An investigation of Korean learners' difficulties in using English intonation to express emotion: Perception and production

by

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ABSTRACT

The present study investigated whether Korean English as a Foreign Language learners experience difficulties in using English intonation particularly to perceive and express emotion. The difficulties are examined in both perception and production of emotional intonations by comparing the differences in the emotional responses of Korean English as Foreign Language learners and native speakers to the presented emotional declarative sentences. Based on Core Affect theory, the construct of emotion was operationalised on a two-dimensional matrix: *valence* (positive vs. negative) and *intensity* (strong vs. weak). A combination of the Autosegmental Matrix Model and Halliday's tone models were adapted to analyse intonation patterns. The study conducted a three-phase data collection process: (a) Phase 1: conducting an emotion word rating survey, (b) Phase 2: conducting a production task, a brief stimulated interview, and a perception task for American undergraduate participants (c) Phase 3: conducting the same production task, stimulated recall task, and perception task for Korean students. The results of the current study provided empirical evidence that Korean English as Foreign language learners experience difficulties in using English intonation to express emotions. The results of this study showed that on the word perception level, Korean participants experienced a lesser degree of emotional valence when reading emotion words compared to the American group. Korean students also were less likely to recognise English prosodic cues as semantic components when they listen to emotional utterances. On the production level, Koreans also used a different parsing pattern and utilised a narrower range of pitch variations, which can contribute to diminishing the pragmatic force of their spoken messages. Korean students also tended to recall contexts that were less personal and specific when producing emotional utterances. All these aspects led to Korean students' pragmatic difficulties in communicating emotion in English.

The study, therefore, calls attention to the need for the teaching of intonation patterns to express emotions, which in turn may help learners to take more ownership of using English for internal and emotional use.

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CHAPTER 1

INTRODUCTION

1. 1 Research rationale

Pragmatic competence, which is defined as "the ability communicate your intended message with all its nuances in any socio-cultural context and to interpret the message of your interlocutor as it was intended (Fraser, 2010, p. 15), is imperative for effective communication because spoken messages contain intentional and emotional information in addition to semantic content (Buck, 1984). The emotional information, which conveys the subtle nuances of the meaning and intentions of the message, is expressed through various verbal and nonverbal channels such as words, sounds, gestures, or facial expressions. Apart from the complex mechanisms of kinesics, the emotional message in speech communication is delivered through two channels: words and vocal cues (Buck, 1984; Pell, Jaywant, Monetta, & Kotz, 2011). The former carries semantic content that refers to emotional states while the latter adds information about the speaker's intention through the acoustic parameters of intonation and pitch.

Effective integration of verbal and vocal cues for expressing emotions is vital for successful oral communication (Pell et al., 2011). The ability to make use of effective word choice as well as the use of prosodic cues helps speakers to communicate their intentions and emotions better. Speakers who understand the connotations of words correctly are more likely to choose the most 'appropriate' words in different situations. Utilising prosodic features also plays a key role in emotional speech because cues can alter the meaning of words and sentences. For instance, making a positive statement in a negative tone is often interpreted as sarcasm (Cheang & Pell, 2008). The use of intonation for expressing intentions is also an important paralinguistic factor for communicative competence, especially for

second language learners (Celce-Murcia, Dörnyei, & Thurrel, 1995; Min & Schirmer, 2011). What may be particularly challenging, however, is when the intonational system of the target language and that of the first language differ significantly (Pell & Skorup, 2008).

This is the case for adult Korean learners of English. Studies in speech comprehension support the argument that in the English language, the two acoustic features of intonation, namely the utterance pitch range and the contour of intonation, generally contribute to determining the degree of positiveness or negativeness of the utterances when the syntactic and semantic features of the utterances coincide (Murray & Arnott, 1993; Protopapas & Lieberman, 1997; Scherer, 2003). The measure of fundamental frequency (F0), the lowest frequency of a periodic sound waveform of a speaker, signals the degree of the speaker's positive or negative intention in English. A higher fundamental frequency (F0) with more inflections signals positiveness whereas an intonation with a lower F0 and fewer inflections signals negativeness (e.g. Weger, Meier, Robinson, & Inhoff, 2007). Simply put, more skilled English users are likely to utilise pitch variations to express emotional intentions.

In Korean, on the other hand, the characteristics of F0 or the intonation contour have a minimal influence on the positive or negative cues. The number of syllables and the location of the words in a sentence decide the overall intonation contour and the range of F0 when the sentence type is the same (Kim, Yu, Hong, & Lee, 2007). Korean learners of English, therefore, can be expected to experience difficulties expressing and perceiving emotional contents conveyed with English intonations. When communicating with native English speakers, for example, they may seem 'emotionless' or 'insincere' due to their own neutral and monotonous intonations. At times, they also misinterpret the emotional cues conveyed in their interlocutor's intonations. These pragmatic difficulties, however, have been treated as a rather tacit agreement instead of being systematically studied.

Currently, there is a growing interest in emotions as a primary factor in spoken language in the fields that study emotion and verbal communication. For instance, in the field of psycholinguistics, neurolinguistics, and computational linguistics, the differences in processing between neutral and emotional speech (e.g. Friedrich, Kotz, Friederici, & Alter, 2004; Min & Schirmer, 2011; Scherer & Larsen, 2011), the neural bases that involve emotional speech (e.g. Dmitrieva & Gelman, 2012; Pell & Baum, 1997), and the acoustic characteristics of emotional speech (e.g. Banse & Scherer, 1996 ; Lieberman & Michaels, 1962; Murray & Arnott, 1993; Protopapas & Lieberman, 1997) have been investigated. The results of these studies support the claim that emotional speech is distinctive from neutral utterances, and that there are 'emotional intonations' that are acoustically identifiable. Drawing on scientific support from these results, the present study aimed to investigate whether adult Korean learners of English have pragmatic difficulties in perceiving and expressing emotional content conveyed in English intonations.

The contributions that this study will make to the existing body of literature is twofold. First, it examines emotional speech in second language use, an area rarely visited in the field of Second Language Acquisition (SLA). Studies show that L2 learners experience detachment when they use the L2 for expressing and understanding emotions (Altarriba & Canary, 2004; Segalowitz, Trofimovich, Gatbonton, & Sokolovskaya, 2008) This emotional distance between second language learners and the L2 can result in some unfortunate or even harmful consequences in critical situations, such as during a counseling session or an emergency visit to the hospital (Altarriba & Santiago-Rivera, 1994; Santiago-Rivera & Altarriba, 2002). Although English as a Foreign Language (EFL) learners may only rarely encounter such serious environments where communicating emotions is vital, the ability to effectively deliver intentional elements is also crucial in other contexts, such as striving towards academic and career goals. Despite the crucial role of emotion in communication, the

emotional dimension of second language learning has been underemphasised. Due to its subjectivity, researchers and practitioners in SLA have abstained from including the communication of emotional contents in the curriculum (p. 375, Dewaele, 2005). This is why the use of intonation to express intention, in particular, has been largely excluded in teaching ESL and EFL learners. Most English communication curriculum includes conversation scripts that resemble everyday communications or instructs on how to use pitch variations in English to distinguish different types of sentences, such as declaratives or tag questions. It seldom teaches students the intentional elements of using intonation. Applied research on the use of emotional intonation in second language learning, therefore, may enrich our understanding of L2 learners' pragmatic difficulties in using English intonation, which in turn would lead to improved curricula for incorporating elements of emotional communication.

Second, this study investigates the difficulties that Korean learners encounter in communicating emotional information when using English intonation at the sentence level. Most studies investigating emotional speech have constructed short segments of speech such as words or phrases for the experiments (e.g. Kitayama & Ishii, 2002; Min & Schirmer, 2011). Although these experiments provide insights about emotion and language, they rarely mirror real life utterances. The present study, therefore, chose to use emotional sentences that are actually used in English-speaking countries (e.g. '*She is happy*' or '*She is angry*'). These sentences do not convey ample contextual information, so for this very reason, participants were assumed to focus on the emotional words embedded in each sentence. Additionally, differences observed between American students and Korean EFL students in using emotional intonation support the argument that Korean EFL students experienced difficulties even in using a simplistic pattern of emotional intonation.

1. 2 Organisation of the thesis

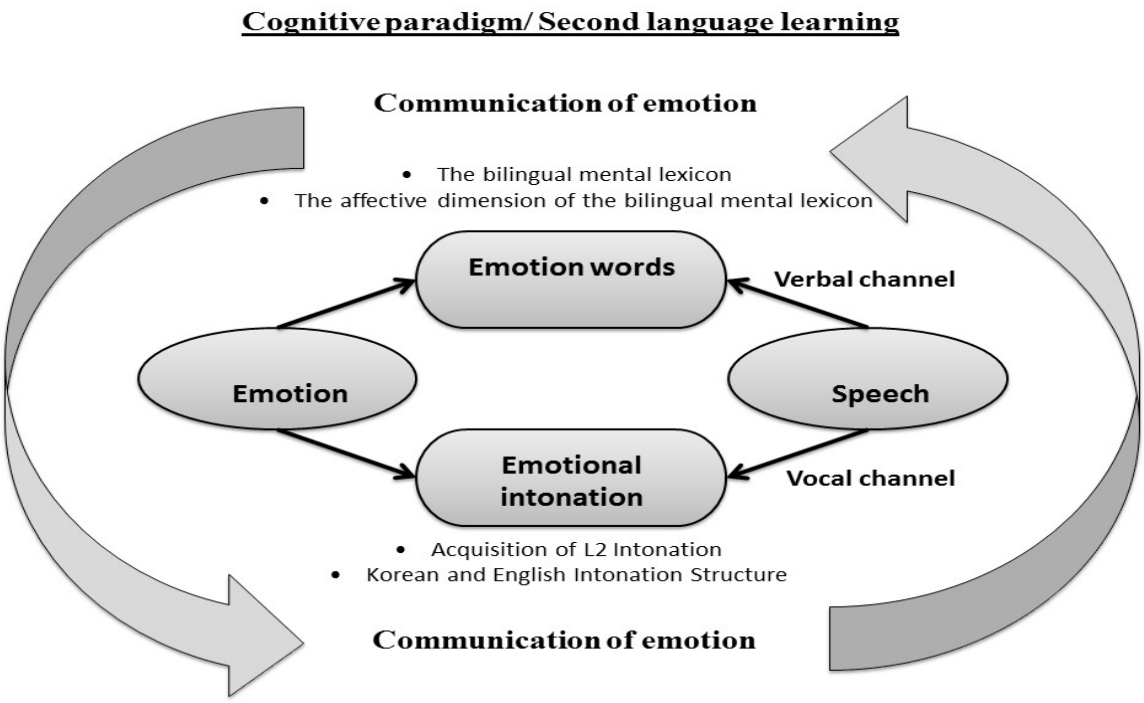
The next chapter, Chapter 2, draws on multiple literatures to present the theoretical underpinnings of the present study. It is categorized into four sub-sections: emotion, the bilingual mental lexicon, emotion words, and emotional intonation, which feed into the research questions. Next, Chapter 3 unfolds the detailed methodological procedure: the main three phases of the research. Five types of data - word survey data, perception data in listening, word description data, production data in speaking, and stimulated recall data - were generated to investigate Korean students' pragmatic difficulties in using English intonation in the context of communication with emotion. Chapter 4, 5, and 6 present the results of the emotion words survey, the perception tasks, and the production tasks, respectively. Chapter 7 draws the findings together and discusses the theoretical implications of this study. Finally, Chapter 8 concludes the thesis by discussing the pedagogical implications for curricula and instructional strategies to facilitate Korean students' pragmatic skills.

CHAPTER 2

LITERATURE REVIEW

This section briefly reviews the literature that is relevant to this study. The current study investigated whether Korean EFL students experience difficulties in using English intonation to perceive and express emotional contents. This research question required the review of three key concepts: emotion, emotion words, and intonation. Defining emotion was a departure point because emotional communication for EFL learners, in a broad sense, was the overarching subject of this study. The review, therefore, starts with discussing the cognitive models of emotions that are adapted to this study and then discusses the verbal and vocal channels of emotional speech. The discussion closes with highlighting the differences between the Korean and English intonation systems.

Figure 2.1
Overview of the theoretical frameworks of the current study



2.1 Cognitive theories of emotion

Emotion is an inseparable part of our being. We experience a wide range of emotions while we exist, and these experiences are real and familiar to us. However, a number of authors find that it is extremely challenging to define what emotion is. The difficulty in understanding emotional processes is mainly due to the intangible and ephemeral nature of these phenomena, which involves the unclear starting and ending point of the processes. In other words, it is simply hard to scientifically observe emotional processes. Early studies, therefore, focused on emotional processes in relation to observable physiological responses. Although these theories (e.g. the James-Lange theory, the Cannon-Bard theory of emotion) take different views concerning the direction of the causal relationship between emotion and bodily responses (Cannon, 1927), they all highlight the role of physiological reactions to external stimuli as the evidence of emotional processes. For instance, the James-Lange theory argues that physiological reactions to events cause emotions. On the other hand, the Cannon-Bard theory suggests that emotions result in physiological reactions. During the development of physiological emotion theories, therefore, cognitive-emotional interactions remained a peripheral issue in the field.

Since the 1980s, however, the main interest of emotion research has shifted to the relationship between emotion and cognition (Quinlan & Dyson, 2008). For instance, Oatley and Johnson-Laird (1987) proposed the notion of 'signal propagation' in a modular system of the mind. Signal propagation refers to emotional information indicative of an emotional state of the person sent by the controller of the mind. Thus, Oatley & Johnson-Laird (1987) incorporated affective processing (signal propagation) into the modular model of cognition.

In a similar vein, a group of researchers (e.g. Duncan & Barrett, 2007; Eder, Hommel, & Houwer, 2007; Panksepp & Watt, 2011; Russel, 2003; Schachter & Singer,1962; Scherer, 2009) have investigated emotion in relation to cognition, and these theories take different

standpoints on the extent to which emotion is distinct from cognition (Eder et al., 2007). From the view that sees emotion as a separate component of the mind to the view of emotion as a different form of cognition, cognitive emotion theories can be broadly classified into three different groups (Pavlenko, 2012): (1) Basic emotion theories, (2) Appraisal theories, and (3) Constructionist theories. These three views do not necessarily contradict each other. Rather, they highlight the different aspects of cognitive-emotional process in a different scope of definition. The key concepts of these three cognitive theories of emotion are discussed in what follows.

2.1.1 Basic emotion theories

Basic emotion theorists generally agree that there are universal emotional experiences that individuals from different cultures can commonly experience; only a few Basic emotion researchers (e.g. Ekman & Cordaro, 2011) acknowledge that emotional experiences acquired from cultural learning can develop into basic emotions. These models also support the claim that a set of discrete basic emotions is the bases of complex emotions. For instance, embarrassment (a complex emotion) is a specific manifestation of fear (a basic emotion) (Oatley & Johnson-Laird, 1992). In terms of the list of basic emotions, different researchers define a different set of basic emotion. However, they all agree that *happiness, sadness, fear,* and *anger* are basic emotions, and these emotions are considered fundamentally different from cognitive processes (Ekman & Cordaro, 2011; Pankesepp & Watt, 2011).

Although different researchers support different accounts of basic emotions, they agree on the three key features of basic emotions. First, a basic emotion should accompany physiological and somatovisceral responses as well as a distinguishable feeling. Somatovisceral responses refer to any responses related to ‘somato (body) + visceral (deep inward feelings)’ responses that *internally* occur. For instance, sweating is considered to be a

‘physiological reaction because it can be seen whereas any neural reactions caused by emotional stimuli are considered ‘somatovisceral’ reactions.

The discrete feeling also should be tested through “longstanding interaction with ecologically valid stimuli” (Tracy & Randles, 2011, p. 398.). In other words, the stimuli causing a specific basic emotion should represent the real world setting, not imaginary stimuli such as scary creatures in a novel. According to this definition, therefore, *fear* is a basic emotion because human beings have experienced *fea*r when they encounter a life-threatening danger in nature (the real word setting) throughout history and across different cultures. In addition, people generally experience physiological responses to a degree (e.g. sweating) when they are frightened; thus, *fear* is viewed as a basic emotion. However, *guilt* is not included in a set of basic emotions because feeling guilty involves subjective judgement on the stimuli. For instance, if a person values eating healthy, the person can feel guilty for eating junk food, but for those who do not place importance on healthy diet, they would not feel guilty for the same behaviour.

Secondly, basic emotions are ‘primitive’, that is, a basic emotion should be experienced in its pure form. Although adults also experience basic emotions every day in generating more complex emotions by combining basic emotions, and in interacting with other higher levels of cognitive processes, ‘pure’ forms of basic emotions are generally observed in young children (Tracy & Randels, 2011). Accordingly, babies’ crying caused by a type of psychological discomfort can be seen as primitive. In contrast, adults’ crying, which is often a mixture of a set of complex emotions is not regarded as ‘primitive’. Another aspect of the primitiveness is defined neurophysiologically (Panksepp and Watt, 2011). Pankesepp and Watt (2011) argue that primitive basic emotions should be generated from the subcortical areas of the brain, the regions below the cerebral cortex, including basal ganglia, limbic system, thalamus, hypothalamus, and so on.

This particular argument stems from a hierarchical view of brain structures. Pankesepp and Watt (2011) assert that emotional processes have three different levels of processing: (1) primary processes, (2) secondary processes, and (3) tertiary processes. Primary processes are equivalent to primitive basic emotions originated from the subcortical regions. Secondary processes involve behaviouristic emotional processes; these processes refer to rather mechanical learned emotional behaviours as the results of repeated stimuli. The third level, tertiary processes refer to complex cognitive-emotional processes, such as memory and attention that arise from neocortical interactions with paralimbic and limbic structures. Thus, according to Panksepp and Watt (2011) basic emotions are primitive in a sense that they are purely emotional, not involved with other cognitive processes and that their neurological bases are found in the subcortical areas.

Thirdly, researchers agree that there should be "genetically encoded neural structures dedicated to emotional activation" (Tracy & Randles, 2011, p. 398). This notion is closely linked to the neurobiological primitiveness mentioned above. Although Basic emotion theorists acknowledge that cultures and individual learning environments can influence or change the intensity of emotional experiences, different learning conditions cannot create a new emotion that is not proven through neural reactions (Ekman & Cordaro, 2011). In other words, basic emotions are innate, not learned. This concept of 'innateness' underpins the theoretical claim that there is a set of prototypical emotions, allowing comparison across participants of different cultural and linguistic backgrounds. This particular assumption of Basic emotion is also supported by the present study because this study also involves crosslinguistic comparisons on emotional speech; however, this argument is opposed by the Appraisal view of emotion.

2.1.2 Appraisal theories

The main argument of Appraisal theories is that emotional responses result from an individual's subjective evaluation of external stimuli. Appraisal approaches emphasise emotions as idiosyncratic reactions to events. In other words, different people can experience different emotional responses to the same stimuli. For instance, if one's evaluation of bungee jumping is negative, thinking that it is extremely dangerous and horrifying, the person will experience great fear as she is in the waiting line for bungee jumping. On the other hand, for the people who appraise bungee jumping as a fun, exciting adventure, they will feel excited to be in the same waiting line.

The Appraisal models can be generally classified into two different approaches: (1) the structural model (Lazarus, 1991) and (2) the process model (Scherer, 2005). The structure approach provides accounts for how a particular mechanism of appraisal elicits a particular emotion. According to Lararus (1991; 2006), appraisal processes consist of two different levels (primary and secondary appraisal). Primary appraisals are processed in terms of three aspects: *goal relevance*, *goal congruence*, and *type of ego involvement* (Lazarus, 2006, p. 92).

Goal relevance refers to the degree to which a situation can influence one's overall well-being. *Goal congruence* is defined as one's evaluation of how a situation will favourably or unfavourably work for obtaining a goal (Lazarus, 1991). As *goal relevance* and *goal congruence* are appraised, various types of individual values are coming into play, and this is called '*type of ego involvement*' (Lazarus, 2006, p. 92). An example of primary appraisals can be a case of a student who values getting a high mark on a test. If the student is taking a Physics test, and she is good at Physics, the situation is *goal congruent* (favourably working for her goal). Since getting a good mark on the Physics test is a 'meaningful' event (*ego involvement*) for the student, she will experience happiness when she gets a good mark on the test.

Secondary appraisals, which are also known as ‘stress theory’ (Lazarus, 2006), mainly deal with stress coping mechanisms. Lazarus (2006) claims that there are three components of secondary appraisals: *blame or credit for an outcome*, *coping potential*, and *future expectation*. Taking the case of the student, if she does not do well in the Physics test, she can blame on herself for not studying enough or on her classmate who made constant noises while she was taking the exam (*blame for the outcome*). If she evaluates studying Physics as less challenging (*positive coping potential*), she will think that studying hard will result in a better mark (*positive future expectation*). However, if she thinks that she is simply not good at Physics (*negative coping potential*), she will evaluate the situation as impossible to improve (*negative future expectation*). Accordingly, in case of negative future expectation, she will experience greater anxiety for her next Physics exam.

The structural approach of Appraisal theories elucidates what elements are evaluated in appraisals; however, they lack a clear theoretical account for how different elements work together to evaluate stimuli. Thus, a group of researchers illustrate the process of appraisals (Smith & Kirby, 2000; Scherer, 2009; Roseman, 1984). For instance, Smith and Kirby (2000) propose that *perceptual stimuli*, *associative processing* and *reasoning* are the key components to appraisal process. They argue that as a person receives sensory information (*perceptual stimuli*) she will immediately evaluate the information based on her prior knowledge that is relevant to the received sensory information (*associative processing*). Then, the person will critically think about the stimuli (*reasoning*). Similarly, the three levels of appraisal processing (*innate, learned, and deliberate*) proposed by Scherer (2009) also make a distinction between sensory information (*innate*), memory-based evaluation (*learned*), and critical reasoning processing (*deliberate*). Although theses componential approaches propose different levels or elements of appraisal processing, they all emphasise that the underlying mechanism of emotional processing is ‘appraisal’.

Although the current study does not necessarily argue against the subjective and evaluative aspects of Appraisal framework, these models are not suitable for the current study for a number of reasons. First, they lack a clear theoretical account for the elements that constitute 'emotion'. Second, they focus on situational analysis, which is not adaptable for this study dealing with sentence level stimuli. Third, the focus on the idiosyncratic emotional mechanisms of appraisal makes group comparison unfeasible.

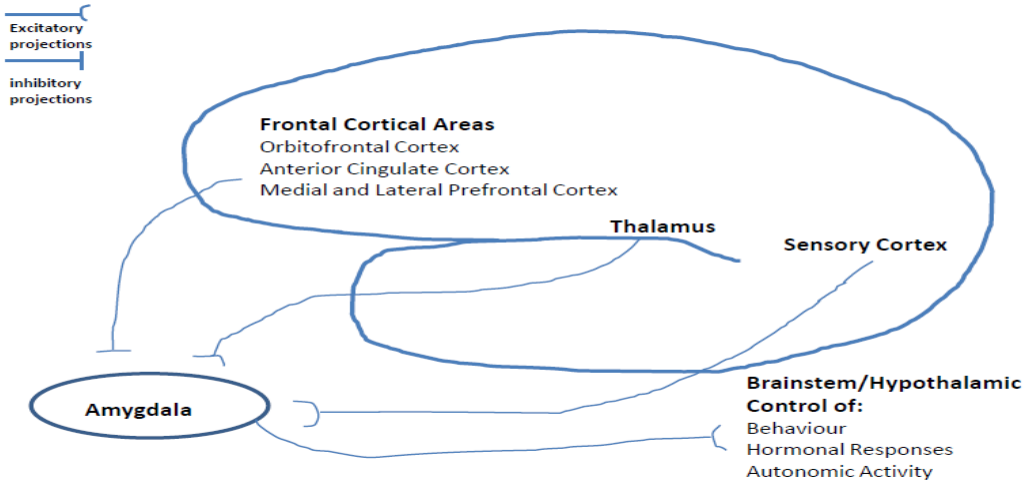
2.1.3 Constructionist theories

Constructionists argue that emotion and cognition are functionally different but the underlying nature is the same (Duncan & Barrett, 2007). They insist that affect is inextricably intertwined with both sensory and cognitive processing; emotion is taking an active role in perception and cognition even when we do not experience a feeling. Thus, the distinction between affect and cognition is not meaningful according to Constructionists. This assertion results from a broader definition of 'core affect' that Constructionists support. They define 'core affect' as an instantaneous neurophysiological and somatovisceral (internal) change, reflecting a relationship to external stimuli. (Barrett, 2006; Russell, 2003). In other words, any internal changes caused by an object or an event can be considered as 'affective'. For example, you meet a person wearing a vivid coloured shirt (external stimulus), which you think is quite bright (individual relationship to the external stimulus), so it makes an 'impression' (affective processing). Although you might not experience any physiological responses (e.g. the heart beats faster) or discrete feelings (e.g. joy, sadness) this 'impression', which also results in better attention, is considered affective.

Constructionist theories also disagree with the cognition/emotion distinction that was based on the traditional and localistic view of the functional structure of the brain. The traditional view (LeDoux, 1996) supports that the circuitry of affect and cognition are different in the brain; it takes the localist approach of brain function that a particular region of

the brain is associated with a particular function of the brain (see Figure 2.2). For affect, the amygdala and nucleus accumbens are known to mediate between receiving the sensory input from thalamic nuclei and sensory cortex and sending output to the brainstem. In addition, the traditional accounts propose that subcortical regions are in charge of affective processing whereas cognitive process originates in anterior frontal regions.

Figure 2. 2
A simplified version of the traditional view of the cognition/emotion distinction (Duncan & Barrett, 2007, p. 1187)

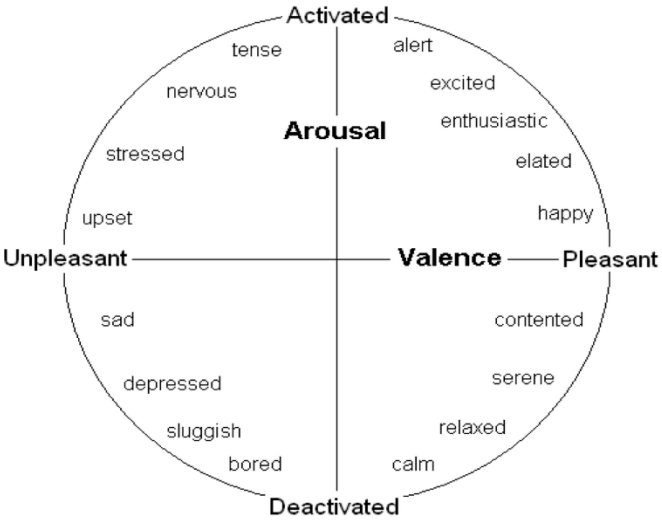


Constructionists, however, contend that the traditional view of functional neuroanatomical structures is oversimplified. They assert that anterior frontal regions, which are traditionally known as 'cognitive' areas, are also directly involved in "computing *value* (affective processing) of an object and guiding visceral and motor responses" (Duncan & Barrett, 2007, p. 1188.). They also argue that the circuitry of affect is widely spread over subcortical and anterior frontal regions. Thus, according to Constructionists, the example of seeing a person wearing a bright shirt, thinking that it is bright, and experiencing an impression is not a sequential process of neural reactions; it occurs rather simultaneously over both subcortical and anterior frontal regions.

This comprehensive Constructionist's view provides theoretical ground for investigating subtle, internal emotional processes such as emotional language processes.

Specifically, a Constructionist theory, the core affect model of emotion provides a conceptual framework that is adaptable for language analysis (Russell, 2003). The model views emotion on two dimensions: *valence* ('pleasant vs. unpleasant' or 'positive vs. negative') and *arousal* (or intensity) (see Figure 2.3). According to Russell (2003) "a feeling at a given moment is a single integral blend of these two dimensions." (p. 148).

Figure 2.3
Core Affect (Russell, 2003, p. 148)



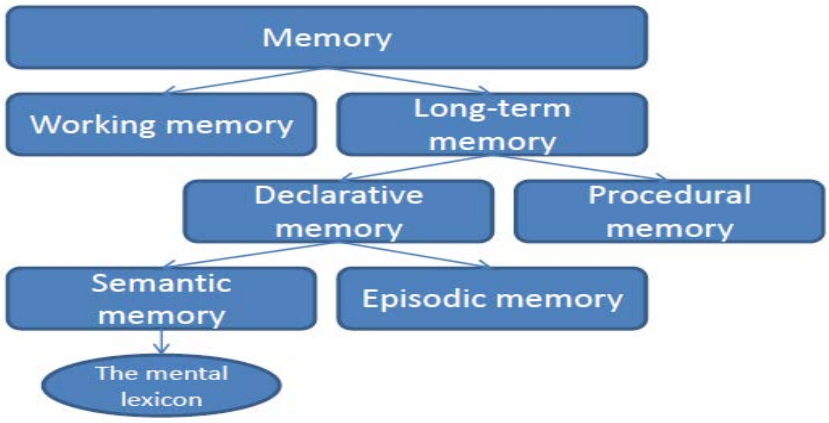
In fact, many language researchers have applied this model for investigating emotion words, defining emotion words on the two levels. According to this view, all words we speak convey a certain degree of affective connotation. In the next section, this particular area of affective processing, speech communication and emotion is reviewed.

2.2 The bilingual mental lexicon

Memory (see Figure 2.4) can be subdivided into working memory and long-term memory in terms of the duration that information can be stored. Simply put, working memory (Baddeley, 1974) refers to a temporary information store that can only hold information briefly whereas long-term memory (Atkinson & Shiffrin, 1968) can store information for long periods of time. In long-term memory, two different types of knowledge, namely

declarative (explicit knowledge or knowing '*what*') and procedural knowledge (implicit knowledge or knowing '*how*') are stored (Graf & Schacter, 1985). Long-term declarative memory then can be subdivided into semantic memory and episodic (autographical) memory. Although these two different types of long-term declarative knowledge are intricately intertwined, they differ in the nature of the information stored. Semantic memory and episodic memory refer to factual information and individual experience, respectively (Tulving, 1972). In this structure of memory, the mental lexicon constitutes a key component of semantic memory (de Groot, 2013).

Figure 2.4
The structure of memory



The mental lexicon is generally known to have two levels of representations: form and conceptual representations. The former refers to surface-level representations, such as orthographic, phonological forms. The latter is defined as 'meaning' aspects. For the bilingual lexicon, these two levels of representations comprise a more complex structure than the monolingual lexicon because words from two different languages are represented. Thus, a central issue in the field of the bilingual lexicon concerns the organisation of the mental lexicon elucidating the form-meaning mapping from two different languages (Kroll & de Groot, 1997).

In keeping with this line of argument, the current review mainly deals with the organisation of the bilingual mental lexicon with regard to the form-meaning mapping. In the first section, the overall structural distinctions among the bilingual lexicon models are reviewed. Then, the 'shared' or 'mixed' representation of the bilingual mental lexicon, which is a relatively recent theoretical account that supports "a separate but interconnected" lexicon structure (Kroll & de Groot, 1997, P. 170.), is discussed.

2.2.1 The organisation of the bilingual mental lexicon

In the study of the bilingual lexicon, there has been much debate about whether the structure of the bilingual mental lexicon is a separate or a unitary system. Although different models account for different aspects of the bilingual mental lexicon, the models supported by earlier studies, can be roughly categorised into three different types: "coordinative", "compound", and "subordinative" (Weinreich, 1968). According to the coordinative type, both form and conceptual representations have a separate storage system for L1 and L2. Some studies support this model (e.g. Lambert, Ignatow, & Krauthamer, 1968) by providing evidence from the results of word association and word recall tasks.

The compound model, on the other hand, supports the view that bilinguals have separate form representational systems but the conceptual system is unitary. In other words, the compound model assumes that translation-equivalent pairs of L1 and L2 look and sound different, but they refer to the same meaning. The Concept Mediation Model proposed by Potter, So, Von Eckard, and Feldman (1984), which also argues for a common conceptual system, is equivalent to the compound model. These compound storage models, however, were challenged by recent studies (e.g., Chen & Leung, 1989; de Groot & Hoeks, 1995). The study by Chen and Leung (1989) used picture naming, reading aloud, and translation tasks to measure the participants' reaction times. In their experiments, they categorised the participants into the three different groups (proficient, adult beginners, and second-and

fourth-grade child beginners) in terms of different levels of proficiency. According to the results, the proficient participants demonstrated similar reaction times between their L1 and L2 whereas non-proficient learners reacted slower to the stimuli presented in their L2 than L1. Thus, Chen and Leung (1989) argued that proficient learners directly access to a compound conceptual storage, but less proficient learners retrieve the meaning through the corresponding L1 words or relevant visual image.

Similarly, the different routes to the conceptual system between L1 and L2 were highlighted by the subordinate model. According to the model, a L2 word connects to a conceptual representation via the form representations of the corresponding L1 word. In the same vein, the Word Association model (Potter et al., 1984) advocates the access to the meaning of L2 words through the L1 translation-equivalent words.

Although the aforementioned three types of the models shed some light on the organisation of the bilingual lexicon, they all assume a defined form of the structure within a bilingual whether it is common or separate. Therefore, a model that elucidates developmental change in the structure was proposed. The Revised Hierarchical Model by Kroll and Stewart (1994) combined the compound (or the Concept Mediation Model) and the subordinative model (or the Word Association model) in order to explain a developmental shift from the dependence on translation (the subordinative model) to acquiring direct links to a common conceptual system (the compound model). According to the Revised Hierarchical Model (Kroll & Stewart, 1994), as learners become more proficient, the L2 acquires direct connections to a common semantic representation. Kroll and Steward (1994) also suggested that L1 and L2 have an asymmetrical relation; L1 usually has a larger conceptual system than L2.

Despite the significant contribution illustrating developmental change in the mental lexicon system, the Revised Hierarchical Model (Kroll & Stewart, 1994) has a number of

limitations. First of all, it implicitly suggests that L1 and L2 terms of a translation pair always have the same meaning. This assumption is quite problematic because it is a well-accepted argument that there are meaning aspects specific to each language (de Groot, 1992). For bilinguals, it is not challenging to find a L2 word that cannot be translated to a L1 word. For instance, '*integrity'* in English cannot be directly translated to a Korean word because there is no translation equivalent Korean word for '*integrity*'. In addition, researchers who support the Revised Hierarchical Model almost exclusively focus on concrete words in their experiments. Considering a body of literature showing that different word types are processed and stored differently (e.g., Altarriba, Bauer, & Benvenuto, 1999; Altarriba & Basnight-Brown; 2011; Farley, Ramonda, & Liu, 2012), the model that only focuses on concrete words provides a partial, limited account.

2.2.2 A mixed representation and word type effects

Recently, another key line of research has developed to account for shared conceptual representations. The shared or 'mixed' view advocates an interconnected or patricianly shared conceptual system between L1 and L2. The shared view acknowledges 'common' as well as 'language specific' conceptual elements between L1 and L2. Therefore, the main issue of the shared view models concerns the extent to which L1 and L2 conceptual representations are shared and language specific.

For instance, the Distributional Conceptual Feature Model (de Groot, 1992) suggests that conceptual representations can differ according to different word types; the conceptual representations of concrete translation pairs share more semantic units than those of abstract words. For example, the meanings of '*apple*' and '사과', which is a concrete word translation pair of English and Korean, are much closer than the meaning of '*love*' and '사랑', an abstract pair. The Distributional Conceptual Feature Model (de Groot, 1992) also explicitly posits that some conceptual representations are language specific; thus, some words cannot be translated

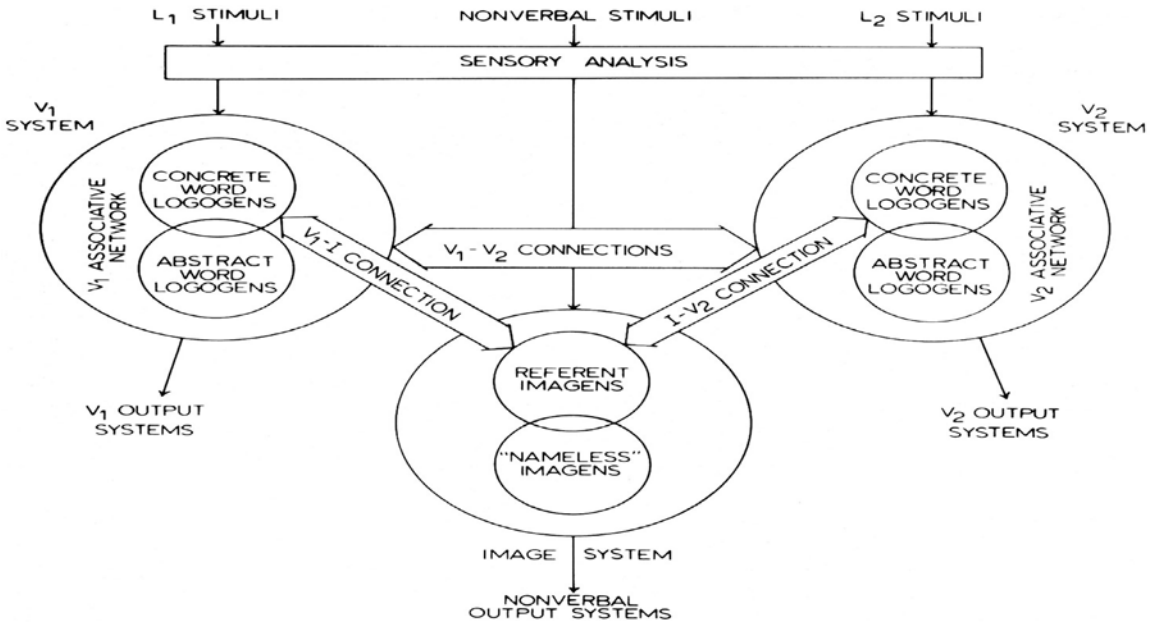
to words in another language. This shared semantic view has developed through the Shared Distributional Asymmetrical model (Dong *et al*., 2005) and the Modified Hierarchical Model by Pavlenko (2009). All of these models propose that the conceptual representations of bilingual memory are partially shared between L1 and L2 or "distributed over a set of elementary conceptual units." (De Groot, 2013, P. 179.)

The 'shared' mental lexicon models, however, which emphasizes different conceptual representations depending on different word types (concrete vs. abstract), fail to account for what defines 'concreteness' and 'abstractness'. Although these models generally describe that concrete words are associated with experiential, sensory information and abstract words with linguistic information, they lack a clear ontological distinction between concrete and abstract words. Therefore, in the following section, the theoretical models explaining the distinction between concrete and abstract words are reviewed.

2.2. 3 Concrete words vs. Abstract words

As regards differences between concrete and abstract words, two of the most well accepted accounts are Dual Coding Theory (Paivio, 1971) and the Context Availability Model. Both frameworks acknowledge that concrete words are stored better and processed faster than abstract words due to richer and denser visual and contextual information than abstract representations (Kousta, Vigliocco, Vinson, Andrews, & Del Campo, 2011). However, these two accounts take a different view with regard to how concrete and abstract words are represented in long-term memory. According to Dual Coding Theory (Paivio, 1971), concrete and abstract words are stored in a representationally different but functionally connected system.

Figure 2.5
Dual Coding Theory Model (Paivio, 1971)



Dual Coding Theory proposes that concrete words are stored in a verbal semantic representation and connected to referent images while abstract words are stored in a verbal representation. This verbal referent, which refers to a multimodal concept that includes auditory, visual, haptic, and motor elements, is named '*logogen*'. The nonverbal units, *imagens*, are "mental representations that give rise to conscious imagery" (Paivio & Sadoski, 2011, p. 199). Like logogens, imagens are assumed to be multimodal (visual, haptic, auditory, and motor) (see Figure 2.5). Thus, when a concrete word is processed, it initially activates logogens and then, activates imagens that are associated with the concrete word. However, for an abstract word, it only activates associated logogens. Therefore, concrete words have the advantage of having double associations with verbal and nonverbal information.

In contrast, the Context Availability Model (Schwanenflugel & Stowe, 1989) suggests that both concrete and abstract words are stored in a single verbal conceptual system. The underlying nature of conceptual representations for concrete and abstract words is not

different according to this model. The framework proposes that comprehension of both concrete and abstract words depends on available contextual information, and context can be provided by previous discourse or a prior semantic knowledge base. Concrete words "exhibit stronger or more extensive associative links to the stored material" (Holcomb, Kounios, Anderson, & West, 1999, P. 2); thus, they are processed faster than abstract words.

These two different theoretical standpoints have been tested by a substantial number of studies across multiple disciplines (e.g. Altarriba et al., 1999; Holcomb et al.,1999; Sadoski, Goetz, & Avila, 1995; van Hell & de Groot, 1998; West & Holcomb, 2000). The results of these studies, however, have been inconclusive. Some studies provide evidence supporting the Context Availability model (e.g. Schwanenflugel, 1988; Schwanenflugel & Stowe, 1989), but other studies advocate for Dual Coding theory (e.g. Sadoski et al., 1995; West & Holcomb, 2000). In an attempt to resolve the issue of the inconsistent findings, Altarriba and Benvenuto (1999) drew attention to the need of incorporating another word category, emotion words. They argue that the concrete and abstract words used in the experiments for testing the conceptual structures of abstract and concrete words are confounded with emotion words. In order to support their argument, Altarriba and her colleagues conducted a series of experiments (Altarriba & Benvenuto, 1999; Altarriba & Bauer, 2004; J. Altarriba & Basnight-Brown, 2011) providing evidence that emotion words have a processing advantage because they have significantly higher imageability than concrete words and other neutral abstract words. Thus, they argue that emotion plays a key role during language acquisition (Kousta et al., 2011).

2. 3 Verbal channel: Emotion words

2. 3. 1 Emotion words

When we communicate our emotions via *emotion words*, we not only process their form and the meanings, but we also 'feel' or 'experience' the emotions they incite. This

entire mechanism represents the affective dimension of the mental lexicon. According to Pavlenko (2008), the affective dimension can be examined from three different aspects: (1) *emotion words*, (2) *emotion concepts*, and (3) *emotionality*.

The first aspect, *emotion word*, which refers to words that describe our emotional states, such as *fear*, *happiness*, *enjoyment*, *anger*, or *disgust* (Clore, Orthony, & Foss, 1987), is generally defined in terms of two major components, *valence* (positive vs. negative) and *arousal* (strong vs. weak intensity). This componential definition draws on Osgood's work (1969) that examined emotion words from three aspects: *evaluation* (good vs. bad), *activity* (passive vs. active), and *potency* (weak vs. strong). Similarly, words prompting emotional responses without directly referring to emotional states, such as *cancer*, *prison*, or *dream*, are defined as *emotion-laden words.* Both *emotion words* and *emotion-laden* words, which are categorised as verbal emotional stimuli, have higher (positive) or lower (negative) *valence* with stronger *arousal* than neutral words.

The second level, *emotion concepts* refer to "prototypical scripts that are formed as a result of repeated experiences and involve causal antecedents, appraisals, and physiological reactions, consequences, and means of regulation and display" (Pavlenko, 2008, p. 150). This definition, which is grounded in Appraisal theory (Lazarus, 1991) and Basic emotion theory of emotion (e.g. Ekman & Cordaro, 2011; Pankesepp &Watt, 2011), implies that emotion concepts are not only idiosyncratic but also socially constructed; thus, they may reflect a particular culture and language. Therefore, the definition allows us to investigate cross-linguistic conceptual variations within the affective dimension.

The third aspect, *emotionality* is defined as "autonomic arousal elicited by particular languages or words and examined directly" (Pavlenko, 2008, p. 155). Put simply, *emotionality* refers to emotional reactions caused by verbal emotional stimuli. This particular

aspect is also expressed in various terms such as *emotional reactivity*, or *affective processing*. For clarity's sake, this review selects *emotionality* for the remaining discussion.

In the field of bilingualism, researchers across disciplines have studied the three aspects of the affective dimension in the L1 and the L2. For example, psycholinguistic studies chiefly deal with an automatic processing aspect of the affective dimension by measuring reaction times to emotional verbal stimuli. Applied linguistic and sociolinguistic studies, on the other hand, pay particular attention to whether bilinguals' *emotion concepts* and *emotionality* differ in their L1 and L2 language use.

The automatic processing aspects of emotion words

The automatic processing aspect of the affective dimension is the central issue within psycholinguistic studies on the affective dimension. These studies claim that emotion words are processed and represented differently based on the findings that emotion words have significantly higher imageability, which refers to the level of mental richness that a word arouses, than neutral words (Kousta, Vigliocco, Vinson, Andrews, & Del Campo, 2011). According to the psycholinguistic research, the emotionality attached to emotion words results in *memory effects*, *interference effects*, and *congruence effects*.

Accordingly, a number of researchers suggest that emotion words should be treated as a separate word category distinct from both concrete and abstract words in the mental lexicon (Altarriba, 2003; Altarriba & Basnight-Brown, 2011; Altarriba, Bauer, & Benvenuto, 1999; Bauer, Olheiser, Altarriba, & Landi, 2009).

a. Memory effects

A series of studies (Altarriba & Canary, 2004; Altarriba & Bauer, 2004; Anooshian & Hertel, 1994; Ayçiçegi & Harris, 2004; Ayçiçegi-Dinn & Caldwell-Harris, 2009; Bauer et al., 2009) provide evidence that emotion words have an advantage in memory retention; emotion

words are remembered better and retained longer than neutral words (Annoshian & Hertel, 1994; Ayçiçegi-Dinn & Caldwell-Harris, 2009; Ayçiçegi & Harris, 2004).

Despite the insights we can gain about the memory effect from the results of recall tasks, the validity of recall tasks is called into question. Especially, Schmidt (2012) points out that the experiments using norming studies for creating word stimuli used individual words out of context. Since words usually have multiple meanings, it is unclear what specific meaning participants are rating. The structure of the word-list was also found to contribute to the emotional memory effect: The stimuli presented in a mixed list of emotional and neutral words were remembered better than the stimuli in a list of homogeneous items (Schmidt, 2012). Thus, further research on the validity of recall tasks is necessary.

b. Interference effects

The interference effect is typically examined by an emotional Stroop task[1] and a Rapid Search Visual Presentation (RSVP) task[2], which measure selective attention to emotional stimuli. A significant difference for reaction time and accuracy between conditions (e.g. emotion words vs. neutral words) provides evidence that the representations of emotion words in memory differ from neutral words; longer response times and higher error rates indicate interferences caused by *emotionality*.

For instance, in the study by Sutton and her colleagues (2007), Spanish –English adult bilinguals displayed greater interferences within both their L1 and L2 *emotion words* when completing the emotional Stroop task; the reaction times to the negatively valenced *emotion words* were longer than the neutral words. Similarly, Colbeck and Bowers (2012) conducted

[1] Unlike the original Stroop tasks, which present colour words in colour congruent (e.g. '*red*' in red colour) or colour incongruent conditions (e.g. '*red*' in blue colour), the emotional Stroop task presents emotion words in different colour (e.g. '*anger*' in green). Then, participants ask to state the colour of the emotion words presented; thus, any relative delay compared to neutral words in responding to the stimuli is considered as the interference effect caused by '*emotionality*.'

[2] In the Rapid Search Visual Presentation (RSVP) task, a pair of emotion and colour word or a pair of neutral and colour word are rapidly presented in the same spatial location. Then, participants are asked to state the name of the colour (Pavlenko, 2012, p. 416).

the RSVP task to measure the interference effect, and the result showed reduced interferences in L2 *emotion words* compared to L1 *emotion words*. Although the 'reduced' interferences in L2 *emotion words* facilitates processing emotion words (faster reaction times), it also implies that bilinguals experience weaker emotionality with L2 emotion words. Thus, 'the processing advantage in L2 emotion words'(Pavlenko, 2012) can be phenomenologically described as 'distant' or 'detached' emotional reactions to L2 emotion words.

With regard to the factor contributing to the interferences effects, some studies show that age of onset of acquisition (Eilola & Havelka, 2011; Sutton et al., 2007) and language dominance (Sutton et al., 2007) influence the degree of the interferences; early exposure and frequent use of the L2 can result in higher levels of the interference effects

c. Congruence effects

Researchers adopt an affective priming task to investigate the congruence effect. In the priming paradigm, faster reaction times between primes and targets indicate that the activation spreading in a network of representation (e.g. semantic network) is more automatic (Meyer, Schvaneveldt, & Ruddy, 1975). Taking this paradigm, the affective priming tasks use affectively congruent (e.g. prime: negative word – target: negative word) and incongruent conditions (e.g. prime: negative word- target: positive word) to test automaticity in processing affectively valenced verbal stimuli.

A group of researchers (Altarriba & Canary, 2004; Degner, Doycheva, & Wentura, 2012; Hermans, Houwer, & Eelen, 1994) investigate how different conditions influence levels of the congruence effects; the arousal dimension on emotion words (Altarriba & Canary, 2004), the presentation of verbal stimuli in multiple modalities (Hermans et al., 1994), and the frequency in language use (Degner et al., 2012) are positively correlated with the congruence effects. In addition, the L1 demonstrates a higher level of the congruence

effect (e.g. Altarriba & Canary, 2001; Hermans et al., 1994) than the L2 except when the L2 is the dominant language (Degner et al., 2012).

In sum, a growing body of evidence (Altarriba & Canary, 2004; Degner et al., 2012; Hermans et al., 1994; Houwer et al., 2013; Segalowitz, Trofimovich, Gatbonton, & Sokolovskaya, 2008) indicates that emotionality elicited in the affective priming task is weaker in the L2 than the L1. This weaker representation of emotion words is especially evident for adult second language learners, who began their language learning after puberty (Ayçiçegi & Harris, 2004; Ayçiçegi-Dinn & Caldwell-Harris, 2009). In other words, it is more challenging for adult learners to 'feel' the emotional arousal or intensity of affectively valenced words (affective processing) than 'understand' the meanings of the emotional words (semantic processing) in their L2.

Although these psycholinguistic studies provide empirical evidence on the representational and processing differences of emotion words in the bilingual mental lexicon, these experiments are limited in that they generally reduce verbal stimuli to individual word levels out of context. Thus, these studies do not offer an explanation for bilinguals' use of emotion words in their L1 and L2. Studies within applied linguistics and sociolinguistics reveal the language use of emotion words utilized in more authentic settings. This will now be discussed.

The use of emotion words in L2

Researchers espousing the applied linguistic paradigm investigate whether bilinguals' use of emotion words and perception of language emotionality differ in their L1 and the L2 (e.g. Dewaele, 2008; Pavlenko, 2004). These studies typically use an introspective method such as a questionnaire and an interview. For instance, a large-scale online survey was administered to examine the factors contributing to bilinguals' language preference in expressing emotions (Dewaele, 2004, 2006, 2008, 2010, 2016; Dewaele & Salomidou, 2017

). According to the results language dominance, age of onset of acquisition, context of acquisition, and order of acquisition were significantly related to their choice of language in using emotion words. Specifically, languages used more frequently, acquired early and in more ‘naturalistic’ settings cause stronger emotional intensity.

Generally, stronger emotionality in the L1 was also observed in different categories of emotional expressions such as anger (Dewaele, 2006), swear words (Dewaele, 2004), and words expressing affection (Dewale, 2008). Pavlenko (2004) argues that the L1 elicits higher levels of emotional intensity than the language learned later because childhood experiences imprint stronger emotional scripts on our minds. Interestingly, however, the results of the study by Dewale (2016) contradicted the general stronger emotionality found in the L1, showing that LX users estimated the degree of offensiveness of English offensive words more strongly than did L1 users. It was, however, speculated that the result was due to the fact that most LX users might have received cautionary advice about the use of English offensive words in a formal classroom setting. It is, therefore, not clear whether the stronger self-reported offensiveness from LX users indicates LX users’ actual emotionality or their instructed ‘perception’ of English offensive words. In other words, it is possible that LX users simply evaluated the presented English offensive words as highly ‘inappropriate’ in the online survey without experiencing emotional reactions.

The differences in the semantic representations of emotion words were also studied amongst three different variations of English L1 users (Dewaele, 2017). The three groups of Americans living in the USA, living in the UK, and living in non-English-speaking countries participated in an online survey about the perceived offensiveness of four American origin offensive words and another four British origin offensive words. The study showed that the British origin offensive words were more susceptible to the influence of exposure to other variations of English offensive words. The Americans who lived in the USA perceived the

four British origin offensive words as less offensive than did the two groups who did not live in the USA. Therefore, the study suggests that the semantic representations of the L1 emotion words that originated from another variety are likely to change when L1 users live in a language environment where the other varieties are more frequently used.

Another strand of the emotion word research centres its interest on the relationship between culture and language. These studies view language as a cultural artifact that reflects different cultural values (Logan & Schumann, 2005). Sociolinguistic approaches also claim that emotion is socioculturally scripted; they highlight that emotional experiences are culture- and language-specific (Searle, 1995; Parrot & Harré, 1996). Therefore, these studies (e.g. Panayiotou, 2004; Marian & Kaushanskaya, 2004) pay particular attention to how different linguistic backgrounds contribute to a formulation of emotion *concepts*, which in turn result in different emotional reactions.

For example, the study by Panayiotou (2004) investigated whether bilinguals' emotional reactions change depending on different languages. The participants (5 English-Greek and 5 Greek-English bilinguals) were presented with a scenario about a young male (American script: Andy, Greek script: Andreas) who appeared to ignore every significant relationship in order to become successful. Interestingly, the findings showed that the bilinguals' emotional responses were different depending on the language presented. When the script was presented in Greek, the participants exhibited concerns for Andreas' lack of significant relationships. However, when the script was presented in American English, the participants were accepting of Andy's extreme devotion to work. Panayiotou (2004) speculated that the different responses arose from the participants' views of the two different cultures; their responses towards Andreas reflected the family-Oriented Greek culture whereas their reactions to Andy reflected their perception about the American culture and its celebration of individual achievements.

This cross-cultural difference was also explored in language production. Marian and Kaushanskaya (2004) asked Russian-English bilinguals to recount their autobiographical memory. The result showed that the participants displayed more intense emotional reactions when the language of retrieval and encoding was matched. Interestingly, the participants also used more individualistic narratives in English whereas in Russian, they used more collective narratives in this study. In sum, the study (Marian & Kaushanskaya, 2004) supports the view that different culture might influence the perception of language emotionality. Moreover, bilinguals exhibit more intense emotions when the language of retrieval and encoding is the same.

So far, the affective dimension of emotion words has been reviewed. The findings gained from the three different disciplines support the view that emotion words are represented and processed differently. In addition, bilinguals generally experience emotional 'detachment' (Marcos, 1976).

2. 4 Vocal channel: Emotion and intonation

Along with the words, vocal cues play a critical role in conveying emotions in speech. Past research supports that the emotional states of a speaker impact on the articulatory patterns of speech (e.g. Scherer 2003) such as voice quality (Gobl & Ní Chasaide, 2003), utterance duration, and pitch contour. The relationship between these vocal parameters and specific emotions has been explored in various fields such as neurolinguistics, speech science, and computational languages. Although there has been much debate about what specific acoustic features contribute to the perception of emotion the most, these studies generally support that there are some regular patterns in the speakers' perception of emotion based on intonational parameters (e.g. f0 range, f0 contour) and voice quality (Protopapas & Lieberman, 1997)

Among these vocal parameters, voice quality is known as an intra-vocal quality, which refers to vocal characteristics such as 'breathy' or 'soft' that contributes to how a speaker sounds, because it differs across individuals. Thus, the systematic comparisons of vocal quality parameter between groups from different linguistic backgrounds are nearly impossible. However, the fact that emotions are still delivered in speech communication despite the idiosyncratic voice quality of each speaker gives evidence for 'regularity' in emotional speech (Buck, 1984, p. 15). Specifically, studies argue that the different acoustic patterns of intonation are closely linked to the perception and expression of the emotional states of speakers (Bulut & Narayanan, 2008; Ladd, 1996).

Concerning the most significant intonational acoustic features in conveying emotions, different studies provide different results. However, the overall effect of the use of intonation in emotional communication has been recognised in many studies (e.g. Bulut & Narayanan, 2008; Ladd, 1996). The majority of these studies however, generally investigate the role of emotional intonation in the context of first language use. Only recently, emotional intonation in the context of communication between native and non-native speakers has been investigated. The following section presents the pragmatic difficulty that second language learners experience in conveying emotion through the use of intonation.

2. 4. 1 Emotional intonation in L2

The role of emotional intonation also has received increased attention in the field of second language study due to its communicative value in language learning. These studies apply different methods, such as acoustic analysis (e.g. Wennerstorm, 2001; Verdugo, 2005), psycholinguistic tasks (e.g. Pell & Skorup, 2008; Kitayama & Ishii, 2002), or perception-judgement tasks (e.g. Graham, Hamblin, & Feldstein, 2001; Min & Schirmer, 2011) to investigate the different aspects of emotional intonation.

Generally, the studies can also be categorised into the perception and the production studies in terms of the direction of the speech process of emotional intonation. The production studies usually focus on the different patterns of the acoustic features between native and non-native groups. For instance, Wennerstorm (2001) examined whether heightened pitch is related to evaluative language in native speakers of English and Japanese learners of English. The subjects were told to tell an emotionally-charged story and their stories were taped for acoustic analysis. The emotional narratives were then analysed at the clause level, and the results showed that intonational peaks were linked to evaluative emphasis in both groups.

On the other hand, the perception research is much interested in how native and non-native speakers perceive emotional intonation differently. According to the results of the perception studies, both native and non-native speakers integrate the verbal and vocal emotion cues in their perception (e.g. Min & Schirmer, 2011). Research supports that the non-native speakers of English, however, experience difficulty in recognising emotional contents expressed through native speakers' intonation (e.g. Graham, Hamblin, & Feldstein, 2001; Verdugo, 2005).

Much of the existing research mentioned above, however, is framed within either the perception or the production of emotional speech, measuring a targeted emotional intonation feature separately for group comparison. Scant research investigates the communicative aspect of emotional intonation between native and non-native speakers (e.g. Verdugo, 2005). Therefore, the pragmatic difficulty, particularly in the context of emotional communication between speakers from different first language backgrounds, merits further research attention.

