Date

Mental Health Resources List

East Alabama Mental Health	Opelika, AL	Phone Number: (334)742-2701
		(After hour): 334-742-2877
	Phenix City, AL	Phone Number: (334)298-2405
	Valley, AL	Phone Number: (334)756-4117
Alabama Psychiatry & Counseling	Birmingham, AL	Phone Number: (205)440-6292
Alabama Psychiatric Services	Montgomery, AL	Phone Number: (334)409-9090
	Mobile, AL	Phone Number: (251)633-7830
	Cullman, AL	Phone Number: (256)739-4910
	Huntsville, AL	Phone Number: (256)533-9393
	Fairhope, AL	Phone Number: (251)517-8150
	Dothan, AL	Phone Number: (334)793-1964
Southwest Alabama Mental Health	Evergreen, AL	Phone Number: (251)578-4545
	Brewton, AL	Phone Number: (251)867-3242
	Monroeville, AL	Phone Number: (251)575-4203
South Central Alabama Mental Health Center	Andalusia, AL	Phone Number: (334)222-2523
Northwest Alabama Mental Health	Jasper, AL	Phone Number: (205)302-9000
Mary S. Harper Geriatric Psychiatry Center	Tuscaloosa, AL	Phone Number: (205)759-0900
West Alabama Mental Health	Demopolis, AL	Phone Number: (334)289-2639
	Greensboro, AL	Phone Number: (334)624-4520
Chilton-Shelby Mental Health Center	Calera, AL	Phone Number: (205)340-8079
	Clanton, AL	Phone Number: (205)755-5985
Capital Care South	Irondale, AL	Phone Number: (205)340-8065
Behavioral Sciences of Alabama	Huntsville, AL	Phone Number: (256)883-3231

Appendix J

Recruitment Email Flyer

Dear ,

My name is Haidi Song, and I am currently a fifth-year doctoral student in the counseling psychology program at Auburn University. I am doing a research project on language use and emotional expression among bilinguals who are fluent in both Chinese and English. I would like to invite you to participate in our study. The research will build knowledge to understand how language usage affects emotional expression.

Your survey responses will be anonymous and data from the research will be reported only in the aggregate. Dr. Evelyn Hunter is the faculty advisor of the project, which is approved by the Auburn University IRB (protocol #) through xx/xx/xxxx. Please email hzs0051@auburn.edu if you have any questions about the project.

Below is the link of our study survey. If you would like to participate, please click it or copy and paste it into a web browser:

If you have any questions or concerns about the study, please contact me using the information provided below.

With sincere regards,

Haidi Song, M.A.
Doctoral Student
Telephone: 334.844.7068
Email: hzs0051@auburn.edu
Department of Special Education, Rehabilitation, & Counseling
Auburn University