2. 4. 2 The definition of intonation

Intonation, which is generally interchangeably used with suprasegmental prosody, refers to the overall change of pitch in utterances. Due to its complex features, currently there

is no one single, all-encompassing definition of intonation despite its crucial role in speech intelligibility and comprehensibility. Different scholars use the term in a different way depending on their research interests. For instance, Pierrehumbert's (1980) hierarchical structural definition of intonation as the sum of smaller units, is generally used for acoustic analysis whereas Bolinger (1989) highlights the communicative and emotional role of intonation by placing much weight on the overall contour of intonation rather than individual pitch levels.

Intonation is generally defined by the three acoustic features: *pitch*, *intensity*, and *duration*. *Pitch* refers to "height of the sounds produced in speech" (Chun, 2002, p. 4). *Intensity* means 'loudness' or 'energy' produced by speakers, and *duration* refers to the length of a sound. The acoustic correlate of *pitch*, the fundamental frequency (f0), is measured in hertz (Hz), and *intensity* is measured by decibels (dB). *Duration* can be a relative measure because phonologically, a particular sound does not have a fixed duration (Chun, 2002, p. 5). In other words, the patterns of the length of sounds are idiosyncratic.

Different researchers emphasise different roles of intonation. They, however, generally agree on the three major roles of intonation in speech: (1) grammatical, (2) informational (3) attitudinal (Bolinger, 1989; Brazil, Coutthard, and Johns, 1980; Halliday, 2008; Pierrehumbert, 1980). The grammatical function is primarily associated with how untterances are grouped into smaller tone units marking syntactic structures. For instance, the sentence, '*She is happy*' can be grouped into the predicate, '*She is*' and the adjective phrase, '*happy*' (She is // happy). This role of parsing or grouping is also closely linked to Halliday's concept of '*tonality*' (2008). The same sentence however can convey different meanings by placing prominence on different words. For instance, the sentence 'SHE is happy' (not someone else), and 'She IS happy' (happy now) can emphasise different information. This prominence placement is called '*tonicity*' (Halliday, 2008).

One the other hand, tone, which refers to an overall contour and a direction of pitch (e.g. High to Low or Low to High), can signal both a sentence type and the attitude of a speaker. For instance, generally, a question sentence is spoken in a rising tone. According to Verdugo (2005), the degree of rising and falling tone is also associated with the level of certainty. Also, the variations in the rising and falling tone structures, i.e. the overall contour of pitch range, is shown to be related to the attitudinal function. For instance, a high pitch range generally signals positive attitude where as a low pitch is associated with negativeness (Weger et al., 2007).

For the phonological analysis of these acoustic parameters, a framework that allows categorising the internal structure of intonation is also required. Measuring the acoustic features in an absolute sense can be misrepresentative because the same sound can characterise different phonological features (Jun, 2002). For this reason, the present study supports the autosegmental-metrical model of intonation (e.g. Pierrehumbert, 1980; Beckman & Pierrehumbert, 1986) to compare the acoustic features of native and non-native speakers of English.

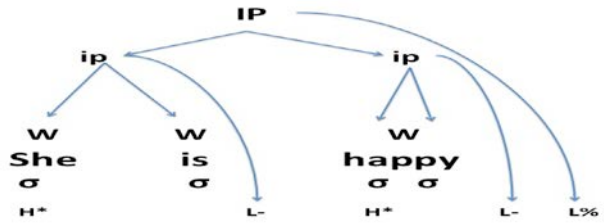
The autosegmental-metrical model is widely used for acoustic analysis across many different languages due to its adaptable features. This model represents intonation by two different pitch levels, High (H) and Low (L). Additionally, the model enables an analysis of the underlying internal structure of intonation within a hierarchical framework. In the following section, the characteristics of intonational structures of English and Korean are compared within the autosegmental-metrical model.

English intonation systems

Let us look at an example of the intonation structure of an English declarative sentence analysed by the autosegmental-metrical model. The intonation structure of a declarative sentence, '*She is happy*' can be structured as shown in Figure 2.6 when it does not

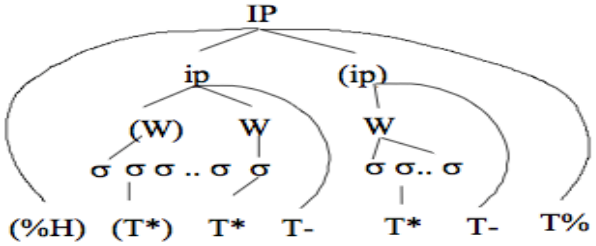
signal any other pragmatic meanings, such as '*She IS* (now) *happy*' or '*SHE* (not someone else) *is happy*', rather than conveying the state of being happy. Each sigma (δ) stands for an individual syllable, and 'W' for each word. In this sentence, the predicate, '*she is*' and the adjective phrase '*happy*' made two ips. Within the two ips, the syllable '*She*' and '*Ha*' mark pitch accent. Each ip ends with low phrase accent (L-), and the sentence finally ends with the low boundary (L%).

Figure 2.6
Example of the intonation structure of 'She is happy'



According to Beckman and Pierrehumber's model (1986), English has two prosodic units higher than words: an Intonation Phrase (IP) and an Intermediate Phrase (ip). An IP, the highest prosodic unit, generally consists of at least one ip. An IP is marked by either a high or a low boundary tone (High boundary: H%, Low boundary: L%) on the phrase-final syllable (see Figure 2.7). Phrase final lengthening also marks the IP and sometimes a pause can follow the IP (Jun, 2002). In terms of an ip, it contains at least one pitch accent (annotated by *), which refers to the prominence of a stressed syllable. An ip is also marked by a phrase accent (High phrase accent: H-, Low phrase accent: L-).

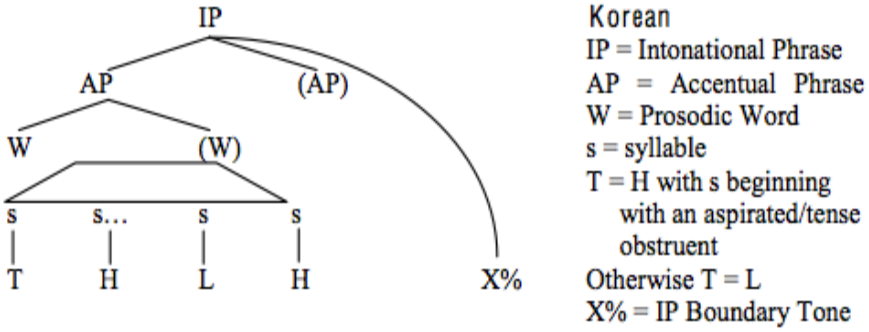
Figure 2.7
Intonation Structure of English (Jun, 2002, p. 31)



Korean intonation systems

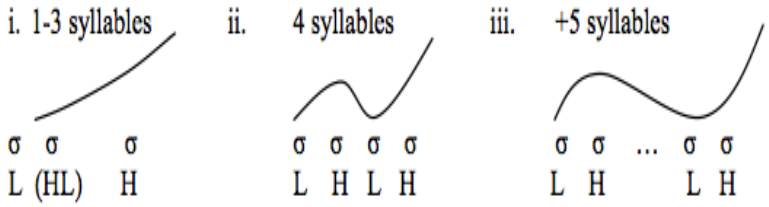
Korean also has prosodic units higher than words, namely an IP and an Accented Phrase (AP). An IP in Korean has similar features to the English IP; it is also marked by phrase final lengthening and an optional pause. However, an AP, a unit lower than an IP yet higher than words (see Figure 2.8), differs from the ip in English. The most distinctive feature of AP is that it is marked by a phrase-final rising tone (LHa), transcribed by 'a' at the end of AP phrases, not by phrase-final lengthening or a pause (Jun, 2002; MacDonald, 2011).

Figure 2.8
Intonation structure of Korean (MacDonald, 2011, p.4)



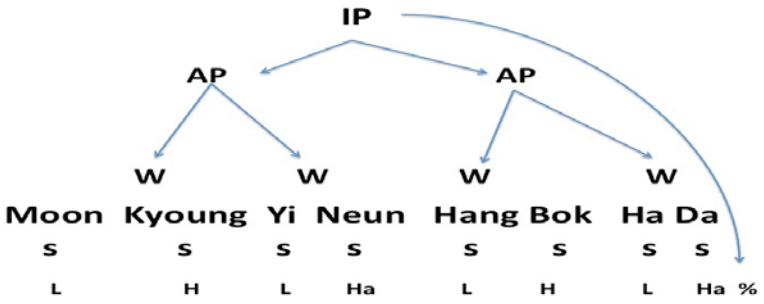
The typical AP pattern of four syllables is that the initial two syllables generally have a high plateau (HH) or a rising tone (LH), and the last two syllables have a rising tone (LHa). Therefore, HHLHa or LHLHa are the typical Korean AP pattern of four syllables. These patterns, however, can have variations when the number of syllables is less than four (see Figure 2.9).

Figure 2.9
Tonal realization of an AP in Korean (MacDonald, 2011, p.3)



According to the aforementioned intonation model, the translated version of '*Moon Kyoung is happy*', '*문경이는* (*Moon Kyoung Yi Neun*) *행복하다* (*Hang Bok Ha Da*)', is structured as follows: In the intonation structure below (see Figure 2.10), each AP consists of four syllables. Accordingly, the AP structure follows the typical LHLHa pattern.

Figure 2.10
Example of the intonation structure of 'Moon Kyoung is happy' in Korean



Differences between English and Korean Intonation systems

The intonation systems of English and Korean differ significantly in a number of ways. First, English is a lexical stress language that marks the prominence of a word by pitch accent while Korean is not (Jun, 2002; MacDonald, 2011). In Korean, the prominence is associated with the location of a word; the word is located at the initial place in a phrase when it is prominent. Second, as aforementioned, the ip in English has phrase-final lengthening while the Korean AP does not. Additionally, the variations of the AP depend on the size of the words. Third, the pragmatic meaning of a sentence is expressed through the overall contour of the sentence in English. However, the IP boundary tone of the phrase-final syllable marks the pragmatic meaning of a sentence in Korean (Jun, 2002; MacDonald, 2011).

These differences contribute to the pragmatic difficulty that Korean learners experience when using English intonation. Korean learners are not generally accustomed to express or perceive the pragmatic meaning through the overall variations of intonation

marked by pitch accent. In the current study, the pragmatic difficulty in using and perceiving emotional intonation is investigated.

2.4.3 The roles of intonation (prosodic cues) in spoken messages

Past research provided evidence that suprasegmental prosody, which is often used interchangeably with 'intonation', is a key contributor to speech intelligibility and comprehensibility (e.g. Frazier, Carlson & Clifton, 2006; Itzhak, Pauker, Drury, Baum & Steinhauer, 2010; Pannekamp, Toepel, Alter, Hahne & Friederici, 2005; Trofimovich & Baker, 2006).

In particular, neurolinguistic studies, which measure distinct brainwave peak components signifying syntactic, semantic, and prosodic processing, have investigated the role of suprasegmental prosody in language processing. In order to study the influence of lexical biases on prosodic processing in garden path sentences, the study by Itzhak et al. (2010) examined the role of prosody in clarifying meanings of garden path sentences when there is a lexical violation (transitivity). The results of the study (Itzhak et al., 2010) provide evidence that prosodic information integrates with lexical information in early stage of sentence processing. Additionally, neurolinguists discovered the Closure Positive Shift (CPS) ERP component (Pannekamp et al., 2005), which signifies prosodic processing. The CPS component is related to a shift occurring at the end of an Intonation Phrasal Boundaries (IPh), the highest prosodic unit. The discovery of the CPS component has enabled investigation on pure prosodic processes without violation features. ERP studies have provided evidence that prosody is a full grammatical property, which interactively integrates with lexical information in early stage of sentence processing (Itzhak et al., 2010).

A group of researchers (Frazier et al., 2006) in the field of psycholinguistics also shed light on the role of suprasegmental prosody particularly in comprehension. Frazier and his colleagues (2006) experimented how listeners understand what speakers intended to convey

by using prosodic units of different sizes in sentences. In the experiment, sentences were manipulated by different sizes of prosodic units; each sentence contained smaller and larger prosodic units, such as intermediate phrase boundary (ip) and intonational phrase boundary (IPh). The study (Frazier et al.,2006) argued that speakers generally have an internal pattern in using prosody. According to the results, the role of prosody in comprehension becomes more prominent when the prosodic unit is relatively larger than the adjacent prosodic units in sentences. Relative sizes of prosodic units, therefore, were found to be more important than mere presence of prosodic boundaries in sentences (Frazier et al., 2006).

In the field of SLA, relatively few have investigated suprasegmental prosodic features. SLA studies have paid less attention to the role of prosody partly due to the ephemeral nature and high variability of prosodic information that is hard to quantify. The difficulty of studying prosody is compounded by a lack of theoretical models that could potentially provide consistent definitions of prosodic features across different languages (Jun, 2005). In addition, the SLA studies focused on segmental features, assuming that segmentals are the areas that cause foreign accents and pronunciation errors, which in turn interrupt effective communication in a second language.

However, recently, more researchers in SLA call attention to suprasegmentals. For example, the study by Trofimovich and Baker (2006) investigated effects of length of residency in the U.S. on the production of five suprasegmentals (stress timing, peak alignment, speech rate, pause frequency, and pause duration). The participants of this study, 30 adult ESL speakers and 10 English native speakers, were asked to produce six declarative sentences. The data collected from the native speakers were used as the baseline for assessing the production of the ESL speakers. The collected data were acoustically analyzed along with listener judgments. The results of the study indicated that suprasegmentals are in fact more prominent features that influence listeners' judgments of comprehensibility and accentedness

than segmental (Trofimovich & Baker, 2006)

With these perspectives in mind, the current review discusses suprasegmental prosody. In particular, the role of prosodic phrasing in speech communication is presented due to its significance in interpretation of utterances.

The role of prosodic parsing

One of the major roles of suprasegmental prosody is grouping words into smaller or larger syntactic and semantic units (Itzhak et al., 2010; Frazier et al., 2006; Fodor, 1998), which is called prosodic phrasing or parsing. With a different prosodic phrasing feature, interpretations of the same sentence can be altered. Prosodic parsing cooperates with syntactic information to determine specific meanings in utterances. To summarize prosodic phrasing in different linguistic domains, the current review classifies prosodic phrasing into two different uses: (1) internal and (2) external. For the internal domain, silent reading was reviewed. For the external domains, the role of prosodic parsing in speaking and listening is discussed. This categorization of internal and external prosody was based on whether parsing process is covertly or overtly produced. In this respect, listening can be classified as external prosodic parsing due to the fact that listeners receive externally produced prosodic information.

Internal prosody, which is hearing a voice inside while reading quietly (i.e. you are probably hearing your voice while you are reading this paper), is a universal phenomenon (Slowiaczek & Clifton, 1980). Two of the theoretical views that provide accounts for the prosodic parsing in silent reading are the Implicit Prosody Hypothesis (Fodor, 1998) and the Integrative Hypothesis (Slowiaczek & Clifton, 1980). The former highlights the salient role of implicit prosodic phrasing in silent reading whereas the latter focuses on understanding what types of cognitive processes are involved in prosodic phrasing.

Implicit Prosody Hypothesis (Fodor, 1998) argues that readers project prosodic contours onto sentences when they read silently, and the prosodic contour helps to resolve syntactic ambiguity. In order to test the hypothesis, Fodor (1998) first defined factors influencing overt prosody in sentence reading. He proved that the overt prosodic difference influences clarification of the meanings of sentences. Then, the factor overtly tested was included in a silent reading task to see if the factors affected in ambiguity resolution in silent reading as well. The assumption of application of these procedures was that a prosodic pattern projected onto sentences in silent reading might be identical to the overt prosody for that sentence in a similar context. The study examined relative clause attachment in four different languages: Japanese, French, English, and Croatian. Fodor (1998) claimed that prosodic patterns are partly universal, but partly language-specific; therefore, cross-linguistic experiments are essential to study the role of prosodic parsing in silent reading. The results of the study showed that universal patterns preferring a hierarchical structure in ambiguity resolution were observed, although the extent of this preference varies according to different languages. The study concluded that implicit prosody is shown to be a cause, not just an effect of the syntactic preferences that readers demonstrate. Interestingly, this finding aligned with the results of recent ERP studies. Suprasegmental prosody is not just affected by syntactic structures; prosodic parsing can, in fact, lead to interpretations of utterances.

The Integrative Hypothesis (Slowiaczek & Clifton, 1980), on the other hand, concentrates on identifying types of cognitive processes involved in prosodic parsing. Slowiaczek and Clifton (1980) experimented to find whether the suppression of subvocalization (inner speech) influences comprehension or recognition of speech. This study inhibited generation of prosodic process by mechanical and articulatory activity of counting or uttering ‘cola cola cola…’. The study provided evidence that internal prosody is a higher cognitive process involved in comprehension, rather than a low-level recognition. The

Integrative Hypothesis (Slowiaczek & Clifton, 1980) also supports the argument that internal prosody plays a key role in grouping words into syntactic and semantic units.

Concerning external prosody phrasing, the study by Cole, Mo, and Baek (2010) investigated the relationship between syntactic and prosodic phrase structures in the production and perception of spontaneous speech. Unlike the previous studies that used data from manipulation of sentences, the data used for this study was drawn from the Buckeye corpus of spontaneous, conversation-style speech collected from interviews with adult speakers from Columbus, Ohio, the US (Pitt et al., 2007). The researchers (Cole et al., 2010) initially created excerpts out of the corpus, and four stimuli sets were formulated based on the excerpts. Orthographic transcripts were generated for each excerpt with removing all possible prosodic markers, such as punctuation and capitalization. A total of 97 untrained listeners were asked to mark prosodic boundaries on the printed stimuli while they were listening to the same stimuli. The results of this study showed that syntactic clause boundaries and vowel duration are the first and second strongest predictors of boundary perception in spontaneous speech.

Thus far, the current section has reviewed one of the key roles of suprasegmental prosody, prosodic parsing, concerning the first language (L1). According to the results of the aforementioned studies, prosodic parsing indeed was found to be essential in speech intelligibility and comprehensibility both internally and externally. Considering the significance of the role of L1 in L2 acquisition, it is worthwhile to look at how L1 prosody influences L2 prosody learning.

2.4.4 L1 prosodic transfer

Adult second language learners are more prone to have a foreign accent even after an extremely long period of studying a second language. One of the reasons for this commonly observed phenomenon is known to be L1 transfer occurring in the process of second language

acquisition. The term ‘transfer’ refers to “the psychological process whereby prior learning is carried over into a new learning situation” (Gass & Selinker 1994, p. 54). The acquisition of pronunciation, which includes segmental and suprasegmental prosody, is most susceptible to L1 transfer. In particular, when prosodic features between L1 and L2 significantly differ, L1 prosodic transfer tends to be more evident in the process of L2 acquisition.

The effect of L1 transfer in acquiring second language prosody can be categorized into two areas: (1) segmental prosody and (2) suprasegmental prosody. Although segmental prosodic features are not the focus of this study, the review of L1 segmental prosody transfer is necessary because suprasegmental prosody features consist of segmental features. First, concerning segmental prosodic L1 transfer, theoretical models of prosodic transfer offer different interpretations of the extent to which L2 learners obtain L1 segmental prosodic features: some are rather skeptical about acquisition of L2 prosodic features whereas others are optimistic about it. For instance, the Representational Deficit Hypothesis (RDH) suggests that it is impossible for L2 learners to acquire the prosodic features of L2 that are absent in their L1. In order to test this hypothesis, Hawkins and Liszka (2003) conducted oral production tasks with two Chinese-speaking participants. The study reported that the two participants had greater difficulty producing the English *t/d* in regular past tense contexts than in the case of past participles. However, this result is less effective in supporting the hypothesis due to the significantly small sample size of two participants. Second language learning is known to be highly idiosyncratic; that is, numerous individual factors uniquely function to determine even one specific learning process. As such, observations from only two learners are not applicable to a larger population.

On the other hand, the Prosodic Transfer Hypothesis (Goad &White, 2006) argues against the Representational Deficit Hypothesis. The hypothesis asserts that L2 learners could adopt L1 prosodic features for learning a L2, although it can be minimal and limited. Goad

and White (2006) investigated the L2 acquisition of English by 10 Mandarin speakers to test the Prosodic Transfer Hypothesis. A combined sentence completion and production task was given to the 10 participants for the experiment. For the control group, 9 native English-speakers participated in the study. The result (Goad & White, 2006) suggested that Mandarin-speaking participants exhibited few problems. It also suggested that L2 prosodic features are attainable even with the absence of the same or similar prosodic features in L1. However, the study supported the Prosodic Transfer Hypothesis focused on a minimal segmental feature. Therefore, these studies are limited in terms of investigating the L1 transfer effect on suprasegmental prosodic features.

Studies generally support a clear influence of L1 suprasegmental prosodic transfer (Rasier and Hiligsmann, 2007; Todaka, 1990; Ueyama and Jun, 1998). Rasier and Hiligsmann (2007) examined the role of the L1 in the L2 acquisition of suprasegmental prosody. This study looked at the L2 acquisition of pitch accent in Dutch and French. Rasier and Hiligsmann (2007) postulated that L1 prosodic transfer is an important factor in L2 prosody learning. However, they also stated that there may be universal systems of acquiring prosodic features. The comprehensive framework of suprasegmental prosody transfer (Rasier & Hilgsmann, 2007, p. 46) diagrammed the interconnectedness of three possible L1 and L2 relationships: (1) L1 to L1, (2) L1 to L2, and (3) L2 to L2 in addition to the relationships between L1, L2, and interlanguage. Based on this model, the study conducted contrastive analysis between Dutch and French. Since the two languages examined in this study belong to different language families (Dutch: Germanic vs. French: Romance), differences in prosodic patterns were expected. The results showed that there were significant differences between Dutch and French regarding accent placement, and these variations influence the acquisition process of accentuation.

Todaka (1990) also compared English intonation of Japanese speakers of English and native English speakers by adopting the Autosegmental Model by Pierrehumbert (1980). In this study, the intonation patterns were rather holistically analysed without comparing differences in intonation contour patterns between the two groups. The results of this study provided evidence of L1 influence on L2 suprasemgental prosody features. Japanese participants in this study lowered their pitch after the focus while American participants raised their pitch after the focus. The study by Ueyama and Jun (1998) also investigated focus realization patterns between Japanese and Korean English as a second language learner. The study showed that both Japanese and Korean participants used a narrow range of fluctuations showing the influence of Japanese and Korean which use relatively 'monotonous' intonation patterns. Thus, L1 suprasegmental prosody transfer occurred for both Japanese and Korean participants.

So far, four main theoretical foundations have been reviewed that are relevant to the present studies, emotion, the bilingual mental lexicon, the verbal channel of emotional intonation, and the vocal channel of emotional intonation. Studies have suggested that second language users are likely to experience pragmatic difficulties in using emotional intonation on the perception and production level. Building upon this theoretical argument, the present study proposed five research questions.

2. 5 The present study

The present study investigates the pragmatic difficulty that Korean EFL undergraduate students experience. In particular, it focused on the difficulty experienced when they perceive and produce emotional content with English intonation. The research questions of the present study are as follows:

1. The perceptual aspects:
    a. Does the degree of emotional valence that Korean EFL students experience in reading English emotion words significantly differ from that of Americans?
    b. Do Korean EFL students experience difficulty in listening to the emotional content expressed through English intonation?
    c. How do Korean EFL students' perceptions of English emotional intonation differ from those of Americans?
2. The productive aspects:
    d. To what extent, do Korean students speaking English produce the pragmatic force of emotion words? Do their intonation patterns significantly differ from those of Americans?
    e. What kinds of mental scripts do Korean EFL students engage in while producing English emotional intonation? How do they differ from those of Americans?

CHAPTER 3

METHODOLOGY

This section provides the specific methods used in this study to investigate the proposed research questions as well as the philosophy that underpins the selected methodological approach. There were two main methodological challenges in the current study: how to define and operationalise the major construct, *emotion*, in language production and perception tasks and how to objectively compare the results of the investigated phenomena between American and Korean EFL students. The study also sought out validation from additional qualitative data to obtain comprehensive information for the research questions.

These concerns were better resolved within a post-positivism research paradigm due to the need for quantitative and qualitative elements. First, the context of the study can influence what is observed. Thus, the researcher attempted to eliminate possible biases in an effort to obtain an 'objective assessment'. Second, the main research method involved comparing the linguistic behaviours of two different groups. . These two assumptions favoured a quantitative method. Lastly, the study adopted an introspective method in order to complement the proposed quantitative analysis. Given these three reasons for the need for both quantitative and qualitative methods, the data collection and analysis processes followed a mixed-method, primarily relying on quantitative data from relatively large sample sets but adding a qualitative element as a supplemental process. Specifically, this study adopted a sequential Mixed Method design with some qualitative Stimulated Recall interviews used to add depth to the quantitative findings (Tashakkori & Teddlie, 2016). The quantitative data collected was used to form a basis, namely sound-stimuli, for collecting Stimulated Recall

interview data. Thus, the qualitative findings of this study were affected by the quantitative findings.

3.1 Research design

Table 3.1 presents tasks and analyses used for answering each research question.

Table 3.1
The tasks and analyses of the present study

	Research Question	Task	Participants	Analysis
The perceptual aspects:	- Does the degree of emotional valence and intensity that Korean EFL students experience in reading emotion words significantly differ from that of Americans?	The emotion word survey	**American** ANEW data : Univ. of Arizona **Korean** (N=40): Inha Univ.	Independent-Sample t-test
	- Do Korean EFL students experience difficulty in listening to the emotional content expressed through English intonation?	The perception task part 1: The congruency task	**American** (N=50): Univ of RI **Korean** (N=50): Inha Univ.	Two- way ANOVA & Independent-Sample t-test
	- How do Korean EFL students' perceptions of English emotional intonation differ from that of Americans?	The perception task part 2: The description task	**The same groups as the perception task 1 groups**	Qualitative analysis & Frequency Analysis
The productive aspects:	- To what extent, do Korean students speaking English produce the pragmatic force of emotion sentences? Do their intonation patterns significantly differ from those of Americans?	The production task	**American** (N=50): Univ of RI **Korean** (N=50): Inha Univ. **(*These groups are different groups from the perception task groups)**	Two-way ANOVA, One-way ANOVA, & Independent sample t-test Chi-squared Test
	- What kinds of mental scripts do Korean EFL students engage in while producing English emotional intonation? How do they differ from those of Americans?	The stimulated recall interview	**The same groups as the production task groups**	Qualitative analysis

For collecting quantitative data, the present study chose a quasi-experimental (a.k.a. Ex post facto) research design (Lammers & Badia, 2005) because the independent variable of this study, namely, language background (Americans vs. Korean EFL speakers), was a pre-existing variable that could not be manipulated by the researcher. The responses from American and Korean participants were compared; the rating, production, and perception task results were therefore the dependent variables of the present study (see Table 3.2).

Table 3.2
Research design of collection of the quantitative data of the present study

Tasks for quantitative data collection	**The emotion word survey**	**The production task part:**	**The perception task part 1: The congruency task**
Research Model	Quasi-experimental	Quasi-experimental	Quasi-experimental
Independent Variable	Americans vs Korean EFL	Americans vs Korean EFL	Americans vs Korean EFL
Dependent Variable	Valence and arousal ratings	Measures of the acoustic parameters of the intonation of emotional declarative sentences	Emotional intonation congruency rating
Material	Emotional words/Emotional sentences	Emotional declarative sentences	Speech production of Americans' emotional declarative sentences

This study comprised a three-phase data collection process. Phase 1 was the preparatory phase for the main tasks in Phases 2 and 3 in addition to collecting data for the first research question. A set of emotional adjectives was chosen from the results of an emotion word rating survey. The survey was only administered to Korean undergraduate students because the results from the *Affective Norms for English Words* (ANEW) survey

(Bradley & Lang, 2010) provided the emotion word rating results of American students. American undergraduate students in the Department of Psychology at the University of Arizona participated in the ANEW survey. The ANEW provides an extensive list of English words in terms of normative ratings based on valence, intensity, and dominance on a 9-point scale. Among these three dimensions of emotion words, the dominance domain, the degree of control exerted by emotion words or the degree of their power or influence, was not relevant to the current study because the dominance domain is also often investigated more in interactional contexts such as conversations. The dominance domain, therefore, was not included in the present study.

In Phase 2, American undergraduate students participated in production and perception tasks in order to gather baseline data. Two different groups of American undergraduate students participated in either the production or perception task. They were not allowed to participate in both because their experience with the production task, conducted two weeks prior to the perception task, could influence their responses in the perception task. For the production task, students were asked to speak a set of emotional declarative sentences in a positive or negative intonation. This task could have conditioned them to be more aware of the two different patterns of intonation.

For the production tasks, students were individually recorded speaking emotional sentences followed by a brief stimulated recall interview. The speaking data collected from American students was then used to create emotional sentence audio files for the perception task. The perception task, however, was conducted in a group. The perception task resembled a listening test format, requiring participants to write their answers for each question using a dichotomous scale (congruent vs. incongruent). The perception task intended to measure participants' authentic reactions rather than subtle responses, such as reaction time. Therefore, having American undergraduate students participate in the

perception task in a group was acceptable albeit not ideal. In Phase 3, Korean students followed the same procedures for the production and perception tasks as that of American students. Two different groups of Korean undergraduate students participated in the production and perception tasks for the reason mentioned earlier. The settings of the perception and the production tasks for Korean students were also similar to those of American students. Section 3. 5 presents the detailed procedures for the production and perception tasks.

3. 2 Participants

3. 2. 1 Korean EFL students

This study aimed to investigate the difficulty that Korean university students experience when they produce and perceive English intonation particularly in the context of expressing their own emotional intent. In order to recruit a sample of the targeted population, Korean university students who are enrolled in a four-year university, two criteria were used: (1) EFL students and (2) university students with a relatively high English proficiency level.

First, the Korean participants represented typical university students who spent, on average, more than ten years studying English, often beginning English lessons in public schools at about nine or ten years of age. Although the number of Korean university students studying abroad has increased, generally, most Korean students are considered as EFL learners who have limited exposure to an English-speaking environment. According to a report from Korea Research Institute for Vocational Education and Training (KRIVET) (Ryu, 2012), 6.8% of Korean university students have learned English while studying abroad. In addition, although the percentage of English as Medium of Instruction (EMI) classes reached 30% of all university classes in the Seoul metropolitan area (Kim, 2011), EMI classes are still uncommon at universities in the other regions of South Korea.

One of the key characteristics of EFL learners is a limited amount of English exposure because the country they reside is not English speaking. EFL students learn English in an environment where they have few opportunities to use English outside of the classroom. The dividing line between EFL and English as a Second Language (ESL) learners who learn English in an English-speaking country, is becoming more porous than ever because current EFL students have increased exposure to English speaking cultures due to globalisation and the availability of digital technology. A further discussion on the definitions of EFL vs. ESL, albeit worthwhile, is beyond the scope of this study.

Second, recruiting students whose English proficiency is higher than intermediate level was important to preclude or minimise the influence of an extraneous variable, the lack of English proficiency. The current study intended to examine Korean students' difficulties in using English intonation despite their understanding of the semantic meaning of the presented emotional words and sentences. Therefore, the difficulties observed from students who do not understand the semantic meaning of the emotion words and sentences are considered invalid for analysis. Additionally, this study did not aim to investigate the relationship between the degree of the difficulty and different proficiency levels. It was, therefore, critical to recruit students whose English proficiency belonged to a similar level.

The English proficiency of the participants tended to be similar due to the highly standardised college selection criteria, which includes test scores from the National College Entrance Exam and high school percentile rankings. Inha University, where the participants were recruited, is a large university ranked 12th (according to the 2015 national evaluation of Korean universities conducted by the Korean Ministry of Education) among 340 four-year universities in South Korea. Korean participants, therefore, represent students who obtained a relatively high score in English. This specific homogenous group was selected to match key characteristics of the undergraduate students, native speakers of English that participated

in the *Affective Norms for English Words* (ANEW) rating survey (Bradley & Lang, 2010). American survey participants were from the University of Arizona, a state university that ranks at or about 100th place among 2968 four-year American universities. Therefore, all the participants studied at fairly large four-year universities ranked (according to national assessments) in the top percentile.

It is also worth noting that Korean survey participants were recruited from the Department of English Education only because the American undergraduate students participated in the ANEW rating survey were from the same department, the department of psychology. The Korean perception and production groups were, however, from seventeen different academic departments because their American counterparts in the perception and production tasks were also from various academic departments. The next sections present the detailed description of Korean participants for each task.

Korean EFL*: *Survey participants

Forty Korean undergraduate students from the Department of English Education at Inha University participated in the survey. Their age ranged 19 to 28 years with the average age being 21.7. Of these forty participants, ten were male and thirty-one were female. All participants had normal vision without any difficulty reading words.

Thirty-eight out of the forty participants were freshmen and sophomores (the first and second year students) who were taking general electives (e.g. Introduction to economics, Introduction to English literature) along with English conversation and composition classes. Two senior students were mostly taking English teaching-related classes such as ‘Using technology for teaching English’ and ‘Practicum’. Their coursework programme does not include a linguistic class relevant to the emotion word survey such as ‘Semantics’ or ‘Vocabulary teaching’.

The present study assessed the amount of English exposure according to the Length of Residency (LOR) in an English-speaking country; LOR is generally considered as an indicator of the amount of English exposure. The goal was to recruit homogeneous Korean EFL participants with similar language learning backgrounds rather than to examine the relation between LOR and rating patterns on emotion words. Survey participants who lived or studied in an English-speaking environment longer than a year were excluded.

Many studies have investigated the effects of LOR on various aspects of second language acquisition, such as morphosyntax, grammar, pronunciation, and phonological perception. (e.g. Abrahamsson, 2012; Babcock, Stowe, Maloof, Brovetto, & Ullman, 2012; Larson-Hall, 2006). These studies, however, did not specifically examine Korean adult learners' vocabulary acquisition; it not clear exactly 'how long' is considered to have a significant effect on vocabulary acquisition. Many studies on LOR agree, however, that less than a year is a relatively short period of time for acquiring second language skills. According to the background survey, most of the Korean participants had never studied or lived in an English-speaking country. Only eleven of the participants studied for six to ten months in an English-speaking country such as USA, Canada, or Australia.

The emotional condition of the participants may directly affect the rating process. If a participant is emotionally impaired, for example, her/his ratings of the emotion words in the survey will not reflect the emotional response that the survey intends to measure. To establish construct validity, ensuring that the participants' emotional instability or abnormal conditions did not influence their ratings on the emotion words, all participants were asked to take the *Beck Depression Inventory II* (Beck, Steer, & Brown, 1996).

Table 3.3 shows the interpretations of the *Beck Depression Inventory II* scores. Participants with a score higher than 30 were considered severely depressed and, thus their results from the survey were excluded in the data analysis. Korean participants scored on

average an 8.6 on the *Beck Inventory II* (see Table 3.4). Only one student scored a 26, resulting in a skewed distribution to the right. Additionally, most of the Beck scores of the Korean participants ranged between 0 to 15 (see Figure 3.1). These results indicate that the participants showed a normal emotional state; therefore, it is safe to conclude that their responses to the emotion words presented in the survey are representative of their normal emotional responses.

Table 3.3

Interpretation of the Beck Inventory II

Total score	Level of depression
0 – 10	These ups and downs are considered normal
11 – 16	Mild mood disturbance
17 – 20	Borderline clinical depression
21 – 30	Moderate depression
31 – 40	Severe depression
over 40	Extreme depression

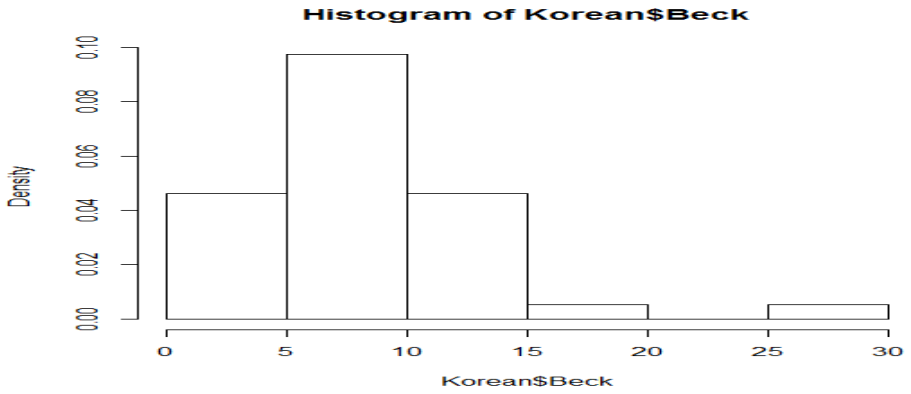
Table 3.4

Descriptive statistics of Korean survey participants' Beck Inventory II scores

Minimum	Mean	Maximum	SD
0	8.6	26	4.9

Figure 3.1

Histogram of Korean survey participants' Beck Inventory II scores



Past research asserts that various factors such as gender and proficiency level impact on the perception and production of emotional speech in a second language (e.g. Dewaele & Pavlenko, 2002; Rintell, 1984). These studies show quite inconsistent results concerning

gender effects. Moreover, they have consistently confirmed that proficiency level is strongly linked to emotional speech production and perception in a second language and that higher level students tend to do better at producing and perceiving emotions in English (Dewaele & Pavlenko, 2002; Rintell, 1984).

One of the purposes of the survey was to compile a set of emotion words to be used as main predicate adjectives for the emotional sentences in the main tasks. The survey did not have as a purpose to examine correlations between proficiency levels and Korean EFL students' ratings on the *valence* and *intensity* of the emotion words. Therefore, recruiting Korean participants with similar proficiencies was important to control for the effects of varying English proficiencies.

As mentioned earlier, it was important that participants clearly understood the semantic meaning of the presented words. This would result in more accurate ratings of the presented emotion words and less misunderstandings or conjectures. To meet these requirements, participants were recruited from the Department of English Education, a department that admits students based on high scores on the Test of English for International Communication (TOEIC) or the Test of English as a Foreign Language (TOEFL). The English language skills of those students from the department were far above those of the average Korean undergraduate student according to their official test scores (See Table 3.5).

Korean survey participants were also asked to take the *Word Associates Test* (Read, 1993), which measures depth of English vocabulary knowledge. While some vocabulary tests measure the size or the number of words known, this test assesses students' understanding of the definitions of words as well as their associations with other words. Kirby and his colleagues investigated the relationship between the breadth and depth of the vocabulary and their effects on reading comprehension (Kirby, Cain, & White, 2013; Li & Kirby, 2015). The results showed that while the two dimensions of vocabulary knowledge are interrelated, depth

of vocabulary has a stronger relationship with reading skills requiring a deeper text processing, such as summary writing. Although it would have been ideal to administer a word breadth and depth test to obtain a comprehensive measure of vocabulary knowledge, it was not feasible for the present study because taking two different kinds of vocabulary tests required too much time from participants. In addition, the vocabulary knowledge that the emotion word survey intended to assess was also strongly linked to how deeply students understand the meaning of the given emotion words, rather than 'how many' emotion words students know. Accordingly, the present study decided to administer the *Word Associates Test*, a word depth test to Korean survey participants.

Table 3.5

Descriptive statistics of Korean survey participants' Word Associates Test and TOEIC test scores

N= 40	Mean	SD
Word Associate test	78	5.4
TOEIC test	838	98

According to the scores on the official English test and the *Word Associates Test,* all of the participants' English proficiency levels were considered above those of intermediate students (see Table 3.5). Five students provided a TOEFL score, and these scores were converted to an equivalent TOEIC score according to the conversion table provided by the official TEPS website (http://www.teps.or.kr/Teps/Public/conversion_table.aspx). Table 4 shows that the mean TOEIC score was 838 out of 990. They also scored 78 % in the *Word Associates Test* (Read, 1988). Therefore, it was likely that Korean participants had a proficient English vocabulary knowledge, and that they understood the linguistic meaning of the presented emotional and neutral words.

Korean EFL: Production task participants

Fifty Korean college students were recruited from the same institution. This group consisted of twenty-five males and twenty-five females. Table 3.6 summarises their background information. Students' ages averaged 22 with a mean of longer than 14 years studying English. They were from seventeen different academic departments (see Table 3.7).

Table 3.6

Descriptive statistics of Korean production task participants'Backgrounds

N= 50	Mean	SD
Age	22	2
Age of Onset	8	2
Learning period	14	2
Beck	8	6
TOEIC test	863	70

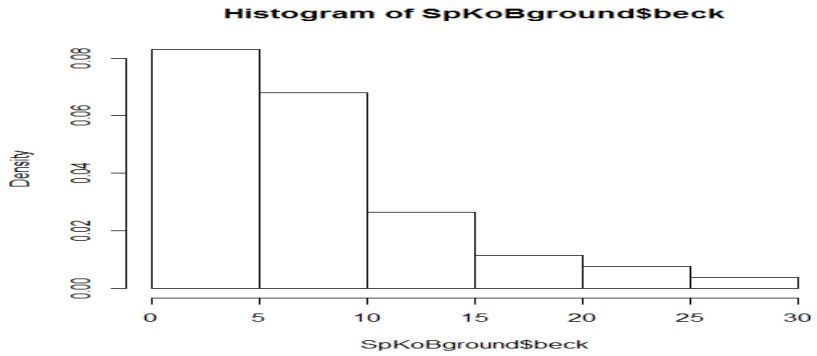
Table 3.7
Academic departments of Korean production task participants

The total number of academic departments	Academic departments
17	Asian Pacific logistics, Business Management, Political administration, Industrial Business Chinese, Korean, English Literature, Educational Philosophy, Journalism Kinesiology Mathematics, Electrical Engineering, Mechanical Engineering, Life Science, Material Science, Computer Science

They typically started learning English in elementary school at the age of eight or nine years old. All fifty participants were classified as EFL learners because thirty five out of the fifty never studied overseas in an English-speaking country. The number of those who had participated in a study abroad programme in an English-speaking country was fifteen out the fifty, but their stay was less than 12 months. As for their emotional states, the *Beck Inventory*

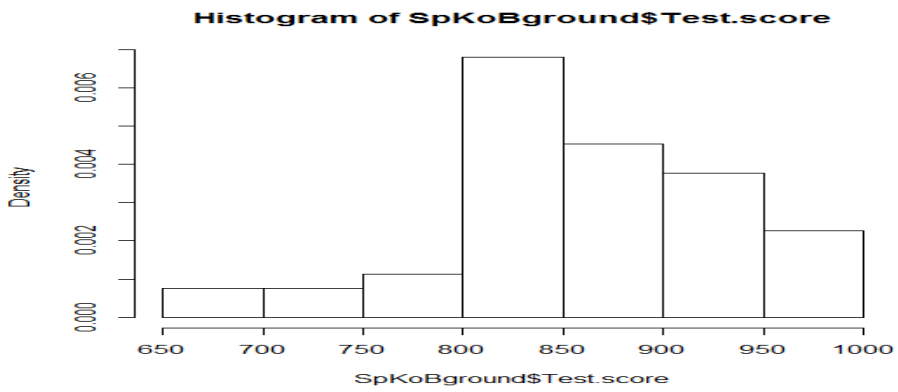
II results revealed that none of the fifty participants were severely depressed. The mean Beck score of this group was 8, which is considered normal according to the score interpretation table (see Table 3.3). The distribution is skewed to the right, indicating that most Korean-production task participants obtained a low Beck score (see Figure 3.2)

Figure 3.2
Histogram of Korean production task participants' Beck Inventory II scores



They also have a relatively high TOEIC; their English proficiency levels assessed by the TOEIC were higher than intermediate. The histogram of their TOEIC scores shows that their TOEIC scores ranged from 650 to 990 with a distribution skewed to the left (see Figure 9). This result shows that most Korean production task participants obtained a high TOEIC score. Unlike Korean survey participants, the Korean production task group was not asked to take the *Word Associates Test* (Read, 1988) because the production task focused more on English speaking skills than English vocabulary knowledge.

Figure 3.3
Histogram of Korean production task participants' TOEIC scores



Korean EFL: Perception task participants

Fifty Korean EFL undergraduates at the same institution participated in the perception task. Twenty-four students were male and twenty- six were female. Korean perception task participants were also from the same seventeen different academic departments (see Table 3.7) as Korean production participants. As mentioned in Section 3.1, the students who participated in the production task were not allowed to participate in the perception task due to 'the training effect' from the production task. Table 3.8 summarises the background information of Korean perception task participants. Their overall characteristics are similar to those of Korean production task participants; Korean production and perception participants had an identical mean age, age of onset of acquisition, and learning period.

The mean Beck score of Korean perception participants was 9; hence their ratings on the emotion words were likely to reflect normal emotional responses. Figure 3.4 demonstrates that the distribution of the Beck scores was skewed to the right, denoting lower range scores indicative of normal emotional states.

Table 3.8

Descriptive statistics of Korean perception task participants' Backgrounds

N=50	Mean	SD
Age	22	2
Age of Onset	8	2
Learning period	14	2
Beck	9	6
TOEIC test	833	84

Figure 3.4

Histogram of Korean perception task participants' Beck Inventory II scores

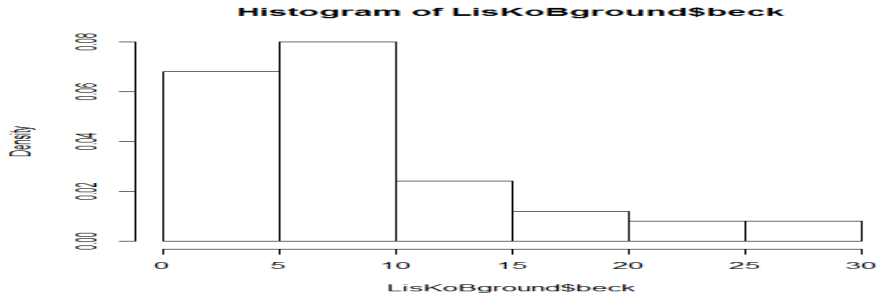
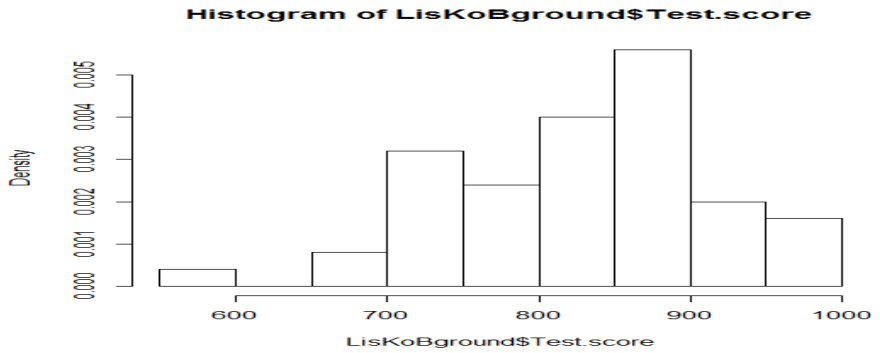


Figure 3.5

Histogram of Korean perception task participants' TOEIC scores



In addition, Korean participants in the perception task group also had a relatively high TOEIC score. The mean TOEIC score was 833 and the distribution of the score was skewed to the left (see Figure 3.5). Korean perception participants, therefore, were considered students with English proficiency levels higher than the intermediate.

3. 2. 2 American participants

American undergraduate participants residing in the United States were recruited at a state University located in Rhode Island. Due to its geographical location, most American participants were from Rhode Island or from a state on the east coast (see Table 3.9). The American participants in this study, therefore, represent those who speak English with a northern accent in terms of American English accent variations. Only four out of the one hundred American participants were from a southern state (e.g. Oklahoma (OK) or Delaware (DE)). In addition, all the participants in both the production and perception tasks were either monolingual or had very little exposure to second language learning.

Table 3.9
American participants' home state information

State	American students for the production task	American students for the perception task	State	American students for the production task	American students for the perception task
CT	5	3	**NJ**	3	3
DE*	1		**NY**	3	5
MA	8	1			1
MD*		1	**OK***	1	1
ME		1	**PA**	23	31
			RI		
NC*	1		**UT**		1
NH	2	1	**VA**	1	

Note: * marked a southern state

American participants: Production task participants

Fifty undergraduate students participated in the perception task. Of these fifty students, only ten were male and the rest were female. Forty-nine students were from twenty different departments (see Table 3.10) and one participant's major was undecided. In addition, 20% of the fifty students were majoring in pharmacy. Table 3.11 presents the mean age and the mean Beck score of American production task participants. The mean age of American production participants was 19.

Table 3.10
Academic departments of American production task participants

The total number of academic departments	Academic departments
20	Pharmacy, Nursing, Pre-Vet, Health Science, Kinesiology Psychology, Criminal Psychology, Sociology, Communication, Journalism, Human Development & Family Studies, Secondary Education Global Business Management, Business Management Chinese, English, Biology, Wild Conservation Biology Mechanical Engineering

Table 3.11

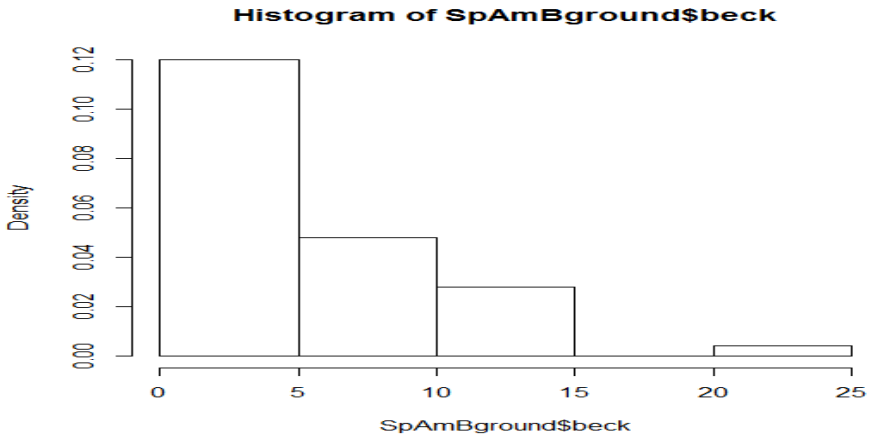
Descriptive statistics of American production task participants' Backgrounds

N=50	Mean	SD
Age	19	1
Beck	6	5

They also all had normal vision, hearing, and emotional stability. Although their mean Beck score was the same (M=6) as that of the Korean production and perception groups, their score distribution was more skewed to the right than their Korean counterparts (see Figure 3.6). Most of the Beck scores of American production task participants ranged from 0 to 5. This result indicates that they showed fewer traits of depression than their Korean counterparts. In other words, they were statistically 'happier' than the Korean participants. In addition, as mentioned earlier, all American production task participants were monolingual with limited second language learning experiences. Their language performance in the production task, therefore, was considered as being void of other language influences.

Figure 3.6

Histogram of American production task participants' Beck Inventory II scores



American participants: Perception task participants

Fifty American undergraduates participated in the perception task. All fifty students were recruited from two introductory educational psychology classes because the classes were composed of students from various academic departments. The American perception task group comprised 38 females and 12 males from 13 different departments (see Table 3.12).

Table 3.12
Academic departments of American perception task participants

The total number of academic departments	Academic departments
13	Education, Communication, Communication Disorder, , Psychology, Marketing, Human Development & Family Studies, Political Science History, English, Economy Biology, Health Science

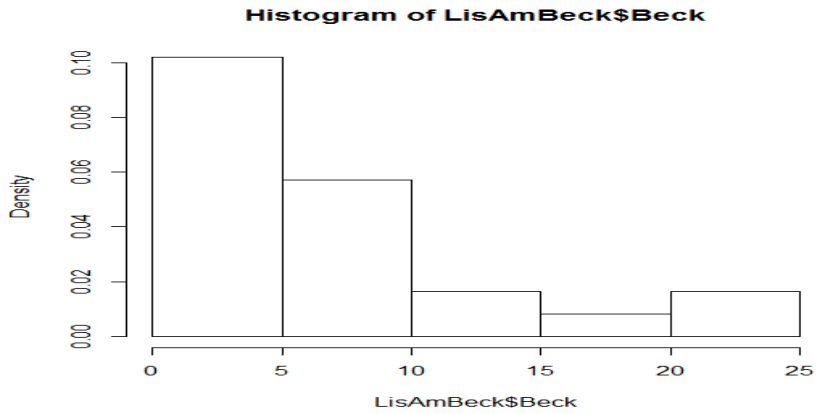
Table 3.13 shows that the mean age of American perception participants was 20, one year older than American production task participants. The mean Beck score of American perception task participants was 7, and the score distribution was also heavily skewed to the right (see Figure 3.7), indicating that their emotional responses were not affected by severe depression. The background survey results showed that none of the American perception task participants had any difficulties hearing or reading; they were also considered as English-speaking monolinguals. Therefore, their language perception skills were not 'clouded' by experiences of learning another language.

Table 3.13

Descriptive statistics of American perception task participants' Backgrounds

N=50	Mean	SD
Age	20	2
Beck	7	8

Figure 3.7
Histogram of American perception task participants' Beck Inventory II scores



3. 3 Materials: Emotional words and sentences

3. 3. 1 Material: Emotion words

The current study defines 'emotion' in terms of two domains: *valence* (positive vs. negative) and *intensity* (weak vs. strong) based on the cognitive model of emotions discussed in Chapter 2. This study initially selected emotion words based on the data from the ANEW (Bradley & Lang, 2010). According to the ANEW (Bradley & Lang, 2010), the ratings on the valence domain on average have a significantly larger standard deviation (SD) than that of the intensity dimension; the mean SD for the intensity ratings is approximately one point higher than the ratings on the valence domain. The larger SD of the intensity domain indicates that ANEW survey participants' ratings on intensity are more widely distributed than their ratings on the valence domain. This might be because the definition of '*valence*' tends to be conceptually clearer to rate than the intensity domain. In other words, judging between 'positive' vs. 'negative' might have been easier for ANEW survey participants than deciding the *intensity* (strong or weak) of the word. Interestingly, as shown in Table 3.14, the neutral word items, a set of concrete words, also have a smaller SD (Valence: 1. 2; Intensity: 2.0) than that of the selected emotion word items on valence (Positive: 1.4; Negative: 1. 4) and intensity (Positive: 2.3; Negative: 2.4). This more consistent pattern of the ratings of the concrete words might be due to the conceptual clarity of the neutral words.

Table 3.14
Normative ratings of the valence and intensity of the selected ANEW items

	Mean Val	Mean Intensity	Mean_L	Mean Log_Freq_HAL
Positive	7.601(1.431)	5.916 (2.318)	6.000	9.094
Negative	2.332(1.457)	5.457(2.427)	5.833	8.701
Neutral	5.267(1.242)	3.713(2.068)	5.429	9.569

A data set with a more consistent pattern of rating distribution provides more of a convenience for group comparisons; therefore, this research focused on the valence domain by controlling the intensity rating variable. For both positive and negative words, the mean intensity ratings are manipulated as 5.91 and 5.4, respectively, on a 9-point scale (1: very weak, 9: very strong). For the initial stimuli selection, fifty-three relatively common words (positive: 18; negative: 18; neutral: 17) were chosen from the ANEW (Bradley & Lang, 2010) as the native speakers' baseline rating data. The average of the valence ratings of the positive words is 7.9 and that of the negative words is 2.3 on a 9-point rating scale (1: very negative; 5: neutral; 9: very positive).

Each set of positive, negative, and neutral words was controlled for word length and frequency. Although the present study did not measure 'online' reaction times such as lexical decision tasks, word length and frequency are generally related to the perceived difficulty of words in reading. Simply put, longer words and less frequently used words tend to be perceived as more 'difficult'. The present study used log Hyperspace Analogue to Language (HAL) frequency data, which is a statistical model based on word co-occurrence frequency. The Log HAL frequencies of the selected positive, negative, and neutral words were 9.0, 8.7, and 9.5 respectively (see Table 3.15). The manipulation for word length and frequency are executed by the English Lexicon Project (ELP) website created by Washington University (http://elexicon.wustl.edu/WordStart.asp), which is the online database that generates the selected set of lexical characteristics of the requested word items typed in a query box.

Additionally, the English emotion words that generally have one Korean equivalent word were chosen so that Korean survey participants did not interpret the words in multiple ways.

A set of positive and negative words were selected from the ANEW (see Table 3.15 &3.16) for the emotion word survey after these controlling procedures. It is a commonly accepted argument that participants generally get tired toward the end of a survey; participants respond more clearly to items or sections presented first. To control for the possibility of ordering effects, half of the surveys presented the valence rating first while the other half started with the intensity rating first.

Table 3.15
Valence and intensity ratings of the selected positive emotion words

Word	L	Val (SD)	Inten (SD)	Word	L	Val (SD)	Inten (SD)
adorable	8	7.35(1.37)	5.38(2.39)	joy	3	8.57(0.76)	8.14(0.86)
brave	5	6.76(2.02)	5.95(2.60)	kind	4	7.50(1.18)	3.80(2.49)
bright	6	7.05(1.61)	5.45(2.21)	lively	6	6.89(1.53)	5.49(2.84)
cheer	5	7.7(1.38)	5.95(2.37)	lucky	5	7.94(1.24)	7.00(1.90)
comfort	7	7.73(1.28)	6.53(2.50)	passion	7	7.80(1.14)	7.70 (1.89)
confident	9	6.45(2.21)	4.35(2.87)	satisfied	9	8.25(1.06)	5.92(3.32)
delight	7	7.92(1.31)	5.73(2.49)	terrific	8	7.44(1.59)	4.44(2.01)
free	4	7.83 (1.85)	5.09 (3.02)	thrill	6	8.40(1.59)	8.40(1.06)
happy	5	8.25(1.39)	7.00(2.73)	wise	4	7.00(1.26)	4.17(2.25)

* L: length; Val: valence; Inten: Intensity

Table 3.16
Valence and intensity ratings of the selected negative emotion words

Word	L	Val (SD)	Inten (SD)	Word	L	Val (SD)	Inten (SD)
anger	5	2.87 (1.25)	6.73(2.31)	loneliness	10	1.67(1.07)	4.67(3.03)
bored	5	2.82(1.47)	2.88(2.28)	mad	3	2.35(1.23)	7.20(1.77)
cruel	5	2.64(2.41)	5.27(2.46)	misery	6	2.30(1.53)	4.95(2.68)
drown	5	1.96(1.72)	6.68(2.64)	pain	4	1.87(1.06)	4.20(2.31)
grief	5	2.20(1.15)	6.35(2.30)	sad	3	2.90(1.77)	5.70(2.27)
hatred	6	1.80(1.40)	4.70(2.83)	sick	4	2.12(1.20)	4.44(2.27)
humiliate	9	2.53(2.26)	6.47(2.72)	terrified	9	1.87(1.06)	4.20(2.31)
hurt	4	2.55(1.51)	6.27(2.76)	useless	7	1.80(1.06)	7.30(2.41)
insecure	8	2.20(0.92)	3.90(1.60)	violent	7	3.53(2.17)	6.33(2.74)

* L: length; Val: valence; Inten: Intensity

3. 3. 2 Materials: Emotional sentences

A total of 18 words were selected (positive: 6; negative: 6; neutral: 6) for creating emotional sentences. The selected positive and negative words served as the predicate adjective of the emotional sentences starting with '*She is'* (e.g. *She is angry*). The selected neutral words were also used as the predicate noun of the neutral sentences in the production task (e.g. *This is a chair*). The neutral sentences were included in the production task to control for ordering effects, and to measure the baseline F0 range of each participant.

The purpose of the main production and perception tasks was to examine Korean students' difficulty in producing and perceiving emotional sentences despite their conceptual understanding of the meaning of the words. Three criteria were used to select the words. First, words clearly understood by Korean students were chosen. If they did not understand the semantic meaning of the selected words, their responses to the given emotion word survey along with the production and perception tasks would be invalidated. For instance, if a participant did not know the meaning of '*happy*', the participant could not judge the degree of valence and intensity. As a means of excluding the words that Korean students did not understand, both the emotion survey and the perception task required Korean participants to write down the definition of each word on the answer sheet. The production task required that they notify the researcher when they did not understand the meaning of the presented emotional sentence. Their speech production of that sentence was not recorded. In addition, those words with substantially different cultural connotations or interpretations were excluded. Despite a clear understanding of the semantic meaning of the presented words, varying cultural connotations can interfere with the appraisals of *valence* and *intensity*, which in turn results in inciting a substantially different degree of emotional responses between Korean and American participants. For example, all Korean students provided the translation equivalent definition for the word, '*wise*'. However, they rated the word, '*wise*' more

positively than did American participants. Although the possibility of other unknown intrapersonal factors affecting Korean students' ratings exists, it is plausible that cultural values led Korean students to consider being '*wise*' as more positive than American students. The Korean culture, a collectivistic culture, emphasises harmonious relationships with others and celebrates being '*wise*' as more favourable than being '*exceptional*'. Therefore, if a word espousing significantly different cultural connotation, such as '*wise*', is used for the production and perception tasks, it would be difficult to assess whether the observed differences in Korean and American participant responses resulted from the differences in cultural values or from their use of intonation.

Second, along the same lines, it was expected that Korean and American participants would rate the valence and intensity in a similar way. A significantly different rating between the two groups should not be viewed as a confounding variable in measuring the differences in the use of emotional intonations. Rather, similar word ratings between the two groups validated the effect of the use of intonation also known as 'the vocal channel'.

Third, it was important that the level of word difficulty be minimal so as to avoid a lack of participant semantic understanding during the production and perception tasks. A total of six positive words were chosen (See Table 3.17) based on the aforementioned criteria. All Korean survey participants successfully wrote the translation equivalent in the survey, and the definitions across participants were almost identical.

As shown in Table 3.17, the mean intensity ratings and the mean valence ratings between Korean and American groups were quite close. Although the rating values are ordinal, a parametric test, namely an independent-samples t-test, was chosen to test the mean difference of the chosen six positive and negative words. It is worth noting that the valence and intensity rating variable is not a 'Likert scale' in a genuine sense, made up of many items (Carifio & Perla, 2007). Rather, the emotion word survey used a 'Likert-type item', which

did not use the composite measure of each item in the survey: The rating result of each word item was analysed separately. In addition, generally, the t-test assumes a normal distribution. However, in fact, when a sample size is large (N>30), the t-test is valid even when the sample does not follow a normal distribution due to the Central Limit Theorem (Durrett, 2004).

The mean difference of the valence rating between the Korean and American groups were tested to select the words did not show statistically significant differences in the valence rating. As mentioned earlier, this process was important because the production and the perception tasks aimed to investigate different patterns in using English intonation between the Korean and American groups despite a similar degree of emotional reaction to the presented emotional sentences. According to an independent-samples t-test, the mean difference of the valence rating of Koreans (M= 7.5, SD= 0. 3) and Americans (M= 7.8, SD= 0.4) groups on the selected emotion words was not significant at the p <. 05 level; t (8.5) = -1.9, p = 0.08 (see Table 3.17). The group difference in the intensity rating of the six positive words was also not statistically significant. An independent-samples t-test indicates that the mean difference between Korean (M= 6.8, SD= 0.6) and American (M= 6.2, SD= 0.5) participants on the valence rating of the six words was not significant at the p <.05 level; t (9.8) = 0.67, p = 0.6. (see Table 3.17). Therefore, the words were valid to use for the production and perception tasks.

Table 3.17

The mean valence and intensity rating of the selected positive words

Positive words	**Valence**		**Intensity**	
	Korean	**American**	**Korean**	**American**
1 Confident	7.5	8.0	6.8	6.2
2 Lively	7.1	7.3	6.0	5.7
3 Brave	7.2	7.3	6.5	6.2
4 Lucky	7.5	8.2	5.8	6.4
5 Happy	7.8	8.2	6.9	6.4
6 Passionate	7.6	8.0	7.3	7.3
Average rating	**7.5**	**7.8**	**6.8**	**6.2**

Table 3.18 shows the six negative words selected. Korean participants also provided a clear definition in the survey. An independent-samples t-test indicated that the difference between Korean (M= 2.2, SD= 0.22) and American (M= 2.0, SD= 0.24) participants was not statistically significant at the p <.05 level; t (9.9) = 1.82, p = 0.09. The difference in the intensity rating was slightly larger than the mean valence difference. The intensity rating difference of the six negative words between Korean (M= 6.5, SD= 0.4) and American (M= 5.6, SD= 1.3) participants was, however, also not statistically significant at the p <.05 level; t (5.9) = 1. 68, p = 0.14.

Table 3.18

The mean valence and intensity rating of the selected negative words

Negative words	**Valence**		**Intensity**	
	Korean	**American**	**Korean**	**American**
1 Angry	2.2	2.2	7	7.9
2 Useless	2.6	2.1	6	4.9
3 Cruel	2.4	2.3	6.7	6.1
4 Miserable	2.0	1.7	6.2	4.6
5 Lonely	2.1	1.8	6.8	5.3
6 Humiliated	2.1	1.8	6.2	4.6
Average rating	**2.2**	**2.0**	**6.5**	**5.6**

Korean students' word frequency data for English words currently has not been established. Thus, the word frequency was controlled only for the American participants. Table 3.19 shows the mean word frequency for the selected positive and negative words. An independent-sample t-test indicated that the mean word frequency difference between the chosen positive and negative words was not statistically significant at the p <.05; t (9.5) = 0.56, p = 0.58. The word frequency was a continuous variable; thus, a relatively lenient alpha level was chosen.

Most psycholinguistic studies prefer word-level items because the use of word items eliminates additional contextual information. Word- level stimuli, however, rarely resemble actual speech utterances. This study also aimed to measure the actual use of emotional

intonation and not the internal process of using emotional intonation. Thus, sentence level items, albeit manipulated, were created for the main speaking and perception task.

Table 3.19
The mean word frequency for the selected positive and negative words

	Positive words	Mean Log_Freq_HAL		Negative words	Mean Log_Freq_HAL
1	**Confident**	8.6	**1**	**Angry**	9.5
2	**Lively**	8.6	**2**	**Useless**	8.6
3	**Brave**	11.1	**3**	**Cruel**	6.6
4	**Lucky**	7.5	**4**	**Miserable**	8.5
5	**Happy**	9.7	**5**	**Lonely**	8.1
6	**Passionate**	7.7	**6**	**Humiliated**	9.5
	Average	8.9		**Average**	8.5

To create a declarative sentence with the selected emotion words, each emotion word received one subject word, '*She*' and a matching copular verb, "*is*" (see Table 3.20) to form a sentence structure with minimal extra contextual information. Restricted contextual information was also required because participant responses should primarily come from a mixture of verbal channel (emotion words) and vocal channel (emotional intonation) inputs, not from other substantial contextual information.

Table 3.20
Selected emotional sentences

	Positive words	Positive sentences	Negative words	Negative sentences
1	Confident	She is confident	Angry	She is angry
2	Lively	She is lively	Useless	She is useless
3	Brave	She is brave	Cruel	She is cruel
4	Lucky	She is lucky	Miserable	She is miserable
5	Happy	She is happy	Lonely	She is lonely
6	Passionate	She is passionate	Humiliated	She is humiliated

The third person singular subject was chosen because if a first person subject, such as '*I*' or '*We*' was used, self-praising or self-deprecating utterances (e.g. *'I am adorable'* or '*we are useless'*), which can provoke negative responses in both cases, could be constructed. This is highly plausible in Korean culture where 'humility' rather than 'confidence' is

preferred. Self-praise is considered extremely inappropriate. Thus, sentences such as '*I am confident*', '*I am brave'*, or '*I am kind*' for example, can incite a 'negative' reaction regardless of the different patterns of intonation. In addition, self-deprecating utterances (e.g. *I am useless*) can also incite stronger negative reactions than the sentences expressing emotional states (e.g. *I am angry*). The plural subject '*they*' was also eliminated for the sake of conceptual simplicity. For the noun emotional word items, the adjective form of the noun (e.g. anger → angry, joy→ joyful) was used. The alteration of this part of speech did not significantly influence either the meaning or the overall intonation of the sentence items.

3. 3. 3 Material: The perception task items

A total of twenty-four perception task items (positive sentence items: 12, negative sentence items: 12) from the production task were selected from American participants' emotional sentence production. The perception task items were controlled for the number of congruent and incongruent items and the speaker's gender by including an equal number of congruent and incongruent items in the perception task. The number of positive sentences having the same condition was three (3 x 2: congruent vs. incongruent x 2: male and female =12) (see Table 3.21).

Table 3.21
12 positive sentences spoken by male and female speakers in the perception task

	Positive intonation: Congruent (N=6)		**Negative intonation: Incongruent (N=6)**	
Positive sentences N=12	**Male, N=3**	**Female, N=3**	**Male, N=3**	**Female, N=3**
	P1, Am 31	P2, Am 1	P2, Am 11	P1, Am 15
	P3, Am 10	P4, Am 22	P4, Am 10	P3, Am 20
	P5, Am 31	P6, Am 14	P6, Am 11	P5, Am 8

***P=positive sentence number (see Section 3.3.2); Am: American participant number**

Each positive sentence sound file was initially selected per the researcher's judgement. The researcher listened to the fifty sound files of each sentence produced by Americans and excluded the audio files with unwanted acoustic qualities such as a soft voice or more background noise. Studies show that a positive intonation is generally characterised

by having a higher mean F0 and a larger discrepancy between the Max and the Min F0 (Bulut & Narayanan, 2008). In other words, the pitch in a positive intonation tends to be higher than the pitch in a neutral or negative intonation. Moreover, the overall contour of a positive intonation fluctuates more than neutral and negative intonations. Therefore, after the initial screening process, the audio files showing these two characteristics were selected from the remaining files.

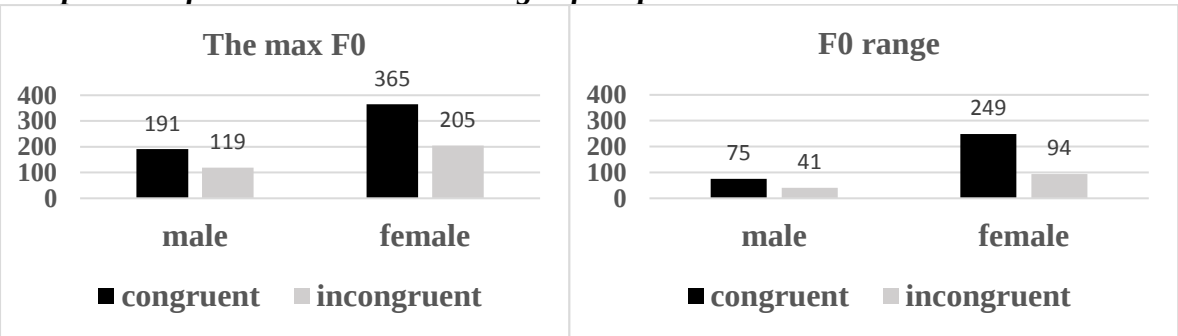
Table 3.22 summarises the Max F0 and the F0 range of each selected positive sentence. The 6 positive sentences spoken by female speakers had the biggest Max F0 and F0 range; their tone of voice was higher and fluctuated more than their male counterparts. Within the six female students' positive sentences, the three congruent sentences (the positive sentences with positive intonation) had a higher Max F0 and an F0 range than the incongruent sentences (a positive sentence with negative intonation). In addition, between the congruent and incongruent sentences, the male students' Max F0 and F0 range discrepancies were smaller than those of the female speakers (see Figure 3.8). The male speakers also had a smaller F0 range with both positive and negative intonations. In other words, the male students tended to have a low voice and a flat tone.

Table 3.22
The Max F0 and F0 range of the 12 positive perception task items

	Positive intonation: Congruent (N=6)				**Negative intonation: Incongruent (N=6)**			
Positive sentences N=12	**Male, N=3**		**Female, N=3**		**Male, N=3**		**Female, N=3**	
	Max F0	**F0 range**	**Max F0**	**F0 range**	**MaxF0**	**F0 range**	**Max F0**	**F0 range**
	195	85	340	280	131	52	190	125
	177	100	454	246	111	33	206	129
	203	40	302	221	116	40	221	30
Average	191	75	365	249	119	41	205	94

* The numeric values in the table represent Hz

Figure 3.8
Comparison of the Max F0 and F0 range of the positive sentence items



The 12 negative sentences were chosen following the same selection procedure as selection of the positive sentences. The gender of the speaker and the number of congruent and incongruent intonations were controlled (see Table 3.23). A negative intonation is generally characterised by a lower Max F0 and a smaller F0 range. The negative sentences showing these acoustic characteristics more clearly were chosen. The researcher initially assessed the quality of each file from fifty sentences and then the acoustic parameters were measured using the Praat programme.

Table 3.23
12 negative sentences spoken by male and female speakers in the perception task

	Negative intonation: Congruent (N=6)		**Positive intonation: Incongruent (N=6)**	
Negative sentences N=12	**Male, N=3**	**Female, N=3**	**Male, N=3**	**Female, N=3**
	N1, Am 42	N2, Am 1	N2, Am 36	N1, Am 1
	N3, Am 2	N4, Am 34	N4, Am 2	N3, Am 39
	N5, Am 2	N6, Am 6	N6, Am 44	N5, Am 1

*N=Negative sentence number (see Section 3.3.2); Am: American participant number

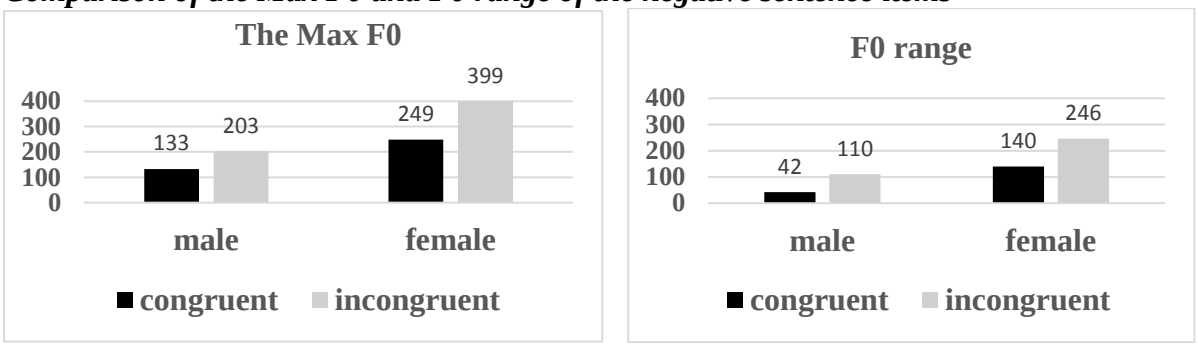
Table 3.24 summarises the Max F0 and the F0 range of each negative sentence. The female speakers had a higher Max F0 and a larger F0 range than the male students with both the congruent and incongruent intonation items. The negative congruent sentences (a negative sentence with a negative intonation) spoken by the selected male speakers had the lowest Max F0 and the smallest F0 range (see Figure 3.9). The twenty-four selected sound files were randomly ordered for the perception task.

Table 3.24
The Max F0 and F0 range of the 12 negative perception task items

	Negative intonation: Congruent (N=6)				Positive intonation: Incongruent (N=6)			
Negative sentences N=12	**Male, N=3**		**Female, N=3**		**Male, N=3**		**Female, N=3**	
	Max F0	**F0 range**	**Max F0**	**F0range**	**MaxF0**	**F0range**	**MaxF0**	**F0range**
	127	36	238	68	184	110	389	213
	151	55	222	144	220	100	369	196
	121	37	287	208	207	122	441	331
Average	133	42	249	140	203	110	399	246

* The numeric values in the table represent Hz

Figure 3.9
Comparison of the Max F0 and F0 range of the negative sentence items



3. 4 Pilot study and sample size determination

3. 4. 1 Pilot study

A pilot study was conducted to examine the unforeseen methodological challenges and to test the feasibility of the proposed tasks. Among the three tasks, the survey and the production task were piloted because the perception task involved a straightforward, simple procedure, which was listening to one declarative sentence and answering on a dichotomous scale. The validity of the perception task heavily depended on selecting the sound files representing the characteristics of the emotional intonation not on the procedure itself.

The pilot study: The emotion word survey

10 Korean undergraduate students from the Department of Education at Inha University, South Korea, participated in the pilot survey. A total of three paper-based questionnaires and a vocabulary test were administered: (1) a Korean-English bilingual

version of the *Language History Questionnaire 2.0* (adapted from Li, Zhang, Tsai, & Puls, 2013) (Appendix 3); (2) the *Vocabulary Size Test* (Nation & Beglar, 2007); (3) The *Beck Depression Inventory II* (Beck, Steer, & Brown, 1996) (Appendix 4); and (4) a word rating survey (Appendix 5). The pilot survey package was distributed in a class at the department and students volunteered to complete the survey. Then, on the next day, they returned the completed surveys to the Department of English Education.

After the pilot survey, the *Vocabulary Size Test* was changed to the *Word Associates Test* (Read, 1988) for two reasons. First, the *Vocabulary Size Test* alone takes a much longer time (almost 40 minutes) to complete than the *Word Associates Test*. To check the breadth of their vocabulary, the pilot study participants answered a lengthy list of multiple-choice questions about the definitions of the presented words prior to taking the main emotion word survey. The pilot survey participants expressed that they felt less focused towards the end of the survey. The *Word Associates Test*, however, took approximately 10 minutes to complete. Second, the *Word Associates Test* was more relevant to the present study than the *Vocabulary Size Test.* The *Word Associates Test* assesses depth of vocabulary knowledge whereas the *Vocabulary Size Test* measures breadth of vocabulary knowledge. The present study focused more on 'how well' participants understand the meaning of the presented vocabulary than 'how many' words they know. Besides the vocabulary test, the students did not express any difficulties participating in the pilot survey. Besides the issue of the lengthy time that the Vocabulary Size Test required for a participant to complete, the emotion word survey was conducted without any procedural complications.

The pilot study: The production task

The production task was piloted to test possible methodological complications and issues. A total of 10 (Korean: 5; American: 5) undergraduate students participated in the production pilot study. Two issues were identified during the pilot study. First, the

participants were permitted to take longer than 10 seconds prior to producing each sentence shown by the researcher. However, it was observed that a 10-second period could give participants sufficient time for rehearsing their performance, which in turn could affect their production performance. Therefore, after the pilot study, participants were asked to speak each sentence immediately after reading the emotional sentence card presented by the researcher.

Another procedural complication observed in the pilot study was that some pilot study participants were overwhelmed by the instructions for saving audio files. To remove this procedural complication, the researcher set up the laptop between the researcher and participants so that the researcher could control the keyboard to save each audio file. Thus, for the production task, participants were only asked to perform the production task without having to save each audio file.

3. 4. 2 Sample size determination

Sample size estimation was calculated prior to deciding the number of participants needed for each task in order to achieve reliable statistical conclusions. In order to determine the adequate sample size for each task, three parameters were required: the level of statistical power, the alpha level, and the effect size. The level of statistical power and the alpha level were chosen for the survey (power: 0.8; alpha: 0.05), the perception task (power: 0.9; alpha: 0.01), and the production task (power 0.8; alpha: 0.01). The perception and production tasks applied a more stringent power and an alpha value because the results of these two tasks were the main interests of this study. By applying the selected level of statistical power and the alpha level, the effect size for each task was calculated to obtain the adequate sample size for this study. For the survey and production tasks, the current study calculated Cohen's *d* as the effect size parameter of each task with using the rough estimates of the means and SDs obtained from the pilot study (see Table 3.25):

$$\text{Cohen's } d = M_1 - M_2 \,/\, \sigma_{pooled}$$

$$\text{where } \sigma_{pooled} = \sqrt{[(\sigma_1^2 + \sigma_2^2) / 2]}$$

The perception task was not piloted due to its straightforward procedure. However, it was possible for the researcher to decide the number of participants needed for the perception task based on the mean and SD obtained from the first group of perception task participants (approximately 20 students in both Korean and American groups). The perception task was conducted across two sessions of the same class on different days. Therefore, the mean and SD obtained from the first group of students was used to decide how many more perception task participants were needed to make valid statistical claims. To obtain the values of the effect size, the sample size for each task was decided from an independent-samples t-test.

Table 3.25
The mean and SD of the emotion word survey, production and perception tasks

	Mean		SD		Cohen's *d*
	American	**Korean**	**American**	**Korean**	**Effect Size**
Survey	8	7	1.5	1.0	0.78
Production task	350	234	50	30	0.79
Perception task	21	19	2.9	2.3	0.76

Finally, the sample size for each task was calculated using the statistical package R (see Appendix 8). According to the calculation, the required sample sizes for the selected reliable statistical power and the alpha level for the survey as well as the production and perception tasks were 38, 44, and 49, respectively. Considering the practical aspects of conducting the current research, the sample sizes for each task was finalised as 40 for the survey and 50 for the speaking and perception task (see Table 3.26)

Table 3.26
The number of participants for the emotion word survey, the perception and the production tasks

	Korean	**American**
The emotion word survey	40	The ANEW data
The production task	50	50
The perception task	50	50

3. 5 Data collection

3. 5. 1 Phase 1: emotion words and sentences selection

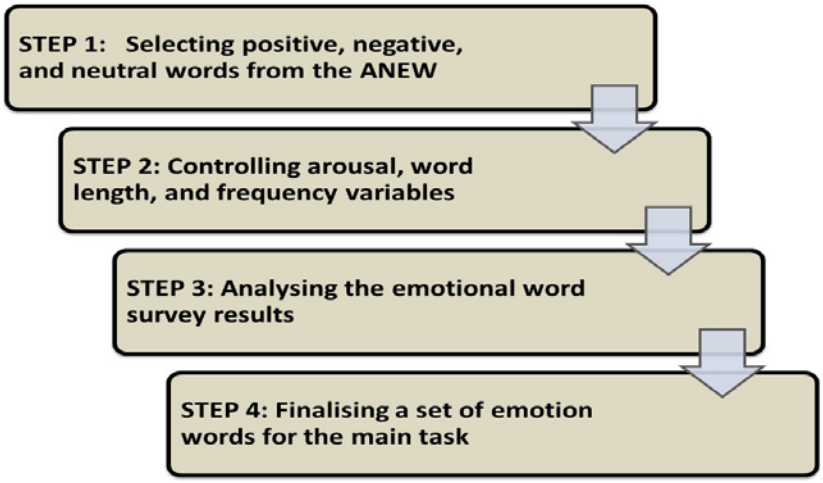
This phase aimed to select the English emotion words and the emotional sentences which served as the 'verbal' channel of speech for the main speaking and perception task. In order to create 'emotional' sentences, and to validly compare the emotional rating data between American and Korean students, two criteria were crucial. First, the ratings should result from emotionality incited by emotion words, and very little else. Thus, Korean students who participated in the survey should understand the semantic meaning of the selected emotion words so that the meaning aspect of the words should not intervene as a confounding variable. In other words, the emotionality rating process should not be hindered by participants' incomprehension of the meanings. Second, as explained in Section 3.3.2, the emotion words that heavily carry cultural connotations were excluded because emotions that people universally experience across different cultures was the interest of the current study.

A four-step selection process was conducted for finalising the emotion words and sentences for the rating survey (see Figure 3.10). The first two steps (step 1 & step 2) involving the initial word selection processes are presented in Section 3.3.1. The selected positive, negative, and neutral words were then presented in randomised order in a paper-form survey. For valence and intensity, the survey used the same 9-point unit of measurement as the ANEW (Bradley & Lang, 2010). As mentioned in Section 3.3.1, the content of the survey was presented in one of two formats with either the valence or intensity domain first. Additionally, in the first rating section, participants were asked to provide for each word its Korean equivalent (see Appendix 5).

After analysing the results of the survey data, words demonstrating minimal rating discrepancy between Korean and American participants were selected for the emotion

sentences in the production and perception tasks. The rationales for selecting these words for the emotion sentence is presented in Section 3. 3. 2.

Figure 3.10
Four-step emotion words selection process



The survey administration procedure

Korean survey participants were recruited via campus visits. Once students agreed to participate in the study, they took the survey package and returned it individually to the office of the Department of English Education. Each survey package contained the information sheet (Appendix 1) and the written informed consent form (Appendix 2).

As shown in Table 3.27, a total of three different paper-based questionnaires and a vocabulary test were administered: (1) a Korean-English bilingual version of the *Language History Questionnaire* (LHQ) 2.0 (adapted from Li, Zhang, Tsai, & Puls, 2013) (Appendix 3); (2) the *Word Associates Test* (Read, 1988); (3) The *Beck Depression Inventory II* (Beck, Steer, & Brown, 1996) (Appendix 4); and (4) a word rating survey (Appendix 5). The completed survey sheets were collected and stored in a locked box to which only the researcher has access.

Table 3.27
The list of the surveys and test included in the emotion word survey package

	Name	Type of questionnaire/test	Purpose
1	Language History Questionnaire	A paper-based questionnaire	To obtain information on participants' language background
2	Word Associates Test	A paper-based Vocabulary test	To test participants' depth of vocabulary knowledge
3	Beck Depression Inventory II	A paper-based questionnaire	To screen out participants with severe depressions
4	Emotion word survey	A paper-based questionnaire	To obtain Korean participants' emotion word rating data

3. 5. 2 Phase 2: American participants' data collection

The second phase comprised three tasks: the emotional sentence production task, a stimulated recall interview, and the perception task. The group of fifty American university students participated in the speaking test and the stimulated recall interview first. Then, another fifty students completed the perception task.

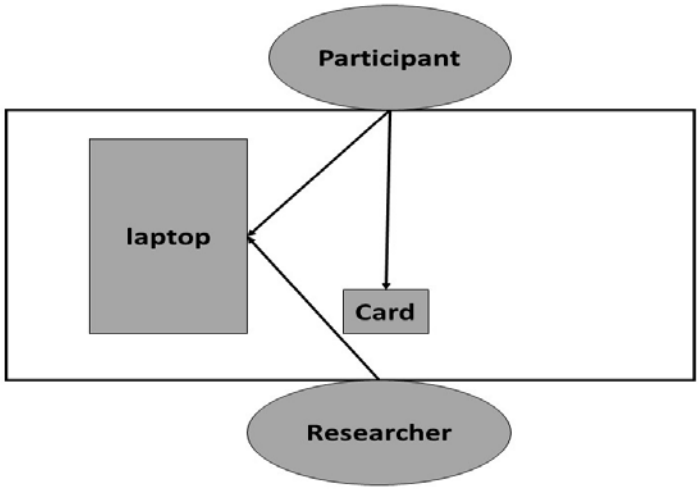
American participants: The emotional-sentence-production task

The speaking test aimed to acoustically measure the Max F0, the Min F0, and the F0 range of the emotional declarative sentences produced by American students. The data collected from Americans served two purposes: (1) baseline data for comparison with Korean participants' production data and (2) resources for constructing the sound prompt files used for the perception task. It is also worth noting that the production task was designed to measure the proposed acoustic parameters of actual utterances, not to measure any internal online processes, such as reaction times. The production task and the stimulated recall interview were done individually. The declarative sentences and the interview answers produced by each participant were recorded by the software Praat Version 5. 4. 17 (Boersma, Paul, Weenink, & David, 2015) using a PC laptop.

a. The setting of the production task

Each participant was invited to the same office located in one of the residence halls on campus. The setting for the production task and interview was also consistent for each participant (see Figure 3.11). The researcher sat opposite the participant and the computer was placed between the participant and the researcher. The position allowed for the participant to see each flash card (provided by the researcher) with the emotional sentence intonation (positive or negative). Both the participant and the researcher could see the laptop screen placed between them. The screen displayed the Praat window with the 'Record' and 'Save' buttons to be clicked before and after performing the task.

Figure 3.11
Arrangement of the production task setting



b. The production task procedure

Both Korean and American production participants first received a written (see Appendix 7) and verbal explanation of the overall procedure for f the production task. After confirming willingness to participate, they were asked to sign a consent form before beginning the surveys. Table 3.28 summarises the procedures and time involved for the production task. Ten to fifteen of those minutes were utilised to complete the *LHQ* and *Beck Depression Inventory II*. Approximately eight to ten minutes were spent on the main

production task, which also included a practice session consisting of completing the recording of four sample emotional sentences.

Table 3.28
The tasks and time involved in the production task

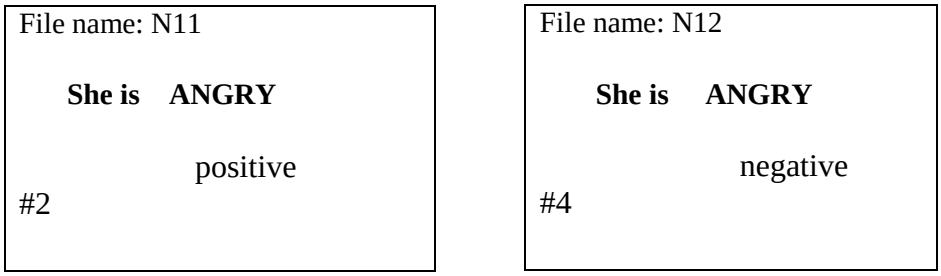
Order	Task	Time
1	The LHQ	10 mins
	The Beck Depression Inventory II	
2	The production task	8-10 mins

Once they completed the *LHQ* and the *Beck Depression Inventory II* surveys, the researcher explained the procedure for the production task. The researcher first explained each component of the flash card (see Figure 3.12): a file name, one declarative sentence, and either '*positive*' or '*negative*' depending on the type of intonation participants were asked to produce. The adjective in each sentence was boldface so as to indirectly encourage participants to place prominence on the adjective rather than the subject and the verb, '*She is*'. They were told that the file name was for the researcher to save each sound file, so they were instructed to pay attention to the sentence and the intonation pattern instructed on each card.

The researcher also explained by showing a couple of practice cards that the cards were categorised into three different types: congruent, incongruent, or neutral. For instance, Card #2 on the left presents a sentence incongruent with the intonation pattern directed. The sentence communicates a negative emotion yet the intonation written on the bottom of the card directs the participant to speak the sentence with a positive intonation. Card 4 on the right exemplifies a congruent sentence with the sentence and intonation to be used both negative. The neutral cards also followed the same format as the emotional sentence cards, but the sentences comprised the subject and the verb, '*This is*', and a predicate nominative, which was an object noun, such as '*a chair*' obtained from the word rating survey data. The

neutral sentence cards were included in the task to obtain a baseline F0 range for each individual speaker. They were randomly distributed throughout the emotional sentence cards.

Figure 3.12
Examples of the production task sentence cards



After instructing on the use of the cards, the researcher demonstrated how to click the 'Record' and 'Save' button on the Praat window. The researcher also checked the laptop's internal microphone and set the recording frequency to 22050 Hz (Yang, 2010) before recording. The recording procedure involved a few simple steps. First, the researcher showed one of the sentence cards to the participant. The time allowed to complete the main production task was controlled. As soon as the participant silently read the sentence card, he/she was asked to immediately click the 'Record' button on the Praat window to start recording. They generally took one second before clicking the 'Record' button. Once the participant completed speaking the individual sentence, he/she immediately clicked the 'Stop' button. They generally and successfully completed the production task after practising two to three times. During the main recording session, a total of thirty positive, negative, and neutral sentences (positive: 12; negative: 12; neutral: 6) were presented in random order. Each recorded sound file was saved in AFIC format in a designated folder by the researcher. This same procedure was repeated until the participant finished the entire set of cards.

American participants: A brief stimulated recall interview

The stimulated recall interview followed the production task. It was conducted to investigate the underlying cognitive and affective processes that guided participants' speech

production during the production task. In other words, the stimulated interview was designed to tap into the mental pictures or contextual information that participants were thinking when they spoke each given emotional sentence using a positive or negative intonation. Two of the key features of a stimulated recall interview are: (1) the relationship to a specific action and (2) the temporal relationship to an action (Gass & Mackey, 2000). Stimulated recall interviews aim to obtain information about a specific action at a specific time, not general attitudes or tendencies. In addition, Gass and Mackey (2000) stress the importance of the immediacy of the stimulated recall interview. Although participants might be able to recall a previous event, immediate retrospection allows participants to describe or provide their internal thought processes in details.

The stimulated recall interview conducted in the present study also aligned with these two characteristics. A stimulus, the speech file of the participant's own production in this study, was used to remind the participant what he or she was feeling and thinking while they were speaking each sentence. Since the stimulated recall interview was conducted immediately after participants completed the production ask, the elapsed time between the production task and the stimulated recall interview was generally less than 5 minutes.

a. The structure of the stimulated recall interview

Each production task participant was asked to participate in a stimulated recall interview, in which each listened to the four different sound files they produced. The four sentences consisted of a positive and negative sentence with either a congruent or incongruent intonation (2: sentence type x 2: intonation = 4) (see Table 3.29).

Table 3.29
The example of the four sentence-stimulus for the stimulated recall task

	Sentence Type	Sentence example	Intonation
1	Positive	She is lively	Congruent: Positive intonation
2	Positive	She is lively	Incongruent: Negative intonation
3	Negative	She is angry	Congruent: Negative intonation
4	Negative	She is angry	Incongruent: Positive intonation

The stimulated recall interview followed an open-ended question. The researcher attempted to minimise the influence on participant responses. The interview questions did not include any expressions eliciting specific responses, such as ‘what kind of situation were you thinking of?’ or ‘what strategy were you using when you were producing the intonation? These questions would influence their responses and thus they would not have provided honest answers about their thought processes during their production performance. The present study, therefore, asked participants the following open-ended question without eliciting any specific aspects of their thinking processes

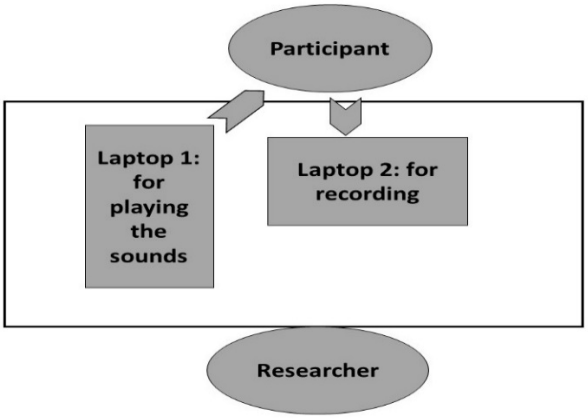
- Could you please tell me how you felt or what you were thinking when you were speaking this specific sentence?

b. The setting and the procedure of the stimulated recall interview

The stimulated recall interview took place as soon as each production task participant completed the production task. The recording procedure was the same as the production task. The setting, however, included an additional laptop. Laptop 1 was used for playing the sound clips and Laptop 2 was used for recording participant responses (see Figure 3.13).

Prior to recording the stimulated recall interview responses, each participant received verbal instruction on the interview procedure (see Appendix 9). They were asked to reflect and describe their thoughts and feelings as they were producing the sentences requested. After the verbal instructions and when the participant was ready, the researcher played one individual sound clip and asked the interview questions. Participants were given time to respond. Then, when ready, they clicked the ‘Record’ button on the Praat window. Once they finished recording, they clicked the ‘Stop’ button. The interview responses were recorded by the Praat Sound recorder and saved in AIFC format for transcription and qualitative analysis.

Figure 3.13
Arrangement of the stimulated recall task setting



American participants: The emotional sentence perception task

a. The perception task format

The perception task had two sub-sections: (1) identifying congruency between the meaning of the presented sentence and the intonation pattern and (2) describing how each speaker sounds using brief adjectives. For the congruency task, participants marked the answer sheet using a dichotomous (congruent/incongruent) scale. If the intonation of the sentence matched the meaning of the text (e.g. '*She is happy*' in a positive intonation), they marked 'congruent', but if the intonation and the meaning did not match, they marked 'incongruent' (see Figure 3.14).

Figure 3.14
The scoring process of the perception task

	Sentence items	Sentence/ intonation (Intended)	Answers	Score
Positive	e.g. She is satisfied	She is satisfied (+ intonation) She is satisfied (- intonation)	Positive (O) → 1 Incongruent (X) → 0 Positive (X) → 0 Incongruent (O) → 1	
Negative	e.g. She is hurt	She is hurt (+ intonation) She is hurt (- intonation)	Negative (X) → 0 Incongruent (O) → 1 Negative (O → 1 Incongruent (X) → 0	

Students were also asked to provide a brief adjective about the tone of the sentence immediately after having marked its congruency (see Appendix 10).

b. The perception task procedure

The perception task was conducted in a group. Table 3.30 summarises the tasks and time involved in the perception task. Prior to the main perception task, participants were asked to fill out the *Beck Depression Inventory II* and the *LHQ*. Students generally completed the two surveys within 10 minutes. After the surveys, the researcher provided participants with verbal instructions and using the Praat programme, the researcher played two practice sound files.

Table 3.30
The tasks and time involved in the perception task

Order	Task	Time
1	The LHQ The Beck Depression Inventory II	10 mins
2	The perception task	8-10 mins

Two external speakers were connected to a laptop, and the internal and external volumes were equally manipulated for the two different perception task sessions. Since the perception task measured the accuracy of perception based on listening to the sentence production items, the researcher also controlled for the number of times participants could listen to the speech items. Each intonation sentence item was played once with the same interval between each individual sentence. Students were given 10 seconds for marking the congruency and providing an adjective descriptor for each listening question. Once they completed the perception task, the researcher collected the answer sheets. Then, the scores were compiled and calculated for statistical analysis.

3. 5. 3 Phase 3: Korean students' data collection

Korean students participated in the same production task and stimulated recall interview. The production task and the interview were done individually in an office located

in the Department of Education. The setting for the production task and the interview were the same as those of Americans. Verbal instructions were given in Korean and participants were allowed for the stimulated recall interview to respond in Korean.

Korean students also followed the same procedure for the perception task. The only difference between the Korean and American groups in performing the perception task was that Korean participants were asked to provide the Korean equivalent of underlined English adjective. Approximately five minutes were given to fill out these definitions prior to taking the perception task. This additional procedure was required because the test assumed that participants understood the semantic meaning of each sentence. Ambiguous items were excluded when comparing the scores on the perception task between Korean and American students. In addition to the word definition section of the task format, the perception task environment was slightly different from that of the American group. The researcher visited two sessions of the same course held in the same classroom each time. For Korean students, however, the researcher visited one session of two different courses, Introduction to Education Philosophy and Introduction to English Literature. The size and overall setting of the two classrooms were, therefore, slightly different from each other, which in turn might have affected the sound transfer.

3. 6 Data analysis

3. 6. 1 Quantitative analysis

The current study aimed to compare the proposed task results of two different groups. Therefore, the linguistic background serves as the main factor (or the Independent Variable). In order to validate the proposed hypotheses (see Section 3.1), several statistical analyses were carried out using the statistical package R. First, descriptive statistics were calculated to compare the results between the two groups of the Phase 1 surveys. Then, a series of independent-samples t-tests was conducted to compare the emotional rating results of the

Korean and American groups. The results of the perception task were also statistically analysed using independent-samples t-tests. Second, a two-way Analysis of Variance (ANOVA) was conducted to compare the numerical values of the acoustics measured in hertz (Hz), generally ranging from 0 Hz to 600 Hz. Two-way ANOVA analyses were chosen to test interaction between different factors affecting the perception task scores as well as the performance of the production task. For both independent-samples t-tests and ANOVA analyses, some data were skewed and variances were not homogenous. Generally, transformation of data (e.g. a log transformation) are considered when a set of data does not meet the assumption of homogeneity of variance and normal distribution. For the present study, however, transformed data were not used for two reasons: (1) The sample size of the current study was large enough to be robust to violations of the assumptions. As explained earlier, due to the Central Limit Theorem (CLT) (Durrett, 2004), when a sample is larger than 30, it is valid to use t-tests and ANOVA tests even when a set of data violates the assumptions. (2) Once data is transformed to a log or squared root value, it is hard to interpret the implications of the value.

3. 6. 2 Acoustic analysis

In addition to measuring the three acoustic parameters, the intonation patterns produced by American and Korean participants were analysed by the autosegmental-metrical model (Beckman & Pieerehumbert, 1986) and Halliday's tone model (2008). The hierarchical intonation framework allows marking specific patterns of intonation contour by a set of transcription conventions (see Appendix 11). Thus, the model was used to further analyse the characteristics of the internal intonation contour structures produced by American and Korean participants. In addition, the three features of tone patterns, namely *tone*, *tonality*, and *tonicity* are analysed by adopting the Halliday's tone model (2008). The first feature, tone patterns refers to the way each emotional utterance was spoken by participants. 'Tonality'

refers to the number of phrasal level units within a sentence. For instance, the sentence, '*she is happy*' can be grouped into two phrasal units, '*she is*', and '*happy*'. Lastly, 'Tonicity' means the tonal accent of the sentence. In the case of the sentence, '*she is happy*', three different tonal accents (SHE is happy; she IS happy, she is Happy) are possible.

3. 6. 3 Qualitative analysis

The stimulated data analysis process followed three steps of transcribing, coding, and analysing and describing. The stimulated recall interview responses were first transcribed for coding. For Korean students, the interviews results were transcribed in Korean first and then translated into English. Gass and Mackey (2000) suggest that coding schemes should be developed to answer the research questions. The stimulated recall interview in the present study was conducted to obtain information about underlying cognitive and affective processes contributing to the different patterns of speech production in the production task. Coding schemes were, therefore, initially developed to address different patterns between the Korean and American groups in their responses. For instance, Korean participants tended to provide more task-oriented responses whereas American participants described a specific context and feeling to which they pictured in their mind when they were producing the given emotional sentence. However, the initial coding schemes were revised and modified in the process of coding. Then, the result of the interview analysis was compared between the Korean and American groups. The present study was not able to use inter-rating, meaning the researcher was the only person who analysed the qualitative data, because of the lack of financial resources required to hire another rater.

In addition, establishing reliability of the coded data was crucial to avoid the subjective interpretation of the stimulated recall interview (Gass & Mackey, 2000). The present study compared the stimulated recall interview results with the acoustic patterns (e.g. Max F0 and Min F0) of participants' speech production. This process was only done for

Korean participants in order to examine the relationship between the internal cognitive process information obtained from the stimulated recall interview and their actual production performance patterns. The stimulated recall interview results were also compared with Korean participants' English proficiency test scores to investigate the relationship between their proficiency level and the types of cognitive and affective information that they were thinking while they were performing the production task.

3. 7 Ethical considerations and proposed timeline for the present study

The present research involved human subjects and used personal data. Thus, the researcher conducted the study after receiving ethical approval from the Central University Research Ethics Committee at the University of Oxford. The researcher also adhered to the ethical guidelines stipulated by the British Educational Research Association. Informed consent was obtained from all participants prior to data collection. The consent form conveyed to participants their rights, the purpose of the study, procedures and expectations, and the potential benefits of participation (see Appendix 1). Participation in the study was voluntary. A monetary incentive of ten dollars was given to all survey, perception and production task participants to facilitate survey recruitment and motivate participation.

CHAPTER 4

THE EMOTION WORD SURVEY RESULTS

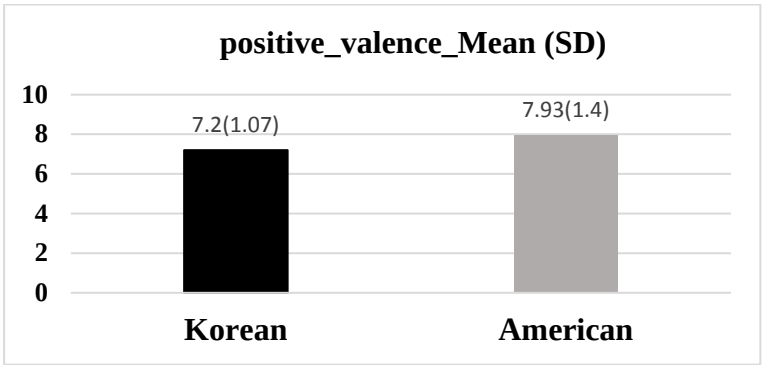
The present study investigated whether there were any significant differences between the Korean and American groups in the degree of the *valence* that emotion words incited when reading the words and differences in producing and perceiving English emotional intonation. This section summarises and compares the valence ratings between the Korean American groups on the selected positive, negative, and neutral words.

4. 1 Emotion word survey results

4. 1. 1 Positive words

Figure 4.1 compares the mean and SD of the valence ratings on positive words between the Korean and American groups. The mean valence rating of the American group (M= 7.9) was higher than that of the Korean group (M=7.2) (1: very negative; 5: neutral; 9: very positive). American students also had a higher SD (SD= 1.4) than did Korean participants (SD= 1.07), indicating that Korean students' valence ratings on the positive words were less variable than those of Americans. This might be due to the smaller sample size of Korean participants. The larger SD, however, could also result from a wider range of context that American students can associate with the positive words. While Korean students have relatively limited contextual information on the positive words, mostly obtained from classroom learning, American students have various and richer contextual scripts that they have accumulated; this in turn could contribute to the wider range of the valence rating distribution on the degree of positiveness.

Figure 4.1
The mean and SD of the valence ratings on the positive words between the Korean and American groups



The comparison of the valence rating results on the positive words between Korean and American participants revealed some between-sample differences. An independent-samples t-test with the Bonferroni adjustment indicated that the mean difference between the Korean and American groups was statistically significant at the $p < .003$ level: $t(23.4) = -3.5$, $p = 0.001$. Therefore, the lower mean value of Korean students supports the argument that the degree of positiveness that Korean students experienced when they read the presented positive words was less than that of Americans. In other words, Korean students 'felt' the words were less positive than did Americans when reading the positive words in the survey.

Overall, all Korean participants successfully provided the translation equivalent of the positive words except for two words, '*thrill*' and '*terrific*'. The definitions of the positive words that Korean survey participants provided, except for the two words, '*thrill*' and '*terrific*', were consistent across Korean participants, showing a clear understanding of the semantic meaning of the positive words. This result suggests that the lower valence ratings of Korean students were actually due to a lesser degree of the positiveness that Korean participants experienced though it was possible that the lower ratings resulted from some unknown intrapersonal factors.

Table 4.1 summarises the mean rating and SD of each positive word. The word, '*delight*' received the highest mean valence rating from Korean participants (M=8.02) while

the American group assigned the highest mean valence rating on the word, '*joy*'. The least positive word for Korean participants was '*thrill*' (M=5.07). There were, however, more than ten Korean survey participants who failed to provide the definition of the word, '*thrill*'; they either left the definition section blank or provided a wrong definition. It is, therefore, likely that those ten Korean survey participants assigned a neutral rating on the word, '*thrill*' because they were unfamiliar with it. The word received the least valence ratings from American participants was '*lively*' with the mean valence rating, 7. 28. Both the Korean and American groups had the most consistent ratings on the word, '*joy*' with the SD of 0.76 and 0.70, respectively. The positive word that displayed the widest valence rating distribution was 'free' for Koreans (SD= 1.85) and 'lively' for Americans (SD= 2. 16).

Table 4.1
The mean valence rating and SD of individual positive word

	Positive Word	Korean Mean (SD) N=40	American Mean (SD) N=100		Positive Word	Korean Mean (SD) N=40	American Mean (SD) N=100
1	**Wise**	7.72 (1.26)	7.57 (1.17)	**10**	**Lucky**	7.75 (1.24)	8.10 (1.06)
2	**Satisfied**	7.79 (1.59)	7.95 (1.34)	**11**	**Cheer**	7.02 (1.38)	8.30 (0.86)
3	**Delight**	8.02 (1.41)	7.57 (1.57)	**12**	**Thrill**	5.07 (1.59)	7.98 (1.42)
4	**Confident**	7.46 (1.28)	7.98 (1.30)	**13**	**Happy**	7.87 (1.40)	8.20 (2.00)
5	**Lively**	7.10 (1.53)	7.28 (2.16)	**14**	**Terrific**	6.02 (1.06)	8.15 (1.15)
6	**Free**	7.20 (1.85)	8.31 (1.00)	**15**	**Kind**	6.94 (1.18)	7.59 (1.78)
7	**Brave**	7.21 (1. 54)	7.35 (1.64)	**16**	**Passion**	7.61 (1.14)	8.02 (1.30)
8	**Bright**	7.05 (1.61)	7.69 (1.44)	**17**	**Adorable**	7.45 (1.37)	7.92 (1.11)
9	**Joy**	7.51 (0.76)	8.60 (0.70)				

Table 4.2 summarises the result of an independent-samples t-test for each positive word. The positive words that showed a statistically significant difference between the Korean and American groups in the valence ratings were: '*free*', '*bright*', '*joy*', '*cheer*', '*thrill*', '*terrific*', and '*adorable*'. The words, '*thrill*' (t (138) =10. 58) and '*terrific*' (t(138)= 10.11) had the widest gap between the Korean and American groups. The words showed that the least difference between the two groups were '*lively*' and '*brave*'. Figure 4.2 visualises the valence rating difference between the two groups.

Table 4.2

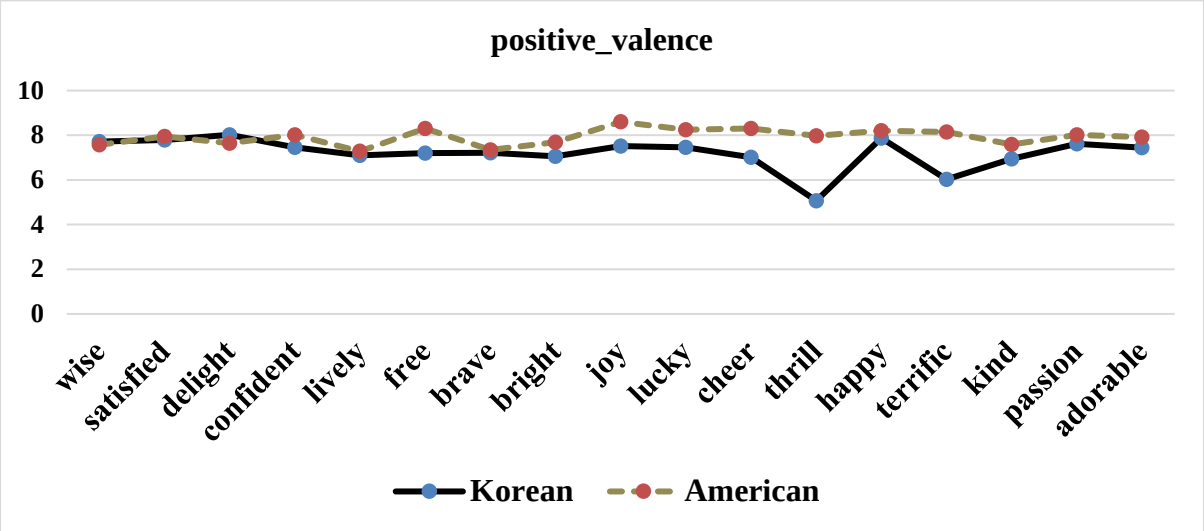
An independent-samples t-test result of the valence rating of each positive word

	Positive Word	t (df)	p-value		Positive Word	t (df)	p-value
1	**Wise**	t (138) = 0.67	0.50	**10**	**Lucky**	t (138) = 1.67	0.09
2	**Satisfied**	t (138) = 0.60	0.54	**11**	**Cheer**	t (138) = 6.61	0.00*
3	**Delight**	t (138) = 1.57	0.11	**12**	**Thrill**	t (138) = 10.58	0.00*
4	**Confident**	t (138) = 1.86	0.06	**13**	**Happy**	t (138) = 0.95	0.34
5	**Lively**	t (138) = 0.48	0.63	**14**	**Terrific**	t (138) = 10.11	0.00*
6	**Free**	t (138) = 4.57	0.00*	**15**	**Kind**	t (138) = 2.12	0.76
7	**Brave**	t (138) = 0.46	0.64	**16**	**Passion**	t (138) = 1.74	0.08
8	**Bright**	t (138) = 2.29	0.02*	**17**	**Adorable**	t (138) = 2.11	0.03*
9	**Joy**	t (138) = 8.12	0.00*				

Note: *: significant difference at α = 0.05

Figure 4.2

Visualisation of the positive word valence rating comparison between the Korean and American groups

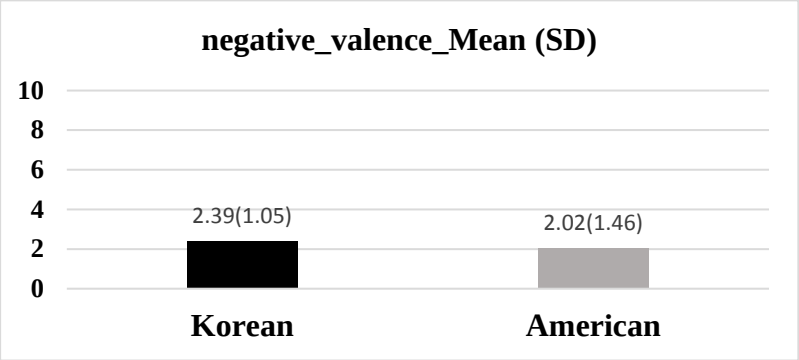


4. 2 Negative words

Figure 4.3 shows that the mean valence rating of the Korean group (M= 2. 39) was higher than that of the American group (M= 2.02) (1: very negative; 5: neutral; 9: very positive). An independent-samples t-test with the Bonferroni correction indicated that the mean difference between the two groups was statistically significant at the p <.03 level: t (30)= 2.3, p= 0.02, meaning Korean students experienced less negativeness than did the American group when reading the negative words in the survey. The mean SD of the Korean group (1.05) was lower than that of the American group (1.46); the distribution of Korean students' valence ratings on the negative words was less variable than that of American

students' valence ratings. In terms of the word definition, four Korean survey participants failed to provide the definition of the words, '*insecure*' and '*humiliate*'. The rest of Korean students successfully provided the translation equivalent of the negative words in the survey.

Figure 4.3
The mean and SD of the valence ratings on the negative words between the Korean and American groups



The mean and SD of each negative word are presented in Table 4.3. The word received the lowest mean valence rating from the Korean group was '*violent*' (M= 1. 53) with the lowest SD of 0.70. In other words, the word, '*violent*' consistently invoked the greatest degree of negativeness across Korean survey participants.

Table 4.3
The mean valence rating and SD of individual negative word

	Negative Word	Korean Mean (SD) N=40	American Mean (SD) N=100		Negative Word	Korean Mean (SD) N=40	American Mean (SD) N=100
1	**Anger**	2.20 (0.80)	2.21 (1.30)	**10**	**Misery**	2.23 (1.03)	1.93 (1.61)
2	**Hatred**	1.92 (1.50)	1.90 (1.80)	**11**	**Bored**	3.25 (0.88)	2.99 (1.30)
3	**Violent**	1.53 (0.70)	1.99 (1.03)	**12**	**Cruel**	2.23 (1.22)	1.97 (1.04)
4	**Insecure**	2.83 (0.93)	2.35 (1.40)	**13**	**Drown**	2.30 (1.41)	2.14 (1.65)
5	**Useless**	2.61 (0.80)	2.20 (1.28)	**14**	**Sad**	2.25 (0.91)	1.54 (0.90)
6	**Mad**	2.20 (0.90)	2.47 (1.80)	**15**	**Grief**	2.36 (1.17)	1.68 (0.92)
7	**Humiliate**	2.44 (1. 66)	2.25 (1.40)	**16**	**Hurt**	3.12 (1.11)	1.88 (1.12)
8	**Pain**	2.26 (0.81)	1.88 (1.70)	**17**	**Sick**	2.87 (0.86)	1.79 (1.07)
9	**Loneliness**	2.10 (0.99)	2.17 (1.01)				

In the same way, Americans assigned the lowest valence ratings on the word, '*sad*' (M= 1. 54) with the lowest SD of 0.91. Both the Korean (M = 3. 25) and American (M= 2.

99) groups assigned the highest valence rating on the word, '*bored*', showing that both groups 'felt' the least degree of negativeness when reading the word.

The results of an independent-samples t-test for each negative word are presented in Table 4.4. The valence rating mean differences in the words, '*violent*', '*insecure*', '*sad*', '*grief*', '*hurt*', and '*sick*' were statistically significant at the $p < .05$. The word had the largest and smallest t-values were '*hurt*' ($t(138) = 5.93$) and '*anger*' ($t(138) = 0.04$). These results show that the word had the biggest rating difference between the Korean and American groups was 'hurt' whereas the two showed a similar degree of negativeness toward the word, '*anger*'.

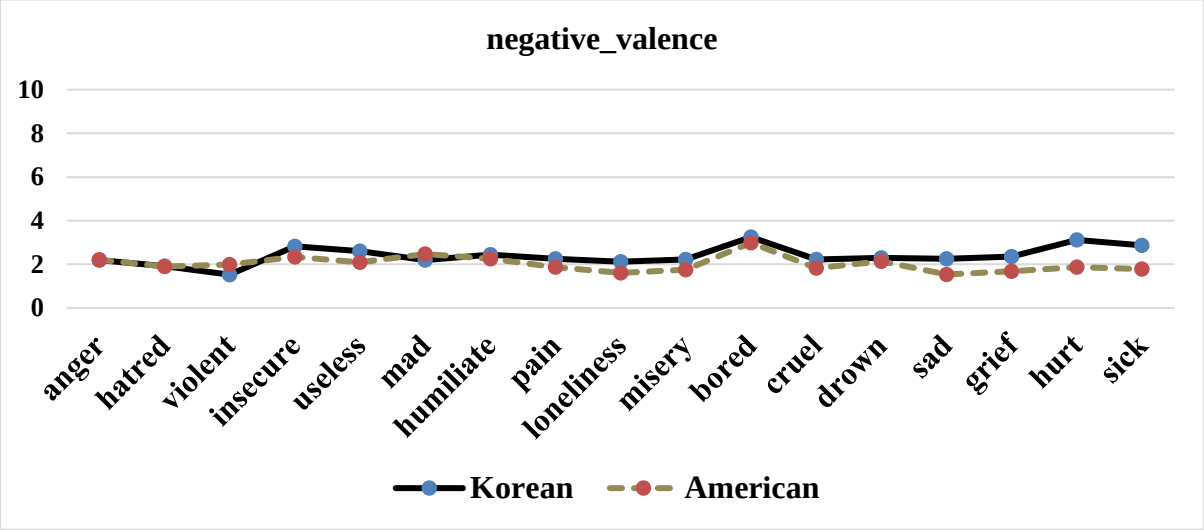
Table 4.4
An independent-samples t-test result of the valence rating of each negative word

	Negative Word	t (df)	p-value		Negative Word	t (df)	p-value
1	**Anger**	t (138) = 0.04	0.96	**10**	**Misery**	t (138) = 1.09	0.27
2	**Hatred**	t (138) = 0.06	0.95	**11**	**Bored**	t (138) = 1.16	0.24
3	**Violent**	t (138) = 2.59	0.01*	**12**	**Cruel**	t (138) = 1.27	0.20
4	**Insecure**	t (138) = 1.99	0.04*	**13**	**Drown**	t (138) = 0.53	0.59
5	**Useless**	t (138) = 1.88	0.63	**14**	**Sad**	t (138) = 4.20	0.00*
6	**Mad**	t (138) = 0.90	0.36	**15**	**Grief**	t (138) = 3.64	0.00*
7	**Humiliate**	t (138) = 0.68	0.49	**16**	**Hurt**	t (138) = 5.93	0.00*
8	**Pain**	t (138) = 1.35	0.17	**17**	**Sick**	t (138) = 5.68	0.00*
9	**Loneliness**	t (138) = 0.37	0.71				

Note: *: significant difference at $\alpha = 0.05$

Figure 4.4 also displays the mean valence rating difference on the negative words between the two groups: overall, the pattern of the solid line (the Korean group) bears a resemblance to that of the dotted line (the American group). Interestingly, Korean participants considered the words related to describing an individual's negative emotional and physical state such as '*sad*', '*hurt*', '*grief*' and '*sick*', less negative than other negative words.

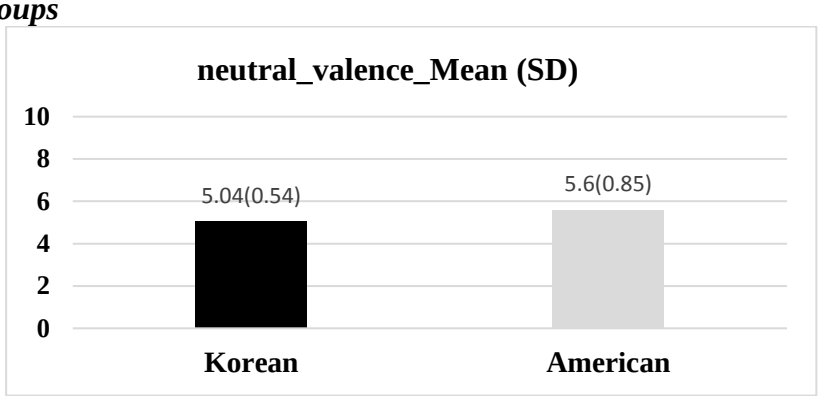
Figure 4.4
Visualization of the negative word valence rating comparison between the Korean and American groups



4. 3 Neutral words

The mean valence rating of Korean participants (M= 5.04) on the neutral words was lower than that of American participants (M= 5. 60) (1: very negative; 5: neutral; 9: very positive) (see Figure 4.5). An independent-samples t-test with the Bonferroni adjustment indicated that the mean valence rating difference between the Korean and American groups on the neutral words was statistically significant at the p <.03 level: t (15.9) = 2.58, p= 0.01.

Figure 4.5
The mean and SD of the valence rating on the neutral words between the Korean and American groups



The neutral words had the smallest SD (0.54) among the three types of words (positive, negative, and neutral), indicating that the students showed the most consistent ratings on the neutral words. Generally, Korean participants showed a clear understanding of

the semantic meanings of each neutral word except for three participants who failed to provide the definition of the words, '*rug*' and '*kettle*'.

As shown in Table 4.5, '*blanket*' (M= 5.25) and '*pillow*' (M= 5.50) received the highest valence rating value from the Korean group, indicating that Korean survey participants regarded those two words somewhat more positive than the rest. The words, '*blanket*' and '*pillow*' probably evoked stronger emotional responses than other neutral words from Korean participants because these two words are generally associated with '*comfort*' and '*rest*'. This phenomenon is also clearly shown in the American group. American students rated both '*blanket*' (M= 7.12) and '*pillow*' (M= 7.93) significantly higher than other neutral words. American students also assigned a higher rating on the word, '*computer*' (M= 6.29) than other neutral word. This might be because computers are often associated with positive traits such as '*efficiency*' or '*convenience*'. Both the Korean (M= 4.91) and American (M= 4. 93) groups assigned the lowest valence rating on the word, '*rug*'.

Table 4.5
The mean valence rating and SD of individual neutral word

	Neutral Word	Korean Mean (SD) N=40	American Mean (SD) N=100		Neutral Word	Korean Mean (SD) N=40	American Mean (SD) N=100
1	**Blanket**	5.25 (0.60)	7.12 (1.19)	**9**	**Road**	5.12 (0.60)	5.56 (1.06)
2	**Door**	5.02 (0.31)	5.13 (1.50)	**10**	**Plate**	5.00 (0.22)	5. 35(2.01)
3	**Engine**	5.05 (0.70)	5.13 (1.49)	**11**	**Kettle**	4.97 (0.40)	5.23 (1.08)
4	**Closet**	4.97 (0.54)	5.35 (1.00)	**12**	**Cupboard**	4.87 (0.31)	4.73 (1.31)
5	**Pillow**	5.50 (0.82)	7.93 (1.17)	**13**	**Chair**	5.10 (0.60)	5.07 (0.95)
6	**Table**	5.00 (0.90)	5.21 (1.06)	**14**	**Building**	4.92 (0.40)	5.17 (1.23)
7	**Train**	5.02 (0.23)	5.51 (1.58)	**15**	**Computer**	4.97 (0.72)	6.29 (1.92)
8	**Window**	5.00 (0.51)	5.90 (1.60)	**16**	**Rug**	4.91 (0.61)	4.93 (1.16)

Table 4.6 summarises the result of an independent-samples t-test for each neutral word at the $p < .05$ level. The neutral words that showed a significant mean valence rating difference were '*blanket*', '*closet*', '*pillow*', '*train*', '*window*', '*road*', and '*computer*'. All of the neutral words received a significantly higher valence rating from the American group, suggesting that the American group felt more positive towards these neutral words. As

mentioned earlier, although these words are not directly describing an emotional state, it is likely that these words were considered as 'emotion-laden' words, conveying a strong association with emotional content.

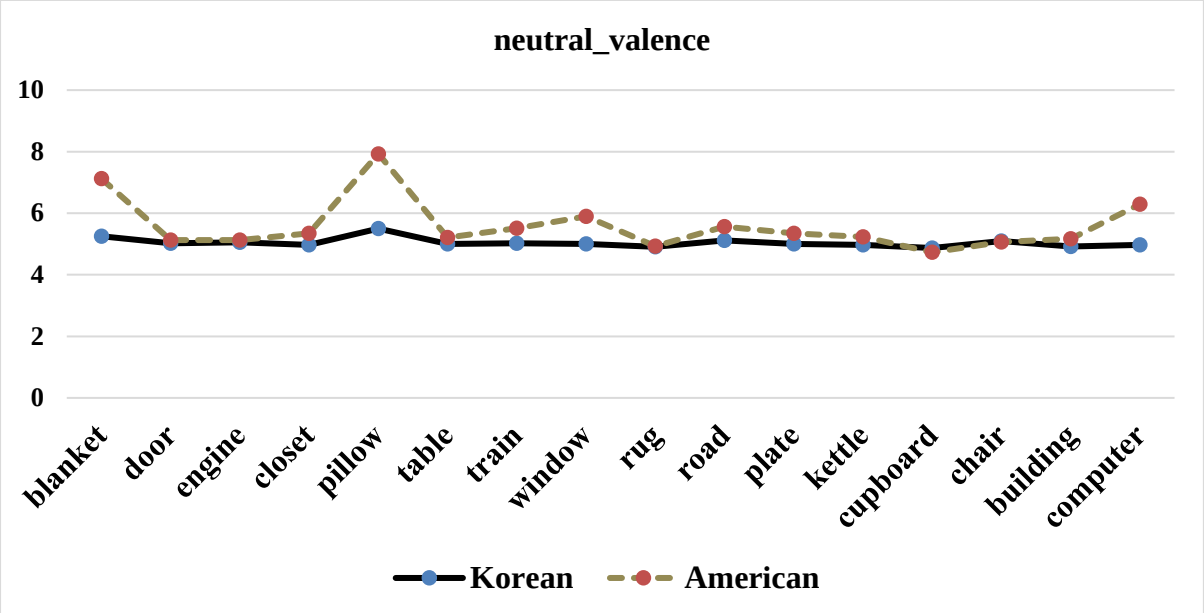
Table 4.6
An independent-samples t-test result of the valence rating of each neutral word

	Neutral Word	t (df)	p-value		Neutral	t (df)	p-value
1	**Blanket**	t (138) = 9.45	0.00*	**9**	**Road**	t (138) = 2.46	0.01*
2	**Door**	t (138) = 0.45	0.64	**10**	**Plate**	t (138) = 1.09	0.27
3	**Engine**	t (138) = 0.32	0.74	**11**	**Kettle**	t (138) = 1.47	0.14
4	**Closet**	t (138) = 2.27	0.02*	**12**	**Cupboard**	t (138) = 0.66	0.50
5	**Pillow**	t (138) = 11.9	0.00*	**13**	**Chair**	t (138) = 0.18	0.85
6	**Table**	t (138) = 1.10	0.27	**14**	**Building**	t (138) = 1.25	0.21
7	**Train**	t (138) = 1.94	0.05*	**15**	**Computer**	t (138) = 4.22	0.00*
8	**Window**	t (138) = 3.48	0.00*	**16**	**Rug**	t (138) = 0.10	0.91

Note: *: significant difference at $\alpha = 0.05$

Figure 4.6 illustrates the valence rating patterns between the two groups on the neutral words. As can be seen, both the dotted line (the American group) and the solid line (the Korean group) show a consistent pattern except for the peaks of the dotted lines at the words, '*blanket*', '*pillow*', and '*computer*'.

Figure 4.6
Visualisation of the neutral word valence rating comparison between the Korean and American groups



Summary of the quantitative findings:

- The degree of positiveness that Korean students experienced when reading the positive words was less than that of Americans
- The degree of negativeness that Korean students experienced when reading the negative words was less than that of Americans
- Korean students rated the presented neutral words more negatively than did their American counterparts

CHAPTER 5

THE PERCEPTION TASKS RESULTS

5. The perception task results

This section comprises the results of the two perception tasks: (1) the congruency task and (2) the adjective description task. Section 5.1 summarises and compares the results of the congruency task between the American and Korean groups. Section 5.2 presents the adjective description task results.

5.1 The congruency task results

5.1.1 American participants: The congruency task results

American participants: Individual congruency task item results

Table 5.1 summarises the descriptive statistics of American students' congruency task scores. The mean congruency task score was 0.86, indicating that the American group answered 86% of the twenty-four task questions correctly on average. The SD was 0.11 showing that American students' congruency task scores were centred around the mean.

Table 5.1
American: Descriptive statistics of the congruency task scores

American	Mean	SD
N= 50	0.86	0.1

76 % of American participants answered higher than 80% of the twenty-four congruency task questions correctly (see Figure 5.1). This result shows that the congruency task was not difficult for most of the American group. However, five of American students marked significantly lower than the mean, scored from 54% to 67% (see Figure 5.1). These five students also answered randomly for the second part of the perception task, the adjective description section, without following the given instruction. For instance, three out of the five students only used the adjective, 'neutral' for describing the intention of each speaker for the

twenty-four description task questions. This suggests that the lower scores of these five students might be due to their lack of understanding about the task instruction.

Figure 5.1
American: Histogram of the congruency task scores

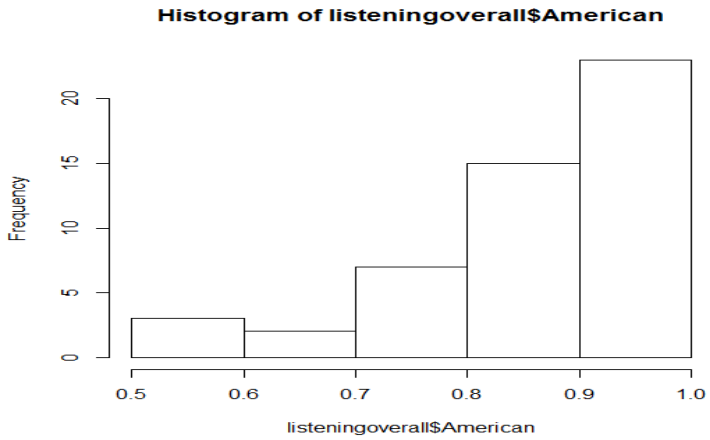


Table 5.2 summarises the mean and SD of each congruency task question for the American group. The upper quartile questions, the top 25% showing the highest correct-answer rate out of the twenty-four congruency task questions, were question 1, 4, 7, 11, 20, 22, 23, and 24. The mean of the upper quartile ranged from 96% to 100%. Except for question 11 and 22, which were incongruent cases, the other six upper quartile questions were all congruent utterances.

The lower quartile questions, which were the bottom 25%, answered incorrectly by the largest percentage of the American group were question 2, 10, 14, 15, 16, and 17. The lower quartile questions were all incongruent utterances, with the mean ranged from 52% to 74%. This result suggests that the congruency task was significantly easier for the American group when a sentence is presented with a congruent intonation. This result corresponds to the findings of the studies claiming that intonation intervenes in processing the semantic meaning of utterances (e.g. Frazier et al., 2006; Itzhak et al., 2010).

Table 5.2
American: the mean and SD of individual congruency task item

#	sentence		Mean	SD	#	sentence		Mean	SD
1	She is lively	C	1*	0	13	She is cruel	In	0.8	0.40
2	She is lucky	In	0.74^	0.44	14	She is humiliated	In	0.66^	0.47
3	She is cruel	C	0.8	0.40	15	She is brave	In	0.78^	0.41
4	She is passionate	C	0.98*	0.14	16	She is miserable	In	0.52^	0.50
5	She is brave	C	0.92	0.27	17	She is confident	In	0.78^	0.41
6	She is passionate	In	0.9	0.30	18	She is humiliated	C	0.9	0.30
7	She is happy	C	0.98*	0.14	19	She is angry	C	0.82	0.38
8	She is lonely	In	0.82	0.38	20	She is lucky	C	0.96	0.19
9	She is lively	In	0.88	0.32	21	She is happy	In	0.88	0.32
10	She is useless	In	0.72^	0.45	22	She is confident	In	0.96*	0.19
11	She is angry	In	0.98*	0.14	23	She is miserable	C	0.96*	0.19
12	She is lonely	C	0.92	0.27	24	She is useless	C	0.96*	0.19

Note: In: Incongruent; C: Congruent; *: The upper quartile item; ^ : The lower quartile item

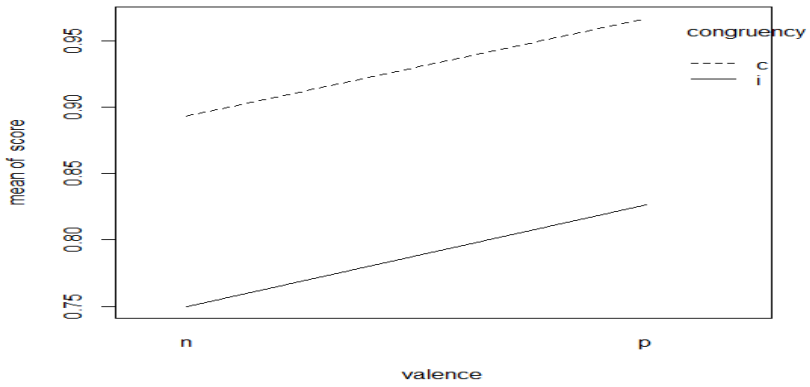
Within the incongruent sentences, the negative incongruent utterance (e.g. '*she is angry*' in a positive intonation) showed a lower correct answer rate than the positive incongruent utterance ('*she is happy*' in a negative intonation). This is probably because uttering a negative sentence in a positive tone is extremely rare speech style in everyday conversations while speaking positive content in a negative tone is used for expressing sarcasm (Cheang & Pell, 2008). The detailed comparisons between the different categories of the congruency task questions follow in the next sections.

American participants: Interaction between congruency and valence

Two different intonational (congruent vs. incongruent) and semantic (positive vs. negative) types were assigned to each congruency task question. Prior to testing the main effect of each factor on the congruency task scores, an interaction effect between these two factors, congruency and valence, on the congruency task scores was examined. This process was necessary because if the interaction effect is found, the two factors are statistically inseparable, meaning these two factors cannot be examined individually. According to a two-way ANOVA there was no statistically significant interaction between the congruency and valence types on the congruency task scores at the $p < .05$ level [$F(1, 20) = 0.0019$, $p = 0.96$]. Figure 5.2 shows that the two lines representing the congruent questions (the dotted

line) and the incongruent questions (the solid line) are parallel without crossing each other, indicating that the congruency task scores were not influenced by the interaction between the types of congruency and valence.

Figure 5.2
American: Interaction plot between the congruency and valence factors on the congruency task scores



American participants: Congruent vs. Incongruent sentence items

Table 5.3 presents the means and SDs of the congruent and incongruent question scores for the American group. The mean of the congruent questions (M = 0.93) was higher than that of the incongruent questions (M = 0.78). The SD of the congruent questions was slightly lower (0.10) than that of the incongruent questions (SD = 0.16), indicating that the scores of the congruent items were less variable than those of the incongruent items (also see Figure 5.3)

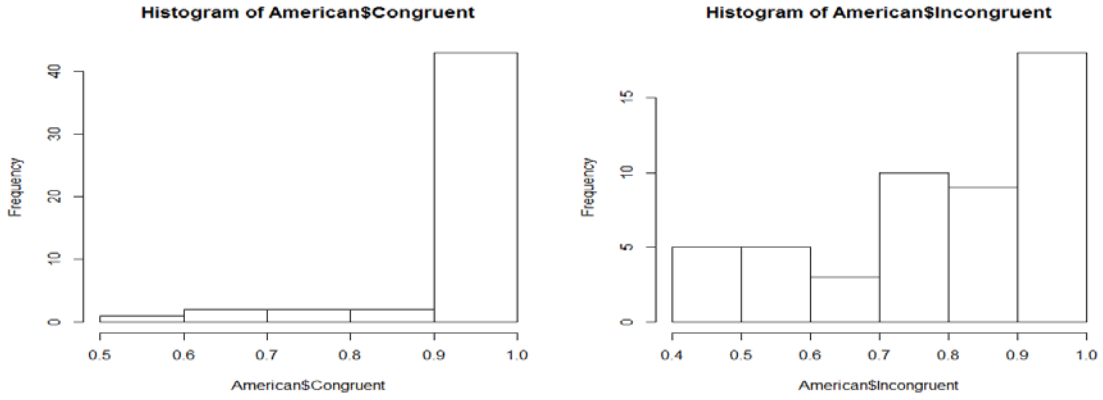
An independent-sample t-test indicated that the mean difference between the congruent and incongruent question types was statistically significant at the p <.05 level: t (82) = 5.15, p = 1. 684e – 0.6. In other words, the task of identifying the relationship between the type of intonation and the semantic meaning became more difficult for the American group when the intonation and meaning were incongruent. This result suggests that the contradicting intonation and semantic meaning significantly interfered with American participants' performance when processing these two linguistic properties at the same time

for the congruency task. In addition to the congruency item effect on the task, the valence type effect on the congruency task scores was examined. The result of the valence effect follows in the next section.

Table 5.3
American: Descriptive statistics of the congruent and incongruent congruency task item scores

N = 50	Congruent	Incongruent
Mean	0.93	0.78
SD	0.10	0.16

Figure 5.3
American: Histogram of the positive and negative congruency task item scores



American participants: Positive vs. Negative sentence items

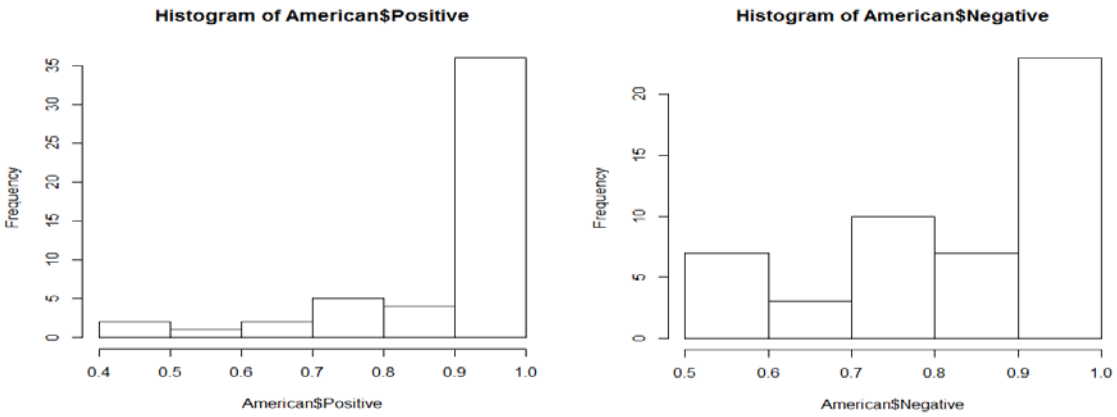
Table 5.4 summarises the means and SDs of the positive and negative congruency task question scores. The mean score of the positive questions was higher (M = 0.9) than that of the negative sentences (M = 0.82) for the American group, indicating that the congruency task was relatively easier for the American group when the task questions was semantically positive regardless of its congruency with its intonation. The SD of both positive and negative sentences was identical as 0.14.

Table 5.4
American: Descriptive statistics of the positive and negative congruency task item scores

N= 50	Positive	Negative
Mean	0.90	0.82
SD	0.14	0.14

Figure 5.4

American: Histogram of the positive and negative congruency task item scores



An independent sample t-test was conducted to compare the effect of the two different types of emotional valence (positive vs. negative) on the congruency task scores. There was a statistically significant valence type effect on the congruency task scores at the $p < .05$ level: $t(98) = 2.54$, $p = 0.01$. This result indicates that the valence type contributed to the level of difficulty when the American group performed the congruency task.

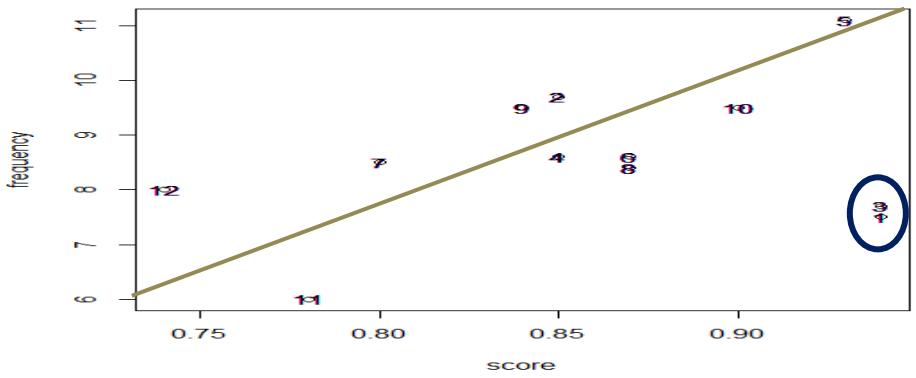
To further investigate the possible confounding factors that could have influenced the association between the negative questions and the lower mean of the congruency task scores, the word frequency effect and the gender effect were examined. The frequency effect refers to the influence of containing a more frequently used word in the congruency task. The word frequency effect was examined because the mean frequency of the negative questions ($M = 8.5$) was slightly lower than that of the positive questions ($M = 8.9$). Before examining the word frequency effect on the congruency task scores, the twenty-four task items were combined into 12 sentences, only labelling the types of valence (see Table 5. 5). Thus, each data point had two different versions of sentences (with congruent or incongruent intonation). According to a Pearson product-moment correlation coefficient, there was a weak positive correlation between the two variables, the word frequency and mean congruency task score, $r = 0.31$, $n = 12$, $p = 0.32$: increases in the word frequency were slightly correlated with increases in the scores of the congruency task.

Table 5.5
The frequency and correct-answer rate of the twelve congruency task items when controlled for the type of intonation

Data #	Word	Frequency	Correct-answer rate	Data #	Word	Frequency	Correct-answer rate
1	Lively	7.5	0.94	7	Cruel	8.5	0.8
2	Lucky	9.7	0.85	8	Lonely	8.4	0.87
3	Passionate	7.7	0.94	9	Useless	9.5	0.84
4	Brave	8.6	0.85	10	Angry	9.5	0.9
5	Happy	11.1	0.93	11	Humiliated	6.6	***0.78**
6	Confident	8.6	0.87	12	miserable	8.0	***0.74**

The congruency task scores and the word frequency were also plotted on an X-axis and Y-axis respectively. Figure 5.5 shows that there were two outliers (Data point 1: '*She is lively*'; Data point 3: '*She is passionate*') among the twelve data points (see Table 5.5). These two items did not follow the general pattern; they both had a high correct answer rate despite relatively a low word frequency rate. Further investigation revealed that the significantly higher mean of the incongruent intonation cases of Data point 1 and Data point 3 resulted in the overall higher mean scores of these two data points despite their lower word frequency rate.

Figure 5.5
The scatterplot: the relationship between the score and the frequency



Interestingly, the incongruent case of Data point 1 ('*she's lively*' in a negative tone) and Data point 3 ('*she's passionate*' in a negative tone) were spoken by the same male speaker whose average F0 range was relatively low compared to other male speakers in the

task. The incongruent case of data point 1 and 3 had the lowest minimum F0 and maximum F0 (see the third and fourth rows in Table 5. 6)

Table 5. 6
The max and min F0 of the six negative intonation task items spoken by a male speaker

Data point #	Test Question #	sentence	C/In	Mean score	Max F0/ Hz	Min F0/Hz
2	2	She is lucky	I	0.74	131	79
7	3	She is cruel	C	0.80	130	91
3	6	She is passionate	I	0.90	111	***78**
1	9	She is lively	I	0.88	116	***76**
8	12	She is lonely	C	0.92	151	96
10	19	She is angry	C	0.82	121	85

Accordingly, it is likely that due to the lower F0 range of the male speaker, the incongruent case of Data point 1 and Data point 3 sounded more 'negative' to American participants. It is possible that the apparent negativity of the intonation helped American students easily distinguish the contradiction between the intonation and semantic meaning of the incongruent case of Data point 1 and 3.

When the two outliers were excluded, the correlation between the word frequency and the mean score was significantly increased. A Pearson product-moment correlation coefficient calculated without the two cases was 0.75 (n= 10, p = 0.01). The results indicate that generally, there was a strong positive correlation between the word frequency and the mean score among the congruency task items except for Data point 1 and Data point 3. Among the six negative sentence data points, Data point 11, '*She is humiliated*' and Data point 12, '*She is miserable*' had a significantly lower score (see Table 5.5).

Further investigation revealed that the incongruent case of '*she is humiliated*' and '*She is miserable*' obtained the lowest score among the entire twenty-four test items (Question Number 14: M = 0.66; Question Number 16: M = 0.52) (see Table 5. 2). Question Number 14 and 16 were also spoken by a male speaker. Further investigation, however, revealed that there was no clear association between the lower F0 ranges of the male speakers

in the negative incongruent utterances (a negative sentence in a positive intonation) and the congruency task score. The Max and Min F0 range of the six positive intonation utterances (three positive congruent utterances + three negative incongruent utterances) were around a similar range without showing any clear association with the mean score (see Table 5.7).

Table 5.7
The max and min F0 of the six positive intonations spoken by a male speaker

Data Point #	Test Question #	sentence	C/In	Mean score	Max F0/ Hz	Min F0/Hz
4	5	She is brave	C	0.92	177	77
5	7	She is happy	C	0.98	203	163
9	10	She is useless	I	0.72	184	74
11	14	She is humiliated	I	0.66	220	100
12	16	She is miserable	I	0.52	207	85
6	22	She is confident	C	0.96	195	110

5. 1. 2 Korean participants: The congruency task results

Korean participants: Individual congruency task item results

Table 5. 8 summarises the descriptive statistics of Korean participants' congruency task results. The mean congruency task score of Korean participants was 84%. The SD of the congruency task score was 1, showing that the congruency task scores of the Korean group were highly invariable. The minimum score was 63% and the maximum score was 100%.

Table 5. 8
Korean: Descriptive statistics of the congruency task scores

Korean	Mean	SD
N= 50	0.84	0.1

Figure 5. 6
Korean: Histogram of the congruency task scores

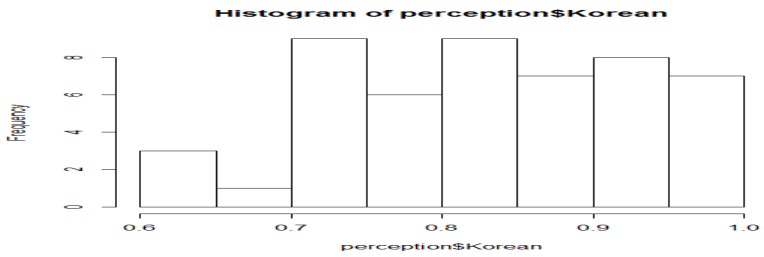


Figure 5. 6 shows that the number of Korean participants obtained a congruency task score lower than 70% was four out of the fifty (8% of the participants). This results indicates that overall, the congruency task was not difficult for Korean participants. The mean and SD of Korean participants' score on each congruency task item is presented in Table 5.9. The upper quartile items were question 1, 4, 5, 6, 20, and 21. The mean of the upper quartile items ranged from 96% to 100%. The SD of these six items ranged from 0 to 0.19. Among these upper quartile items, question 6 and 21 were incongruent items and the other four questions were congruent items.

As shown in Table 5.9, the lower quartile items were question 3, 7, 10, 11, 12, 14, 18, 22. The mean score of these lower quartile items ranged from 32% to 78%. Among these seven items, question 14 (M = 0.32) and question 18 (M = 0.42), which were the congruent and incongruent case of the negative sentence, '*She is humiliated*', had the lowest correct answer rates. Further investigation indicated that most of Korean students failed to provide the translation equivalent of the words, '*humiliated*'. It is, therefore, likely that the lowest score resulted from not understanding the semantic meaning of the word, '*humiliated*', not from difficulty distinguishing congruency between the meaning and intonation type.

Table 5.9
Korean: the mean and SD of individual congruency task item

#	sentence		Mean	SD	#	sentence		Mean	SD
1	She is lively	C	0.96*	0.19	13	She is cruel	In	0.82	0.38
2	She is lucky	In	0.86	0.35	14	She is humiliated	In	0.32^	0.47
3	She is cruel	C	0.72^	0.45	15	She is brave	In	0.86	0.35
4	She is passionate	C	1.00*	0.00	16	She is miserable	In	0.82	0.38
5	She is brave	C	1.00*	0.00	17	She is confident	In	0.90	0.30
6	She is passionate	In	0.98*	0.14	18	She is humiliated	C	0.42^	0.50
7	She is happy	C	0.76^	0.43	19	She is angry	C	0.90	0.30
8	She is lonely	In	0.96	0.19	20	She is lucky	C	0.98*	0.14
9	She is lively	In	0.96	0.19	21	She is happy	In	0.98*	0.14
10	She is useless	In	0.78^	0.41	22	She is confident	In	0.70^	0.46
11	She is angry	In	0.78^	0.41	23	She is miserable	C	0.88	0.32
12	She is lonely	C	0.94	0.23	24	She is useless	C	0.80	0.40

Note: In: Incongruent; C: Congruent; *: The upper quartile item; ^ : The lower quartile item

Interestingly, unlike the American group whose lower quartile items were all incongruent, Korean students were not affected by the type of congruency. Out of the seven lower quartile items, three items were congruent (question 3, 7, and 18) and four items were incongruent (10, 11, 14, and 22). The effect of the type of congruency and valence on the congruency task scores of the Korean group were further examined in the following sections.

Korean participants: Interaction between congruency and valence types

The interaction effect between the congruency and valence factors on Korean participants' congruency task scores was examined. Figure 5. 7 shows that there was an interaction between the congruency factor (congruent vs. incongruent) and valence factor (positive vs. negative); however, the interaction was not statistically significant at the p <. 05 level [F (1, 20) = 0. 161, p = 0.69]. It was, therefore, valid to investigate the main effect of each factor individually on the congruency task scores.

Figure 5.7
Korean: Interaction plot between the congruency and valence factors on the congruency task scores

Korean participants: Congruent vs. Incongruent task items

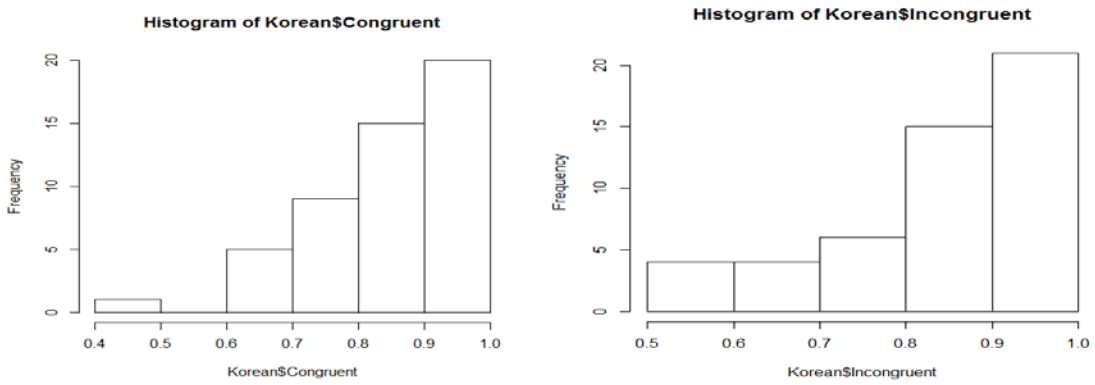
Table 5. 10 summarises the mean and SD of Korean participants' congruent and incongruent item scores. The mean of the congruent items was identical to that of the incongruent items as 0.84. The SDs of the congruent (SD = 0.11) and incongruent (SD = 0.12) items were also nearly identical. The distribution pattern of the congruent and

incongruent task items was also similar (See Figure 5. 8). An independent-sample t-test confirmed that the mean difference between these two conditions was not statistically significant at the p <.05 level: t (96) = 0.14, p = 0.88. This result indicates that congruency between the given sentence and intonation did not influence Korean students' performance. In other words, the intonation pattern did not play a significant role in recognising the congruency between the intonation and the semantic meaning for the Korean group.

Table 5.10
Korean: Descriptive statistics of the congruent and incongruent congruency task item scores

N = 50	Congruent	Incongruent
Mean	0.84	0.84
SD	0.11	0.12

Figure 5.8
Korean: Histogram of the congruent and incongruent congruency task item scores



Korean participants: Positive vs. Negative sentence items

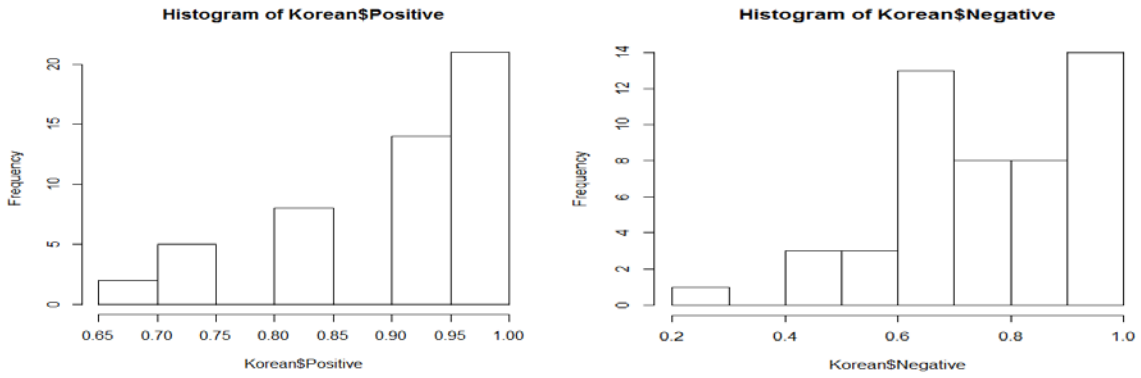
The mean of the positive sentence items (M= 0.91) was higher than that of the negative items (M = 0. 76) for the Korean participants (see Table 5.11). The positive items had a smaller SD (0.10) than the negative items (0.16), meaning the distribution of the positive items were less scattered than that of the negative items (see also Figure 5. 9).

Table 5.11
Korean: Descriptive statistics of the positive and negative congruency task item scores

N = 50	Positive	Negative
Mean	0.91	0.76
SD	0.10	0.16

Figure 5.9

Korean: Histogram of the positive and negative congruency task item scores



According to an independent-sample t-test, the mean difference between the positive and negative items was statistically significant at the p <. 05 level: t (80) = 5.57, p = 3. 245e-07. This result indicates that the Korean participants had more difficulty recognising the congruency between the intonation and meaning when the sentences were semantically negative.

5. 1. 3 Comparison between the American and Korean groups

Comparison: Individual congruency test item results

Prior to comparing the mean difference of the congruency task scores between the American and Korean groups, the two task items, the congruent and incongruent case of the sentence, '*She is humiliated*', were eliminated. As mentioned earlier, the majority of Korean students failed to provide the definition of the word, '*humiliated*'. It was, therefore, likely that Korean students' lack of semantic understanding of the word might have resulted in the exceptionally low mean of the two items (the mean of the congruent case= 0.42; the mean of the incongruent case = 0. 32). In other words, the results of the two task items are not representative of the Korean participants' performance on the congruency task. After the adjustment, the mean congruency task score of the American group became slightly lower (M= 0.85) than that of the Korean group (M= 0.88). The mean difference, however, was not statistically significant at the p <.05 level: t (94) = 0.92, p = 0.36 according to an

independent-sample t-test. This result suggests that the overall difficulty level that the Korean group experienced in distinguishing the congruency between the intonation and semantic meaning was similar to that of the American group.

The result of individual congruency task items was also compared between the American and Korean groups. Table 5.12 summarises the t-value and p-value of each task item obtained by an independent-sample t-test. The Korean and American groups showed a statistically significant mean difference in eight congruency task items (see the items with * in Table 5.12).

Table 5.12
Comparison: the individual task item mean score between the American and Korean groups

Q#	**sentence**		**t (98)**	**p**	**#**	**sentence**		**t (98)**	**p**
1	She is lively	C	1.48	0.13	13	She is cruel	In	0.25	0.79
2	She is lucky	In	1.50	0.13	14	*This item was eliminated*			
3	She is cruel	C	0.9	0.34	15	She is brave	In	1.04	0.29
4	She is passionate	C	1.01	0.31	16	She is miserable**	In	3.37	0.00
5	She is brave*	C	2.09	0.03	17	She is confident	In	1.67	0.09
6	She is passionate	In	1.7	0.09	18	*This item was eliminated*			
7	She is happy**	C	3.4	0.00	19	She is angry	C	1.16	0.24
8	She is lonely*	In	2.33	0.02	20	She is lucky	C	0.59	0.55
9	She is lively	In	1.52	0.13	21	She is happy*	In	2.02	0.04
10	She is useless	In	0.69	0.48	22	She is confident**	In	3.69	0.46
11	She is angry**	In	3.26	0.00	23	She is miserable	C	1.52	0.13
12	She is lonely	C	0.39	0.69	24	She is useless*	C	2.55	0.01

Note: *: significant difference at $\alpha = 0.05$; ** significant difference at $\alpha = 0.001$

Table 5.13 presents the four task items on which the Korean group obtained a higher mean than the American group. Further investigation revealed that two of the four items (#8 and #21) were spoken by a female speaker and other two items were spoken by a male speaker (#5 and #16). Thus, it can be suggested that the gender of the speaker of these four sentences did not influence on the lower means. Interestingly, the item which achieved the lowest mean from the American group, the incongruent case of '*She is miserable*', was spoken by a male speaker whose positive F0 range was relatively low (see Table 5.13).

Therefore, it was possible that the male speaker's low pitch might have resulted in the lower mean from the American group.

Table 5.13
Comparison: The four congruency task items that the Korean group obtained a higher mean than the American group

Q #	sentence		Intonation /speaker	NS: Mean	<	Korean: Mean	Min_F0	Max_F0
5	She is brave	C	Negative/M	0.92	<	1.00	77	177
8	She is lonely	In	Positive/F	0.82	<	0.96	176	389
16	She is miserable	In	Positive/M	0.52	<	0.82	86	207
21	She is happy	In	Negative/F	0.88	<	0.98	192	220

Table 5.14 summarises the characteristics of the four congruency task items that the Korean group achieved a significantly lower mean than their American counterparts. Two of the four items were spoken by a male and the other two were spoken by a female. The gender of the speaker, therefore, did not intervene with the mean differences.

Table 5.14
Comparison: The four congruency task items that the American group obtained a higher mean than the Korean group

Q #	sentence		Intonation /speaker	NS: Mean	>	Korean: Mean	Min_F0	Max_F0
7	She is happy	C	Positive/M	0.98	>	0.76	163	203
11	She is angry	In	Positive/F	0.98	>	0.78	173	369
22	She is confident	In	Negative/M	0.96	>	0.70	110	195
24	She is useless	C	Negative/F	0.96	>	0.80	79	269

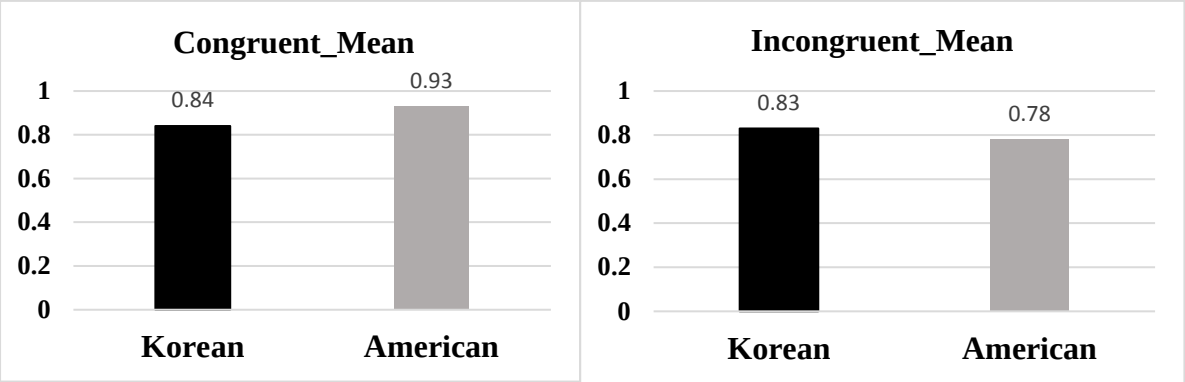
As presented in Section 5.1.1 and 5.1.2, there was a statistically significant mean difference between the congruent and incongruent task items for the American group whereas the Korean group did not show a statistically significant mean difference between these two types. This result suggests that the American group was more influenced by the intonation type than was the Korean group. The result of a further investigation on the congruency on the task scores between the two groups follows in the next section.

Comparison: Congruent vs. Incongruent items

The means of the congruent and incongruent items were compared between the American and Korean groups (see Figure 5.10). For the congruent items, the American group

(M = 0.93) achieved a higher mean than the Korean group (M = 0. 84). An independent-sample t-test showed that the mean difference was statistically significant at the p < .05 level: t (97) = 4.22, p = 5.51e-05. This result suggests that the American group performed significantly better than the Korean group when the type of the intonation corresponded to the type of the semantic meaning. Concerning the incongruent items, the mean difference between the American and Korean groups was statistically insignificant at the p < .05 level: t (92) = 1. 54, p = 0.12.

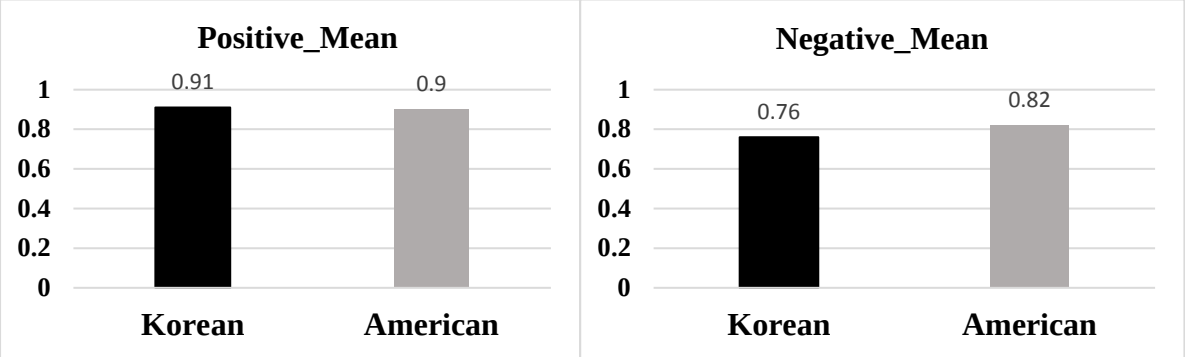
Figure 5.10
Comparison: The mean score of the congruent and incongruent congruency task items between the Korean and American groups



Comparison: Positive vs. Negative items

The means of the positive items were nearly identical between the American and Korean groups (American = 0.9; Korean = 0.91) (see Figure 5.11). As presented in Section 5.1.1 and 5.1.2, the mean of the negative items was significantly lower (see Figure 5.11) than that of the positive items for both of the American and Korean groups. This result indicates that for both groups, the performance on the congruency task significantly interfered when the items were semantically negative. When compared the means of the negative items between the American and Korean groups by an independent-sample t-test, the mean difference was on the boundary of significance at the p <.05 level: t (97) = 1. 93, p = 0.055.

Figure 5.11
Comparison: The mean score of the positive and negative congruency task items between the Korean and American groups



Summary of the quantitative findings:

- The average score of the congruency task between the American and Korean group was not statistically different.
- Korean students' average congruent task item score was statistically lower than American participants' average congruent task item score.
- Korean students' average incongruent task item score was significantly higher than American participants' average incongruent task item score.
- The average of the positive item score was nearly identical between the American and Korean groups.
- Korean students' average negative item score was significantly lower than American students' negative item score.

5.2 The adjective description task results

The second part of the perception task was providing an adjective describing how the speaker of each congruency task question sounded. The adjective description task used an open-ended question, '*how does the sentence sound to you*?' without inducing a specific type of adjectives. Overall, the perception participants provided adjectives delineating the degree of emotional valence (positive or negative) and authenticity (genuine or unnatural) to the question. Adjective responses were categorised into similar types for frequency analyses.

5. 2. 1 Congruent sentences

The adjectives responses to the congruent utterances were initially categorised into four different types: (1) Congruent, (2) Authentic, (3) Neutral/Ambiguous, and (4) Incongruent/Unnatural. Congruent or Incongruent type responses refer to the adjectives that agree or disagree with the category of the utterances. For instance, for the positive congruent sentence, '*she is lucky*' in a positive tone, the adjective response, '*upbeat*' is considered as a congruent type whereas the descriptor, '*depressing*' is considered as incongruent. The Congruent type responses, therefore, is the targeted responses for the case of the congruent utterances.

Congruent: Positive sentence in positive intonation

Table 5. 15 presents the description task results of the six positive congruent sentences. The Korean group had a moderately higher response percentage (68%) than that of the American group (62%) for the positive congruent utterances. Both the American and Korean groups generally provided adjectives with a positive connotation. Only few students perceived the positive congruent sentences as 'negative'. Amongst the six positive congruent sentences, '*she is lively*' received the most consistent responses from the American and Korean groups. Twenty-one American participants described the utterance, '*she is lively*' as '*happy*' and thirteen Korean participants perceived the utterance '*energetic*' (see Table 5. 15).

Table 5.15

Positive Congruent sentences: The adjective description task results

Sentence Total response #	Congruent: Positive sentence in positive intonation American	 Korean
1. She is confident **(Am: 25; Ko: 30)**	**C**: Happy (6), upbeat (3), positive (3) Praising, trustworthy, proud **A**: Factual, believable, assuring **NE**: Neutral (4), strong (2) **IC**: unhappy	**C**: Energetic, courageous, kind, determined Complimenting (2), confident (6) **A**: Agreeing (2) **NE**: Neutral (4) **IC**: Indifferent (6), lethargic (2), Annoyed (3), jealous
2. She is lively **(Am: 32; Ko: 38)**	**C**: Happy (21), optimistic (3), Upbeat (3), lively, Excited, energetic, enthusiastic **A**: Supportive	**C**: Excited (3), energetic (13), happy (8) Cheerful (8), upbeat **NE**: Indifferent (3), clam **IC**: Sarcastic
3. She is brave **(Am:30; Ko: 32)**	**C**: Happy (4), positive (2), admirable (2), Proud (2), impressed (2), courageous (1) Fearless (1), confident (1), kind (5) **A**: Natural (2), believable (1), assuring (2) **NE**: Neutral (3), strong (2)	**C**: Energetic (6), confident (4), upbeat Affirming (7), admiring (4), kind (2), complimenting (5) **A**: Agreeing **NE**: Neutral **IC**: Judging
4. She is lucky **(Am: 30; Ko: 32)**	**C**: Happy (16), upbeat (5), positive (2) Content (1), fortunate (1), nice (1) **A**: Real (1), expressive (1) **NE**: Weak (1) **IC**: Jealous (1)	**C**: Happy (15), upbeat (8), praising Energetic, kind **A**: Agreeing **NE**: Neutral (2) **IC**: Depressing, Jealous (2)
5. She is happy **(Am: 32; Ko: 29)**	**C**: Happy (14), kind (6), upbeat optimistic (2), enthusiastic, carefree **A**: Genuine, real, honest, thoughtful **NE:** Neutral (2), no enthusiasm	**C**: Happy (14), upbeat (2), kind **A**: Affirming **NE**: Lethargic, neutral (3), unemotional (6) **IC**: sad
6. She is passionate **(Am: 29; Ko: 41)**	**C**: Happy (9), kind (6), friendly, admirable Excited (2), enthusiastic (2), upbeat (2) Optimistic, spirited, Loving, **A**: Genuine, natural (2) **NE**: Dull	**C**: Complimenting (10), admiring, affirming, energetic (12), happy (5), passionate (5), cheerful, positive, confident (4) **IC**: Jealous

* Note: C: Congruent; A: Authentic; NE: Neutral/Ambiguous; IC: Incongruent

To compare the percentage of each response category between the American and Korean groups, the frequencies of the adjectives responses were calculated. For this process, the Congruent and Authentic response types were combined because both categories imply agreement between the positive meaning and intonation. As a result, three different responses categories ((1) Congruent/Authentic, (2) Neutral/Ambiguous, and (3) Incongruent/Unnatural) were applied for the frequency analysis.

Table 5.16 shows that the average response percentage of the American group for the Congruent/Authentic category was higher than that of Korean students (American: 90%; Korean: 79%). This result indicates that a larger number of American participants perceived the positive congruent utterances positively than did Korean students. The American group also provided fewer incongruent descriptors than did Korean students. Only 1% of American participants perceived the positive sentences negatively whereas 10% of Korean students perceived the positive sentences negatively.

Table 5.16

Positive Congruent sentences: Comparison of the average percentage of the response frequency in the three categories

	Congruent/ Authentic	**Neutral/ Ambiguous**	**Incongruent/ Unnatural**
American	90	9	1
Korean	79	11	10

Table 5. 17 summarises the percentage of each positive congruent sentence in the three response categories for the American group. The positive congruent sentence, '*she is lively*' received the highest percentage (100%) in the Congruent/Authentic category. The sentence, '*she is lively*' was spoken by a female speaker whose F0 range was the largest (280 Hz) amongst the speakers who uttered the positive congruent sentence. It is possible that the female speaker's distinct change in her inflection might have conveyed more positivity.

Table 5.17
Positive Congruent sentences: The adjective description task results for the American group

Positive Congruent: American	Congruent/ Authentic	Neutral/ Ambiguous	Incongruent/ Unnatural	Total Percentage
1. She is confident	72	24	4	100
2. She is lively	100	0	0	100
3. She is brave	83	17	0	100
4. She is lucky	94	3	3	100
5. She is happy	91	9	0	100
6. She is passionate	97	3	0	100

Further investigation showed that the American group tended to perceive the utterances with a higher F0 more positively. The three positive congruent sentences which obtained a higher response percentage in Congruent/Authentic category from the American group were all spoken by female speakers with a higher Max F0 and F0 Range than the male speakers (see Table 5.18). Korean students, however, did not show the same pattern. This result suggests that American students were more affected by the pitch variations of the utterances than were Korean counterparts when perceiving the utterances of the positive congruent sentences.

Table 5.18
The gender, Max F0, and F0 Range of the speaker of the six positive congruent utterances

Positive Congruent:	Gender of the speaker	Max F0	F0 Range	Congruent/Authentic response percentage
1. She is confident	Male	195	85	72
3. She is brave	Male	177	100	83
5. She is happy	Male	203	40	91
2. She is lively	Female	340	280	*100
4. She is lucky	Female	454	246	*94
6. She is passionate	Female	302	221	*97

Table 5. 19 presents the results of each positive congruent sentence for the Korean group. The sentence, '*she is brave*' received the highest percentage in the Congruent/Authentic category for the Korean group. The positive incongruent sentence, 'she is confident', on the other hand, obtained the lowest target response percentage. Unlike the

American group, the Korean group did not show any association between the acoustic characteristics of the gender and the response patterns.

Table 5.19
Positive Congruent sentences: The adjective description task results for the Korean group

Positive Congruent: Korean	Congruent/ Authentic	Neutral/ Ambiguous	Incongruent/ Unnatural	Total Percentage
1. She is confident	47	13	40	100
2. She is lively	87	10	3	100
3. She is brave	94	3	3	100
4. She is lucky	85	6	9	100
5. She is happy	63	34	3	100
6. She is passionate	98	0	2	100

Figure 5.12 visualises that the American group (the grey line) obtained a higher Congruent/Authentic category percentage than the Korean group (the black line). The Incongruent/Unnatural category, on the other hand, showed the opposite pattern; the Korean group obtained a higher percentage (see Figure 5. 14) than did the American group. The Neutral/Ambiguous category did not show any clear patterns in both the American and Korean groups (see Figure 5. 13).

Figure 5.12
Positive Congruent sentences*: *Comparison of the percentage in the Congruent/Authentic category between the American and Korean groups

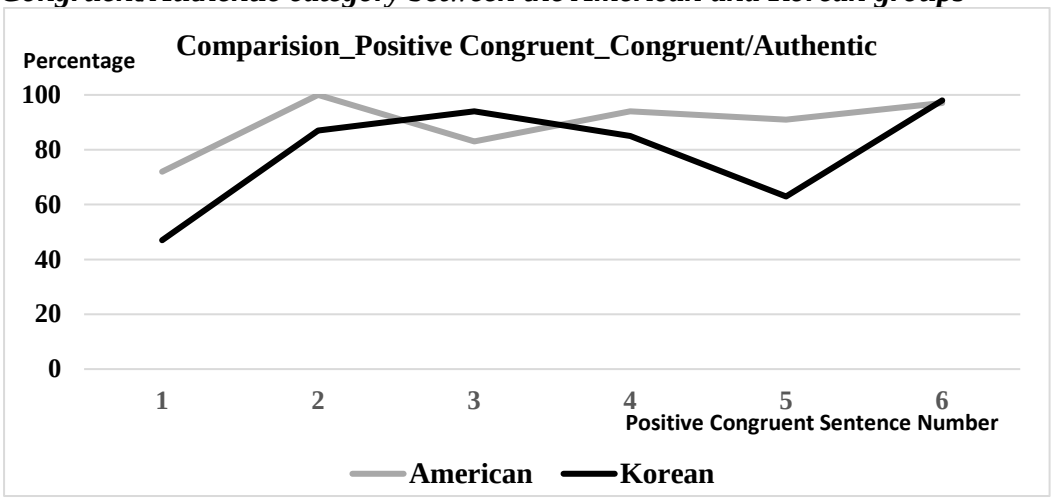


Figure 5.13

Positive congruent sentences: Comparison of the percentage in the Neutral/Ambiguous category between the American and Korean groups

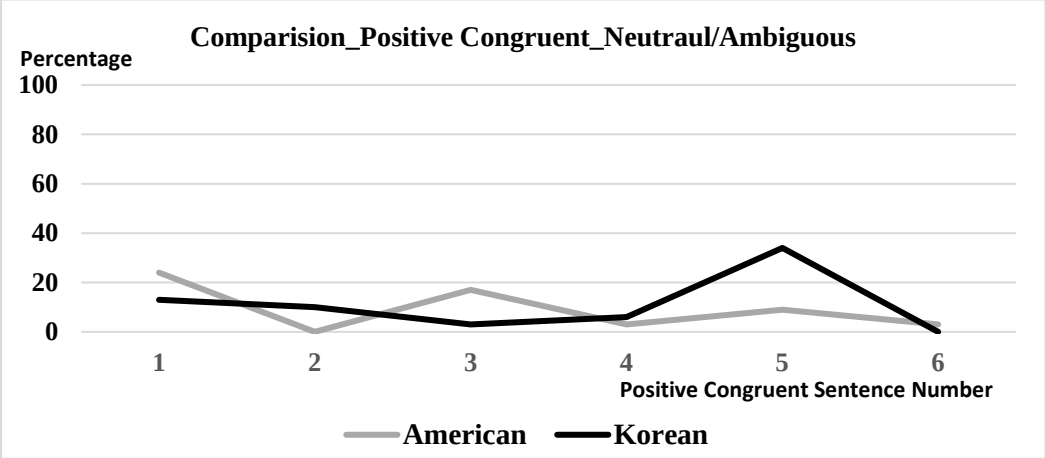
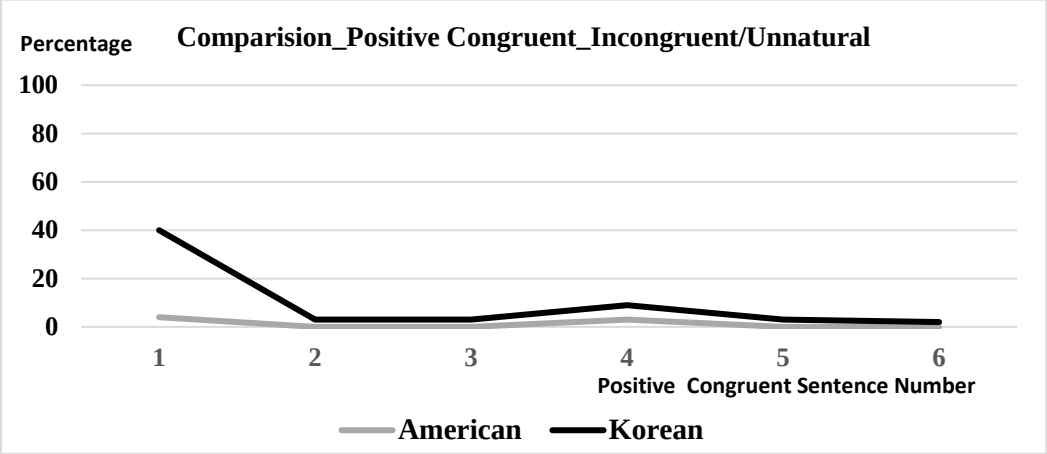


Figure 5.14

Positive congruent sentences: Comparison of the percentage in the Incongruent/ Unnatural category between the American and Korean groups



Congruent: Negative sentence in negative intonation

Table 5.20 summarises the categorisation of the adjective responses to the six negative congruent sentences. Concerning the average response rate, the Korean group had a higher percentage (68%) than that of the American group (62%). The response patterns were similar to those of the positive congruent sentences; most of the participants provided an adjective with a negative connotation. For instance, Most of American participants answered that the negative congruent utterance, '*she is lonely*', sounded '*sad*' (see Table 5. 20).

Table 5.20

Negative Congruent sentences: The adjective description task results

Sentence (Total response #)	Congruent: Negative sentence in negative intonation	
	American	**Korean**
1. She is angry (Am: 27; Ko: 32)	**C**: Sad (10), upset (4), disappointed (2), tired, no energy, down **A**: Realistic, honest, serious (2) **NE**: Neutral (2), bland **IC**: Happy	**C**: Afraid (3), anxious (2), worrying (7), reflecting (2), unhappy (2), angry, discouraged (2), annoyed, exhausted (5), depressing (4), unmotivated **NE**: Unmotivated **IC**: Empathic
2. She is useless (Am:33; Ko: 30)	**C**: Angry (5), upset (4), mean (5), rude (4), negative (3), scathing, miserable, cruel, hateful, sad, pity, condescending, annoyed **A**: Genuine, real (2), believable	**C**: Angry (2), sympathetic (2), sarcastic (5), pathetic, lamenting, disgusted, annoyed (2), Negative, jealous, sad, mean, depressing (2), criticising, dark **A**: serious **NE**: Neutral (2), unemotional, lethargic **IC**: Energetic (2), kind
3. She is cruel (Am: 30; Ko: 34)	**C**: Mean (7), upset (6), mad (4), annoyed, aggravated, hurt (2), sad (2), condescending, angry, hateful, harsh **A**: Meaningful **NE**: neutral (2)	**C**: Depressing (13), cruel (2), criticising (2) Unhappy (2), sad (2), complaining (2) Annoyed (2), angry, **A**: serious **NE**: Unemotional (4), lethargic **IC**: Sympathetic, trustworthy
4. She is miserable (Am: 29; Ko: 39)	**C**: Upset (5), sad (12), miserable (4) negative, rude, unhappy Jealous, disgusted **A**: Real, honest **IC**: flat	**C**: Sympathetic (10), worried (3) apprehensive, sad (2), unhappy (2) discouraged, depressing (8), pathetic (3) sarcastic, angry (2), negative **A**: Agreeing **NE**: Lethargic, Neutral (3)
5. She is lonely (Am: 32; Ko: 41)	**C**: Sad (23), depressed, sombre (2), upset **A**: compassionate, sympathetic **NE**: Neutral (3)	**C**: sad (6), depressing (8), worrying (3), unhappy (2), lonely (9) **A**: Agreeing (2), sympathetic (8) **NE**: Lethargic, unemotional (2)
6. She is humiliated (Am: 36; Ko: 31)	**C**: Sad (22), depressed, annoyed, humiliated, angry, negative, tired, upset (2) **A**: Sincere, compassionate, sympathetic **NE**: Neutral (2) **Un**: Fake	**C**: Depressing (9), discouraged (2), miserable Unhappy (3), angry (2), repressing, **A**: sympathetic (7), worrying **NE**: Unmotivated, unemotional (2), lethargic (2)

* Note: C: Congruent; A: Authentic; NE: Neutral/Ambiguous; IC: Incongruent; Un: Unnatural

The percentage of the response amongst the six negative congruent sentences were averaged to compare the overall response percentage between the American and Korean groups. Table 5.21 shows that the American group had a higher percentage of the Congruent/Authentic responses, indicating a larger number of American participants (93%)

perceived the intended meaning of the negative congruent utterances correctly than the Korean group (87%).

Table 5.21
Negative Congruent sentences: Comparison of the average percentage of the response frequency in the three categories

	Congruent/ Authentic	Neutral/ Ambiguous	Incongruent/ Unnatural
American	93	6	1
Korean	87	10	3

Table 5.22 presents the percentage of American participants' responses in each category. Except for the sentence, '*she is angry*', the five negative congruent utterances received an average percentage higher than 90% in the Congruent/Authentic category from the American group.

Table 5.22
Negative Congruent sentences: The adjective description task results for the American group

Negative Congruent: American	Congruent/ Authentic	Neutral/ Ambiguous	Incongruent/ Unnatural	Total
1. She is angry	85	11	4	100
2. She is useless	100	0	0	100
3. She is cruel	93	7	0	100
4. She is miserable	97	0	3	100
5. She is lonely	91	9	0	100
6. She is humiliated	92	6	2	100

Further investigation on the relationship between the Congruent/Authentic category percentage rate and the gender, Max F0, and F0 range of the speaker revealed that the American group showed a higher Congruent/Authentic category percentage when the utterances were spoken by females (see Table 15.23). The first three sentences in Table 15.23, which were spoken by three different male speakers, showed a lower Congruent/Authentic response percentage.

When the speaker was a female, the utterances with a lower Max F0 and F0 range received a higher number of the Congruent/Authentic responses. In other words, a larger

number of American participants perceived the negative congruent sentences spoken by a female negatively when the intonation of the sentences was flatter and the pitch was lower. For instance, the negative congruent sentence, '*she is useless*' which had the lowest F0 range (68 Hz) received the highest Congruent/Authentic response percentage (100%) among the three negative congruent sentences spoken by a female speaker.

Table 15.23
The gender, Max F0, and F0 Range of the speaker of the six negative congruent utterances

Positive Congruent:	Gender of the speaker	Max F0	F0 Range	Congruent/Authentic response percentage
1. She is angry	Male	127	*36	85
3. She is cruel	Male	151	55	93
5. She is lonely	Male	121	37	91
2. She is useless	Female	238	*68	*100
4. She is miserable	Female	222	*144	*97
6. She is humiliated	Female	287	208	92

Table 15.24 summarises the results of each negative incongruent sentence for the Korean group. The sentence, '*she is angry*' received the highest percentage (94%) in the Congruent/Authentic category. The percentage of the responses in the Neutral/Ambiguous category was the second highest. Further investigation revealed that the Korean group did not show any patterns relevant to the gender or acoustic characteristics of the speaker. This result suggests that the Korean group was less affected by the intonation variations of the speaker than did the American group when performing the adjective description task.

Table 5.24
Negative Congruent sentences: The adjective description task results for the Korean group

Negative Congruent: American	Congruent/ Authentic	Neutral/ Ambiguous	Incongruent/ Unnatural	Total
1. She is angry	94	3	3	100
2. She is useless	80	10	10	100
3. She is cruel	79	15	6	100
4. She is miserable	90	10	0	100
5. She is lonely	93	7	0	100
6. She is humiliated	84	16	0	100

Figure 5. 15 visualises that the American group generally achieved a higher percentage than the Korean group for the Congruent/Authentic category. The Korean group, however, obtained a higher percentage in the Neutral/Ambiguous category (see Figure 5. 16).

Figure 5.15
Negative Congruent sentences*: *Comparison of the percentage in the Congruent/Authentic category between the American and Korean groups

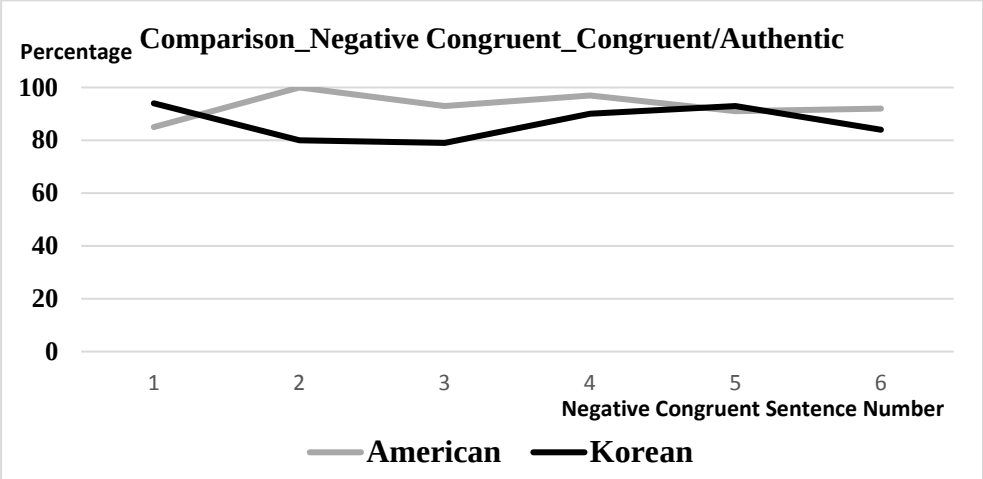


Figure 5.16
Negative Congruent sentences*: *Comparison of the percentage in the Neutral/Ambiguous category between the American and Korean groups

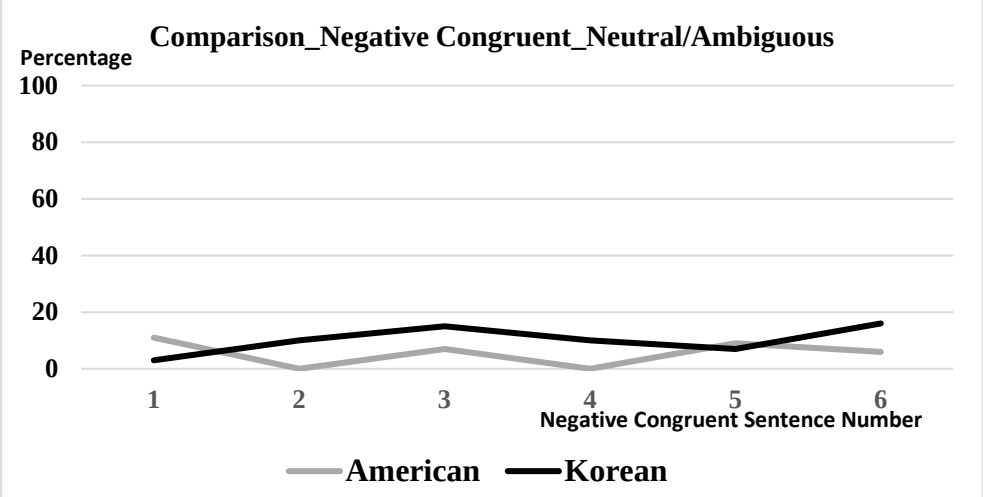


Figure 5.17
Negative Congruent sentences*: *Comparison of the percentage in the Incongruent/Unnatural category between the American and Korean groups

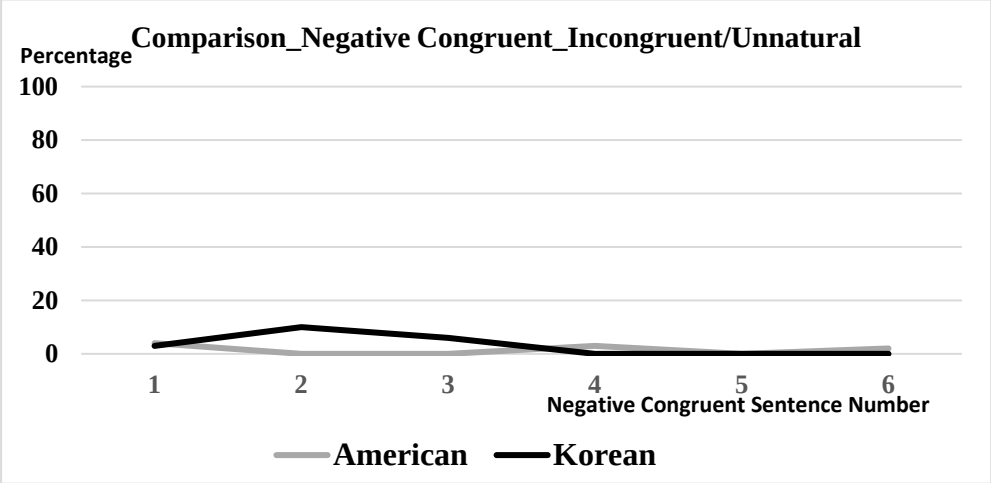


Figure 5. 17 shows that the Korean group generally had a higher percentage in the Incongruent/Unnatural response category, indicating a higher number of Korean participants misinterpreted the utterance of the negative congruent sentences than did the American group.

5. 2. 2 Incongruent sentences

The adjective responses to the incongruent sentences were categorised differently from the congruent sentences; they were initially grouped into five different categories: (1) Interaction, (2) Unnatural, (3) Intonation, (4) Neutral/Ambiguous, and (5) Semantic Meaning. Since the two opposite linguistic properties of the incongruent sentences, namely intonation and semantic meaning interplayed, the adjectives describing interactional aspects such as 'sarcastic' were labelled under the 'Interaction' Category. The adjectives implying the inconsistency between the type of intonation and semantic meaning, such as 'fake' were classified under the 'Unnatural' category.

For the frequency analysis, the Unnatural Category was merged under the Interaction category since the unnaturalness entails the interaction between the contradicting intonation and semantic meaning of the incongruent sentences. The adjectives describing one aspect of the two linguistic properties (intonation or semantic meaning) were labelled as either

Intonation Category or Semantic Meaning. The adjectives carrying vague and neutral emotional valence were categorised as 'Neutral/Ambiguous'. The four categories applied to the frequency analysis were therefore: (1) Interaction, (2) Intonation, (3) Neutral/Ambiguous, (4) Semantic Meaning.

Incongruent: Positive sentence in negative intonation

Table 5. 25 presents the initial categorisation result of the adjective responses to the positive incongruent sentences (positive sentences in negative intonation). The Korean group had a higher average response percentage (80%) than that of the American group (64%). The categorisation result revealed that the responses of the American and Korean groups included the adjectives describing the sarcastic element of the positive incongruent sentences (see Table 5. 25). This result suggests that the contradicting intonation of the positive incongruent utterances played a key role in creating sarcastic tone. A few American participants perceived the negative intonation of the positive incongruent sentences 'unnatural'. None of Korean participants, however, regarded the contradicting intonation of the positive incongruent sentences 'unnatural'.

Table 5. 25
Positive Incongruent sentences: The adjective description task results

Sentence	**Incongruent: Positive sentence in negative intonation**	
Total response #	**American**	**Korean**
1. She is confident **(Am:32; Ko: 37)**	**INT: Sarcastic (15)**, **jealous (3)**, **annoyed rude**, **UN**: Fake (2), unnatural (2) **IN**: Sad **NE**: Neutral, uninterested, boring, lazy **SE**: Confident (3)	**INT**: **Sarcastic (5), jealous**, **insecure (3)** **IN**: Depressing (7), sad (2) **NE**: Uncertain, bored, unemotional, lazy, lethargic (9), tired (2) **SE**: Complimenting (3), admiring, confident
2. She is lively **(Am: 34; Ko: 41)**	**INT**: **Sarcastic (4), jealous**, **annoyed (3) upset (4),** **UN**: Fake (2), weird (2) **IN**: Sad (7), negative (2) **NE**: Boring (7), uninterested **SE**: Happy	**INT**: **Sarcastic (4), jealous, unhappy (3), disappointed (2)** **IN:** Blaming, depressing (17), angry, miserable (3), sad **NE**: Unemotional (3), lethargic (4) **SE**: Praising

3. She is brave **(Am: 33; Ko: 40)**	**INT**: **Sarcastic (18)**, **annoyed (7), jealous**, **not sincere** **IN**: Negative, sombre **SE**: Positive, happy, proud, impressed	**INT**: **Sarcastic (6), unhappy**, **worrying** **IN**: Depressing (8), sad (2) **NE**: Sleepy, bored, timid, tired, lethargic (11), indifferent (3) **SE**: Praising, admiring (2), sympathetic
4. She is lucky **(Am: 30; Ko: 43)**	**INT**: **Sarcastic (6), jealous (9)**, **grumpy, annoyed, upset (3), insecure,** **UN**: Fake (3) **IN**: Negative, **NE**: Neutral, flat, calm, uninterested **SE**: Lively	**INT**: **Sarcastic (4), jealous (2), unhappy (3), angry** **IN**: Pathetic, depressing (17), sad (2) **NE**: Indifferent (2), lethargic (4), uncertain, tired, nervous (2) **SE:** Lucky (2), complimenting
5. She is happy **(Am: 29; Ko: 43)**	**INT**: **Sarcastic (6), upset (2), irritated, displeased, angry** **UN**: Unnatural, weird **IN**: Sad (9), depressed (2) **NE**: Bland (2), neutral **SE**: Happy (2)	**INT**: **Sarcastic (2), jealous (3), unhappy (5), annoyed (2), discouraged (3), apprehensive (2), worrying,** **IN**: Sad (7), depressing (11) **NE**: Lethargic (2), strange, indifferent **SE**: Sympathetic (2), congratulating
6. She is passionate **(Am: 35; Ko: 37)**	**INT**: **Sarcastic (6), jealous (2), annoyed, mean, upset, discouraged** **UN**: Unnatural, fake (8) **IN**: Negative (3), sad (2), mad **NE**: Unamused, uninterested, lazy, bored (2), flat, weak (2)	**INT: Sarcastic (7), jealous, annoyed (4)** **IN**: Depressing (9), angry, dark, negative **NE**: Hesitant, uncertain unemotional (3), lethargic (8)

*Note: INT: Interaction; UN: Unnatural; IN: Intonation; NE: Neutral; SE: Semantic meaning

Table 5.26 shows the average response percentage in the four categories ((1) Interaction, (2) Intonation, (3) Neutral/Ambiguous, and (4) Semantic Meaning) for the American and Korean groups. The American and Korean groups showed a difference in the pattern of the response percentage in the four categories. The largest percentage of the American participants provided an adjective relevant to the interaction of the intonation and semantic meaning. The Korean group, however, showed a relatively similar percentage across the four categories. This result indicates that the Korean group paid less attention to the interaction of the intonation and semantic meaning than did the American group. In other

words, the Korean group had more difficulty in perceiving the interaction between the contradicting intonation and semantic meaning than did the American group.

Table 5.26
Positive Incongruent sentences: Comparison of the average percentage of the response frequency in the four categories

	Interaction	Intonation	Neutral/ Ambiguous	Semantic meaning
American	66	16	12	6
Korean	27	38	28	7

Table 5. 27 presents the result of the individual positive incongruent sentences for the American group. Overall, the six positive incongruent sentences showed a similar pattern in the percentage. Amongst the six sentences, the sentence '*she is brave*' obtained the highest response percentage (82%) in the Interaction category for the American group. Further examination revealed that unlike the congruent sentences, the influence of the speaker's gender, Max F0, and F0 range on the percentage of each category was not observed for the American group.

Table 5. 27
Positive Incongruent sentences: The adjective description task results for the American group

Positive Incongruent: American	Interaction	Intonation	Neutral/ Ambiguous	Semantic meaning	Total
1. She is confident	75	3	13	9	100
2. She is lively	47	27	23	3	100
3. She is brave	82	6	0	12	100
4. She is lucky	81	3	3	3	100
5. She is happy	44	38	10	7	100
6. She is passionate	60	17	23	0	100

Table 5. 28 shows the result of the individual positive incongruent sentences for the Korean group. The sentence, '*she is happy*' received the highest percentage of the Interaction category (42%). The acoustic parameters (the Max F0 and F0 range) and the gender of the speaker also did not influence on the perception of the Korean participants.

Table 5. 28
Positive Incongruent sentences: The adjective description task results for the Korean group

Positive Incongruent: Korean	Interaction	Intonation	Neutral/ Ambiguous	Semantic meaning	Total
1. She is confident	23	24	40	13	100
2. She is lively	24	56	18	2	100
3. She is brave	20	25	45	10	100
4. She is lucky	23	47	23	7	100
5. She is happy	42	42	9	7	100
6. She is passionate	32	33	35	0	100

The American and Korean groups showed a difference in the pattern of the response percentage in the Interaction, Intonation, and Neutral/Ambiguous categories. Figure 5. 18 shows that the grey line (the American group) is placed above the black line (the Korean group) in the interaction category. The opposite pattern, however, was observed in the Intonation category; the Korean group obtained a higher percentage than did the American group (see Figure 5. 19). A greater number of the Korean participants also perceived the positive incongruent utterances as neutral than did the American participants (see Figure 5. 20).

Figure 5.18
Positive Incongruent sentences*: *Comparison of the percentage in the Interaction category between the American and Korean groups

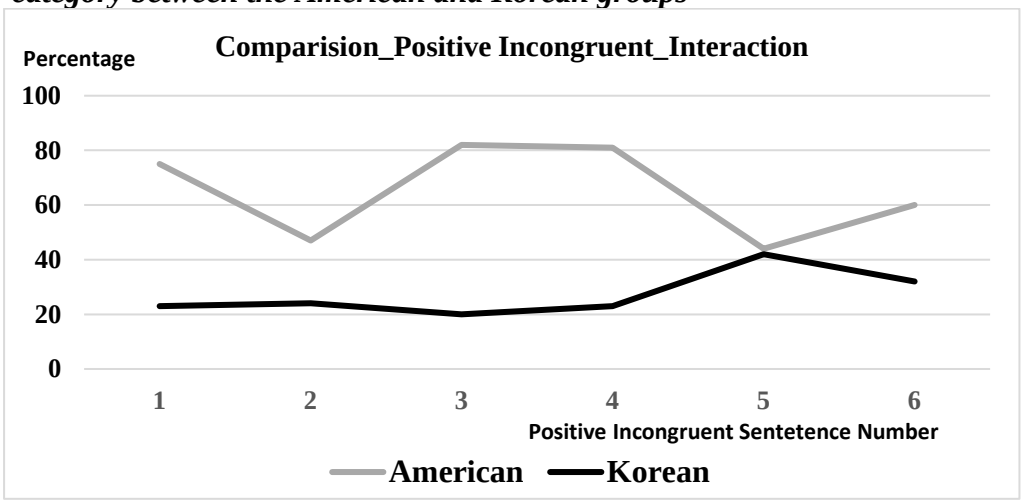


Figure 5.19

Positive Incongruent sentences*: *Comparison of the percentage in the Intonation category between the American and Korean groups

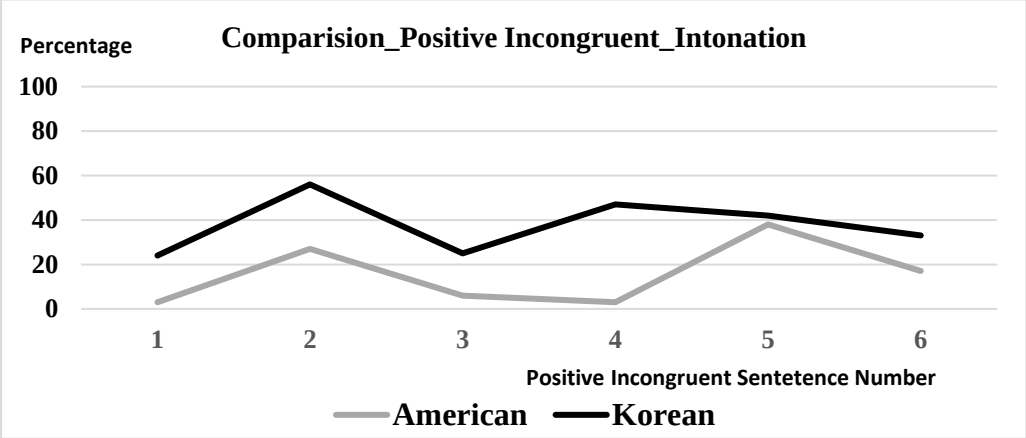


Figure 5. 20

Positive Incongruent sentences*: *Comparison of the percentage in the Neutral/Ambiguous category between the American and Korean groups

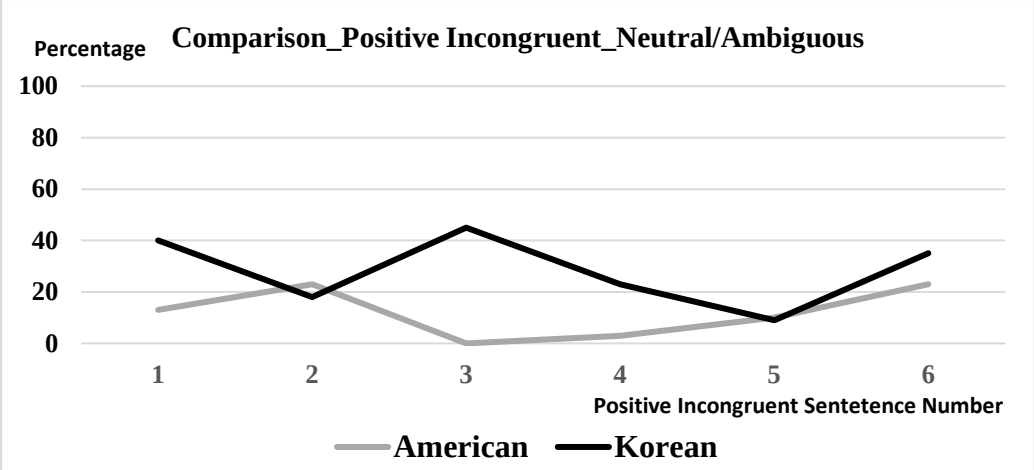
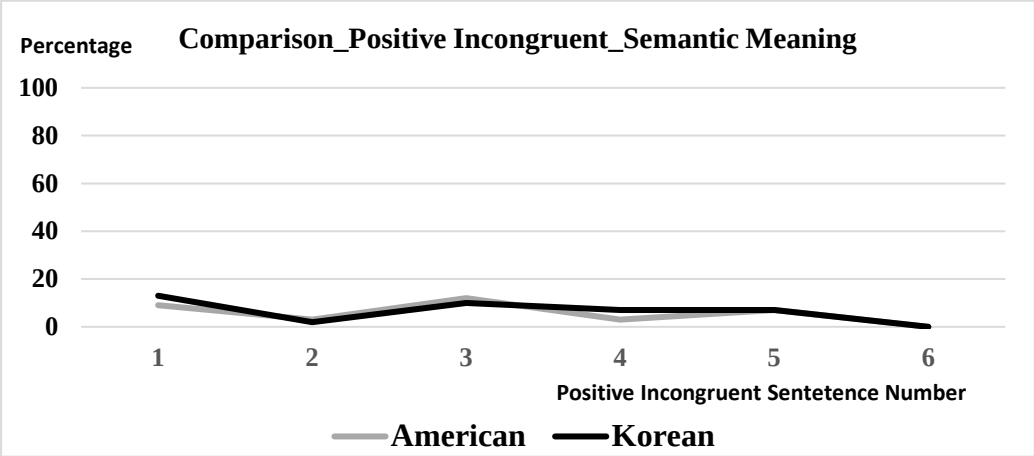


Figure 5. 21 shows a similar percentage response pattern in the Semantic Meaning category between the American and Korean groups; less than 10 % of the respondents (American: 6%; the Korean: 7%) perceived the positive incongruent sentences only according to the semantic meaning. For the American group, the sentence '*she is brave*' (sentence number 3) received the highest percentage (12%) of the Semantic Meaning category. The largest number of the Korean group, on the other hand, perceived the sentence,

'*she is confident*', only semantically. Interestingly, none of the American and Korean group perceived the utterance of '*she is passionate*' only semantically.

Figure 5. 21
Positive Incongruent sentences*: *Comparison of the percentage in the Semantic Meaning category between the American and Korean groups



Incongruent: Negative sentence in positive intonation

Table 5. 29 summarises the result of the categorisation of the adjective responses to the negative incongruent sentences (a negative sentence in a positive intonation). The American group had a slightly higher average response rate (64%) than that of the Korean group (58%). None of the Korean participants perceived the negative incongruent sentences as 'unnatural' whereas a few American participants did. Besides the difference in the Unnatural category, the American and Korean groups showed a similar pattern in their responses.

Table 5. 29
Negative Incongruent sentences: The adjective description task results

Sentence (Total response #)	Incongruent: negative sentence in positive intonation	
	American	**Korean**
1. She is angry (Am: 33; Ko: 29)	**INT**: Sarcastic (2), surprised	**INT**: Teasing
	UN: Fake (2), unnatural, too kind (2)	
	IN: Happy (17), positive, peppy, excited	**IN**: Happy (13), energetic (3), cheerful (2), affirming (2), kind
	NE: Disinterested, curious, soft, certain **SE**: Upset	**NE**: Neutral, indifferent (5), **SE**: Worried

2. She is useless (Am:37; Ko:31)	**INT**: Sarcastic (3), mean (5), rude	**INT**: Sarcastic (5), teasing (2)
	UN: unnatural (2), fake, too positive, weird	
	IN: Happy (14), upbeat (3), sincere, serious, believable	**IN**: Happy (9), kind, affirming, energetic (4), upbeat (4), complimenting (2), determined
	SE: Reproach, spiteful, angry	**SE**: Depressing, indifferent,
3. She is cruel (Am: 36; Ko: 32)	**INT**: Sarcastic (3), mean, hurtful (2), surprised	**INT**: Sarcastic (2),
	UN: Fake, unnatural, too happy (3), too upbeat (3)	
	IN: Happy (16), nice, excited (2)	**IN**: Exciting (3), happy (11), affirming (2) energetic (2), upbeat (7), kind, complimenting, confident
	NE: Disinterested	**NE**: Indifferent
	SE: angry	**SE**: sad
4. She is miserable (Am: 28; Ko: 27)	**INT**: heartless (2), too happy	**INT**: Teasing, criticising
	UN: Weird	
	IN: Happy (7), upbeat (3), positive, exclaimed, passionate, enthusiastic	**IN**: Happy (9), kind (2), cheerful Energetic (5), excited, Reassuring, confident
	NE: Natural (6), Believable (2), honest,	**NE**: Indifferent (4)
	SE: Sad	**SE**: Pathetic
5. She is lonely (Am: 29; Ko: 37)	**INT**: Sarcastic (2), fake (2),	**INT**: Sarcastic (5), anxious, gloating (2)
	UN: weird (4), too happy (5)	
	IN: Happy (6), upbeat, cheerful, positive, kind,	**IN**: Happy (15), energetic (5), upbeat (5), Excited, confident
	NE: Understanding, honest	**NE**: Neutral,
	SE: Sad (2), empathy, sympathetic,	**SE**: lonely
6. She is humiliated (Am:29; Ko: 20)	**INT**: Sarcastic, unnatural (2), weird, shocked, embarrassed, mocking	**INT**: teasing, sarcastic, judging
	IN: Upbeat (3), excited, happy (2) Positive, enthusiastic (3)	**IN**: Happy (4), energetic, confident Praising, complimenting (2), affirming
	NE: Neutral, soft , real (2), important	**NE**: Neutral, unemotional (3),
	SE: Upset, sad, angry (4), sympathetic	**SE**: Angry, depressing, sympathetic

*Note: INT: Interaction; UN: Unnatural; IN: Intonation; NE: Neutral; SE: Semantic meaning

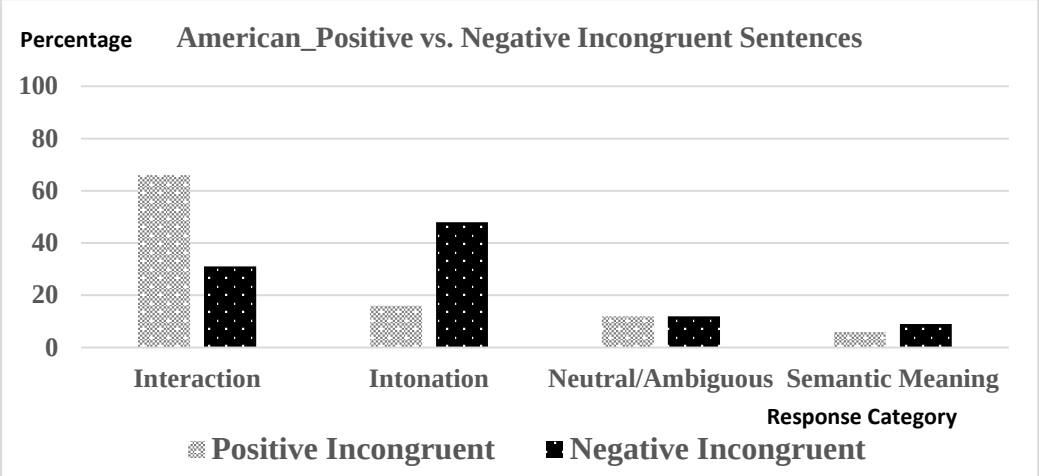
Table 5.30 compares the average response percentage to the negative incongruent sentences between the American and Korean group. The Intonation category received the highest response percentage from both of the American (48%) and Korean groups (38%). This result indicates that a larger number of the American and Korean participants paid only attention to the intonation of the negative incongruent sentences when processing the utterances.

Table 5.30
Negative Incongruent sentences: Comparison of the average percentage of the response frequency in the four categories

	Interaction	Intonation	Neutral/ Ambiguous	Semantic meaning
American	31	48	12	9
Korean	12	72	10	6

Figure 5.22 compares American participants' responses to the positive and negative incongruent utterances. The Interaction category received the largest percentage for the positive incongruent sentences whereas the Intonation category obtained the largest percentage for the negative incongruent sentences. This might be due to the fact that speaking a semantically negative sentence in a positive tone is a rare type of speech.

Figure 5. 22
American: Comparison of the average percentage of the response frequency between the Positive and Negative incongruent sentences



The Korean group showed a similar response pattern to the American group, the Intonation category receiving a higher percentage for the negative incongruent sentences. Figure 5. 31 shows that the Korean group had the largest percentage discrepancy in the Intonation category between the positive and negative incongruent sentences. This result suggests that the Korean group also had more difficulty in perceiving the interaction of the contradicting intonation and semantic meaning when the negative sentences were spoken in a positive tone.

Figure 5.23
Korean: Comparison of the average percentage of the response frequency between the Positive and Negative incongruent sentences

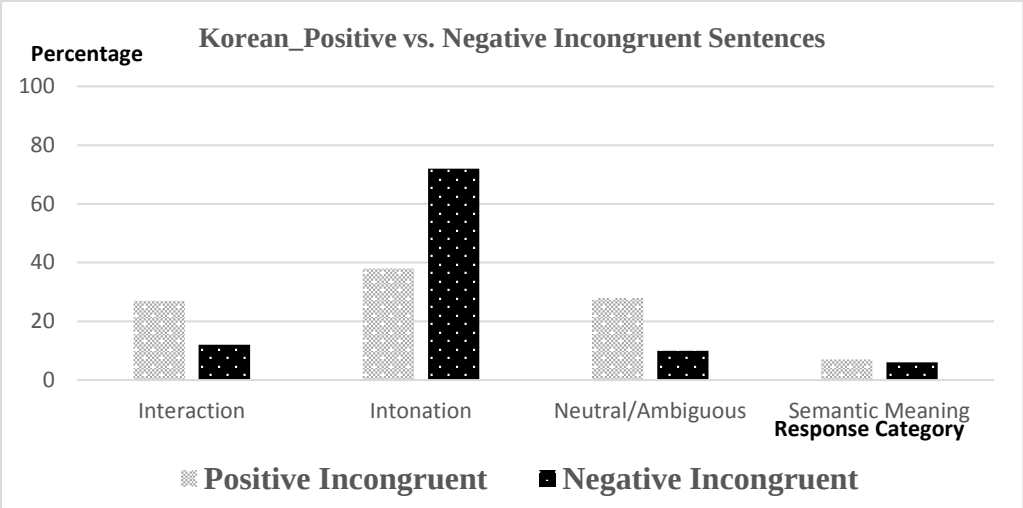


Table 5. 31 presents the percentage response of each negative incongruent sentence for the American group. Only the sentence, '*she is lonely*' received a higher percentage (45%) in the Interaction category than the Intonation category. Further investigation revealed that no associations between the Max F0, F0 range, and gender of the speaker and the patterns of the response percentage were found for the American group.

For the Korean group, the sentence, '*she is cruel*' received the highest response percentage (88%) in the Intonation category (see Figure 5. 32), indicating that 88 percent of the Korean participants perceived the sentence, '*she is cruel*' positively despite its negative semantic meaning. The Korean group also did not exhibit any relationship between the

response percentage patterns and the two acoustic parameters (the Max F0 and F0 range) and the gender of the negative incongruent utterances.

Table 5. 31
Negative Incongruent sentences: The adjective description task results for the American group

Negative Incongruent: American	Interaction	Intonation	Neutral/ Ambiguous	Semantic meaning	Total
1. She is angry	24	61	12	3	100
2. She is useless	38	54	0	8	100
3. She is cruel	42	52	3	3	100
4. She is miserable	14	50	32	4	100
5. She is lonely	45	34	7	14	100
6. She is humiliated	24	35	17	24	100

Table 5. 32
Negative Incongruent sentences: The adjective description task results for the Korean group

Negative Incongruent: Korean	Interaction	Intonation	Neutral/ Ambiguous	Semantic meaning	Total
1. She is angry	3	73	21	3	100
2. She is useless	23	71	0	6	100
3. She is cruel	6	88	3	3	100
4. She is miserable	7	74	15	4	100
5. She is lonely	21	73	3	3	100
6. She is humiliated	15	50	20	15	100

Figure 5. 24 displays the different percentage pattern between the American and Korean groups in the Interaction category for the negative incongruent sentences. The American group (the grey line) had a higher percentage (31%) than that of the Korean group (12%) (the black line). The Intonation category, on the other hand, showed the opposite pattern; the Korean group (72%) had a significantly higher response percentage than that of the American group (48%) (see Figure 5. 25).

Figure 5. 24

Negative Incongruent sentences*: *Comparison of the percentage in the Interaction category between the American and Korean groups

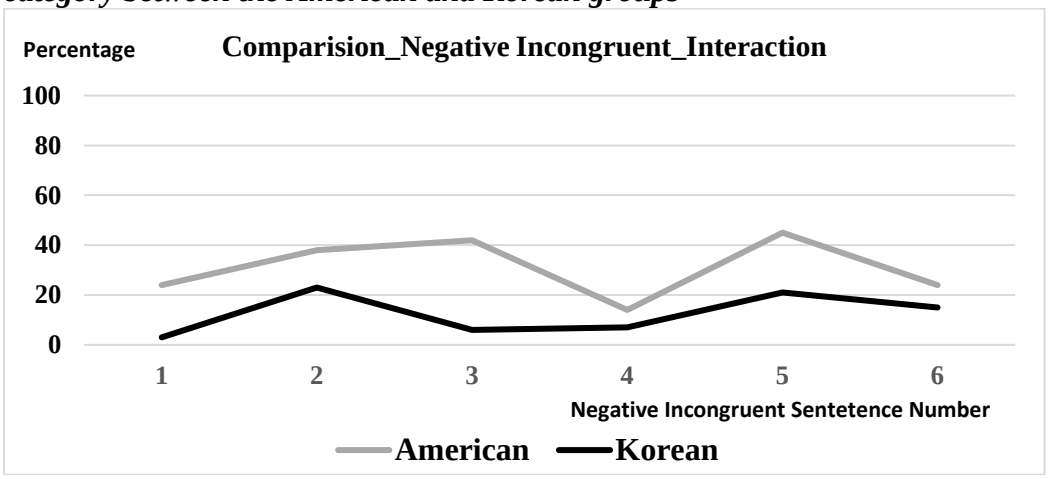


Figure 5. 25

Negative Incongruent sentences*: *Comparison of the percentage in the Intonation category between the American and Korean groups

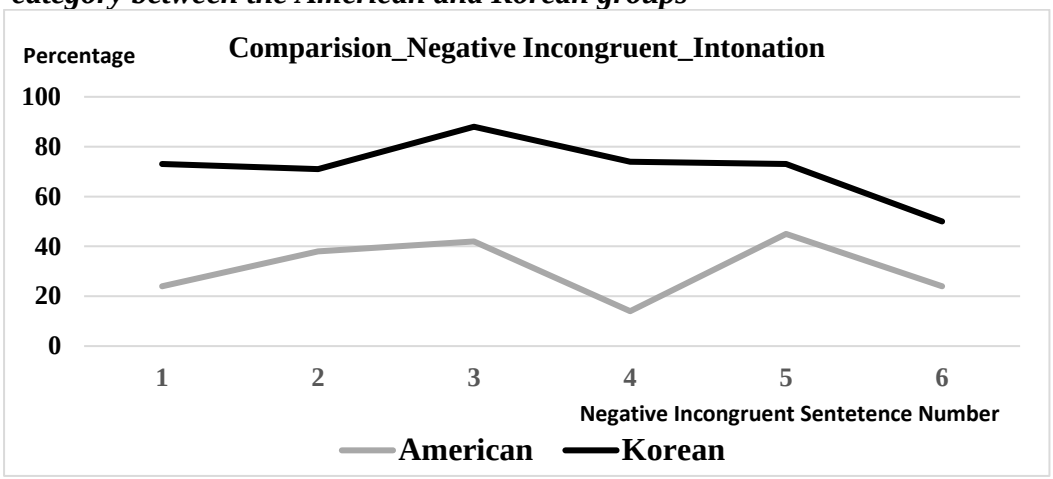


Figure 5. 26 and 5. 27 show that the response pattern of Korean participants in the Neutral/Ambiguous and Semantic Meaning category was similar to that of the American group except for the negative incongruent sentence, '*she is miserable*'. The sentence, '*she is miserable*' received a higher response percentage in both the Neutral/Ambiguous and Semantic Meaning categories from the American group. This result indicates that a larger percentage of the American group participants interpreted the utterance, '*she is miserable*' either neutral/ambiguous or positive than did the Korean group.

Figure 5. 26

Negative Incongruent sentences*: *Comparison of the percentage in the Neutral/Ambiguous category between the American and Korean groups

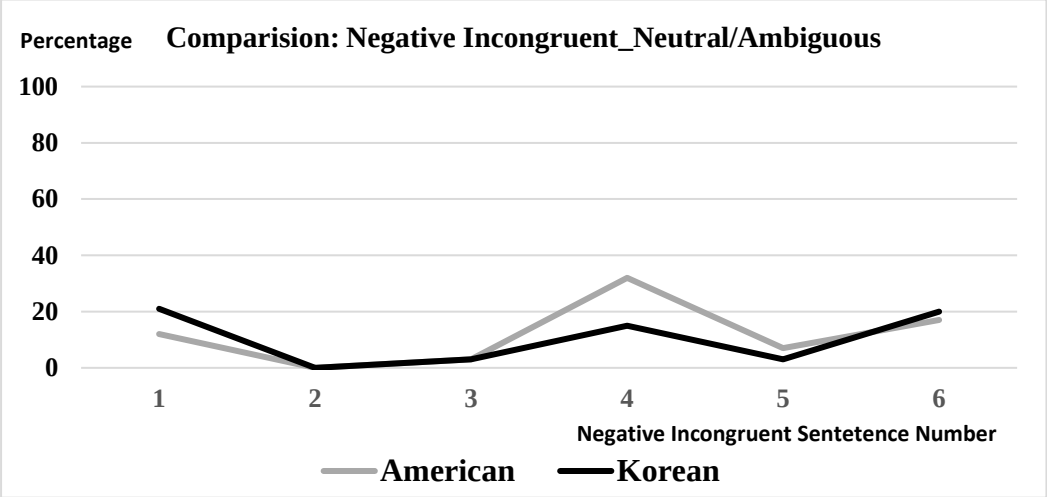
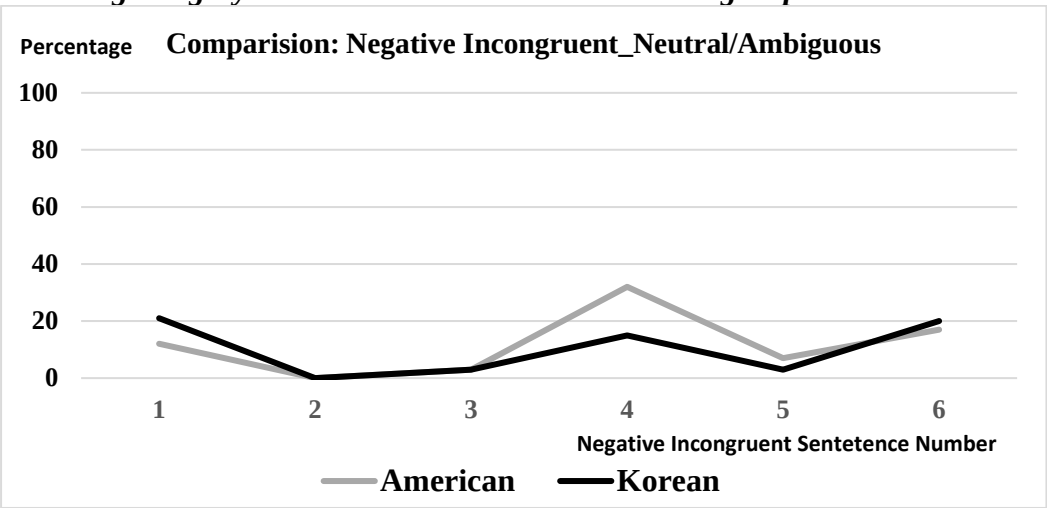


Figure 5. 27

Negative Incongruent sentences*: *Comparison of the percentage in the Semantic Meaning category between the American and Korean groups



Summary of the quantitative and qualitative findings:

- A larger number of American participants perceived the positive congruent utterances positively than did Korean students.
- A larger number of American participants perceived the negative congruent utterances negatively than did Korean students.
- A larger number of American students provided adjectives describing the interaction between the intonation and semantic meaning than did Korean participants when they listened to the positive sentence with negative intonation utterances.
- A larger number of American students provided adjectives describing the interaction between the intonation and semantic meaning than did Korean participants when listened to the negative sentence with positive intonation utterances.

CHAPTER 6

THE PRODUCTION TASKS RESULTS

The two productive aspects of Korean students' difficulties in using English emotional intonation investigated were: (1) To what extent, do Korean students' English intonation produce the pragmatic force of emotional sentences? and (2) What kinds of mental scripts do Korean students engage in while producing English emotional intonation? The pragmatic force of Korean students' English emotional intonation was examined by analysing the phonological and non-phonological features of the English emotional utterances. The phonological aspect, the overall contour of the emotional intonation, was analysed by adapting the Autosegmental Matrix Model (Pierrehumbert,1986) and Halliday's tone model (2008). The non-phonological features, the use of pitch variations, were analysed by comparing the Max F0, Min F0, and F0 range of the emotional sentences between the American and Korean groups. To explore the internal cognitive and emotional process of producing emotional intonation, stimulated recall interviews were followed. This chapter, thus, comprises three parts. Section 6.1 and 6.2 provide the results of the phonological and non-phonological analyses, respectively. Section 6.3 summarises the results of the stimulated recall interview.

6. 1 The phonological analysis of the emotional intonation

The two positive ('*she's confident*' and '*she's passionate*') and two negative sentences ('*she's miserable*' and '*she's humiliated*') with more than two-syllabled adjectives were eliminated from analysis in order to control the influence of the number of the syllables of the main adjective. Although the elimination narrows down emotional utterances to the simplest sentence structure with the two-syllabled main verbs, this procedure was necessary

to compare the intonation patterns that are not affected by the number of syllables in the main adjectives. As a result, four positive and negative sentences were selected for phonological analysis (see Table 6.1).

Table 6.1
Four positive and negative sentences selected for phonological analysis

	The four positive sentences	The four negative sentences
1	She is lively	She is angry
2	She is brave	She is useless
3	She is lucky	She is cruel
4	She is happy	She is lonely

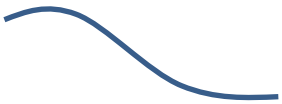
6. 1. 1 The Autosegmental Matrix Model

The Autosegmental Matrix (AM) model allows analysing intonation contour patterns by employing the system of transcription notation (see Appendix 11). The AM model adapts 'bitonal' (High and Low) elements to describe pitch movements. The results of AM analysis showed that most American and Korean participants displayed a consistent AM pattern for the positive and negative emotional intonation.

The positive intonations followed a 'LH*L' pattern according to AM analysis; The highest pitch of the positive intonation placed on the first syllable of the emotional adjective. For instance, in the case of the positive congruent utterance, '*she's happy*', the tone rose within the subject predicate, '*she is*', and '*ha*', the first syllable of '*happy*', received a pitch accent (marked by *). The tone then dropped in the second syllable of the word, '*happy*' (see Table 6.2).

The negative intonation, on the other hand, generally had a 'HL*0' pattern, with a low pitch accent. For example, the tone of the subject predicate, '*she is*' dropped, and '*an*', the first syllable of '*angry*', received the tonal accent (L*). The second syllable of '*angry*' then maintained the low tone (marked as '0') (see Table 6.2).

Table 6.2
The typical positive and negative intonation pattern of the emotional utterance according to the AM model

	Positive Utterance	**Negative Utterance**
Emotional Utterance	She is happy	She is angry
Intonation contour		
AM notation	L H* L	H L* 0

The intonation patterns of each positive and negative emotional utterance were compared between the American and Korean groups. The results indicated that both groups demonstrated a similar pattern concerning the overall intonation contour. For the positive intonation utterances, both groups predominately used the LH*L positive intonation. The influence of the semantic incongruence on the intonation contour, however was only found in the American group. The majority of American and Korean participants also used the HL*0 negative intonation when they spoke the negative intonation utterances. The following sections present the detailed results of AM analysis.

Positive Intonation: Positive sentence in positive intonation

The intonation contour of the four positive congruent utterances (a positive sentence in a positive intonation) generally followed the LH*L positive intonation, a rising-and-falling pattern, according to AM description. The detailed results of each individual utterance are as follows.

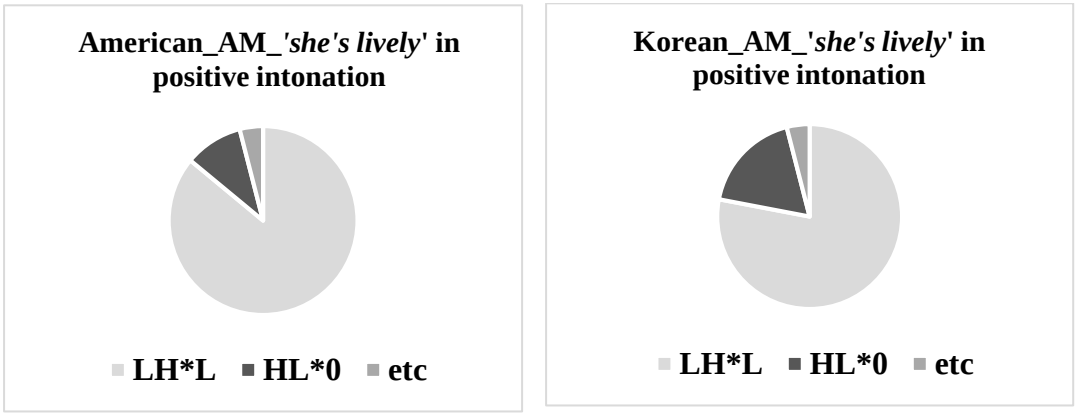
Table 6.3 and Figure 6.1 show that 86% of American and 78% of Korean participants spoke the positive congruent sentence, '*she's lively*' using the LH*L positive intonation. According to a Chi-square test, the percentage difference in the LH*L category between the American and Korean groups was not significant at the $p < .05$ (χ^2 (1) = 1.3, p = 0. 25), indicating that a similar percentage of the American and Korean groups spoke the sentence, '*she's lively*' using the LH*L positive intonation. As shown in Table 6.3, few American and

Korean students spoke the sentence using the HL*0 negative intonation (American: 10%; Korean: 18%), and the proportion difference between the two groups in the HL*0 category was not significant at the p<.05: χ^2 (1) = 1.07, p = 0. 3.

Table 6.3
The proportion of the intonation contour patterns of 'she is lively' in positive tone

Intonation Contour	American	Korean
LH*L	**43 (86%)**	**39 (78%)**
HL*0	5 (10%)	9 (18%)
etc	2 (4 %)	2 (4%)
Total	50 (100%)	50 (100%)

Figure 6.1
The visualisation of the proportion of the AM intonation patterns of 'she is lively' in positive intonation



A Chi-square test of independence was also calculated to test associations between two variables: language background and intonation contour types. According to the result, there was no significant interaction between the two variables at the p <.05 (χ^2 (4) = 2.89, p = 0. 57). In other words, participants' first language background was not associated with the intonation contour patterns of the utterance, '*she's lively*' in positive intonation.

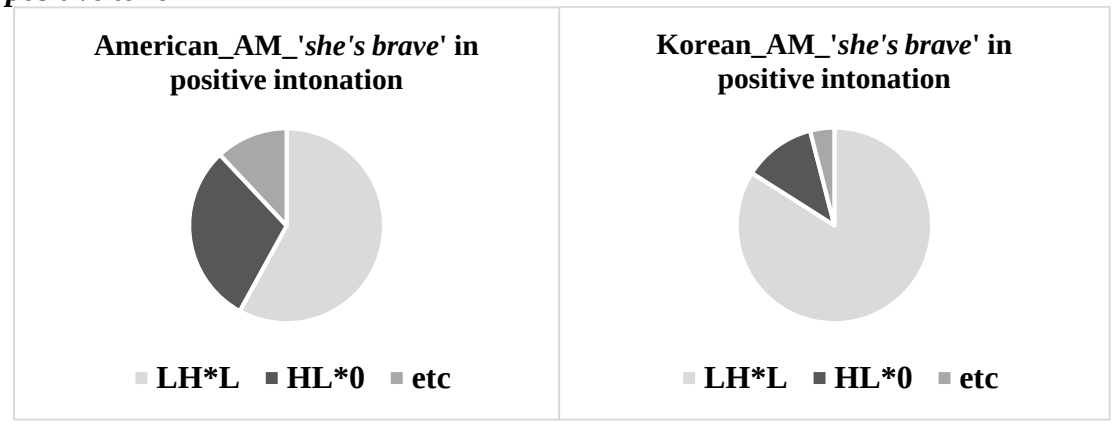
Table 6.4 and Figure 6.2 show that the largest percentage of the American (58%) and Korean (84%) groups spoke '*she is brave*' in the positive LH*L intonation. Interestingly, the proportion difference in the LH*L contour between the American and Korean groups was significantly different at the p< .05 (χ^2 (1) = 8.12, p = 0. 004). This is because a larger

percentage of American participants (30%) spoke '*she is brave*' in the HL*O negative intonation (see Table 6.4), a dropping tone, instead of the LH*L positive tone. The proportion of the HL*0 pattern for the Korean group, however, did not increase for the same utterance. In addition, further analysis revealed that 10% of American participants spoke the positive congruent '*she's brave*' using a HL*H, a falling-and-rising contour, which is a tone for questioning. The language background and the intonation contour patterns were also not significantly associated at the p <.05 level (χ^2 (9) = 5.88, p = 0. 75).

Table 6.4
The proportion of the intonation contour patterns of 'she is brave' in positive tone

Intonation Contour	American	Korean
LH*L	29 (58%)	**42 (84%)**
HL*0	**15 (30%)**	6 (12%)
etc	6 (12 %)	2 (4%)
Total	50 (100%)	50 (100%)

Figure 6.2
The visualisation of the proportion of the AM intonation patterns of 'she is brave' in positive tone



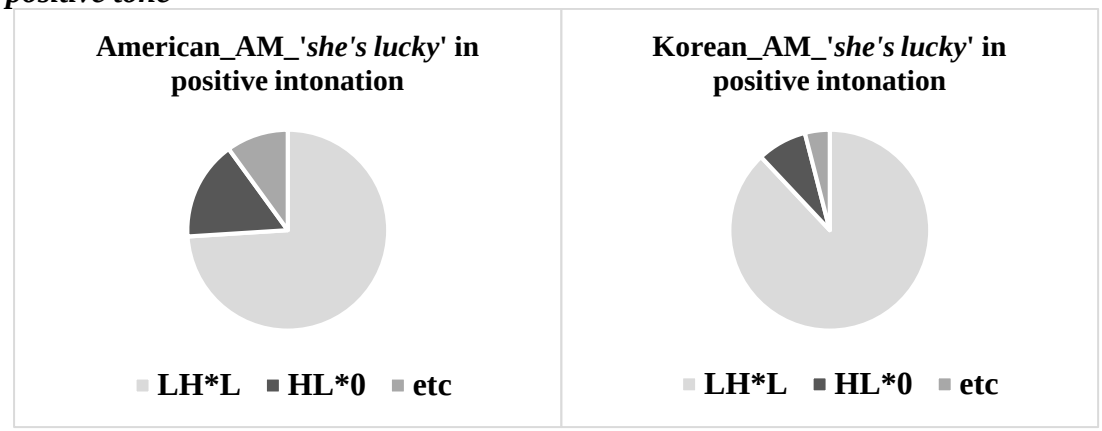
For the positive congruent sentence, '*she's lucky*', the largest percentage of the American (74%) and Korean (88%) groups used the same LH*L positive contour (see Table 6.5 and Figure 6.4). The result of a Chi-square test indicates that the proportion difference in the LH*L pattern between the American and Korean groups was not statistically significant at p the <.05 level (χ^2 (1) = 3.15, p = 0.07), meaning a similar percentage of the American and

Korean groups used the same LH*L intonation contour for speaking '*she's lucky*' in positive intonation. A Chi-square test of independence also revealed that the language background and intonation contour patterns were not significantly associated at the p<.05 level: χ^2 (9) = 2.39, p = 0. 98.

Table 6. 5
The proportion of the intonation contour patterns of 'she is lucky' in positive tone

Intonation Contour	American	Korean
LH*L	**37 (74%)**	**44 (88%)**
HL*0	8 (16%)	4 (8%)
HL*H	5 (10 %)	2 (4%)
Total	50	50

Figure 6. 3
The visualisation of the proportion of the AM intonation patterns of 'she is lucky' in positive tone



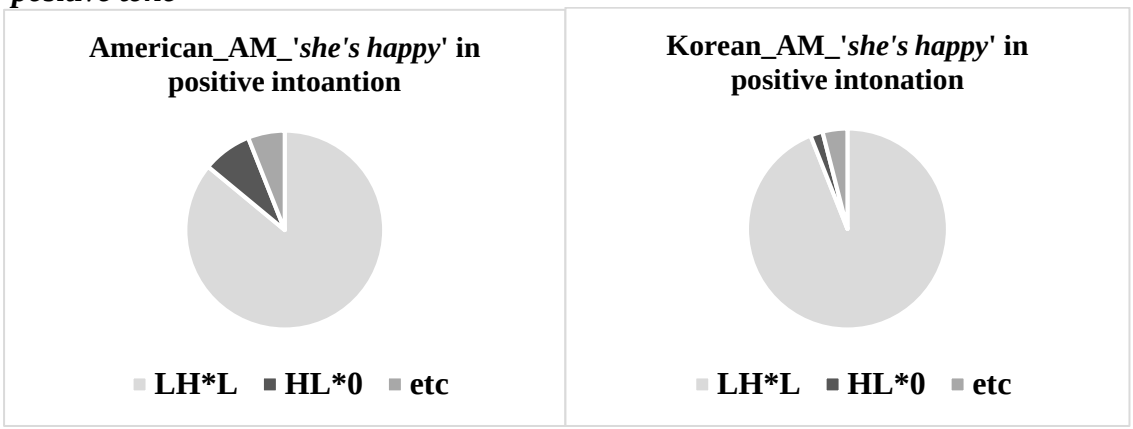
Among the four positive congruent utterances, '*she's happy*' obtained the largest percentage in the LH*L positive intonation pattern for both the American (86%) and Korean groups (94%) (see Table 6.6 and Figure 6.4). The difference in the proportion of the LH*L contour between the American and Korean groups was not statistically significant at the p<.05 level: χ^2 (1) = 1.76, p = 0. 18. This result shows that a similar ratio of American and Korean participants used the LH*L contour when they spoke '*she's happy*' in positive intonation. A Chi-square test of independence also indicates that the language background

variable was not significantly associated with the intonation contour types for the positive congruent, '*she's happy*' at the p <.05 level: χ^2 (9) = 5.88, p = 0. 75.

Table 6.6
The proportion of the intonation contour patterns of 'she is happy' in positive tone

Intonation Contour	American	Korean
LH*L	**43 (86%)**	**47 (94%)**
HL*0	4 (8%)	1 (2%)
HL*H	3 (6 %)	2 (4%)
Total	50	50

Figure 6.4
The visualisation of the proportion of the AM intonation patterns of 'she is happy' in positive tone



In sum, according to AM analysis, the largest percentage of the American and Korean groups used the LH*L positive intonation when speaking the four positive congruent utterances. The difference in the percentage of the LH*L contour pattern was only significant for the positive congruent utterance, '*she's brave*'. To investigate the influence of semantic incongruence on the intonation patterns, the intonation contours of the negative sentence in positive intonation utterances were analysed in the following section.

Positive Intonation: Negative sentence in positive intonation

The negative semantic meaning affected American participants' use of positive intonation more than did Korean participants. The proportion of American participants using the HL*0, the negative intonation contour, significantly increased for all of the four negative

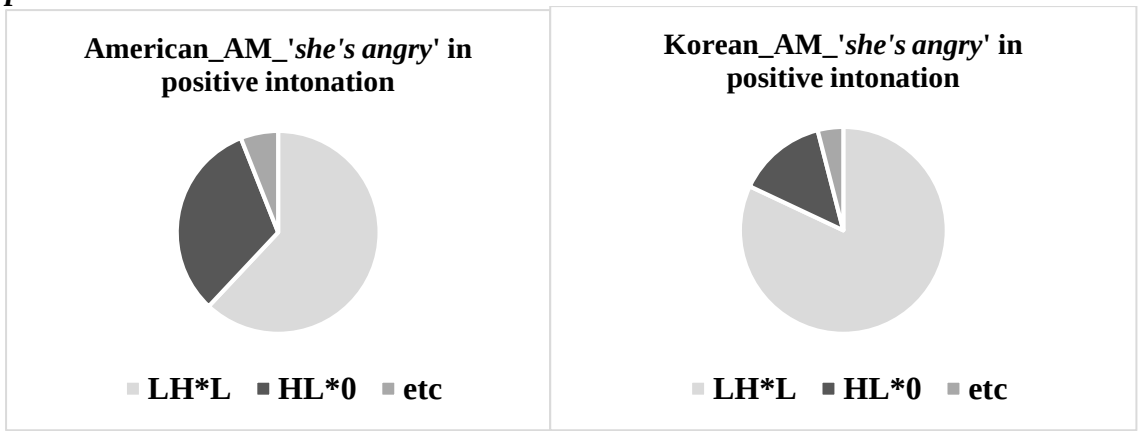
sentence in positive intonation utterances. The Korean group, however, showed the increase in the use of the negative contour in only the two utterances: '*she's useless*' and '*she's lonely*' in positive intonation.

Table 6.7 shows that 62 % of American and 82 % of Korean participants spoke the utterance, '*she's angry*' in positive intonation utterance, using the LH*L positive intonation. A significantly smaller percentage of American participants used the LH*L contour compared to the Korean group at p the <.05 level: χ^2 (1) = 4.9, p = 0. 02. Within the American group, the percentage of the HL*0 negative intonation category significantly increased (32%) (see Table 6.9 and Figure 6.5). The proportion of the HL*0 negative intonation for American participants was also significantly larger than that of Korean participants at the p<.05 level: χ^2 (1) = 4.5, p = 0.03, showing a substantially larger number of American participants used the negative intonation than did Korean participants.

Table 6.7
The proportion of the intonation contour patterns of 'she is angry' in positive tone

Intonation Contour	American	Korean
LH*L	31 (62%)	**41 (82%)**
HL*0	**16 (32%)**	7 (14%)
etc	3 (6 %)	2 (4%)
Total	50	50

Figure 6.5
The visualisation of the proportion of the AM intonation patterns of 'she is angry' in positive tone



The American and Korean groups showed a similar pattern in the use of intonation when speaking '*she's useless*' in positive intonation. The proportion in the LH*L intonation was the same as 72% (see Table 6.8 and Figure 6.6) for the American and Korean groups. The proportion difference of the HL*0 category between the two groups was also statistically insignificant at the $p<.05$ level: $\chi^2(1) = 0.06$, $p = 0.8$. The percentage increase in the negative HL*0 contour for both groups (American: 20%; Korean: 22%) shows that the participants were influenced by the semantically negative meaning of the sentence, '*she's useless*' while producing the positive intonation.

Table 6.8
The proportion of the intonation contour patterns of 'she is useless' in positive tone

Intonation Contour	American		Korean	
LH*L	36	(72%)	36	(72%)
HL*0	10	(20%)	11	(22%)
etc	4	(8 %)	3	(6%)
Total	50		50	

Figure 6.6
The visualisation of the proportion of the AM intonation patterns of 'she is useless' in positive tone

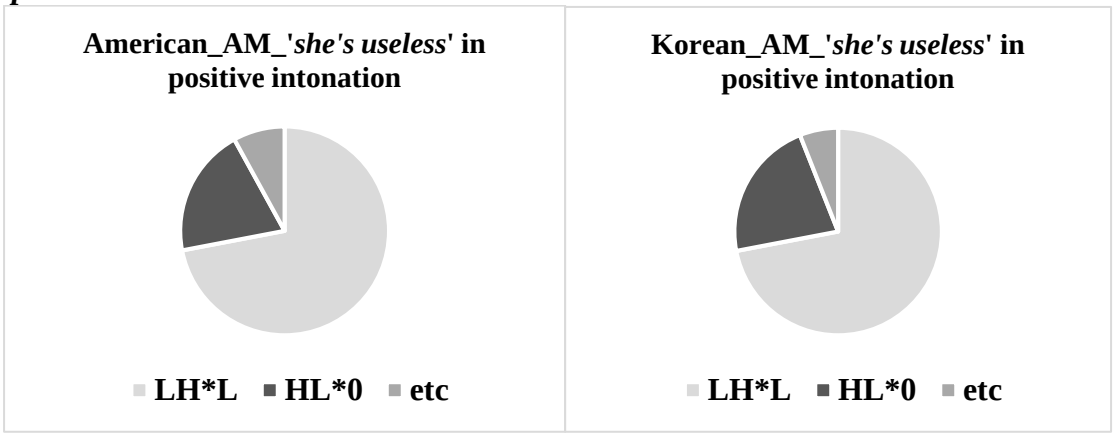


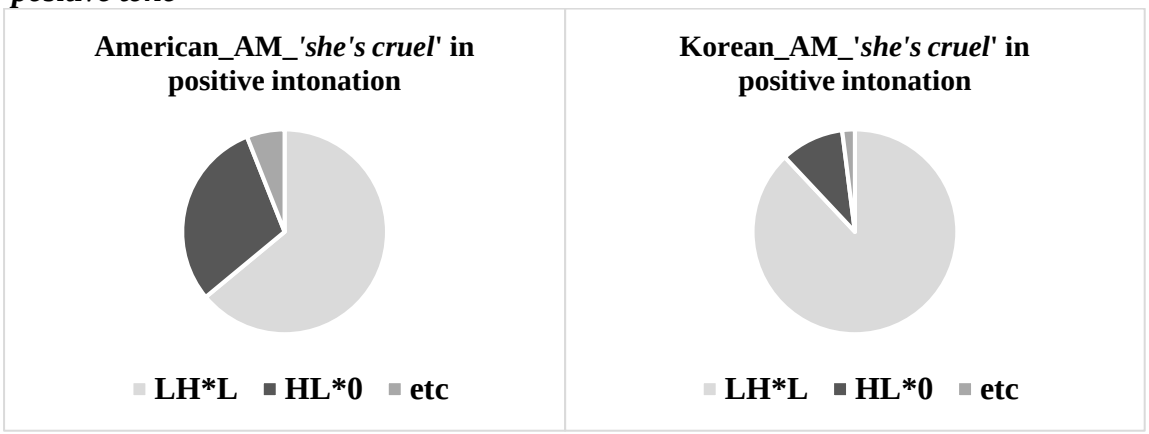
Table 6.9 and Figure 6.7 present the result of the utterance, '*she's cruel*' in positive intonation. The percentage of the HL*0, the negative intonation significantly increased for the American group (30%). According to Chi-square tests, the proportion difference in the LH*L ($\chi^2(1) = 7.8$, $p = 0.005$) and HL*0 ($\chi^2(1) = 6.1$, $p = 0.01$) categories between the

American and Korean groups were statistically significant at the p<.05 level; a significantly smaller number of American participants used the positive LH*L intonation than did the Korean group when speaking '*she's cruel*' in positive intonation. Korean students' relatively consistent use of the positive intonation despite the semantically negative meaning of the utterance shows that they were less influenced by the semantic incongruence.

Table 6.9
The proportion of the intonation contour patterns of 'she is cruel' in positive tone

Intonation Contour	American	Korean
LH*L	32 (64%)	44 (88%)
HL*0	**15 (30%)**	5 (10%)
etc	3 (6 %)	1 (2%)
Total	50	50

Figure 6.7
The visualisation of the proportion of the AM intonation patterns of 'she is cruel' in positive tone



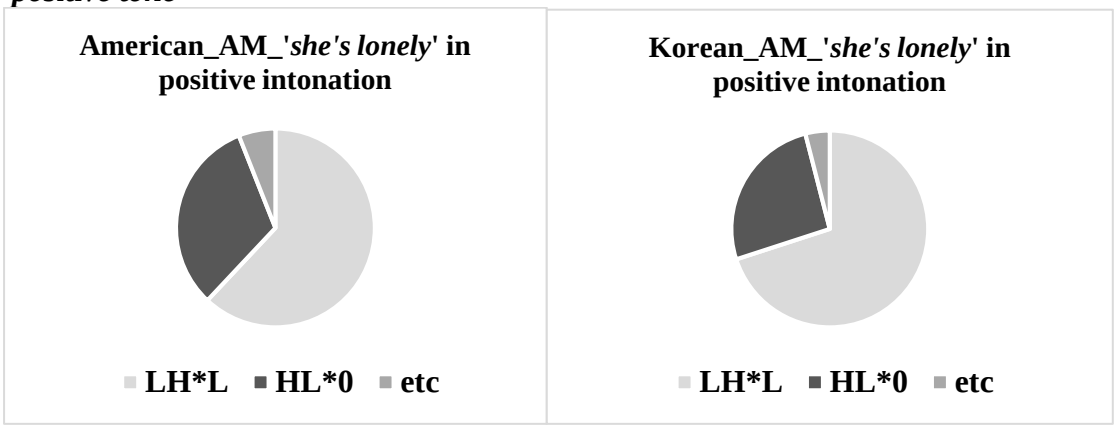
The last utterance, '*she's lonely*' in positive intonation also followed a similar pattern to the three incongruent utterances. The largest proportion of both American and Korean participants spoke the utterance using the LH*L positive intonation (American: 62%; Korean: 70%) (see Table 6.10 and Figure 6.8). The proportion difference for the LH*L positive intonation (χ^2 (1) = 0.7, p = 0.4) and HL*0 negative intonation (χ^2 (1) = 0.43, p = 0.5) categories was not statistically significant at the p<.05 level. The proportion of the HL*0 negative intonation significantly increased for both American and Korean participants,

showing the participants spoke the utterance, '*she's lonely*' using the negative tone although they were asked to speak in positive intonation.

Table 6.10
The proportion of the intonation contour patterns of 'she is lonely' in positive tone

Intonation Contour	American	Korean
LH*L	31 (62%)	35 (70%)
HL*0	**16 (32%)**	**13 (26%)**
etc	3 (6 %)	2 (4%)
Total	50 (100%)	50 (100%)

Figure 6.8
The visualisation of the proportion of the AM intonation patterns of 'she is lonely' in positive tone



So far, the positive intonation utterances were analysed. As mentioned earlier, the American and Korean groups generally used a similar intonation contour pattern when they spoke the positive intonation utterances. The two groups, however, showed a significant difference when they spoke the negative intonation utterances. The following section presents the results of the two different types of the negative intonation utterances, a negative sentence with a negative intonation and a positive sentence with a negative intonation.

Negative Intonation: Negative sentence in negative intonation

The percentage of American participants who used the HL*0 negative intonation contour was substantially larger than that of Korean participants when speaking the four negative congruent utterances (a negative sentence in a negative intonation). Over 90% of

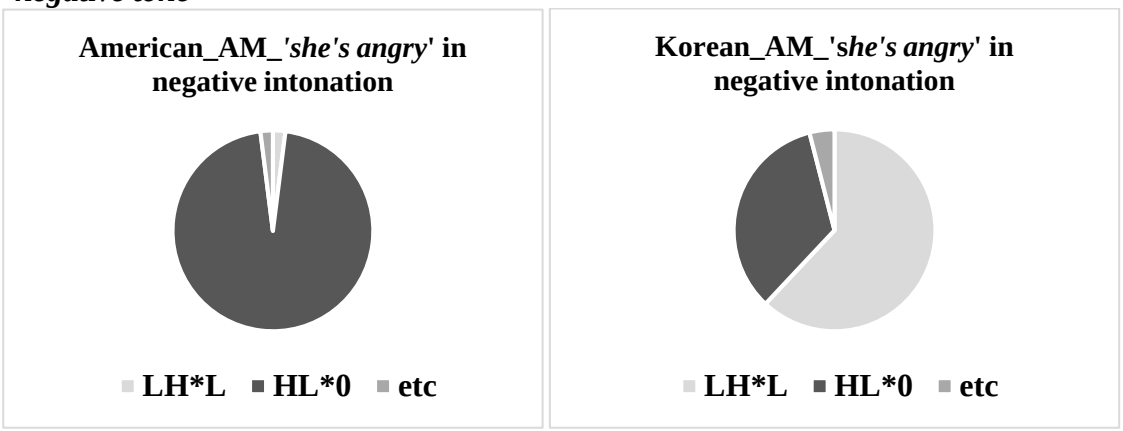
American participants on average spoke the negative congruent utterances using the HL*0 negative intonation whereas a significant number of Korean participants spoke the negative congruent utterances in the LH*L positive intonation. This result suggests that Korean participants were less likely to utilise the negative English intonation contour than did the American group. The detailed results of the four negative congruent utterances are as follows.

Table 6.11 and Figure 6.9 show that a significantly larger percentage of the American group (90%) used the HL*0 negative intonation than did the Korean group (34%) when speaking '*she's angry*' in negative intonation. 62% of Korean participants used the LH*L positive intonation when they were supposed to speak the utterance negatively. A Chi-square analysis also revealed there was interaction between the participants' language background and their intonation patterns at the $p < .05$ level: $\chi^2 (4) = 25.08$, $p = 0.00$. In other words, American participants were likely to use the HL*0 type whereas Korean participants had a tendency to use the LH*L intonation when asked to speak '*she's angry*' in negative intonation. This trend, however, Korean students' significantly larger percentage in the LH*L category, was only found in the negative congruent utterance, '*she's angry*'. The largest Korean participants used the HL*0 intonation for the other three negative congruent utterances.

Table 6.11
The proportion of the intonation contour patterns of 'she is angry' in negative tone

Intonation Contour	**American**		**Korean**	
LH*L	1	(2%)	31	(62%)
HL*0	**48**	**(96%)**	17	(34%)
etc	1	(2 %)	2	(4%)
Total	50		50	

Figure 6.9
The visualisation of the proportion of the AM intonation patterns of 'she is angry' in negative tone



The largest percentage of the American (94%) and Korean (80%) groups spoke the negative congruent utterance, '*she's useless*' in the HL*0 negative intonation (see Table 6.12 and Figure 6.10). According to a Chi-square test, the proportion difference in the negative HL*0 intonation was significant at the p<.05 level (χ^2 (1) = 4.29, p = 0.03), meaning the number of American participants who used the HL*0 intonation was significantly larger than that of Korean participants. In addition, a significant association between the language background and intonation pattern variables was not found at the p <.05 level for the negative congruent utterance, '*she's useless*': χ^2 (2) = 1.39, p = 0.49. This result suggest a particular intonation pattern was not linked to the participants' language background.

Table 6.12
The proportion of the intonation contour patterns of 'she is useless' in negative tone

Intonation Contour	American		Korean	
LH*L	2	(4%)	10	(20%)
HL*0	47	(94%)	40	(80%)
etc	1	(2 %)	0	(0%)
Total	50		50	

Figure 6.10
The visualisation of the proportion of the AM intonation patterns of 'she is useless' in negative tone

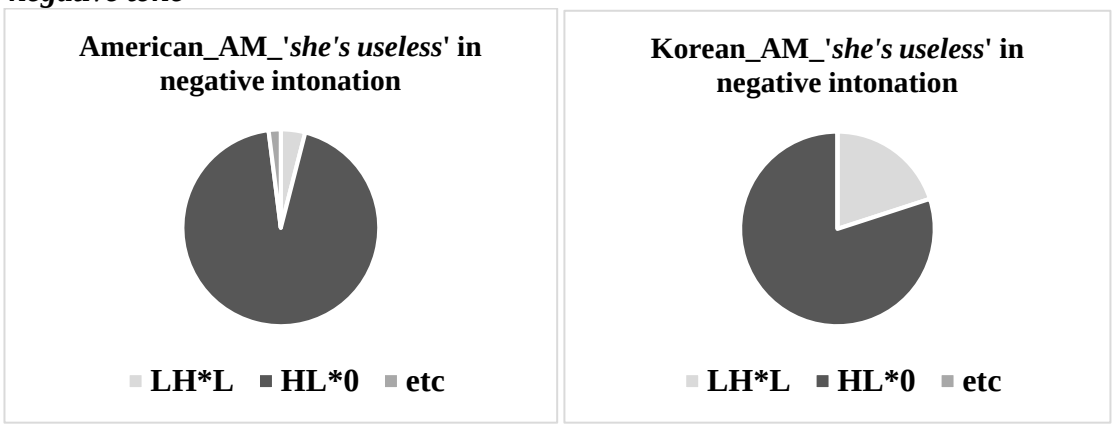
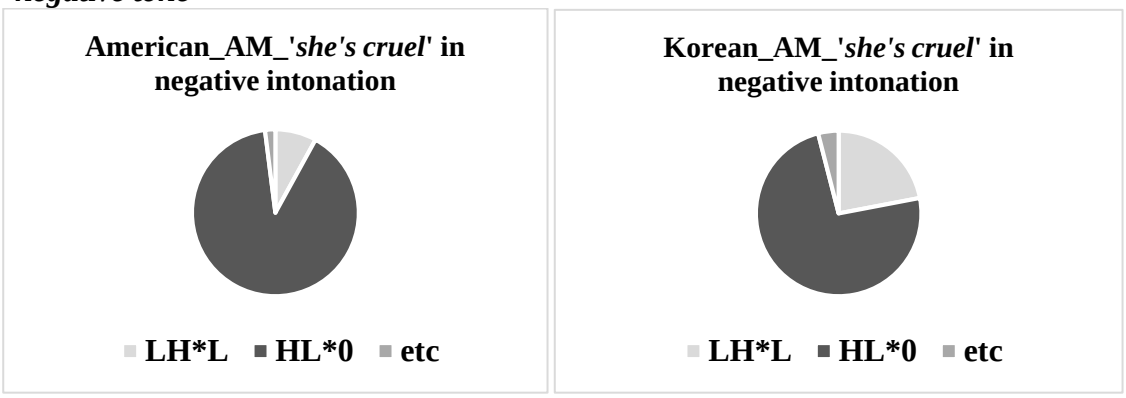


Table 6.13 and Figure 6.11 present the results of AM analysis on the negative congruent utterance, '*she's cruel*'. The largest percentage of both American (90%) and Korean (74%) participants spoke the utterance using the HL*0 negative intonation. The number of American participants in the HL*0 category was significantly larger than that of Korean participants at the $p < .05$: $\chi^2 (1) = 4.29$, $p = .03$, meaning more American students spoke the utterance in the HL*0 negative intonation than did Korean students. A Chi-square test indicated that the language background of participants did not interact with the intonation patterns at the $p < .05$ level: $\chi^2 (4) = 8.8$, $p = .06$.

Table 6.13
The proportion of the intonation contour patterns of 'she is cruel' in negative tone

Intonation Contour	American	Korean
LH*L	4 (8%)	11 (22%)
HL*0	45 (90%)	37 (74%)
etc	1 (2 %)	2 (4%)
Total	50	50

Figure 6.11
The visualisation of the proportion of the AM intonation patterns of 'she is cruel' in negative tone

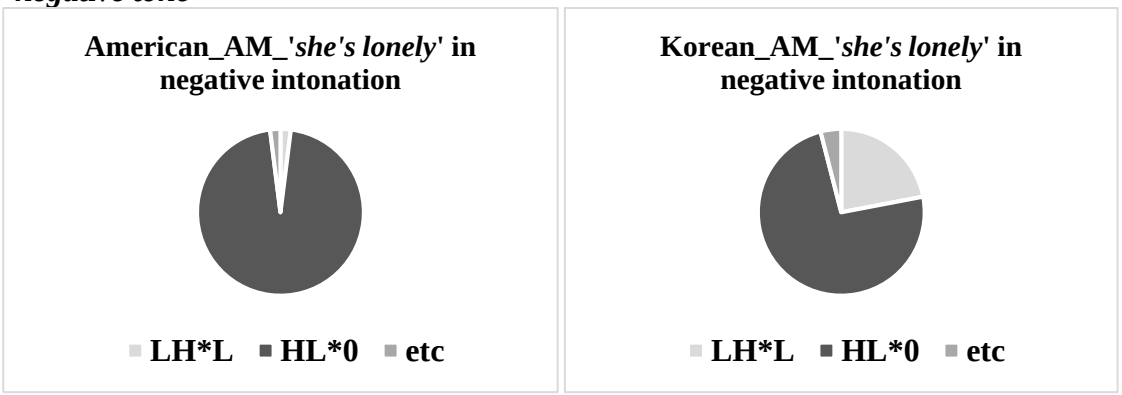


The last negative congruent utterance, '*she's lonely*' also followed a similar pattern to the previous negative congruent utterances: the largest percentage of both groups used the HL*0 negative intonation, and a significantly larger number of American students used the HL*0 pattern than did Korean students at the $p<.05$: (χ^2 (1) = 9.39, p = .002 (see Table 6.14 and Figure 6.12). Additionally, the language background of participants and intonation patterns were associated at the $p<.05$ level: χ^2 (2) = 24.8, p = .00.

Table 6.14
The proportion of the intonation contour patterns of 'she is lonely' in negative tone

Intonation Contour	American		Korean	
LH*L	1	(2%)	11	(22%)
HL*0	48	(96%)	37	(74%)
etc	1	(2 %)	2	(4%)
Total	50		50	

Figure 6.12
The visualisation of the proportion of the AM intonation patterns of 'she is lonely' in negative tone



American and Korean students generally used the HL*0 negative intonation pattern when speaking the negative congruent utterances. The proportion difference in the HL*0 pattern between the two groups, however, was generally significant for the negative congruent sentences; a larger number of American students used the HL*0 pattern than did the Korean group. In the following section, the influence of semantic incongruence on the use of negative intonation was examined by analysing the intonation patterns of the positive sentence in negative intonation utterances.

Negative Intonation: positive sentence in negative intonation

The results of the positive intonation utterances showed that American participants were influenced by the semantic incongruence more than Korean students when speaking the negative sentences in positive intonation. American participants, however, were not influenced by the semantic incongruence when they spoke the positive sentences in negative intonation utterances. A similar number of American participants used the same HL*0 negative intonation pattern. This might be due to the fact that American students were more familiar with the positive sentence in negative intonation utterances, which is commonly used as ‘sarcasm’, than the negative sentence in positive intonation utterances.

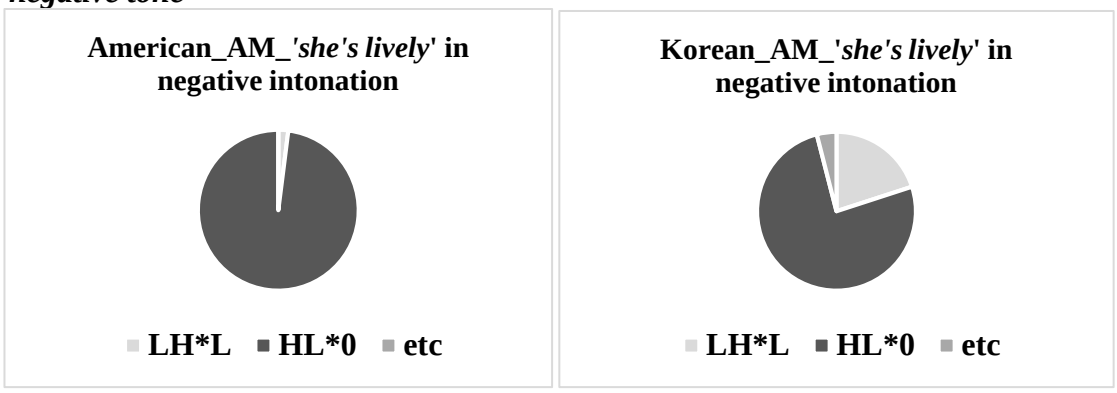
Overall, the American and Korean groups showed a similar trend to the negative congruent utterances; the proportion in the HL*0 category did not significantly change compared to the negative congruent utterances for the American and Korean groups. The largest number of both groups spoke the positive sentence in negative intonation utterances using the HL*0 negative intonation. The proportion of American students in the HL*0 category also was larger than that of Korean students, meaning a larger number of American participants used the HL*0 intonation than did Korean participants. The detailed results of the individual utterance are as follows.

98% of American and 76% of Korean participants used the HL*0 negative intonation when speaking the sentence, '*she's lively*' with a negative intonation (see Table 6.15 and Figure 6.13). Only one American student spoke the utterance using the positive LH*L intonation whereas 20% of Korean students used the LH*L pattern. The proportion difference in the HL*0 intonation category was significant at the p<.05 level (χ^2 (1) = 10.59, p = 0.001), showing that a significantly larger number of American participants used the HL*0 intonation than did Koreans.

Table 6.15
The proportion of the intonation contour patterns of 'she is lively' in negative tone

Intonation Contour	American	Korean
LH*L	1 (2%)	10 (20%)
HL*0	49 (98%)	38 (76%)
etc	0 (0 %)	2 (4%)
Total	50	50

Figure 6.13
The visualisation of the proportion of the AM intonation patterns of 'she is lively' in negative tone



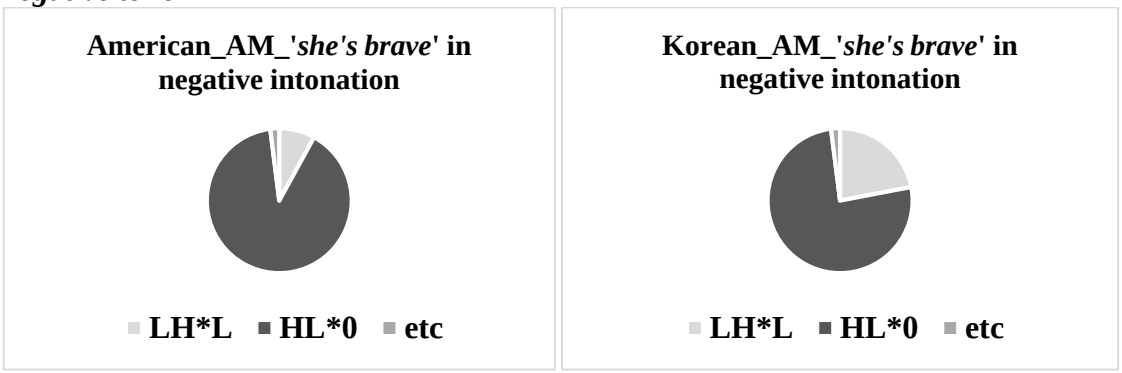
Similarly, the largest number of American (90%) and Korean (76%) students used the HL*0 negative intonation when speaking '*she's brave*' in negative intonation (see Table 6.16 and Figure 6.14). The proportion difference in the HL*0 category was insignificant at the p <.05 level: χ^2 (1) = 3.4, p = 0.06, meaning statistically similar number of American and Korean participants used the HL*0 intonation. The proportion difference in the LH*L positive category between the American and Korean groups, however, was almost marginally

significant at the p<.05 level: χ^2 (1) = 3.8, p = 0.051. In other words, a statistically larger number of Korean participants spoke the sentence, '*she's brave*' using the positive LH*L intonation when they were supposed to speak the sentence in negative intonation.

Table 6.16
The proportion of the intonation contour patterns of 'she is brave' in negative tone

Intonation Contour	American		Korean	
LH*L	4	(8%)	11	(22%)
HL*0	45	(90%)	38	(76%)
etc	1	(2 %)	1	(2%)
Total	50		50	

Figure 6.14
The visualisation of the proportion of the AM intonation patterns of 'she is brave' in negative tone

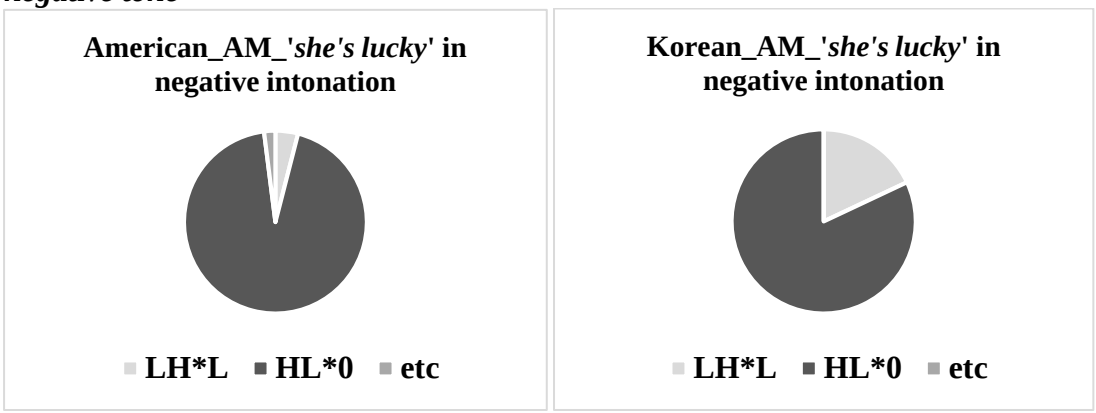


The utterance, '*she's lucky*' in negative intonation, also showed the same trend. The largest proportion of American (94%) and Korean (82) students used the HL*0 negative intonation when speaking the utterance (see Table 6.17 and Figure 6.15). The proportion difference in the HL*0 category between the American and Korean groups was insignificant at the p<.05 level: χ^2 (2) = 3.4, p = 0.07.

Table 6.1.17
The proportion of the intonation contour patterns of 'she is lucky' in negative tone

Intonation Contour	American		Korean	
LH*L	2	(4%)	9	(18%)
HL*0	47	(94%)	41	(82%)
etc	1	(2 %)	0	(0%)
Total	50		50	

Figure 6.15
The visualisation of the proportion of the AM intonation patterns of 'she is lucky' in negative tone



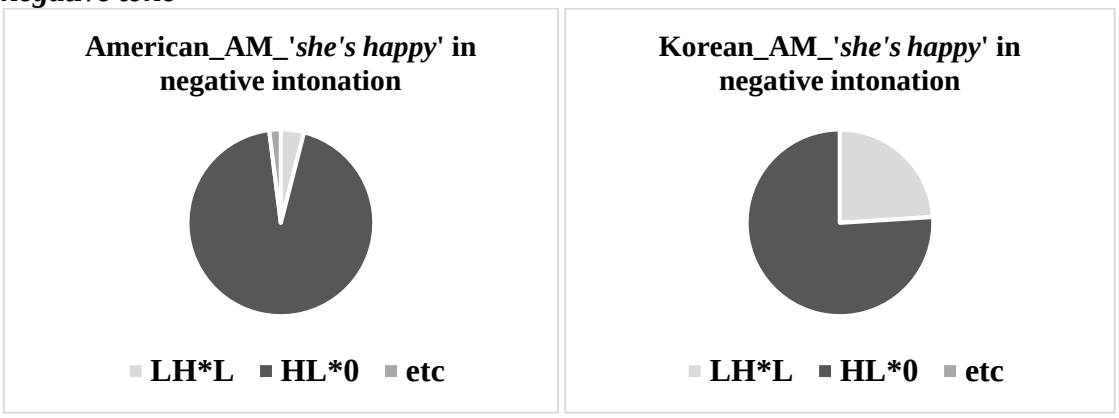
American and Korean groups showed a similar tendency to the previous three utterances when speaking '*she's happy*' in negative intonation. 94% of American and 76% of Korean participants spoke the utterance using the HL*0 negative intonation (see Table 6.18 and Figure 6.16). The number of American students in the HL*0 category was significantly larger than that of Korean students at the $p<.05$ level: $\chi^2(1) = 6.28$, $p = 0.01$.

24% of Korean students spoke '*she's brave*' in the LH*L positive intonation. Korean participants' relatively larger percentage in the LH*L category was also found in the negative congruent utterances. Therefore, Korean students' larger proportion in the LH*L category does not show the influence of the semantic incongruence.

Table 6.18
The proportion of the intonation contour patterns of 'she is happy' in negative tone

Intonation Contour	American	Korean
LH*L	2 (4%)	12 (24%)
HL*0	47 (94%)	38 (76%)
etc	1 (2 %)	0 (0%)
Total	50	50

Figure 6.16
The visualisation of the proportion of the AM intonation patterns of 'she is happy' in negative tone



AM analysis showed that a similar proportion of American and Korean participants used the same LH*L positive contour when speaking the positive intonation utterances. The difference between the two groups, however, was found in the use of negative intonation. To analyse the overall tone, place of salience, and number of parsing of the emotional intonations, the Halliday's tone model was applied. The following section presents the results of Halliday's tone model analysis.

6. 1. 2 Halliday's tone models

The Halliday's tone model allows analysing English intonation patterns with three phonological systems: (1) *tone*, (2) *tonicity*, and (3) *tonality* (Halliday, 2008). In addition to AM analysis, the emotional utterances were analysed by the three phonological systems. First, types of '*tone*', the way an interlocutor says an utterance, were categorised into five different tones (see Figure 6.17). According to the results of tone analysis, most participants used 'Tone 5', a strong tone, when speaking the emotional utterances. Second, the patterns of '*tonicity*', a tonic stress of the emotional utterances, were grouped into four types (Table 6.19). In the case of a dual (a major and a minor) prominence, the major tonic accent was only coded for analysis. For instance, if the utterance, '*she's happy*' is spoken with the minor prominence on '*she*' (subject) and the major prominence on '*ha*', the first syllable of the word '*happy*' (adjective), the tonic accent of the utterance was labelled as 'A(djective)'. The

results of Halliday's tonicity analysis showed that most participants placed the tonic accent on the first syllable of the main adjective. Third, '*tonality*', the number of parsing of the emotional utterances was analysed. Table 6.20 presents the possible number of parsing in the case of '*she's happy*'.

Figure 6.17
Halliday's five different tone systems (Halliday, 2008, p.50)

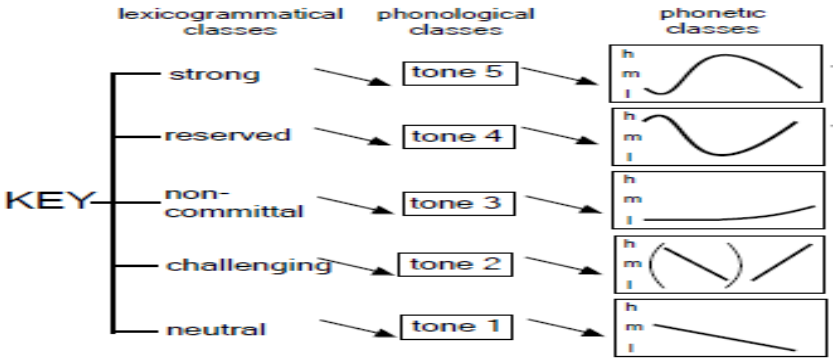


Table 6.19
The examples of tonicity in the case of 'she's happy'

The part of speech receiving salience			Coding
SHE	is	happy	S (subject)
she	IS	happy	V (verb)
SHE	IS	happy	SV (subject & verb)
she	is	HAppy	A (adjective)

Table 6.20
The examples of tonality in the case of 'she's happy'

Sentence examples	The number of parsing
She'shappy	0
She's √ happy	1
She √ is √ happy	2

For the present study, the three phonological systems of intonation was coded as shown in Table 6.21. The first number indicates the type of tone. If the positive congruent utterance, '*she's happy*' was spoken in a strong tone, the first number was coded as '5'. The letter in the middle represents the part of speech which received the tonal accent. If salience was placed on the first syllable of the adjective, '*happy*', the tonicity of the utterance was coded as 'A'. The final number shows the number of parsing. Altogether, the utterance '*she's*

happy' in this case was coded as '5A1' according to the Halliday's tone models (see Table 6.21).

Table 6.21
The coding example of Halliday's tone model analysis on 'she's happy' in positive intonation

Sentence	**She's √ HAppy**
Tone	5: strong 
Tonicity	A: salience on the adjective
Tonality	1 : 1 parsing
Code	**5A1**

The results of Halliday's tone analysis showed that a significant difference was found in the patterns of *tonality*, the number of parsing, and *tonicity*, the place of salience, between the American and Korean groups. The largest proportion of American participants spoke the emotional utterances using one parsing while Korean participants used two. This phenomenon was consistently found across the four different types of the emotional utterances. The difference in the number of parsing implies that Korean students are less likely use a form of 'connected speech' than American participants.

Korean students' parsing pattern (one pause between the subject and verb and another pause between the verb and adjective) also naturally created the dual prominence, a minor prominence on the subject and the major prominence on the adjective. Considering the fact that the place of the tonal accent highlights the intention of an interlocutor, the dual prominence can emphasise the two parts of the emotional utterances, the subject, '*She*' and the emotional adjective. American participants, however, predominantly placed the tonal accent on the main adjective only stressing the emotional state of the subject.

Positive Intonation: Positive sentence in positive intonation

American participants generally spoke the positive congruent utterances using the 5A1 tone (strong tone, prominence on the adjective, and one parsing). The Korean participants, on the other hand, used a 5A2 (strong tone, prominence on the adjective, and two pauses). As explained earlier, Korean students' tonal accents were likely to follow the dual focus with the major prominence on the adjective and the minor prominence on the subject. The detailed results of tone analysis of the positive congruent utterances are presented below.

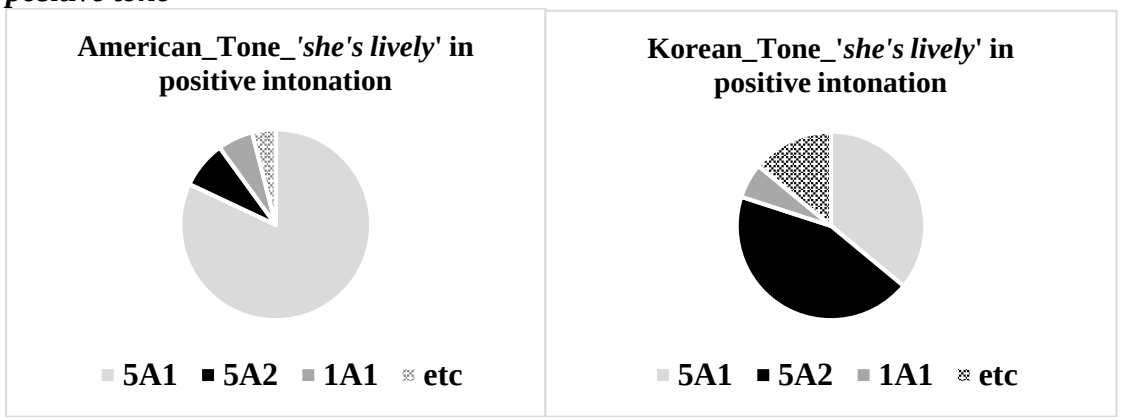
82% of American and 36% of Korean participants spoke the positive congruent utterance, '*she's lively*' following the 5A1 pattern (see Table 6.22 and Figure 6.18). The proportion difference between the American and Korean groups was statistically significant at the $p<.05$ level: $\chi^2(1) = 21.6$, $p = 0.00$. Within the Korean group, the proportion difference between the 5A1 and 5A2 patterns was insignificant ($\chi^2(1) = 0.6$, $p = 0.4$, $p < .05$ level), meaning a similar number of Korean students followed the 5A1 and 5A2 patterns when speaking '*she's lively*' with a positive intonation.

Further analysis also showed that 14% of Korean students spoke '*she's lively*' using the 5SA2 (6%),1A2 (6%), and 5S2 (2%) patterns. A Chi-square analysis also indicated that there was no significant association between the participants' language background and tone patterns ($\chi^2(9) = 11.84$, $p = 0.2$) at the $p < .05$ level. This result suggests that a specific tone pattern was not associated with the participants' first language background.

Table 6.22
The proportion of the intonation contour patterns of 'she is lively' in positive tone

Halliday Tone Model	American	Korean
5A1	**41 (82%)**	18 (36%)
5A2	4 (8%)	**22 (44%)**
1A1	3 (6 %)	3 (6%)
etc	2 (4%)	7 (14%)
Total	50 (100%)	50 (100%)

Figure 6.18
The visualisation of the proportion of Halliday's tone analysis of 'she is lively' in positive tone

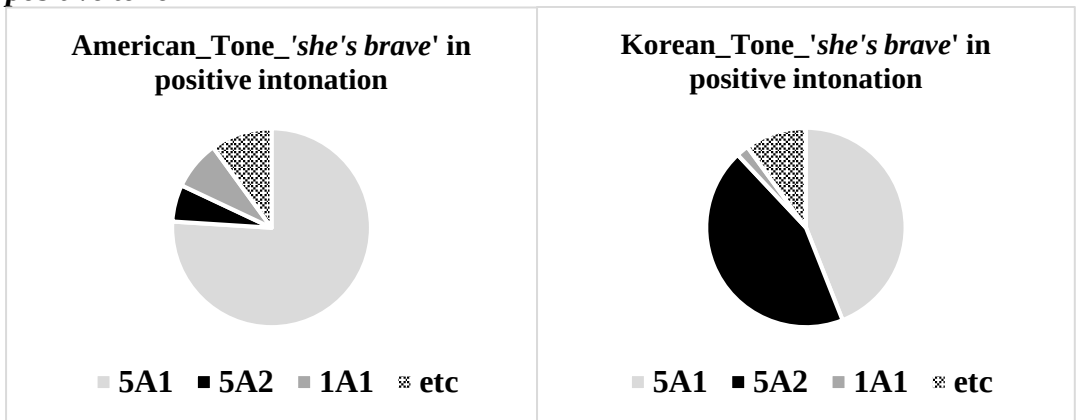


The utterance, '*she's brave*' in positive intonation showed the same trend. The largest percentage of American participants (76%) used the 5A1 tone whereas only 44 % of Koreans used the same tone pattern (see Table 6.23). The proportion difference in the 5A1 tone was also significant at the $p<.05$ level: $\chi^2 (1) = 10.5$, $p = 0.001$.

Table 6.23
The proportion of the intonation contour patterns of 'she is brave' in positive tone

Halliday Tone Model	American	Korean
5A1	**38 (76%)**	22 (44%)
5A2	3 (6%)	**22 (44%)**
1A1	4 (8 %)	1 (2%)
etc	5 (10%)	5 (10%)
Total	50 (100%)	50 (100%)

Figure 6.19
The visualisation of the proportion of Halliday's tone analysis of 'she is brave' in positive tone



The proportion difference in the 5A2 pattern between the American and Korean groups was substantial: 44% of Korean participants also used the 5A2 pattern while only 6% of American participants followed the 5A2 pattern. The participants' language background and the tone patterns were not associated according to a Chi-square test at the $p<.05$ level: χ^2 (1) = 8.75, p = 0.45.

The same trend was repeated for the positive congruent utterance, '*she's lucky*' (see Table 6.24 and Figure 6.20) and the positive congruent utterance '*she's happy*' (see Table 6.25 and Figure 6.21). For both utterances, the largest proportion of the American group used the 5A1 pattern (strong tone, prominence on the adjective, and one parsing). The proportion of Korean students were, however, similar in the 5A1 and 5A2 categories.

Table 6.24
The proportion of the intonation contour patterns of 'she is lucky' in positive tone

Halliday Tone Model	American	Korean
5A1	**41 (82%)**	17 (34%)
5A2	3 (6%)	**23 (46%)**
1A1	3 (6%)	4 (8%)
etc	3 (6%)	6 (12%)
Total	50 (100%)	50 (100%)

Figure 6.20
The visualisation of the proportion of Halliday's tone analysis of 'she is lucky' in positive tone

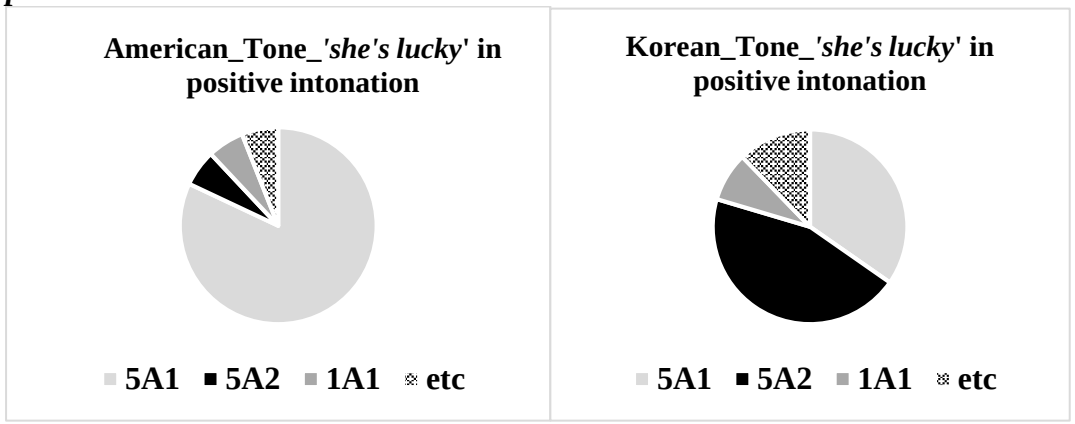
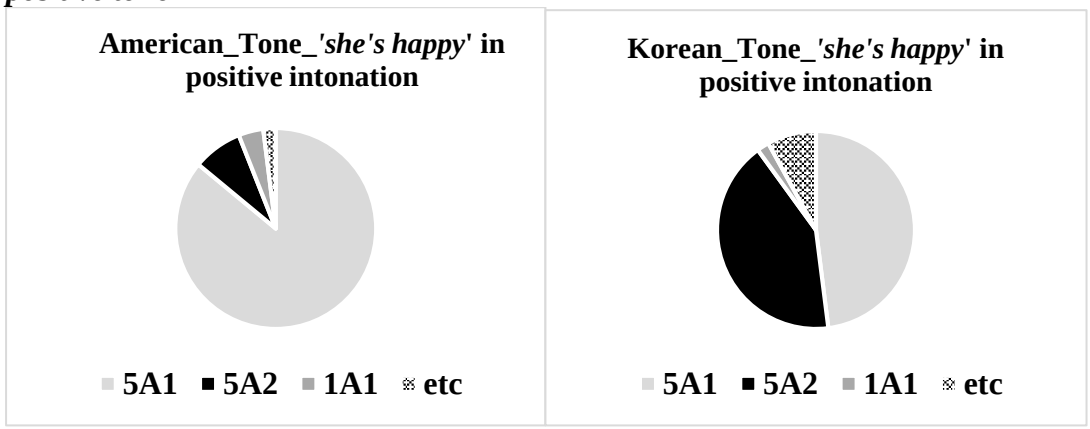


Table 6.25
The proportion of the intonation contour patterns of 'she is happy' in positive tone

Halliday Tone Model	American	Korean
5A1	**43 (86%)**	24 (48%)
5A2	4 (8%)	**21 (42%)**
1A1	2 (4 %)	1 (2%)
etc	1 (2%)	4 (8%)
Total	50 (100%)	50 (100%)

Figure 6.21
The visualisation of the proportion of Halliday's tone analysis of 'she is happy' in positive tone



AM analysis showed that American students' use of the intonation contour was influenced by the semantic incongruence for the positive intonation utterances. To test the same influence on the tone variations, the tone patterns of the negative sentence in positive intonation utterances were analysed.

Positive Intonation: Negative sentence in positive intonation

American and Korean groups' negative sentence in positive intonation utterances followed the same tone patterns as those of the positive congruent utterances. The largest proportion of American students spoke the negative sentence in positive intonation utterances using the 5A1 tone. A similar proportion of Korean participants also used the 5A1 and 5A2 tones. The following presents the results of the tone analysis of the four individual negative sentence in positive intonation utterances.

74% of American students spoke '*she is angry*' in positive intonation using the 5A1 (strong tone, prominence on the adjective, and one parsing) whereas 46% of Korean students used the same tone (see Table 6.26). 38% of the Korean group also spoke the utterance using the 5A2 tone. The proportion difference in the 5A1 (χ^2 (1) = 8.05, p = 0.004) and 5A2 (χ^2 (1) = 10.68, p = 0.001) categories between the American and Korean groups was significant at the p<.05 level (see Figure 6.22). According to a Chi-square test, the language background and tone types of the participants were not associated at the p <.05 level: χ^2 (9) = 6.01, p = 0.73.

Table 6.26
The proportion of the intonation contour patterns of 'she is angry' in positive tone

Halliday's Tone Model	American	Korean
5A1	**37 (74%)**	23 (46%)
5A2	5 (10%)	**19 (38%)**
1A1	4 (8%)	1 (2%)
etc	4 (8%)	7 (14%)
Total	50 (100%)	50 (100%)

Figure 6.22
The visualisation of the proportion of Halliday's tone analysis of 'she is angry' in positive tone

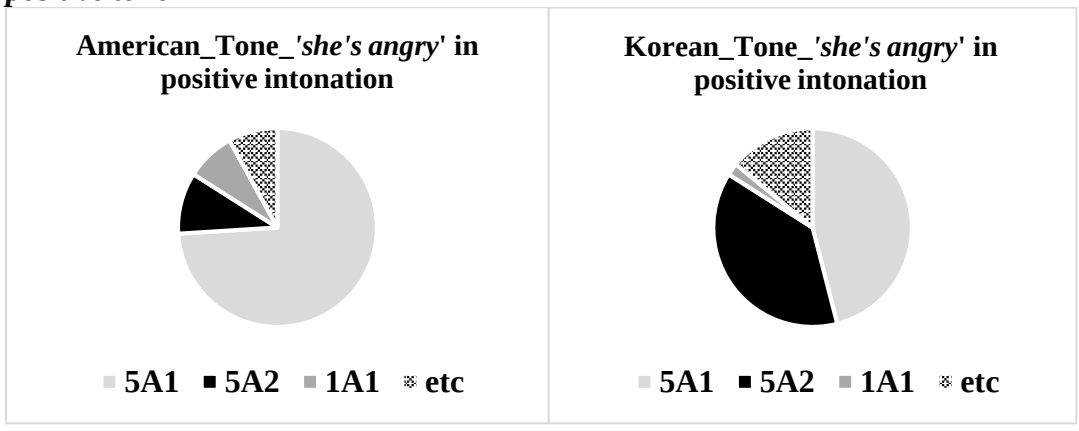


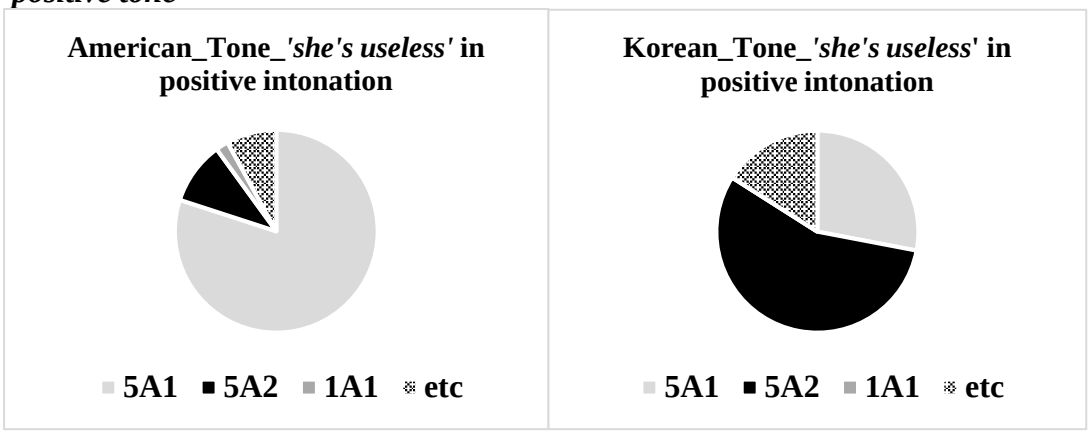
Table 6.27 and Figure 6.23 show that 80% of American students used the 5A1 tone when speaking '*she's useless*' in positive intonation. The largest percentage of Korean students, however, spoke the utterance using the 5A2. The interaction between the language background and tone pattern variables was also not found at the p<.05 level: χ^2 (9) = 6.78, p =

0.34. In addition, further analysis revealed that 14% of Koreans, who used a tone other than the 5A1 and 5A2 patterns, spoke the utterance using two pauses: 5SA2 (8%), 1A2 (6%), and 5S2 (2%). Korean participants' two parsing with the dual focus (the major prominence on the adjective and minor on the subject) created the tone highlighting the subject and verb together. American participants' single parsing with the tonal accent only on the adjective more emphasised the emotional state of the subject.

Table 6.27
The proportion of the intonation contour patterns of 'she is useless' in positive tone

Halliday's Tone Model	American	Korean
5A1	**40 (80%)**	14 (28%)
5A2	5 (10%)	**28 (46%)**
1A1	1 (2 %)	0 (0%)
etc	4 (8%)	8 (16%)
Total	50 (100%)	50 (100%)

Figure 6.23
The visualisation of the proportion of Halliday's tone analysis of 'she is useless' in positive tone



The negative sentence, '*she's cruel*' (see Table 6.28 and Figure 6.24) and '*she's lonely*' (see Table 6.29 and Figure 6.25) in positive intonation showed the same pattern as the previous two utterances. A Chi-square test also showed that there was no association between the language background and tone types of the participants for '*she's cruel*' (χ^2 (9) = 7.77, p = 0.55) and '*she's lonely*' (χ^2 (9) = 9.5, p = 0.39) in positive intonation utterances at the p<.05

level. In other words, the participants' first language background did not influence the use of the tone types.

Table 6.28
The proportion of the intonation contour patterns of 'she is cruel' in positive tone

Halliday's Tone Model	American	Korean
5A1	**44 (88%)**	21 (42%)
5A2	3 (6%)	**23 (46%)**
1A1	2 (4 %)	2 (4%)
etc	1 (2%)	4 (8%)
Total	50 (100%)	50 (100%)

Figure 6.24
The visualisation of the proportion of Halliday's tone analysis of 'she is cruel' in positive tone

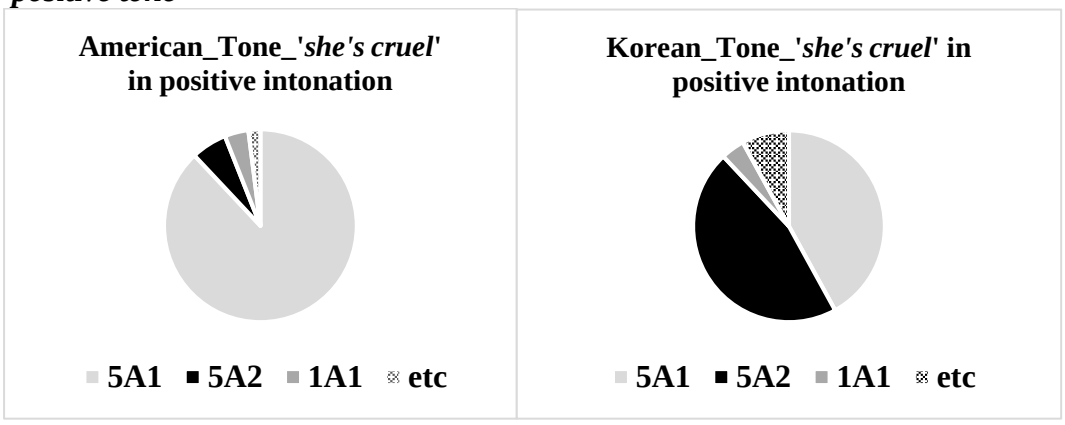
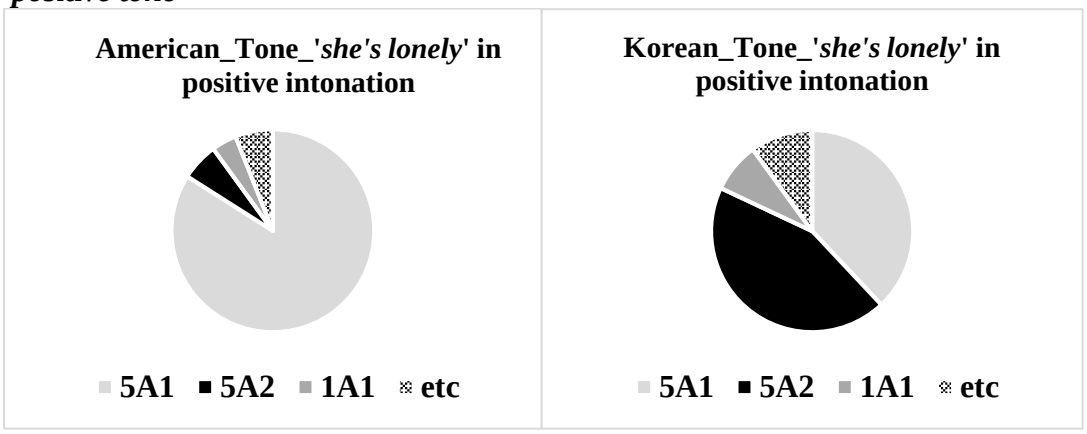


Table 6.29
The proportion of the intonation contour patterns of 'she is lonely' in positive tone

Halliday's Tone Model	American	Korean
5A1	**42 (84%)**	19 (38%)
5A2	3 (6%)	**22 (44%)**
1A1	2 (4 %)	4 (8%)
etc	3 (6%)	5 (10%)
Total	50 (100%)	50 (100%)

Figure 6.25
The visualisation of the proportion of Halliday's tone analysis of 'she is lonely' in positive tone



According to Halliday's tone analysis, the semantic incongruence of the negative sentence did not significantly change the use of tone for the positive intonation utterances. In the next section, American and Korean students' use of tone in the negative intonation emotional utterances were analysed.

Negative Intonation: Negative sentence in negative intonation

The results of Halliday's tone model analysis showed that overall, American and Korean participants' negative intonation utterances followed the same pattern as the positive intonation utterances. The American group predominantly used the 5A1 (strong tone, adjective prominence, and one parsing) tone while the Korean group equally used the 5A1 and 5A2 tones. A larger number of American participants used the 5A1 tone when speaking negative intonation utterances compared to the positive intonation utterances (Positive intonation utterance: 81%; negative intonation utterances: 87%). Interestingly, for the Korean group, the proportion in the 5A2 category (strong tone, adjective prominence, and two parsing) was increased for the negative intonation utterances, meaning more Korean students used the 5A2 pattern when speaking the negative intonation utterances. This result suggests that a larger number of American students used the one pause tone pattern while more Korean counterparts used the two parsing pattern when they conveyed negative emotions. The results of the individual negative intonation utterances are as follows.

For the sentence, '*she's angry*' in negative intonation, 92% of American and 42% of Korean participants used the 5A1 tone (see Table 6.30). The proportion difference in the 5A1 category was statistically significant at the $p<.05$ level: $\chi^2(1) = 27.98$, $p = 0.00$ (also see Figure 6.26).

Table 6.30
The proportion of the intonation contour patterns of 'she is angry' in negative tone

Halliday Tone Model	American	Korean
5A1	**46 (92%)**	21 (42%)
5A2	3 (6%)	**24 (48%)**
1A1	1 (2 %)	0 (0%)
etc	0 (0%)	5 (10%)
Total	50 (100%)	50 (100%)

Figure 6.26
The visualisation of the proportion of Halliday's tone analysis of 'she is angry' in negative tone

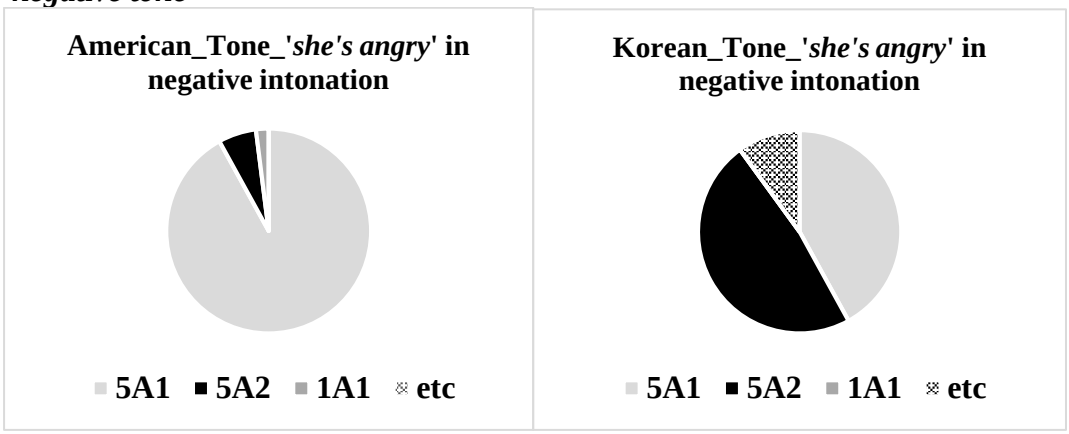
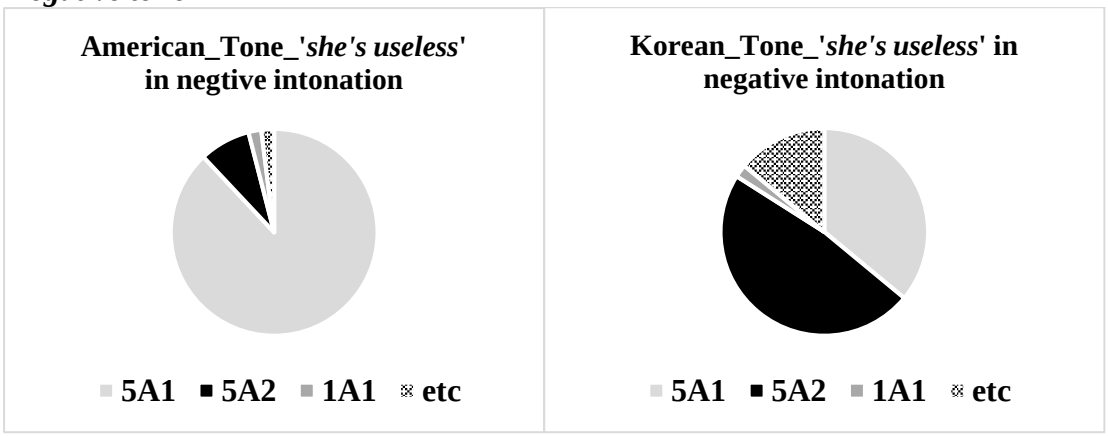


Table 6.31 and Figure 6.27 present the result of tone analysis for the utterance, '*she's useless*' in negative intonation. A significantly larger proportion of American participants (88%) used the 5A1 tone than did Korean participants (36%) at the $p<.05$ level: $\chi^2(1) = 28.4$, $p = 0.00$. In the 5A2 category, the opposite pattern, a significantly larger number of Koreans than Americans was found ($\chi^2(1) = 19.64$, $p = 0.00$, at the $p<.05$ level).

Table 6.1.31
The proportion of the intonation contour patterns of 'she is useless' in negative tone

Halliday Tone Model	American	Korean
5A1	**44 (88%)**	18 (36%)
5A2	4 (8%)	**24 (48%)**
1A1	1 (2 %)	1 (2%)
etc	1 (2%)	7 (14%)
Total	50 (100%)	50 (100%)

Figure 6.27
The visualisation of the proportion of Halliday's tone analysis of 'she is useless' in negative tone



The tone patterns of the negative congruent utterances, '*she's cruel*' (see Table 6.32 and Figure 6.28) and '*she's lonely*' (6.33 and 6.29) followed the same trend as those of the previous negative congruent utterances.

Table 6.32
The proportion of the intonation contour patterns of 'she is cruel' in negative tone

Halliday Tone Model	American	Korean
5A1	**43 (86%)**	21 (42%)
5A2	5 (10%)	**25 (50%)**
1A1	1 (2%)	1 (2%)
etc	1 (2%)	3 (6%)
Total	50 (100%)	50 (100%)

Figure 6.28
The visualisation of the proportion of Halliday's tone analysis of 'she is cruel' in negative tone

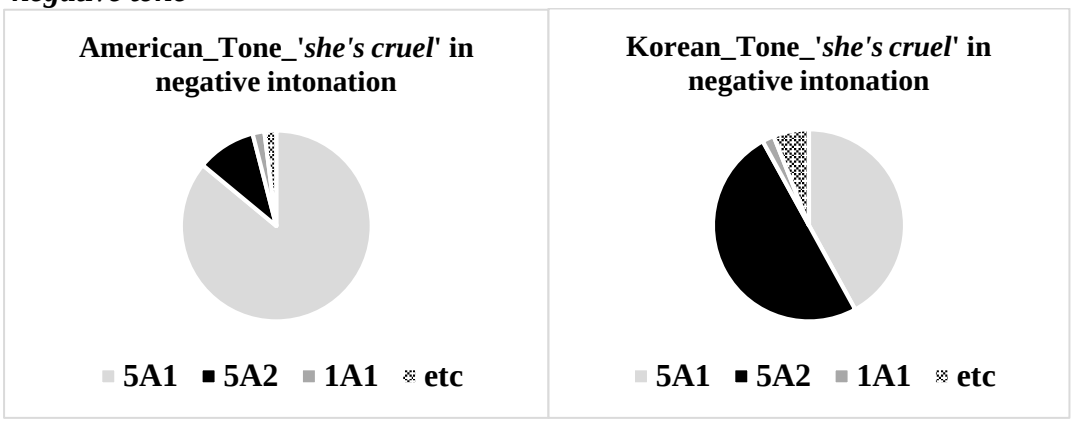
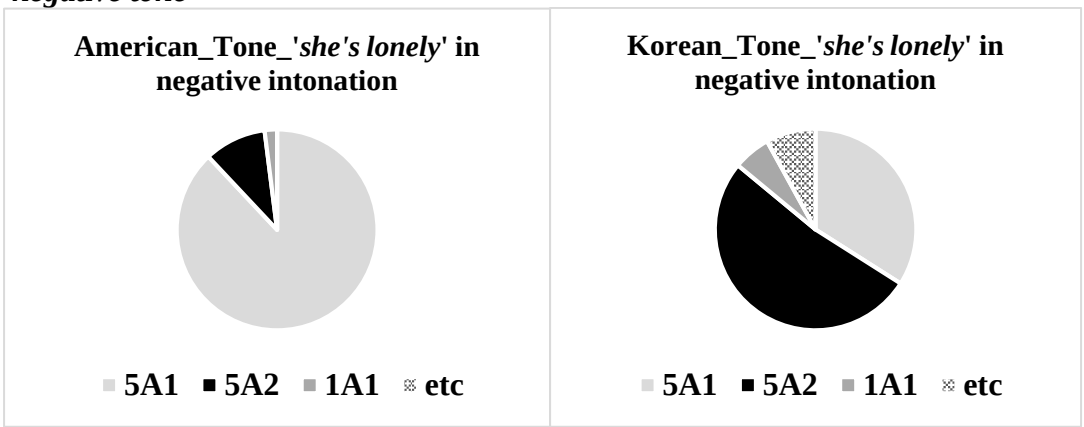


Table 6.33
The proportion of the intonation contour patterns of 'she is lonely' in negative tone

Halliday's Tone Model	American	Korean
5A1	**44 (88%)**	17 (34%)
5A2	5 (10%)	**26 (52%)**
1A1	1 (2 %)	3 (6%)
etc	0 (0%)	4 (8%)
Total	50 (100%)	50 (100%)

Figure 6.29
The visualisation of the proportion of Halliday's tone analysis of 'she is lonely' in negative tone



The American and Korean students used similar tone types to those of the positive intonation utterances when speaking the negative congruent emotional utterances. In the next

section, the influence of the semantic incongruence for the negative intonation utterances was examined.

Negative Intonation: positive sentence in negative intonation

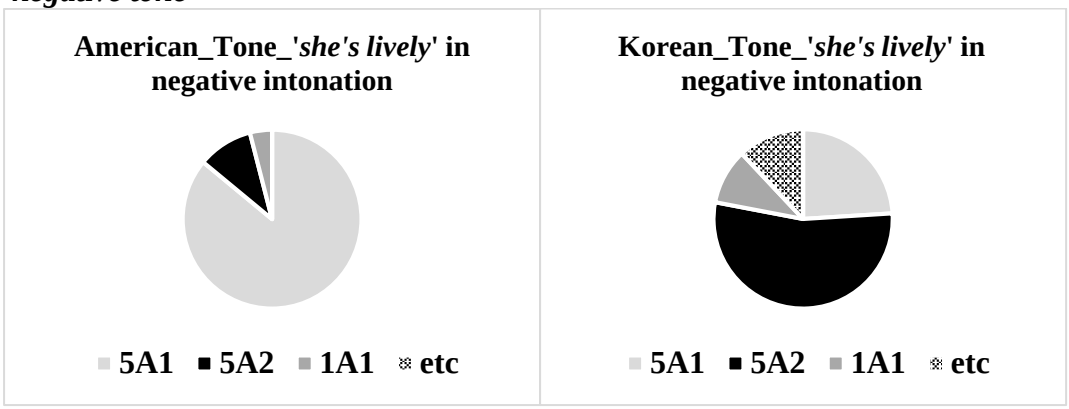
The influence of the semantic incongruence on the tone patterns was not found in the negative intonation utterances. The positive sentence in negative intonation utterances followed the same tone types as the negative congruent utterances. The largest proportion of American participants spoke the positive sentence in negative intonation utterances using the 5A1 tone, and the proportion of the 5A1 category also slightly increased compared to that of the positive intonation utterances. The Korean group also showed the same trend. There was the same increase in the 5A2 tone category as the negative congruent utterances, meaning more Korean participants used the 5A2 tone when speaking the positive sentence in negative intonation utterances compared to the positive intonation utterances. The detailed results are presented below.

A significantly larger proportion of American participants (86%) used the 5A1 tone than did Korean participants (24%) when speaking '*she's lively*' in negative intonation at the $p<.05$ level: $\chi^2(1) = 38.4$, $p = 0.00$. (see Table 6.34 and Figure 6.30). On the other hand, the percentage of Korean students who used the 5A2 tone was significantly larger than American participants ($\chi^2(1) = 22.02$, $p = 0.00$, at the $p<.05$ level).

Table 6.34
The proportion of the intonation contour patterns of 'she is lively' in negative tone

Halliday's Tone Model	**American**	**Korean**
5A1	**43 (86%)**	12 (24%)
5A2	5 (10%)	**27 (54%)**
1A1	2 (4 %)	5 (10%)
etc	0 (0%)	6 (12%)
Total	50 (100%)	50 (100%)

Figure 6.30
The visualisation of the proportion of Halliday's tone analysis of 'she is lively' in negative tone

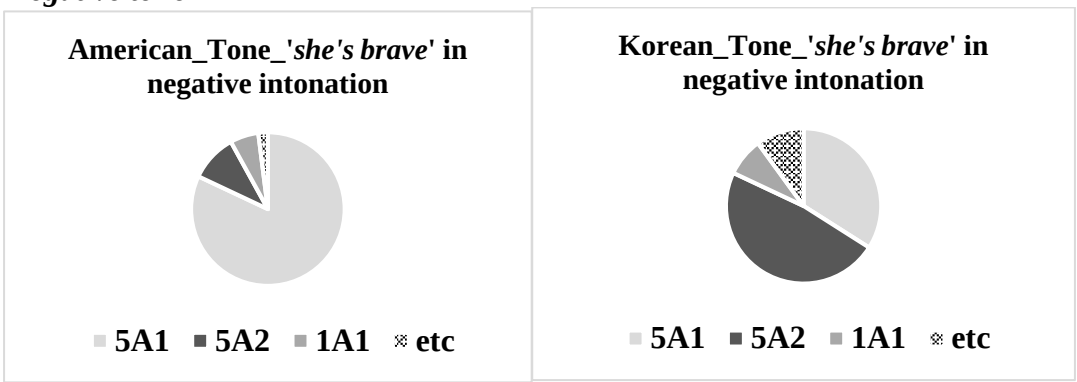


The same pattern was repeated for the utterance, '*she's brave*' in negative intonation. Most American students used the 5A1 tone (82%) while the largest proportion of Korean participants used the 5A2 tone according to Halliday's tone analysis (see Table 6.35). The proportion difference in the 5A1 (χ^2 (1) = 23.4, p = 0.00) and 5A2 (χ^2 (1) = 17.35, p = 0.00) categories was also significant at the p<.05 level (also see Figure 6.31).

Table 6.35
The proportion of the intonation contour patterns of 'she is brave' in negative tone

Halliday Tone Model	American	Korean
5A1	**41 (82%)**	17 (34%)
5A2	5 (10%)	**24 (48%)**
1A1	3 (6 %)	4 (8%)
etc	1 (2%)	5 (10%)
Total	50 (100%)	50 (100%)

Figure 6.31
The visualisation of the proportion of Halliday's tone analysis of 'she is brave' in negative tone



The following tables and corresponding figures revealed that the utterances, '*she's lucky*' (see Table 6.36 and Figure 6.32) and '*she's happy*' (see Table 6.37 and Figure 6.33) in negative intonation also followed similar tones to the previous two positive sentence in negative intonation utterances.

Table 6.36
The proportion of the intonation contour patterns of 'she is lucky' in negative tone

Halliday Tone Model	American	Korean
5A1	**41 (88%)**	17 (34%)
5A2	6 (10%)	**25 (52%)**
1A1	2 (2 %)	5 (6%)
etc	1 (0%)	3 (8%)
Total	50 (100%)	50 (100%)

Figure 6.32
The visualisation of the proportion of Halliday's tone analysis of 'she is lucky' in negative tone

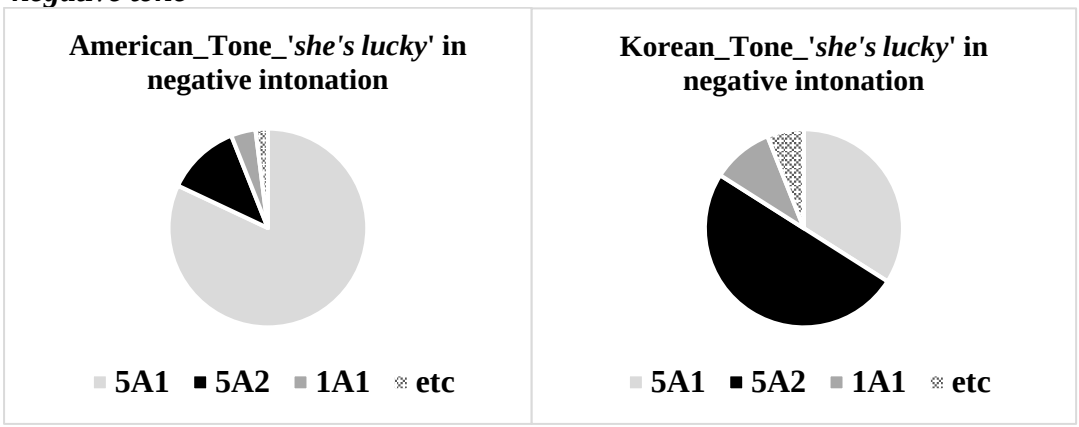
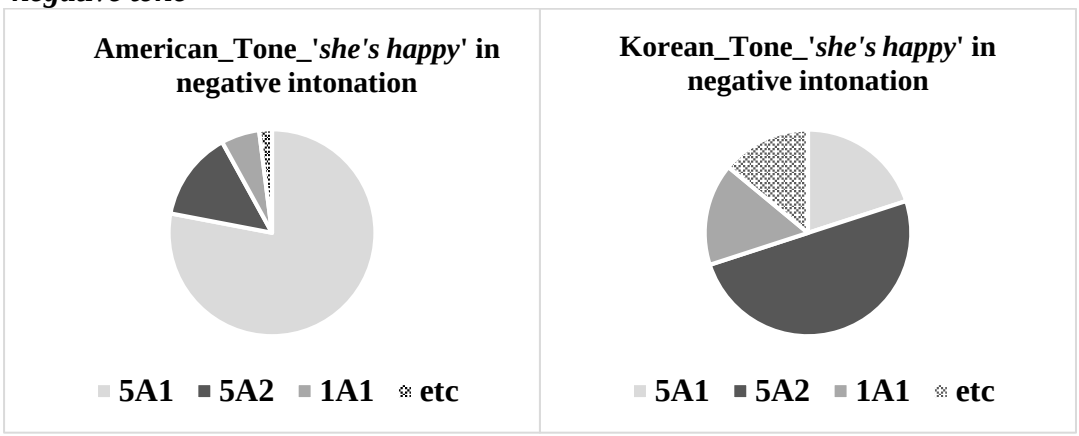


Table 6.37
The proportion of the intonation contour patterns of 'she is happy' in negative tone

Halliday's Tone Model	American	Korean
5A1	**39 (88%)**	10 (20%)
5A2	7 (14%)	**25 (50%)**
1A1	3 (6 %)	8 (16%)
etc	1 (2%)	7 (14%)
Total	50 (100%)	50 (100%)

Figure 6.33
The visualisation of the proportion of Halliday's tone analysis of 'she is happy' in negative tone



The results of the phonological analysis showed that the American and Korean groups generally used similar emotional intonation contours when speaking the four different types of the emotional utterances according to AM analysis. The influence of the semantic congruence was, however, more evident for the American group particularly for the positive intonation utterances. In addition, American and Korean participants showed a clear difference in their use of English tone. Tone analysis indicated that most American participants used the 5A1 tone whereas a significantly large percentage of Korean participants used the 5A2. Besides the phonological aspects of intonation, the use of pitch variations (e.g. High vs. Low) also played a key role in conveying emotionality.

Summary of the quantitative findings:

- The majority of Korean and American participants used the LH*L positive intonation contour when they spoke the positive congruent utterances. The proportion of the participants who used the LH*L pattern was not statistically different between the two groups.
- A larger number of Korean students used the LH*L positive intonation contour than did American student when they spoke the negative sentence in positive intonation utterances.
- A smaller number of Korean students used the HL*0 negative intonation contour than did American participants when they spoke the negative congruent utterances.
- A smaller number of Korean students used the HL*0 negative intonation contour than did American participants when they spoke the positive sentence in negative intonation utterances.
- The largest number of the American and Korean groups used Tone 5 when they spoke the emotional utterances.
- The largest number of the American and Korean groups placed the tonal prominence on the main adjective when they spoke the emotional utterances.
- The majority of Americans used one parsing whereas the majority of Koreans used two parsings.

6. 2 The non-phonological analysis of the emotional intonation

The first section of this chapter presented how the phonological features of emotional intonation, the overall contour, between the American and Korean groups were different. The American and Korean groups also showed a significant difference in the use of the non-phonological variations (the Min F0, Max F0, and F0 range) in producing the emotional utterances. First, the American group, overall, utilised more of the pitch variations than did the Korean group in expressing positive and negative valence. Korean students' neutral utterance pitch patterns were not significantly different from those of the negative congruent utterances (a negative sentence in a negative intonation). This result suggests that Korean students did not change their pitch when expressing negative emotion. Second, Korean students' pitch variations (the Min F0, Max F0, and F0 range) of the positive congruent intonations (positive sentences in positive intonation) were not significantly different from those of American students' neutral sentences. This result suggests that Korean students' positively intended utterances can be perceived as 'neutral' to Americans. Lastly, the American group's use of pitch was affected by the type of the semantic meaning of the emotional sentence whereas the Korean group was not. These results suggest that Korean students had difficulties in integrating the semantic meaning with intonation despite their semantic understanding of the emotional utterances.

6. 2. 1 Positive intonation

Positive sentence in positive intonation

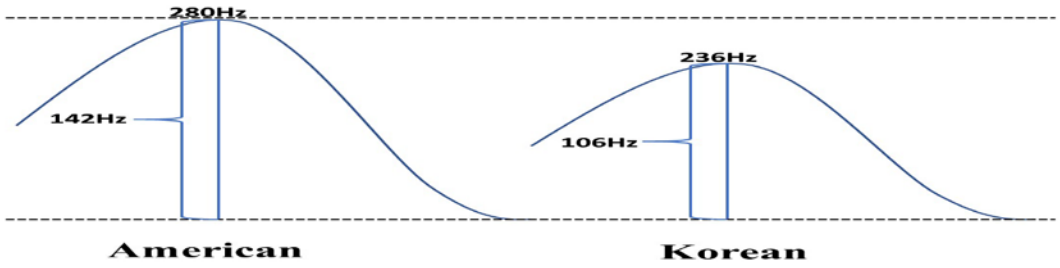
Table 6.38 compares the mean of the Min F0, Max F0, and F0 range of the positive sentences in positive intonation. The mean of American participants' Min F0, Max F0, and F0 range were higher than those of Korean participants. The difference, however, was only statistically significant for the Max F0 ($t(98) = 3.2$, $p = 0.001$) and F0 range ($t(90) = 3.91$, $p = 0.0002$) according to an independent sample t-test at the $p < .05$ level. This result indicates

that the American group raised their pitch higher, which created a larger pitch range, than did the Korean group when speaking the positive sentences in a positive tone (see Figure 6.34). In other words, the Korean group had a relatively monotonous positive intonation pattern than the American group when speaking the positive sentences in positive intonation.

Table 6.38
The mean and SD of the Min F0, Max F0, and F0 range of the positive sentence in positive intonation between the American and Korean group

Positive Sentence	**American**		**Korean**	
Positive Intonation	**Mean**	**SD**	**Mean**	**SD**
Min F0	138 Hz	37 Hz	129 Hz	43 Hz
Max F0	280 Hz	67 Hz	236 Hz	72 Hz
F0 Range	142 Hz	52 Hz	106 Hz	39 Hz

Figure 6.34
Visualisation of the pitch variations of the positive congruent sentences between the American and Korean groups



The analysis of the three acoustic parameters (the Min F0, Max, F0, and F0 range) of the individual positive congruent utterances shows that the American group had a higher Max F0 and a wider F0 range except for the utterance, '*she is passionate*'. The mean of the Min F0 of the other five positive congruent utterances did not show a statistically significant difference at the $p < .05$ level whereas the Min F0 of the utterance, '*she is passionate*', was significantly higher than that of the Korean group at the $p < .05$ level: $t(98) = 2.69$, $p = 0.008$ (see Table 6.39). The F0 range of '*she's passionate*', however, was not significantly different between the American and Korean group at the $p < .05$ (see Table 6.41). This result indicates that the Korean group used a lower pitch for the sentence, '*she's passionate*' but utilised a similar range of inflection. Table 6.40 presents that American students' Max F0 was

significantly higher than that of Korean students for all the six positive congruent utterances. The American group also showed a significantly larger F0 range in the first five positive congruent utterances than the Korean group at the p <.05 level (see Table 6.41). Table 6.40 presents that American students' Max F0 was significantly higher than that of Korean students for all the six positive congruent utterances.

Table 6.39

The mean, SD, t-value, and p-value of the Min F0 of the six positive sentence in positive intonation utterances between the American and Korean groups

Min F0	**American**	**Korean**		
Positive_Positive	**Mean(SD)**	**Mean (SD)**	**t (df)**	**p-value**
1. She is confident	138 (42)	124 (44)	t (98)=1.65	0.10
2. She is lively	126 (41)	120 (40)	t (98)=0.68	0.49
3. She is brave	133 (40)	123 (44)	t (98)=1.20	0.20
4. She is lucky	146 (51)	132 (48)	t (98)=1.38	0.17
5. She is happy	132 (37)	133 (44)	t (98)=0.06	0.94
6. She is passionate	145 (42)	122 (40)	t (98)=2.69	0.008*

*All the values are in Hz

Table 6.40

The mean, SD, t-value, and p-value of the Max F0 of the positive sentence in positive intonation utterances between the American and Korean groups

Max F0	**American**	**Korean**		
Positive_Positive	**Mean(SD)**	**Mean (SD)**	**t (df)**	**p-value**
1. She is confident	291 (74)	230 (68)	t (97)=4.30	4.068e-05*
2. She is lively	281 (66)	223 (68)	t (97)=4.20	4.44e-05*
3. She is brave	265 (57)	223 (67)	t (96)=3.32	0.001*
4. She is lucky	276 (71)	230 (74)	t (98)=3.15	0.002*
5. She is happy	288 (76)	244 (73)	t (98)=2.91	0.004*
6. She is passionate	264 (67)	228 (68)	t (98)=2.61	0.01*

*All the values are in Hz

Table 6.41

The mean, SD, t-value, and p-value of the F0 range of the six positive sentence in positive intonation utterances between the American and Korean groups

F0 Range	**American**	**Korean**		
Positive_Positive	**Mean(SD)**	**Mean (SD)**	**t (df)**	**p-value**
1. She is confident	151 (61)	105 (42)	t (89)=4.61	1.32e-05*
2. She is lively	154 (63)	102 (40)	t (90)=4.68	9.787e-06*
3. She is brave	133 (56)	100 (44)	t (88)=3.40	0.0007*
4. She is lucky	128 (57)	97 (48)	t (91)=3.03	0.003*
5. She is happy	155 (64)	111 (44)	t (88)=3.92	0.001*
6. She is passionate	121 (51)	105 (40)	t (91)=1.70	0.08

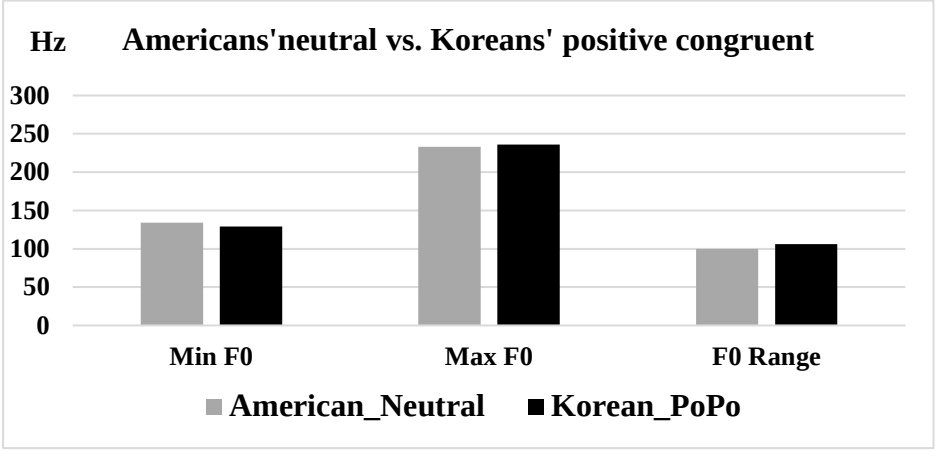
*All the values are in Hz

The production task included six neutral sentences (e.g. '*there is a door.*') to randomise the order of the production and to use as a basis for comparing changes in the pitch variations. Interestingly, the analysis of American students' neutral utterances showed a similar pattern to Korean students' positive congruent utterances (see Table 6.42 and Figure 6.35). According to an independent sample t-test, there was no statistically significant difference between the mean of the Min F0 ($t(70) = 0.35$, $p = 0.72$), Max F0 ($t(90) = 0.23$, $p = 0.81$) and F0 range ($t(97) = 0.73$, $p = 0.46$) at the $p < .05$. This finding suggests that the pitch patterns of Korean students' positively intended utterance resembled those of Americans' neutrally intended utterances. In other words, although Korean students intended to convey their positive intention in English, their utterances can be perceived as 'neutral' by Americans.

Table 6.42
Comparison: The mean and SD of the Min F0, Max F0, and F0 range between American students' neutral utterances and Korean students' positive congruent utterances

Comparison	American: Neutral		Korean:Positive_Positive	
	Mean	SD	Mean	SD
Min F0	134 Hz	89 Hz	129 Hz	43 Hz
Max F0	233 Hz	53 Hz	236 Hz	72 Hz
F0 Range	100 Hz	43 Hz	106 Hz	39 Hz

Figure 6.35
The mean of the Min F0, Max F0, and F0 range between American students' neutral utterances and Korean students' positive congruent utterances



So far, we have seen how Korean students utilised a lesser degree of modulation of English intonation than did the American group when producing the positive sentence in positive tone. Another aspect of the difficulties in using English intonation investigated in this study was the ability to integrate the semantic meaning of the utterances with different intonation patterns. To answer this question, participants were asked to produce the semantically negative sentences in positive intonation, and the next section presents the results.

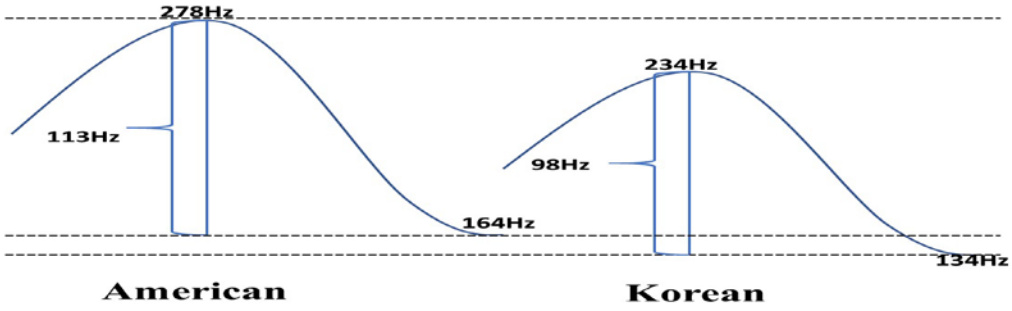
Negative sentence in positive intonation

The American group had a higher Min F0 and Max F0, and a wider F0 range than the Korean group for the negative sentence in positive intonation utterances (see Table 6.43). The mean differences in the Min F0 ($t(98) = 3.52$, $p = 0.006$), Max F0 ($t(98) = 3.16$, $p = 0.002$), and F0 range ($t(98) = 2.1$, $p = 0.03$) were statistically significant at the $p < .05$ level according to an independent sample t-test. This result suggests that the Korean group's lowest and highest pitch were lower than those of the American group. The Korean group also used a narrower F0 pitch range than did the American group when producing the negative emotional sentence in a positive intonation (see Figure 6.36). In other words, Korean students' negative sentence in positive intonation utterances were flatter than those of the American group.

Table 6.43
The mean and SD of the Min F0, Max F0, and F0 range of the negative sentence in positive intonation between the American and Korean groups

Negative Sentence	**American**		**Korean**	
Positive Intonation	**Mean**	**SD**	**Mean**	**SD**
Min F0	164 Hz	40 Hz	134 Hz	45 Hz
Max F0	278 Hz	69 Hz	234 Hz	70 Hz
F0 Range	113 Hz	40 Hz	98 Hz	31 Hz

Figure 6.36
Visualisation of the pitch variations of the negative sentence in positive intonation between the American and Korean groups



Further investigation on the six individual negative sentence in positive intonation revealed that all the six utterances showed a statistically significant mean difference in the Min F0 and Max F0 between the American and Korean groups (see Table 6.44 and Table 6.45) according to an independent sample t-test at the p <.05 level.

Table 6.44
The mean, SD, t-value, and p-value of the Min F0 of the six negative sentence in positive intonation utterances between the American and Korean groups

Min F0	American	Korean		
Negative_Positive	Mean(SD)	Mean (SD)	t (df)	p-value
1. She is angry	153 (36)	126 (39)	t (97)=3.55	0.0006*
2. She is useless	171 (41)	128 (44)	t (97)=5.06	1.959e-06*
3. She is cruel	162 (39)	141 (41)	t (98)=2.63	0.01*
4. She is miserable	157 (41)	128 (40)	t (98)=3.51	0.0006*
5. She is lonely	163 (40)	134 (41)	t (98)=3.55	0.0006*
6. She is humiliated	150 (35)	124 (38)	t (97)=3.53	0.0006*

*All the values are in Hz

Table 6.45
The mean, SD, t-value, and p-value of the Max F0 of the six negative sentence in positive intonation utterances between the American and Korean groups

Max F0	American	Korean		
Negative_Positive	Mean(SD)	Mean (SD)	t (df)	p-value
1. She is angry	261 (67)	228 (65)	t (98)=2.45	0.01*
2. She is useless	285 (41)	223 (67)	t (98)=4.58	1.343e-05*
3. She is cruel	274 (39)	242 (61)	t (98)=2.53	0.01*
4. She is miserable	274 (41)	219 (58)	t (94)=4.22	5.594e-05*
5. She is lonely	268 (40)	233 (68)	t (98)=2.44	0.01*
6. She is humiliated	265 (35)	217 (54)	t (97)=4.25	4.777e-05*

*All the values are in Hz

Three out of the six negative incongruent utterances, however, did not show any statistical mean difference in F0 range at the p <.05 level; The American and Korean groups utilised a similar pitch range when producing '*she's angry*', '*she's cruel*', and '*she's lonely*' in positive intonation (see Table 6.46). This result indicates that the American group used a higher pitch for those three utterances, but the difference between the lowest and highest pitch was similar to that of the Korean group.

Table 6.46
The mean, SD, t-value, and p-value of F0 range of each negative sentence in positive intonation utterances between the American and Korean groups

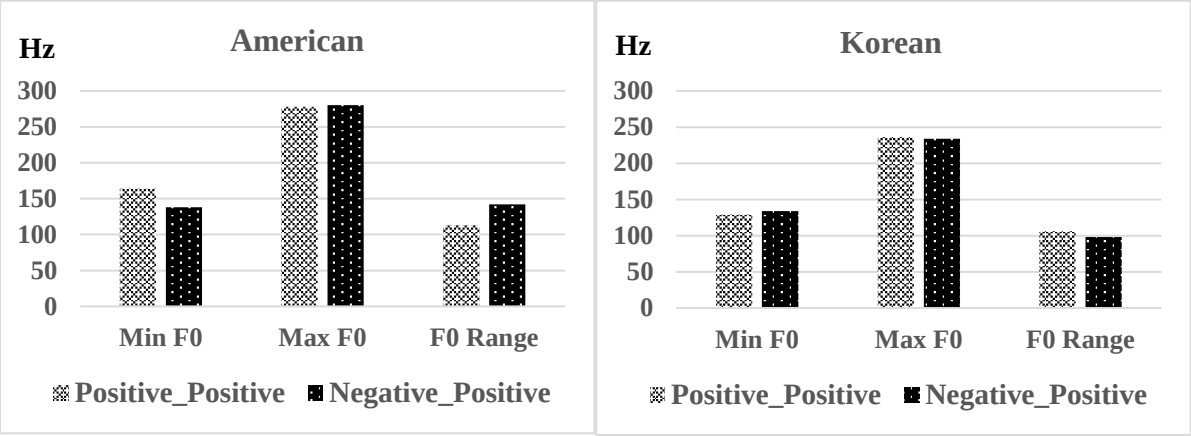
F0 Range	American	Korean		
Negative_Positive	Mean(SD)	Mean (SD)	t (df)	p-value
1. She is angry	107 (46)	99 (32)	t (87)=1.01	0.31
2. She is useless	113(46)	94 (31)	t (86)=2.42	0.01*
3. She is cruel	112 (43)	101 (34)	t (93)=1.39	0.16
4. She is miserable	117 (46)	92 (28)	t (83)=3.20	0.001*
5. She is lonely	104 (45)	95 (32)	t (88)=1.19	0.23
6. She is humiliated	115(39)	89 (23)	t (79)=4.06	0.0001*

*All the values are in Hz

To analyse the influence of the semantic meaning of the utterances in producing emotional intonation, the mean of the three acoustic parameters (the Min F0, Max F0, and F0 range) were compared between the positive sentences in positive intonation (e.g. *'she's happy'* in a positive intonation) and negative sentences in positive intonation (e.g. *'she's angry'* in a positive intonation). The influence of the incongruent semantic meaning of the utterances was not found in the Korean group for the Min F0 (t (98) = 0.58, p = 0.57), Max F0 (t (98) = 0.14, p = 0.88), and F0 range (t (98) = 1.13, p = 0.26) at the p <.05 level. In other words, Korean students did not change their pitch patterns when they produced the semantically incongruent positive intonation (e.g. '*she's angry*' in positive intonation). American students' Min F0 and F0 range were, however, affected by the semantic incongruence: The mean difference of the Min F0 (t (98) = 3.37, p = 0.001) and F0 range (t (98) = 3.12, p = 0.002) between the positive congruent utterances and the negative sentences in positive intonation were statistically significant at the p <.05 level (also see Figure 6.37).

This result indicates that the lowest pitch of the American group became lower when producing the semantically negative sentences in positive intonation.

Figure 6.37
Comparison of the Min F0, Max F0, and F0 range between the positive sentence in positive intonation and negative sentence in positive intonation



* Positive_Positive: Positive sentence in positive intonation; Negative_Positive: Negative sentence in positive intonation

Overall, Korean students had a lower pitch pattern than the American group did when producing the positively intended intonation. Korean students also were not affected by the semantic incongruence when producing the positive English intonations. This result suggests that Korean students are less likely to process the semantic meaning and intonation of English together when they produce English emotional utterances. The following section continues to present the analyses of the pitch variations for the negatively intended English intonation.

6. 2. 2 Negative intonation

Negative sentence in negative intonation

The American group showed a higher mean of the Min F0, Max F0, and F0 range than did the Korean group when speaking the negative congruent utterances (see Table 6.47). The mean difference was, however, statistically significant only for the Min F0 ($t(98) = 2.51$, $p = 0.01$) and Max F0 ($t(98) = 2.42$, $p = 0.01$) at the $p < .05$ level. This result suggests that Korean students had a lower minimum and maximum pitch than the American group. Korean students' range of inflection, however, was similar to that of the American group (see Figure 6.38).

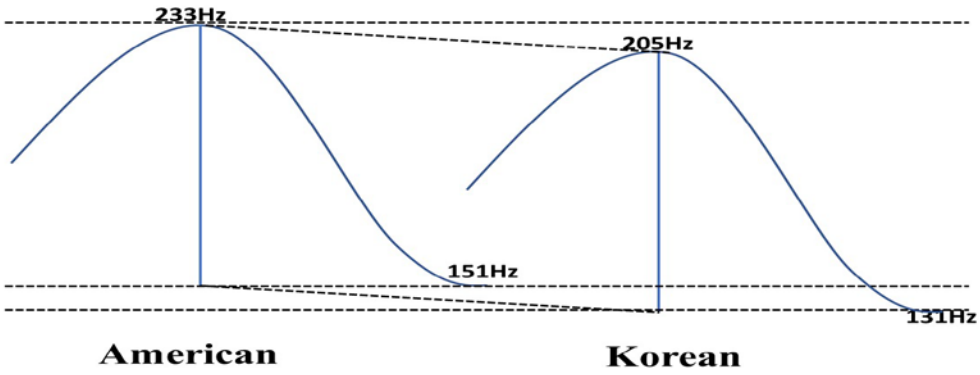
Table 6.47

The mean and SD of the Min F0, Max F0, and F0 range of the negative sentence in negative intonation utterances between the American and Korean groups

Negative Sentence	American		Korean	
Negative Intonation	**Mean**	**SD**	**Mean**	**SD**
Min F0	151 Hz	35 Hz	131 Hz	44 Hz
Max F0	233 Hz	53 Hz	205 Hz	62 Hz
F0 Range	83 Hz	31 Hz	73 Hz	22 Hz

Figure 6.38

Visualisation of the pitch variations of the negative sentence in negative intonation utterances between the American and Korean groups



The analysis of the six negative congruent utterances shows that each negative congruent utterance followed the pattern described in Figure 6.38; Korean students' Min F0 and Max F0 were significantly lower than those of the American group at the p <.05 level (see Table 6.48 and Table 6.49).

Table 6.48

The mean, SD, t-value, and p-value of the Min F0 of the six negative sentence in negative intonation utterances between the American and Korean groups

Min F0	American	Korean		
Negative_Negative	**Mean(SD)**	**Mean (SD)**	**t (df)**	**p-value**
1. She is angry	148 (35)	128 (39)	t (96)=2.70	0.008*
2. She is useless	154 (35)	124 (43)	t (94)=3.75	0.0003*
3. She is cruel	154 (31)	131 (38)	t (94)=3.36	0.001*
4. She is miserable	148 (37)	123 (38)	t (98)=3.28	0.001*
5. She is lonely	150 (38)	129 (43)	t (97)=2.57	0.01*
6. She is humiliated	147 (35)	129 (39)	t (97)=2.48	0.01*

*All the values are in Hz

Table 6.49

The mean, SD, t-value, and p-value of the Max F0 of the six negative sentence in negative intonation utterances between the American and Korean groups

Max F0 Negative_Negative	American Mean(SD)	Korean Mean (SD)	t (df)	p-value
1. She is angry	228 (49)	202 (56)	t (96)=2.43	0.01*
2. She is useless	233 (47)	196 (62)	t (91)=3.30	0.001*
3. She is cruel	233 (57)	205 (54)	t (98)=2.48	0.01*
4. She is miserable	231 (52)	190 (55)	t (98)=3.75	0.0002*
5. She is lonely	235 (62)	204 (65)	t (98)=2.46	0.01*
6. She is humiliated	236 (51)	200 (52)	t (98)=3.50	0.0007*

*All the values are in Hz

The two negative congruent utterances, '*she's miserable*' and '*she's humiliated*' in negative intonation, however, showed the mean difference in F0 range (see Table 6.50) at the $p < 0.5$ level, indicating that Korean students' negative intonations of these two sentences were flatter than those of the American group. As mentioned in Section 6.1, these two sentences were removed from the phonological analysis due to the longer syllables and the less degree of the semantic understanding that Korean participants displayed during the emotional survey and the congruency task. It is, therefore, possible that the Korean group's greater degree of uncertainty on the semantic meaning of these two words might have manifested in their monotonous intonations.

Table 6.50

The mean, SD, t-value, and p-value of the F0 range of the six negative sentence in negative intonation utterances between the American and Korean groups

F0 Range Negative_Negative	American Mean(SD)	Korean Mean (SD)	t (df)	p-value
1. She is angry	81 (33)	74 (27)	t (94)=1.15	0.25
2. She is useless	77(32)	72 (25)	t (93)=0.87	0.38
3. She is cruel	78 (40)	74 (23)	t (78)=0.56	0.57
4. She is miserable	84 (32)	67 (22)	t (87)=3.06	0.002*
5. She is lonely	87 (37)	74 (27)	t (90)=1.98	0.05
6. She is humiliated	87(35)	70 (20)	t (78)=2.98	0.003*

*All the values are in Hz

Table 6.51 compares the mean and SD of Korean students' neutral utterances and the negative congruent utterances. The mean difference of the Min F0 ($t(96) = 1.27$, $p = 0.2$), Max F0 ($t(99) = 0.06$, $p = 0.9$), and F0 range ($t(78) = 1.5$, $p = 0.1$) between the neutral and

negative congruent utterances was statistically insignificant at the p <.05 level. This result suggests that Korean students' pitch patterns of the negative congruent intonation were not different from those of their neutral intonation. In other words, Korean students did not change in the use of the pitch modulation when expressing their negative intention through English intonation.

Table 6.51
Comparison: The mean and SD of the Min F0, Max F0, and F0 range between Korean students' negative sentence in negative intonation and Korean students' neutral utterances

Comparison	Korean: NeNe		Korean:Neutral	
	Mean	**SD**	**Mean**	**SD**
Min F0	131	44	120	39
Max F0	205	62	204	66
F0 Range	73	22	83	39

*NeNe: Negative sentences in negative intonation

Previously, the influence of the semantic incongruence was investigated for the positive intonation utterances. The same phenomenon was examined for the negative utterances. The following section compares the pitch modulation patterns of the positive sentences in a negative intonation between the American and Korean groups.

Positive sentence in negative intonation

Table 6.52 summarises the mean and SD of the Min F0, Max F0, and F0 range of the positive sentence in negative intonation utterances. The mean difference was only significant for the F0 range of the positive incongruent utterances at the p<.05 level: t (96) =2.73, p = 0.007. This result suggests that the Korean group used a narrower pitch range when speaking the positive sentence in negative intonation than did the American group (see Figure 6.39).

Table 6.52
The mean and SD of the Min F0, Max F0, and F0 range of the positive sentence in negative intonation between the American and Korean groups

Positive Sentence	American		Korean	
Negative Intonation	**Mean**	**SD**	**Mean**	**SD**
Min F0	121 Hz	29 Hz	123 Hz	39 Hz
Max F0	228 Hz	54 Hz	209 Hz	65 Hz
F0 Range	107 Hz	40 Hz	86 Hz	35 Hz

Figure 6.39
Visualisation of the pitch variations of the positive sentence in negative intonation between the American and Korean groups

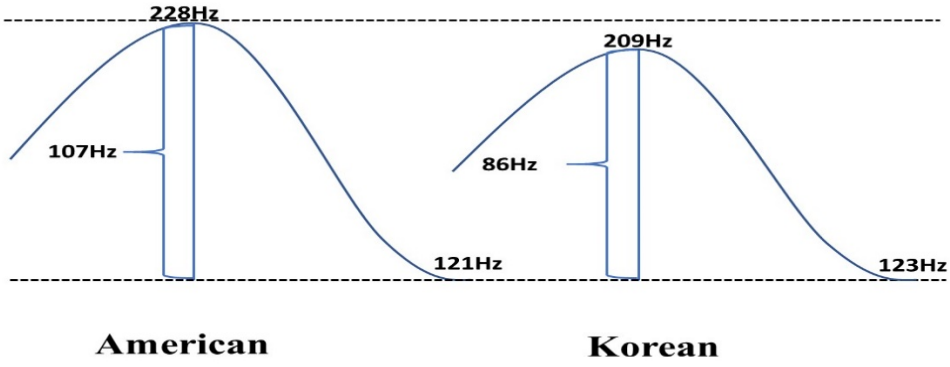


Table 6.53 summarises the results of an independent sample t-test for each positive sentence in negative intonation utterance. The American and Korean group did not show any mean difference in the Min F0 for all the six positive incongruent utterances, indicating the lowest pitch of the Korean group was not significantly different from that of Americans.

Table 6.53
The mean, SD, t-value, and p-value of the Min F0 of the six positive sentence in negative intonation utterances between the American and Korean groups

Min F0	American	Korean		
Positive_Negative	Mean(SD)	Mean (SD)	t (df)	p-value
1. She is confident	118 (37)	118 (41)	t (97)=0.03	0.97
2. She is lively	116 (38)	107 (35)	t (97)=1,19	0.23
3. She is brave	122 (36)	116 (40)	t (97)=0.79	0.43
4. She is lucky	126 (38)	124 (44)	t (96)=0.23	0.81
5. She is happy	119 (33)	129 (44)	t (90)=1.28	0.20
6. She is passionate	120 (38)	124 (44)	t (96)=0.47	0.60

*All the values are in Hz

Half of the six positive sentences in negative tone utterances showed a statistically significant mean difference for the Max F0 between the American and Korean groups. These utterances were: '*she's confident*', '*she's lively*', and '*she's brave*' in negative tone (see Table 6.54). For the three utterances, the American group showed a significantly higher Max F0, showing the American group raised their pitch higher than did the Korean group while producing the three utterances.

Table 6.54

The mean, SD, t-value, and p-value of the Max F0 of the six positive sentence in negative intonation utterances between the American and Korean groups

Max F0 Positive_Negative	American Mean(SD)	Korean Mean (SD)	t (df)	p-value
1. She is confident	235 (46)	206 (59)	t (93)=2.73	0.007*
2. She is lively	225 (57)	197 (61)	t (98)=2.34	0.02*
3. She is brave	230 (46)	194 (57)	t (94)=3.47	0.0007*
4. She is lucky	228 (46)	206 (67)	t (87)=1.89	0.06
5. She is happy	212 (43)	209 (67)	t (83)=0.21	0.83
6. She is passionate	232 (51)	209 (64)	t (93)=1.97	0.05

*All the values are in Hz

The F0 range of American students' positive sentence in negative utterances was generally larger than that of the Korean group (see Table 6.55). Only the utterance '*she's lively*' and '*she's happy*' in a negative tone did not show a significant mean difference for the F0 range. The analysis of the individual positive incongruent analysis showed that the utterance that did not show the mean difference in all the three parameters was '*she's happy*'. Except for the '*she's happy*', the other five positive incongruent utterances showed a difference in either the Max F0 or F0 range, meaning the American group either raised their pitch higher or used a wider range of pitch while speaking the positive sentence in negative tone.

Table 6.55

The mean, SD, t-value, and p-value of the F0 range of the six positive sentence in negative intonation utterances between the American and Korean groups

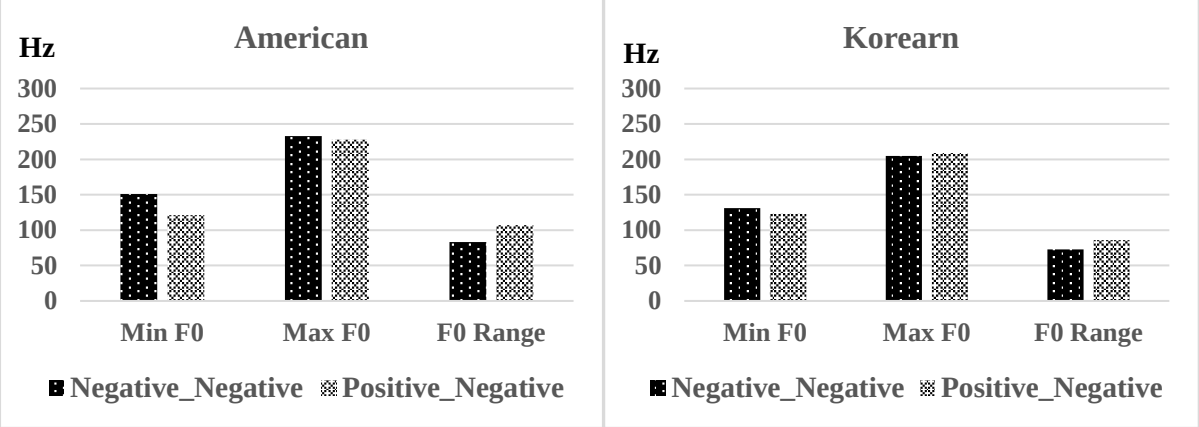
F0 Range Positive_Negative	American Mean(SD)	Korean Mean (SD)	t (df)	p-value
1. She is confident	117 (43)	88 (43)	t (98)=3.34	0.001*
2. She is lively	107 (52)	90 (45)	t (96)=1.93	0.06
3. She is brave	107 (40)	78 (38)	t (97)=3.81	0.002*
4. She is lucky	101 (38)	81 (39)	t (98)=2.55	0.01*
5. She is happy	92 (39)	80 (44)	t (97)=1.44	0.15
6. She is passionate	112 (46)	85 (35)	t (92)=3.28	0.001*

*All the values are in Hz

To further investigate the semantic influence on the production of negative intonation, two different types of utterances, the three pitch parameters of the negative sentence in a negative tone and the positive sentence in negative tone utterances were compared. The

American group's Min F0 became lower (t (94) = 5.52, p = 0.00) and F0 range became wider (t (93) = 3.26, p = 0.001) when producing the positive sentence in negative tone at the p <.05 level (also see Figure 6.40). Considering the fact that speaking a positive sentence in a negative intonation generally signals 'sarcasm', this result suggests that the American group lower their tone, but used a wider range of pitch when expressing sarcasm. The Korean group, however, only showed a change in the F0 range at the p <.05 level: t (83) = 2. 18, p=0.03). Although the mean difference of the F0 ranges between the two different types of utterances for the Korean group, t-value was much smaller than that of the American group. In other words, the mean difference of the F0 range was larger for the American group, indicating the American group utilised a wider range of pitch when producing the positive sentence in negative intonation.

Figure 6.40
Comparison of the Min F0, Max F0, and F0 range between the negative sentence in negative intonation and positive sentence in negative intonation



* Negative_Negative: Negative sentence in negative intonation; Positive_Negative: Positive sentence in negative intonation

The first two sections of Chapter 6 presented how Korean students' actual production of the emotional intonations differed from those of Americans. Korean students' emotional intonations were different not only in the modulation of the phonological and non-phonological features, but in integrating the semantic meaning with the patterns of emotional intonation. The last section of this chapter provides a summary of the internal cognitive

emotional processes that the American and Korean groups were engaged in when producing the emotional utterances.

Summary of the quantitative findings:

- Korean participants used a lower Max F0 and a narrower F0 range than did Korean participants when they spoke the positive congruent utterances.
- Korean participants used a lower Min F0, a lower Max F0, and a narrower F0 range than did American participants when they spoke the negative sentence in positive intonation utterances.
- Korean participants used a lower Min F0 and Max F0 than did American participants when they spoke the negative congruent utterances.
- Korean participants used a narrower F0 range than did American participants when they spoke the positive sentence in negative intonation utterances.
- Korean students' pitch parameters of the positive congruent utterances were similar to those of American students' neutral utterances.
- American students' average Min F0 became lower when speaking the negative sentence in positive intonation compared to the positive congruent utterances.

6. 3 The results of the stimulated recall interview

To explore the cognitive and emotional processes that the American and Korean groups were engaged in while producing the emotional utterances, each participated in the brief stimulated recall interview immediately after completing the production task. Each listened to one of their own emotional utterance sound files recorded, and answered to the open-ended question, '*Please tell me how you felt or what you were thinking when you were speaking this sentence*'. They repeated this procedure for four times for four different types of the utterances ((1) Positive Congruent, (2) Positive Incongruent, (3) Negative Congruent, and (4) Negative Incongruent).

The stimulated recall interview responses were transcribed and initially coded into four different categories: (1) Context, (2) Task, (3) Emotion, and (4) Miscellaneous (see Table 6.56). First, the Context-related responses refer to recalling either a situation or a specific visual or auditory memory associated with the given utterance. The Context category was sub-classified into two levels; *General* and *Specific*, depending on the level of the content specificity of the response. As shown in Table 6.56, *Content-General* responses describe an anonymous subject being in an emotional state that the word depicts (e.g. " *thinking about someone that I like being angry*") while *Content-Specific* answers provide the personal anecdotes to which the participant is linked. Second, the Task-related responses include thinking processes concerning how to perform the production task. The Task category was divided into three types: (1) Difficulty/Naturalness, (2) Manner, and (3) Tone/Pitch. *Task- Difficulty/Naturalness* answers highlight how easy/difficult/natural/unnatural the task was. *Task-Manner* answers, on the other hand, focus on how the participant modulated or changed their mental attitudes to produce the emotional sentence. *Task-Tone/Pitch* answers specifically illustrate the modulation of the participant's articulatory systems to convey the emotional state of the given utterance. Third, the Emotion-

related answers described participants' feelings while producing the given utterances. The last category, Miscellaneous, included no answer or unrelated comments such as how they personally did not like the word they were speaking. All the fifty production task participants in each group participated in the stimulated recall interview. Two of American students' positive congruent, negative congruent, positive incongruent and two of Koreans' negative incongruent sound files were damaged. The total response number of these four emotional utterance categories was, therefore, forty-eight instead of fifty.

Table 6.56
The coding categories of the stimulated recall responses

Main Category	**Sub Category**	**Stimulated Recall Interview Response Examples**
Context	General	"*thinking about someone that I like being angry*" (A response to '*she's angry*' in a negative tone)
	Specific	"*like things I would like to do like mountain climbing was one of the things like popped into my head*" (A response to '*she's brave*' in a positive tone)
Task	Difficulty/ Naturalness	"*I felt that it was easy to say this in a positive tone because 'happy' has to do with positive language" /* *"This one felt 'normal'. That's probably how I would usually say 'she's happy'*. (A response to '*she's happy*' in a positive tone)
	Manner	"*I kinda wanted to say in a confident way, so instead of being more positive, I kinda said it with confidence*" (A response to '*she's confident*' in a positive tone)
	Tone/Pitch	"*I was thinking of lowering my voice." (*A response to '*she's angry*' in a negative tone)
Emotion		" *I felt sympathetic to her..like being miserable..I felt bad*" (A response to '*she's miserable*' in a negative tone)
Miscellaneous		*"I wasn't thinking of anything"* *"I don't know if I ever be happy some's lucky"* *" I wouldn't typically call somebody useless"*

6. 3. 1 Congruent utterances

Congruent: Positive sentence in positive intonation

The American and Korean groups showed differences in their stimulated recall interview responses. On the surface, both the American and Korean groups showed a similar trend. As shown in Table 6.57, nearly one third of the production participants were engaged in either a context-related thinking, conjuring up a situation where the given utterance could be spoken (American: 36%; Korean 42%). Another third of the participants provided task-related responses, focusing on how they could best perform the speaking task (American: 39%; Korean: 28%). The difference between the American and Korean groups, however, was found in the response patterns of sub-categories.

Table 6.57
Comparison of the percentage of each category of the stimulated recall interview responses to the positive congruent utterances

Code Category	American N=48	Korean N=50
Context_General	17%	**36%**
Context_Specific	**19%**	6%
Task_Difficulty/Naturalness	16%	8%
Task_Manner	10%	18%
Task_Tone/Pitch	13%	2%
Emotion	**17%**	12%
Miscellaneous	8%	8%
Total	100%	100%

Context: The largest percentage of American students' Context-related responses were Context-specific (19%) whereas Korean students' were Context- general (36%) (see Table 6.57). Only 6% of the Korean group provided an explicit context that they were related to while producing the positive congruent utterance. American students' Context-specific responses included their own personal experiences where they could speak the given sentences or an audio-visual memory evoked the given utterance:

> *I was thinking about Demi Lovato, singing her song 'confident'* (American female participant: A response to *'she's confident.')*

*Thought about myself. How lively I am..how I am around other people..how enjoy my company (*American female participant*:* A response to *'she's lively.')*
*I was thinking about..um..one of my friends..at the beach right now..(*American female participant*:* A response to *'she's lucky.')*
*I was thinking of having a dog as a pet because all I have is fish (*American female participant*:* A response to *'she's lucky.')*

It is speculated that American students' unambiguous contexts or 'episodic memory' allowed them to experience a greater degree of emotion while producing the given utterance. Korean students' Context-general responses, on the other hand, represented their lack of contextual experiences relevant to the given positive congruent utterances. Their description was vague and limited:

I was thinking of a brave girl (Korean male participant: A response to '*she's brave.*')
I was thinking of someone who is smiling (Korean female participant: A response to '*she's happy.*')
I thought of a hard-working woman (Korean male participant: A response to '*she's passionate.*')

Korean students' general description of the context reflects how Korean students lack available context in their memory even for relatively simple English emotion words.

Task: The American and Korean groups also showed differences in their task-related responses. The American group had a larger percentage of the task-difficulty/naturalness responses than did the Korean group (American: 16%; Korean: 8%) (see Table 6.57). Most of the American group task-related responses focused more on how the congruence between the positive semantic meaning and positive intonation made the task '*easy*' or '*natural*'

I felt that it was easy to say this in a positive tone because 'happy' has to do with positive language (American female participant: A response to '*she's happy.*')
I guess I've said 'people are brave before they did something courageous. So felt like okay saying that. (American male participant: A response to '*she's brave.*')
It's kind of positive word so..it's easier to say it in a positive way (American male participant: A response to '*she's confident.*')

A larger percentage of American participants were, therefore, more aware of the interaction between the semantic meaning and intonation while producing the utterances than did the Korean group. More American students were also engaged in the thinking

process relevant to modulating their tone (American: 13%; Korean: 2%) (see Table 6.57), implying Americans paid more attention to the intonational features of the utterances than did the Korean group:

> *Since it was positive-positive, I tried to talk in a lighter tone* (American male participant: A response to '*she's brave*.')
> *I was trying to make my voice higher pitched to seem positive* (American female participant: A response to '*she's happy*.')

The Korean group, on the other hand, were concerned more about how to perform the speaking task (18%) (see Table 6.57). Korean students' task-manner related answers also tended to provide a semantic-meaning account. In other words, Korean participants were relating the way to speak the positive utterance to the semantic meaning of the positive word:

> *I was thinking how I can say this sentence in a lively way* (Korean male participant: A response to '*she's lively.*')
> *Because 'confident' a good word..I tried to say it positively* (Korean male participant: A response to '*she's confident.*')
> *I was thinking of making it sound 'pleasant'*. (Korean female participant: A response to '*she's lucky.*')

Korean students' task-manner related responses, giving heed to the semantic meaning rather than to the intonational features of the positive congruent utterances, show how a larger percentage of Korean students processed speaking English emotional utterances more semantically with paying less attention to the intonational features.

Emotion: A larger percentage of American participants experienced emotions associated with the positive congruent utterances than did the Korean group (American: 17%; Korean 12%).

> *It's more happy concept and feeling good about what I was saying* (American male participant: A response to '*she's lucky*.')
> *I felt triumphant..like I was overcoming something so the person was brave in that way* (American female participant: A response to '*she's brave*.')
> *I like when people are happy..it made me happy because she was happy* (Korean female participant: A response to '*she's happy*.')
> *I was so proud of her..because she's brave* (Korean female participant: A response to '*she's brave*.')

Interestingly, the negative congruent utterances evoked a negative emotion from a significantly larger number of American students than the Korean group. A possible account for this phenomenon is that 'negative emotions' caused a stronger emotional intensity than positive emotions. The following section provides a detailed summary of the stimulated recall task responses to the negative congruent utterances.

Congruent: Negative sentence in negative intonation

The general trend of American and Korean students' stimulated recall interview responses to the negative congruent utterances was similar to that of the positive congruent utterances; The largest percentage of the responses were either context (American: 33%; Korean: 44%) or task-oriented (American: 33%; Korean: 38%) (see Table 6.58).

Table 6.58
Comparison of the percentage of each category of the stimulated recall interview responses to the negative congruent utterances

Code Category	American N=48	Korean N=50
Context_General	6%	**30%**
Context_Specific	**27%**	14%
Task_Difficulty/Naturalness	**23%**	12%
Task_Manner	4%	**14%**
Task_Tone/Pitch	6%	12%
Emotion	**19%**	4%
Miscellaneous	15%	14%
Total	100%	100%

The notable difference between the positive and negative congruent responses, however, was observed in the percentage of the Emotion category. A substantially larger percentage of American students experienced an emotional reaction to the negative utterances than did the Korean group (American: 19%; Korean: 4%). The sub category patterns of the negative congruent utterances were also similar to those of the positive congruent utterances.

Context: 27% of American participants recalled or imagined a situation that they could use the given negative utterance. The Context-specific responses of the American group generally detailed their personal and social interactions.

> *This one..kinda thought of my mom like when..to be mad at me like..not cleaning my room or something like 'she's angry!'* (American female participant: A response to '*she's angry.*').
> *I felt like I was telling someone that or telling like a friend that someone is upset about the experience they might have had..like..they had a bad test or if they had a bad race or something*. (American male participant: A response to '*she's miserable.*').
> *I thought of like..times..I've been humiliated like when you say it. As you saying it in negative tone you should think I'm an idiot.. back to like..all embarrassing things you've done*. (American female participant: A response to '*she's humiliated.*')

Similar to the positive congruent responses, the largest percentage of the Korean group (30%) was thinking of the context describing an unspecified female who exemplifies the definition of the given negative word:

> *I was thinking of a woman..who is not good at what she does*. (Korean male participant: A response to '*she's useless.*')
> *I thought of a lady who is staying alone*. (Korean male participant: A response to '*she's lonely*.')
> *I thought of a lonely girl*. (Korean female participant: A response to '*she's lonely.*')

Understandably, the Korean group has learned English in an environment where they have few opportunities to use English outside of the classroom. The context that the Korean group provided, therefore, was less personal and interactional. This finding shows that despite a substantially long period of study, the Korean group's emotional and internal use of English seemed limited.

Task: The task category also showed the same trend to the positive congruent responses. The largest percentage of American participants' task-related responses belonged to the task difficulty or naturalness category.

> *I thought this one was easier because it's something that you say pretty much every day*. (American male participant: A response to '*she's angry.*')
> *So when I said this one I felt more normal because 'lonely' having the negative connotation*..(American female participant: A response to '*she's lonely.*')

This one feels more like 'sincere' in tone and sentence so it doesn't contradict kinda..just feels like 'oh..look, it's more serious.' (American female participant: A response to '*she's humiliated*.')

On the other hand, the largest percentage of Korean students' task-related responses to the negative congruent utterances provided an account concerning how to perform the task.

I was thinking of how I can best convey my feelings through my tone. (Korean male participant: A response to '*she's angry*.')
I thought..I should say it as if I lack confidence (Korean female participant: A response to '*she's useless*.')
It was a negative one..so I thought of speaking it in a sort of bad way. (Korean male participant: A response to '*she's miserable*.')

Emotion: The negative congruent utterances evoked a negative emotion from a larger percentage of the American group (19%) than from the Korean group (4%). 19% of American student seemed to experience an intense negative feeling when speaking the given negative sentences.

I felt like 'aggressive' when I was saying it, angry-ish, I guess. (American female participant: A response to '*she's useless*.')
I felt mad that someone was being cruel..I felt like that was happening to me..taking personally. (American female participant: A response to '*she's cruel*.')
I felt sympathetic to her..like being miserable..I felt bad. (American female participant: A response to '*she's miserable*.')

Only two of the fifty Korean students, however, experienced a negative emotion while producing the negative utterance, suggesting few Korean students were involved in the affective process when producing the negative utterances.

I felt a bit depressed when I said this sentence. (Korean female participant: A response to '*she's miserable*.')
It made me feel a bit not good because 'being lonely' is a bad thing. (Korean male participant: A response to '*she's lonely.*')

The results of the congruent utterances showed that the overall stimulated recall response patterns were similar between the American and Korean groups. The sub category patterns in each category, however, were substantially different between the two groups. The following section provides American and Korean students' interview responses to the incongruent utterances.

6. 3. 2 Incongruent utterances

Incongruent: Positive sentence in negative intonation

The largest percentage of the positive sentence in negative intonation responses was context-related (American: 38%; Korean: 44%) (see Table 6.59). Concerning the Task category, the American and Korean group also showed a considerable difference: American students' task-related responses focused more on the task difficulty and naturalness whereas the largest percentage of the Korean group (16%) was concerned about how to regulate their tone and pitch to speak the given positive sentence in negative intonation utterance (see Table 6.59). The most notable response difference between the congruent and incongruent utterances was found in the Emotion category. A significantly larger percentage of the American group described their emotional reactions when listening to the incongruent utterances than to the congruent utterances. For the Korean group, however, the opposite phenomenon was observed; a smaller percentage of Korean students provided emotion-related responses to the incongruent utterances than to the congruent utterances. The detailed account for each category is provided below.

Table 6.59
Comparison of the percentage of each category of the stimulated recall interview responses to the positive sentence in native intonation utterances

Code Category	American N=48	Korean N=50
Context_General	25%	34%
Context_Specific	13%	10%
Task_Difficulty/Naturalness	7% / **7%**	10% / **0%**
Task_Manner	4%	10%
Task_Tone/Pitch	4%	**16%**
Emotion	**26%**	6%
Miscellaneous	14%	14%

Context: The American group showed the opposite trend to the congruent utterances responses within the Context category; a larger percentage of them provided context-general answers than context-specific (Context-General: 25%; Context-specific: 13%) when speaking

the positive sentence in negative intonation utterances (see Table 6.59). It is probable that less frequent use of the incongruent sentences (the positive sentence in negative intonation) led to the larger proportion of American students' relatively ambiguous context-related answers.

> *I thought of more describing someone for doing something like embarrassing. Something I wouldn't do..kinda..yeah..* (American female participant: A response to '*she's brave.*')
> *If someone won something but I didn't like and I was kinda bummed out that they were lucky about it* (American male participant: A response to '*she's lucky*'.)

Korean participants' context-related response patterns, however, appeared similar to those of the congruent utterances; The largest percentage of Koreans (34%) also linked to general ideas about the given emotion words when speaking the incongruent utterances.

> *I said it as if I don't like her being lively* (Korean male participant: A response to '*she's lively.*')
> *I thought of someone I don't like being happy* (Korean male participant: A response to '*she's happy.*')
> *I was thinking of someone being passionate when I was in a depressing situation* (Korean female participant: A response to '*she's passionate.*')

Task: A larger proportion of Korean (36%) participants provided a task-related answer than did American (22%) participants (see Table 6.3.4). The difference in the task-related responses between the two groups was observed in the Task-Difficulty/Naturalness sub category. An equal proportion of American participants described the task difficulty (7%) and naturalness (7%) (see Table 6.59).

> *This one was little bit harder to do ..I would think that when you talk about confidence, it comes across the way..I'm trying to say in a way that what the word means*..(American male participant: A response to '*she's confident.*')
> *It was weird to say 'she's brave' in a negative way because usually it's positive*. (American male participant: A response to '*she's brave.*')
> *That made me really uncomfortable. That was just weird*. (American female participant: A response to '*she's passionate*.')

Korean participants, however, only mentioned how difficult the task was without stating how unnatural the incongruent utterances, showing they focused more on their performances (see Table 6.59).

It was really difficult to say it. I didn't know what to do while I was saying it. (Korean male participant: A response to '*she's confident*.')
It was hard to do it. I felt like I was making it up because I had to speak a positive sentence in a negative way. (Korean female participant: A response to '*she's brave*.')

Korean students' concerns about their performances were also revealed in their Task-tone responses. 16% of Korean participants stated how they tried to regulate their tone to convey the negative intonation.

It told me to say in a negative way, so I tried to lower my voice. (Korean male participant: A response to '*she's confident*.')
I was just concerned about my tone and pronunciation. I couldn't think of anything else (Korean male participant: A response to '*she's lively*.')
I tried hard to drop my tone and talked as if someone's luck brought harm to me. (Korean female participant: A response to '*she's lucky*.')

Emotion: Table 6.59 shows that a considerably larger proportion of American participants exhibited an emotional response than did Korean participants (American: 26%; Korean: 6%). American participants' responses in the emotion category generally described how they felt '*unkind*', '*sarcastic*', or '*jealous*' when speaking the positive sentence in negative intonation utterances. These responses reflect that a larger number of the American group paid attention to the incongruence between the semantic meaning and the type of intonation.

It would seem the meanest out of all of them..even like meaner than saying something negative in a negative tone (American female participant: A response to '*she's lively*.')
I felt really bad, I guess...because I felt like as if.. I was jealous of this person..she who was very passionate about whatever goal or whatever expectation that she maybe have..so I felt really..I guess sarcastic again..(American female participant: A response to '*she's passionate*.')
It was like almost sarcastic, jealous way that 'she's happy'..so..it was affecting me..that way..that made me think 'happy' being negative..(American male participant: A response to '*she's happy*.')

Korean students' emotion-related responses also expressed how they felt 'jealous' or 'unhappy' as if they were comparing their situations to the 'she' person's positive state.

However, only a significantly small number of Korean participants were engaged in emotion-related processes.

> *I felt quite unhappy saying this sentence as if she's doing great while I'm going through a difficult time.* (Korean male participant: A response to '*she's lively*.')
> *I felt jealous of her being lucky because I'm not in general* (Korean female participant: A response to '*she's lucky*.')
> *It was like she was my rival.. and people complimenting her bravery..so I felt quite discouraged accepting the fact that she was brave* (Korean male participant: A response to '*she's brave*.')

Another type of the incongruent utterances used for the stimulated recall interview was the negative sentence in positive intonation utterances. Unlike the positive sentence in negative intonation utterances, which is often used for expressing 'sarcasm', this specific type of utterances is rarely used amongst speakers of English. The results of the analysis of the negative sentence in positive intonation utterances are presented in the next section.

Incongruent: Negative sentence in positive intonation

The response patterns to the negative sentence in positive intonation utterances were similar to those of the positive sentence in negative intonation utterances except that American students' significant decline in the context category. Table 6.60 shows that American students' total response percentage in the context category was 28%, the lowest percentage compared to the other three types of the emotional utterances. The percentage of Korean group's context-related responses to the negative sentence in positive intonation utterances was similar to that of the three utterance types. With regard to the task-related answers, the response pattern was the same as that of the positive incongruent utterances. An almost equal number of American participants was engaged in task-difficulty/naturalness related thinking processes while a larger number of Korean students were thinking of the task difficulty (see Table 6.60). A significantly larger number of American students also experienced emotional responses than did Koreans when producing the negative incongruent

utterances. In addition, a substantial number of Korean students (22%) responded that they were not thinking anything.

Table 6.60
Comparison of the percentage of each category of the stimulated recall interview responses to the negative sentence in positive intonation utterances

Code Category	American N=50	Korean N=48
Context_General	12%	**32%**
Context_Specific	**16%**	6%
Task_Difficulty/Naturalness	14% / **16%**	**19%** / 5%
Task_Manner	6%	8%
Task_Tone/Pitch	6%	6%
Emotion	**22%**	2%
Miscellaneous	8%	**22%**

Context: The negative sentence in positive intonation utterances generally evoked a situation where participants are 'gloating over' someone's misfortune from both American and Korean participants. The contextual information provided by the American group for this particular type of the emotional utterances was not as specific as the other three types. This might be due to the fact that the negative incongruence utterances are seldom used in everyday conversations.

> *Something about someone that you're just kinda like 'okay, she's humiliated and I don't feel too bad for her* (American female participant: A response to '*she's humiliated*.')
> *Thinking of like..my friend..a girlfriend and me being happy that (laughing) she was miserable in her relationship* (American female participant: A response to '*she's miserable*.')

38% of Korean participants provided context-relevant answers also describing a situation that they are enjoying other's mishap. Similar to other three types of emotional utterances, most of the Korean students (32%) provided a vague depiction using the unspecified subject, '*someone*'.

> *I was thinking of a situation where I was kind of feeling triumphant about her uselessness.* (A Korean male participant: A response to '*she's useless*.')
> *When I said this sentence, I was thinking of someone who I don't like.* (A Korean female participant: A response to '*she's lonely*.')

Task: The largest percentage of American participants answered that they were thinking of how difficult or unnatural the task was (30%). Especially, 16% of the American group mentioned that speaking the negative incongruent sentence was either '*weird*' or '*unusual*'.

> *I don't remember if it was supposed to be negative or positive but I just remember thinking that whichever combination of the two seem weird to me..(American male participant*: A response to '*she's useless*.')
> *So I remember I felt definitely unusual to say this sentence. 'lonely' definitely has a more negative context to it. So when I had to say it in positive tone, it felt weird (American female participant*: A response to '*she's lonely*.')

On the other hand, Korean participants focused more on the task difficulty. 19% of Koreans was thinking of how challenging the task of speaking the negative sentence in positive intonation. They also attributed the difficulty to the discrepancy between the semantic meaning and the tone type. Only 5% of Koreans noticed the unnaturalness of the task. This suggests that Korean participants were less attentive to the relationship between the semantic meaning and the intonation type.

> *I felt hard to say the negative sentence, 'she's cruel' in a positive way. I didn't know what to do so I just made my tone sound 'positive'*. (Korean male participant: A response to '*she's cruel*.')
> *I wasn't sure which part I was supposed to focus. 'Being lonely' is not a good thing, but it asked me to say it positively, so I was so confused*. (Korean male participant: A response to 'she's lonely.')

Emotion: 22% of American participants experienced emotional reaction while speaking the negative incongruent utterances. Their responses were similar to those of the positive incongruent utterances, feeling '*mean*', '*uncomfortable*', or '*sarcastic*'. However, only one Korean participant experienced a similar emotional response.

> *I felt uncomfortable saying the word, 'miserable' in a positive tone because usually you're like commiserating someone is miserable or yourself is miserable, not happy about it. (*American female participant: A response to *'she's miserable.')*
> *It was hard saying a negative word in happy way because I felt like that's mean. So, it was little harder than I thought it would be. (*American female participant*:* A response to *'she's lonely.')*

*It made me feel really heartless to say this sentence. Saying the bad word in a positive tone was more brutal. (*Korean male participant: A response to *'she's cruel.')*

Summary of the quantitative and qualitative findings:

- The largest percentage of Korean and American participants provided context-related responses to the emotional utterance stimuli.
- A smaller group of Korean participants experienced emotional reactions to the emotional utterance stimuli.
- Korean students' context-related responses to the emotional utterances were vague and general whereas American students' context-related responses tended to be specific.
- A larger number of the context-related responses of both groups were context-general when the stimuli were the incongruent utterances.
- A larger number of Americans described the production task as unnatural whereas a larger number of Koreans described the task as difficult when the stimuli were the incongruent utterances.

CHAPTER 7

THEORETICAL IMPLICATIONS

7.1 Introduction

The overall aim of this study was to investigate Korean students' pragmatic difficulties, specifically, the use of English intonation in the context of communication with emotions. The present study investigated the use of intonation in emotional communication because intonational features plausibly convey plenty of information about a speaker's intentions in spoken messages. In order to examine the pragmatic difficulties from both perceptual and productive aspects, this study devised tasks representative of unidirectional, involving either the sender or receiver of communicative information, emotional communication. The communicative acts in this study were limited, unidirectional, and asynchronous tasks requiring either responses to a series of sound clips or the production of short declarative sentences. This 'oversimplication' of emotional communication was inevitable due to the complexity of the two overarching constructs of this study, emotion and speech, one of which, emotion, is extremely challenging to scientifically observe in and of itself. In other words, in order to minimise potential confounding variables in creating 'emotional utterances', the decision to narrow down 'emotional communication' to the simple decontexutalised sentence level was made.

The present study examined pragmatic difficulties with perception and production aspects on four levels. First, an emotion survey measured Korean students' pragmatic difficulties, if any, with the degree of emotion experienced when reading emotion words. Second, Korean students' pragmatic difficulties in perceiving emotional content expressed through English intonation was explored by means of two perception tasks. Third, the pragmatic force of Korean students' English emotional intonation was examined by

comparing phonological and non-phonological features of intonation patterns. Lastly, the internal processes of American and Korean participants while producing emotional utterances were explored by conducting the stimulated recall interview.

Despite some limitations, such as the decontexualised and minimalistic use of emotional utterances, the findings of this study are reassuring in terms of three larger theoretical elements of second language processing and use: (1) The affective dimension of L2 vocabulary, (2) the congruence effect in perception of L2, and (3) the roles of intonation in intelligibility in the use of L2. The first section is discussed based on the results of the emotion word survey and the stimulated recall interview. The congruence effect of L2 in perception is examined in relation to the perception task results. Conclusions of the roles of L2 intonation in intelligibility are based on the results of the production task. The remainder of the chapter comprises three parts: Section 7.2 recapitulates the findings and Section 7.3 examines the four sections of the theoretical implications of this study. Lastly, Section 7.4 discusses the limitations and directions for the future study.

7.2 Summary of the study

RQ 1: Does the degree of emotional valence and intensity that Korean EFL students experience in reading English emotion words significantly differ from that of Americans?

Participants rated on a 9-point scale the degree of *valence* (positive vs. negative) that they '*felt*'('*feel*' in live time) when they read each emotion word. The numerical values of the ratings that participants chose when completing the emotion word survey were considered an indirect measure or representation of the emotionality they experienced, although this grossly simplified the complexity of emotional reactions to a two-dimensional matrix. Differences in the rating patterns between American and Korean groups were, therefore, interpreted as differences in the degree of participants' experienced emotionality. A lower number on the

scale indicated less positiveness for the positive words but more negativeness for the negative words.

Overall, the results of the emotion word survey were complementary to those studies which investigated the affective dimension of the second language (e.g. Altarriba, 2003; Dewaele, 2004, 2006, 2008; Pavlenko, 2004). The results may be summarised into two foci: (1) Learners' emotional detachment from English emotion words and (2) Crosslinguistic difference in emotional concepts. The survey results showed that Korean students' average valence ratings were lower for the positive words and higher for the negative words than that of American participants. This suggests that Korean participants '*felt*' a lesser degree of positiveness as well as negativeness when reading the presented emotion words than did American participants. Korean students provided the translation equivalent definition for most of the positive and negative emotion words. Therefore, even though they had a semantic understanding of the emotion words they read, Koreans expressed a lesser degree of emotionality. The findings concur with other studies that show the existence of L2 learners' emotional '*detachment*' (Marcos, 1976). The aforementioned, L2 learners' emotional detachment, shows that L2 learners can 'use' emotion words in a second language with less emotion even though they understand the definition(s) of the words. This phenomenon in particular gives rise to pragmatic issues in the context of intercultural communication because the degree of emotionality is also expressed through interlocutors' intentional selection of particular emotional vocabulary.

The rating difference in the degree of emotionality became significantly wider when the connotations of the emotion words were associated with cultural values. The results of the emotion word survey indicated that Korean students rated the presented neutral words more negatively than did their American counterparts. This was due to some neutral words, such as '*pillow*', '*blanket*', and '*road*' receiving a relatively higher valence rating from the American

group. These three neutral words, thus, functioned as 'emotion'-laden words for the Americans rather than neutral words.

RQ 2: Do Korean EFL students experience difficulty in listening to the emotional content expressed through English intonation?

The difficulty in perceiving the use of English intonation in emotional utterances was measured with the congruency task, which asked participants to answer whether the category of the semantic valence (positive or negative) was congruent with the type of intonation. This task was conducted because the ability to recognise 'the use of intonation' in relation to the semantic meaning plays a key role in perceiving speakers' intentions in emotional communication. The congruency task results suggest that there were no differences between the groups in perceiving the congruence between the semantic meaning and intonation type. Interestingly, however, the semantic incongruence of the emotional utterances interfered with the American group's task performance more than the Korean group, suggesting that the American group was more 'sensitive' to the interaction between the semantic meaning and intonation type than the Korean group. In addition, when the congruency task items were semantically negative, Korean students tended to respond inaccurately.

On the surface, both American and Korean students achieved a high average score in the task (American: 86%; Korean: 84%), showing that both American and Korean students recognised relatively well, the interaction between the semantic meaning and type of intonation. Further analysis showed that the American group was significantly influenced by the semantic incongruence whereas the Korean group was not. When the semantic category of the emotional utterances was incongruent with the intonation type (e.g. positive sentence in negative intonation), American participants' scores significantly decreased (Congruent: 93%; Incongruent: 78%) while the average task score of Korean participants did not change (Congruent: 84%; Incongruent: 84%). When the task item scores were analysed according to

the type of valence, Korean students were more influenced by the negative semantic meaning than American participants. Korean students obtained 91% in the positive sentence items whereas their average score dropped to 76% when the task items were semantically negative. The American group, however, was influenced less by the negative semantic meaning.

RQ 3: How do Korean EFL students' perceptions of English emotional intonation differ from that of Americans?

The participants for the congruency task were also asked to provide an adjective that best described how each speaker 'sounded' to them. This description task was designed to obtain insight into how participants actually perceive the speaker's emotional utterance. For the congruent emotional utterances (e.g. '*she's lucky*' in positive intonation), the majority of American and Korean participants provided adjectives that were aligned with the speaker's intention (e.g. '*upbeat*' or '*energetic*' to '*she's lively*' in positive intonation utterance), showing they understood the speaker's intention correctly. Comparison between the American and Korean groups showed that statistically fewer Korean participants described the speaker's intention correctly (American: 92%; Korean: 83%) when the emotional utterances were congruent. This result suggests that when the emotional utterances are congruent, Koreans, compared to Americans, are less likely to understand the speaker's intention.

The analysis of the adjective descriptors used for the incongruent utterances showed different patterns depending on the type of semantic valence and intonation. For incongruent utterances, a positive sentence in negative intonation, the majority of American participants' descriptors (66%) focused on the interaction between semantic meaning and intonation type. Adjectives such as '*sarcastic*' or '*mean*' were selected, for example. A minority (27%) of Korean participants, on the other hand, paid attention to the interaction. This might be due to

the fact that American participants were more accustomed to the use of negative intonation with positive sentences expressing 'sarcasm' than the Korean group.

When participants listened to incongruent utterances, a negative sentence with a positive intonation, the majority of both American and Korean participants (American: 48%; Korean: 72) provided positive adjectives consistent with the positive intonation (e.g. '*cheerful*' or '*exciting*'). In addition, the American group also paid more attention to the interaction between the semantic meaning and intonation than did the Korean group (American: 31%; Korean: 12%) when describing the speaker of the negative sentence in positive intonation utterances. The larger percentage of American students in the interaction-related adjective category found in both the congruent and incongruent utterances indicated that American students are more 'tuned' in to the interaction between the semantic meaning and intonation type when perceiving emotional utterances than did the Korean group. Thus, Korean students' difficulty in perceiving the information about speaker's intentions might result from their relative insensitivity to the interaction between the intonational features and semantic meaning of utterances.

RQ 4: To what extent, do Korean students speaking English produce the pragmatic force of emotion sentences? Do their intonation patterns significantly differ from those of Americans?

The extent of the pragmatic force that Korean students produce was measured in terms of phonological and non-phonological aspects: (1) the overall contour and tone patterns (phonological) and (2) acoustic variations (non-phonological).

First, the intonation contour of the four types of the emotional utterances was analysed based on the AM model (Pierrehumbert, 1986) using the bitonal (H: high; L: low) transcription notation. For the positive sentence in positive intonation utterances, the majority of American and Korean participants employed the rising-and-falling (LH*L) positive

intonation pattern. When the negative sentence was spoken using a positive intonation, however, a greater number of the American group used the falling (HL*0) negative intonation than those of the Korean group, showing the influence of the negative semantic meaning. Concerning the intonation contour of the negative congruent intonation, the largest proportion of the American and Korean groups used the negative intonation contour. The percentage of those using the negative intonation contour, however, was significantly larger for the American group. This pattern did not change when the positive sentences were spoken with a negative intonation: Both American and Korean participants used the negative intonation contour when speaking the positive sentence in negative intonation.

Another phonological feature was analysed by adapting the Halliday's tone model. The three tone-related features, tone types, tonicity (the tonic accent), and tonality (the number of parsing), were compared between both groups. Both American and Korean participants used a similar pattern with regard to the tone type and tonic accent; the majority in both groups used Tone 5, the strong tone, placing the tonic accent on the main adjective (e.g. '*She's **Ha**ppy*'). The parsing pattern, however, was significantly different between the two groups. Korean participants were likely to use two parsing (e.g. '*she* √ *is* √ *useless*') whereas American students tended to use only one parsing (e.g. '*she's* √ *useless*'). The parsing pattern of Korean students created the dual prominence on the subject and adjective contributing to an emphasis of the subject '*she*' and the emotional adjective. The fact that Korean students used two parsings even in the minimalistic declarative sentence suggests that Korean students' multiple focuses resulted from multiple parsing can give rise to ineffective delivery of the highlighted information. In other words, Korean students' production of the emotional utterances can be pragmatically less effective because the focused information is not clearly conveyed.

Second, the non-phonological features, the Max F0, Min F0, and F0 range were measured and compared between both groups. Overall, the American group utilised more of the pitch variations than did the Korean group when speaking the emotional utterances. Korean students' neutral utterance pitch pattern did not significantly differ from those of the negative congruent utterances indicating that Korean students did not significantly change their pitch variations when conveying negative emotions. Korean students' pitch parameters of the positive congruent utterances were similar to those of American students' neutral utterances. This result suggests that Korean students' positively intended utterances can come across as 'neutral' to the American group. In addition, the influence of the semantic incongruence was also found in the American group. American students' average lowest pitch became lower when speaking the negative sentence in positive intonation than speaking the positive sentence in positive intonation. The Korean group, however, did not show the same influence of the semantic incongruence when using the pitch variations.

RQ 5: What kinds of mental scripts do Korean EFL students engage in while producing English emotional intonation? How do they differ from those of Americans?

The stimulated recall interview responses patterns were analysed according to the four types of emotional utterances. The interview responses to the positive congruent utterances showed that 36 % of American and 42 % of Korean participants were engaged in a context-related thinking process. Within the context-related answers, American participants tended to provide specific information relating to their personal situations whereas Korean participants described a general and definition-like context. Approximately one third of the American (39%) and Korean groups (28%) also provided task-related responses. The difference between the two groups, however, was also found in the task-related subcategories; American participants focused on how speaking the positive congruent sentence was natural or easy whereas Korean students paid more attention to how to produce the positive congruent

utterance as required. In addition, a larger number of American participants were involved in affective processes, experiencing emotions provoked by the positive congruent utterances. The stimulated recall interview response patterns of the negative congruent utterances showed the same pattern as that of the positive congruent utterances.

As for the positive sentence with negative intonation utterances, the largest percentage of American (38%) and Korean (44%) participants provided context-related answers. Interestingly, a larger number of the context-related responses of both groups were context-general. In terms of the task-related answers, American students focused more on the task difficulty and naturalness whereas the Korean group was concerned about how to regulate their tone and pitch to produce the given positive sentence with a negative intonation utterance. A significantly larger number of American students also experienced emotion-related processes than did the Korean group when speaking the positive incongruent utterances.

Lastly, the stimulated recall interview responses to the negative sentence with positive intonation utterances showed that the largest percentage of Korean students provided context-general answers (32%). In the American group, the proportion in the context-specific (16%) and context-general (12%) response categories was not significantly different. The notable difference in the task-related responses was also found in the task-difficulty/naturalness sub-category; A larger number of Americans (16%) described the negative sentence with a positive utterance as unnatural speaking and a larger number of Koreans (19%) described the task as difficult. Similarly, when speaking the negative sentence with positive intonation utterance, a significantly larger percentage of American participants experienced emotion-related responses than did Korean participants.

7.3 Theoretical implications

The research questions of the present study involved two theoretical constructs, namely emotion and intonation. Each of these two constructs raises complex issues particularly in relation to its definition and operationalisation. Due to the theoretical and methodological constraints, these two areas have previously remained rather 'peripheral' in theories and frameworks of second language study. For instance, 'emotion' has been largely investigated from an attitudinal perspective, such as motivation (e.g. Dörnyei, 1990; Masgoret & Gardner, 2003) or foreign-language anxiety (e.g. Maclntyre & Gardner,1994; Maclntyre, Noels, & Clément, 1997), 'assisting' the main cognitive processes. This theoretical standpoint stemmed from the longstanding, dichotomous division between cognitions and emotions in which emotions are considered as separate from cognition (e.g. LeDoux, 1996). The division has also influenced the theoretical stance identifying the cognitive aspects of second language learning separate from the affective dimension, limiting our understanding of L2 processes as well as internal emotional language use (Swain, 2013).

Another construct, the role of intonation, has also remained underdeveloped for quite some time in the field of second language study. Researchers have abstained from investigating the complex mechanisms involving acoustic and phonological variables of intonation. Recently, however, intonation studies have received increased attention due to its crucial role in speech intelligibility and comprehensibility (e.g. Frazier, Carlson, & Clifton, 2006; Trofimovich & Baker, 2006). Intonational features convey a lot of pragmatic information: the utterances with an identical lexical-syntactic structure can cue different intentional meanings. Indeed, intonation, the music of language, makes a spoken language come alive in communication by carrying subtle pragmatic features.

In an attempt to contribute to our understanding of these two complex yet crucial constructs in the areas of second language pragmatics, the theoretical implications of the

findings of this study are discussed within the three larger elements mentioned in the introduction: (1) The affective dimension of the bilingual lexicon, (2) the congruence effect of L2 in perception, and (3) the roles of intonation in intelligibility in the use of L2.

7.3.1 The affective dimension of the bilingual lexicon

The emotional utterances used in the present study were formulated based on the selected emotion words describing emotional states. Emotion words, the intersection between words and emotion, are a window to the affective dimension of the representations of words: The unique emotional components of emotion words extend our understanding of the affective dimension of the representations of words. In this section, the affective dimension of the bilingual lexicon is discussed focusing on: (1) the difference between semantic and conceptual representations and (2) crosslinguistic difference in emotion concepts .

The distinction between semantic and conceptual representations

Studies in psycholinguistics suggest that emotion words are processed differently from concrete and abstract words such as imagining (e.g. Altarriba & Benvenuto, 1999; Altarriba & Basnight-Brown, 2011; Kousta et al., 2011) or recalling (e.g. Altarriba & Canary, 2004; Altarriba & Bauer, 2004; Anooshian & Hertel, 1994). One of the main reasons for the observed processing difference of emotion words from other categories has been attributed to the unique affective components of emotion words, which are often defined in terms of valence (positive vs. Negative) and intensity (weak vs. Strong) (Pavlenko, 2008; Pavlenko, 2012). Although the present study did not examine these 'processing' aspects, the results of the introspective study, the emotion survey, support the argument that the emotion words differed from the neutral words in terms of the degree of valence for Korean EFL learners. The emotion words triggered a positive or negative emotional valence from both American and Korean participants in this study. Both American and Korean participants placed on a 9-

point scale (1: very negative; 5: neutral; 9: very positive) a higher valence rating for the positive words and a lower valence rating for the negative words.

When the valence rating results were compared between both groups, however, the American group appeared to experience a higher degree of positiveness for the positive words and negativeness for the negative words. Although it is not clear whether the participants actually experienced the higher degree of emotional valence while reading the words or the ratings merely reflect their understanding of the degree of emotional valence, the average valence rating results suggest that Korean students experienced a lesser degree of emotional valence compared to the American group despite the fact that they successfully provided the translation equivalent definition of the emotion words. This result implies that Korean students' semantic understanding of English vocabulary was not necessarily representative of the emotional valence they experienced. Although any claims about whether 'semantic representations' are different from 'conceptual representations' or the former is one specific type of the latter, meaning 'semantic representations' are a narrower concept within 'conceptual representations', what the findings of this study support is that 'semantic representations' cannot be interchangeably used with 'conceptual' representations.

Pavlenko (2009) differentiates between 'semantic representation' and 'conceptual representation in the Mental Lexicon model she proposes. She argues that semantic representations can be understood in terms of 'links between words and concepts, as well as words and other words' (Pavlenko, 2009, p. 148) whereas 'conceptual representations' refer to how things are actually represented in the memory. For instance, the word, '*guitar*', is semantically related to other words, such as '*chords*' or '*music*'. The mental representations of the word, '*guitar*' however, can vary depending on individuals. Some might recall an old wooden musical instrument evoking a sense of nostalgia while others might relate to a black electric guitar. In this study, the translation equivalent words that Korean participants

provided are considered as their semantic representations: The definitions indicate the semantic associations between the English emotion words and the Korean emotion words that Korean students have formed in their mental lexicon. Considering the fact that Korean EFL students generally memorise English vocabulary by directly linking to the Korean translation equivalent words often without context, Korean EFL students might have developed clear 'semantic links' between the English emotion words and the Korean emotion words that they provided as the definitions. In addition, the emotion words in the survey were not difficult words that are challenging to understand semantically (e.g. '*angry*', '*lucky*', '*lively*', '*happy*', '*useless*')

Korean students' lesser degree of valence observed in the emotion word survey, thus, might not have been at a 'semantic representations' level. In other words, though Korean students understood the semantic meaning of the emotion words, their less-developed conceptual representations might have caused them to indicate a lesser degree of valence. Korean students' lack of 'conceptual representations' can be also associated with their lack of available contextual information because contextual information contains various types of 'conceptual representations'. According to the stimulated recall interviews, the contextual information that Korean students recalled while producing the emotional sentences was not specific. Their context-related responses resembled an explanation of the definition of the word with the use of the person 'she' (e.g. '*I was thinking of a girl who is lively*' as the interview response to the positive congruent utterance '*she's lively*'). Although the stimulated recall interview was conducted after the production task, it shed light on Korean students' lack of available context, contributing to less developed conceptual representations and to a lesser degree of emotional valence.

The implications of this finding denote the importance of understanding the connotations of L2 vocabulary. The present study showed that Korean students experienced a

lesser degree of valence when reading emotion words despite their semantic understanding. This might be linked to the phenomenon that although Korean EFL students correctly understand the definition of English vocabulary, it is challenging for them to 'experience' the emotional elements attached to the words. The ability to understand the connotations of words and to express subtle intentional elements by using connotations is important both in reading and writing. The pedagogical implications of the 'conceptual representations' are, therefore, discussed in more detail in Chapter 8.

Crosslinguistic difference in emotion concepts

The comparison of the valence rating patterns between American and Korean participants revealed that some of the emotion words in the survey received a nearly identical valence rating from the two groups. Concomitantly, there were emotion words that showed a larger discrepancy in ratings. In the case of the positive emotion words such as '*lively*', '*happy*', '*brave*', '*kind*', '*lucky*', '*confident*', '*passionate*', the ratings of those words were not statistically different between the groups. On the other hand, according to the survey results, the ratings of the words, '*free*', '*joy*', '*bright*' were significantly different between the groups. Interestingly, words that were less culture-specific, received a similar rating pattern from both groups whereas those more culture-specific, received a different rating resulting in a larger discrepancy between the two groups.

For instance, American students rated the word, '*free*' significantly higher than did Korean students (almost one standard deviation difference). Korean students' definitions of the word, '*free*' were consistent, providing the same translation equivalent of its meaning '*not under the control of another*' (*Ja You Roh Un*) in Korean. None of the Korean participants provided the polysemy of '*free*', or the meaning '*without cost*, showing the rating difference was not due to the Korean student's misunderstanding of the word. It can be, therefore, argued that American students experienced more 'positiveness' than did Korean students

when they read '*free*'. This result might also be due to the participants' internalised values influenced by their cultures. American culture tends to celebrate individual freedom and independence whereas Korean culture values more 'harmonious relationships' with others as opposed to individual freedom. The East Asian culture which is heavily influenced by Confucianism emphasises interpersonal harmony with the surroundings rather than self-achievement (e.g. Xu, 1998). Thus, the cultural difference between the two groups might have played a crucial role in students deciding the degree of positiveness of the word, '*free*'.

The phenomenon of the influence of cultural values on the valence rating patterns was also observed with the negative emotion words. For the most of the negative words, the American group overall gave a lower valence rating than did the Korean group, showing that the American group 'felt' the negative words more negatively than did the Korean group. Korean students, however, rated the two words, '*violent*' and '*mad*', lower than their American counterparts. Similar to what they did with the positive words, all Korean participants successfully wrote the definition of the two negative words. Therefore, it can be argued that the lower ratings for '*violent*' and '*mad*' given by the Korean students might not result from their misunderstanding. This might be due to the influence of the 'other-first' Korean culture mentioned earlier. Both '*violent*' and '*mad*' are more associated with a negative action and emotion towards '*others*' than '*self*' (although one can be mad at or violent with oneself). Interestingly, Korean participants considered the negative emotion words describing an individual's negative emotional and physical states such as '*sad*', '*hurt*', '*grief*' and '*sick*', less negative than other negative words presented in the emotion word survey.

The 'influence' of the Korean students' culture on their emotional valence rating patterns on the English emotion words implies the phenomenon of 'L1 conceptual transfer' on the emotion concept (Pavlenko, 2008) found in the bilingual mental lexicon. The study

also showed that the L1 conceptual transfer, however, was observed only for the emotion words conveying culture-specific values. This finding is in line with the models of the bilingual mental lexicon including 'L1-specific', 'L2-specific', and 'Shared' categories (e.g. the Shared Asymmetrical Model (Dong et al., 2005); The Modified Hierarchical Model (Pavlenko, 2009)) in the conceptual storage. In other words, the bilingual lexicon models viewing the conceptual store as one single unit (e.g. the Revised Hierarchical Model (Kroll & Stewart, 1994)) without classifying L1 or L2 specific categories is insufficient to explain the L1 conceptual transfer on the valence rating observed in this study.

This theoretical implication bears much importance for second language vocabulary learning and teaching. Vocabulary teaching methods should be varied according to the extent which students' L1 and L2 concepts intersect. Specifically, when the meaning of L2 vocabulary carries cultural-specific values, this concept needs to be clearly explained to students so that they can increase their 'pragmatic' knowledge while using L2.

7.3.2 The congruence effect in perception of English emotional utterances

One of the consistent findings across the perception tasks was that Korean participants were less affected than Americans by the incongruency, specifically, semantic meaning and intonation type, of the emotional utterances (e.g. the utterance, '*she's lively*' in negative intonation. Interestingly, these findings support psycholinguistic studies, which have observed the congruence effect, that is, the phenomenon that L1 users are more affected by the affective incongruence between primes and targets. Although the present study did not adapt the prime paradigm, the actual performances of American and Korean students confirmed the congruence effect.

This phenomenon entails two important aspects for understanding Korean students' pragmatic difficulties with perceiving English emotional intonation. The first has to do with a possible 'cause' for Korean students' 'immunity' towards incongruency. Their pragmatic

difficulties with using English emotional intonation might be a result of their inability to recognise prosodic cues (e.g. pitch variations, intonational contours, and tonal accents) or to simultaneously 'integrate' two different types of linguistic properties. The second has to do with the emotional distance that Korean students experience when processing emotion words in English. The following sections discuss these two in detail.

Prosodic cues as meaning elements

This study observed that the Korean group's performances on the perception tasks was unaffected by the incongruency between semantic meaning and intonation type whereas the American group was significantly affected. This phenomenon provides another possible account for the pragmatic difficulties of perceiving prosodic cues as meaning components. It is highly likely that American students perceived prosodic cues as a linguistic property either having or carrying meanings and thus their performance on the task was affected. For Korean participants, however, the contradiction did not affect their performances. It is highly plausible that they did not perceive prosodic cues as semantic elements. Considering the fact that Korean students' average congruency task score was almost identical to that of American students, a relatively high score, it cannot be argued that Korean students lacked the ability to simply 'recognise' the different types of prosodic cues. Korean students' pragmatic difficulties resulted in their inability to perceive prosodic cues as meaning aspects, not in their inability to distinguish different intonation patterns.

This finding supports the argument about the interaction or contribution of prosodic cues for conveying meanings (Pell et al., 2010). Traditionally, prosodic cues were more often viewed as supplementary elements for conveying meanings in spoken messages (Nygaard, Herold, & Namy, 2009, p. 128). The lexical, syntactic, and semantic properties were the main components in communicating meanings. Recent studies, however, investigated various roles of prosodic cues in spoken messages. The studies examined the role of prosodic cues in

generally two aspects: (1) signalling the structure of the spoken languages (e.g. Frazier et al., 2006; Itzhak et al., 2010); and (2) conveying the speaker's emotional, intentional or attitudinal information (e.g. Scherer & Bänziger, 2005). The first aspect, which is discussed in greater detail in the next section, focuses on the relationship between parsing patterns and the interpretation of syntactic structures. The second aspect focuses on pitch-related acoustic correlates in conveying the semantic content of emotion words (e.g. Ishii, Reyes, & Kitayama, 2003; Nygaard & Lunders, 2002). These studies argue that prosodic cues are a full grammatical and semantic property, actively integrating with lexical and syntactic information in early stage of sentence processing.

For the present study, the parsing pattern of the speakers in the congruency task was identical as one parsing (e.g. '*she's √ confident*') because the emotional utterances used the simplistic declarative sentence. The speakers in this study utilised the use of pitch variations (Min F0, Max F0, and F0 range) to convey their positive or negative emotional state. Accordingly, it can be argued that Korean students experienced pragmatic difficulties in perceiving the emotional information expressed through the pitch variations, not necessarily the parsing pattern.

The detachment effect on second language learners

Korean participants having scored less on the congruent conditions in the perception task can be a result of the '*detachment effect*' (Marcos, 1976) that second language users experience in their L2. Marcos argued that second language users experience emotional 'detachment' to their L2 because they rarely use their L2 for communicating emotions. Although the advancement of technology has helped EFL students to use English for expressive communication such as social media, EFL students are relatively less exposed to an English-speaking environment. In order to understand the relationship between Korean students' lower scores in the congruent conditions and their emotional detachment, which

might contribute to Korean students' pragmatic difficulties in perceiving English emotional intonation, the theoretical premise of the congruence effect (having scored less) in psycholinguistics needs to be explained.

The greater interference of the affective incongruence between the sentence meaning and the intonation type for American students found in this study concur with the results of psycholinguistic studies which investigated the congruence effect throughout different types of modes and levels. These psycholinguistic studies measure reaction times to congruent and incongruent stimuli throughout different tasks (e.g. Altarriba & Canary, 2004; Degner et al., 2012; Hermans et al., 1994). Priming studies consider faster reaction times indicate faster and more automatic activation spreading in a network of mental representation (Meyer et al., 1975). According to priming studies, the reaction time discrepancy between affective congruent and incongruent conditions signifies a 'processing' difference. The affective priming studies which examined the congruence effect provided evidence that reaction times to L1 affective stimuli are generally faster than those to L2 affective stimuli, affirming that L2 verbal stimuli elicit a weaker emotionality especially for adult second language learners who began their language learning after puberty (e.g. Ayçiçegi & Harris, 2004; Ayçiçegi-Dinn & Caldwell-Harris, 2009). This notion of 'a weaker emotionality' or 'less automatic' processing in L2 affective priming tasks is considered as one of the possible reasons for the lesser degree of emotionality that second language learners experience when using their second language. From a processing perspective, the reduced automatic affective process can be one of the reasons for the detachment effect. In other words, it is more challenging for second language learners to '*feel*' the emotional intensity of emotion words rather than to semantically '*understand*' the meaning when using a second language.

The underlying principle of the congruency task in the present study was to 'recognise' whether the valence of both the semantic meaning and the intonation matched or

not. This is similar to that of the affective priming studies mentioned above. Thus, Korean students' higher scores on average of the incongruent conditions can be representative of the smaller congruence effect. In other words, Korean students were not affected by the incongruence of the semantic meaning and the intonation type. Korean students' lower scores in the congruent conditions could be a result of having perceived the affective information from two different modes, sentence and sound, and thus less automatic for Korean students.

In the first section of the theoretical implication, Korean students' pragmatic difficulty was discussed when they 'read' the emotion words; they felt a less degree of valence compared to the American groups when reading the emotion words. This emotional detachment effect (Marcos, 1976) was also observed when they 'listened' to the emotional utterances. This was due to their inability to perceive meaning elements conveyed through the modulation of prosodic cues. The following section discusses Korean students' pragmatic difficulties in producing emotional utterances.

7.3.3 The role of prosodic cues in expressing emotion in spoken message

The extent of the pragmatic force of Korean students' emotional utterance production was analysed from phonological (the intonation contour and tone patterns) and pitch-related non-phonological aspects (the Min F0, the Max F0, and F0 range). The results showed that Korean students' positive and negative emotional utterance contours were similar to those of American participants. Korean students also used the same tonal accent and tone type as Americans. The difference between the two groups, however, was found in two areas: (1) the use of prosodic parsing and (2) the use of pitch variations. It is probable that the pragmatic force of Korean students' emotional utterances in English might become weaker due to these two areas. The following sections discuss the use of parsing and pitch variations to express a speaker's intentional and emotional information.

The influence of parsing patterns in expressing emotion in utterances

One of the two major roles of prosodic cues is 'parsing' or 'phrasing', which refers to grouping words into smaller or larger syntactic and semantic units (Cooper & Paccia-Cooper, 1980). Prosodic parsing cooperates with syntactic information to determine specific meanings in utterances. Specifically, the role of parsing in marking syntactic boundaries has been extensively investigated through the influence of lexical biases on prosodic parsing in garden path sentences (e.g. Bailey & Ferreira, 2003; Itzhak, et al., 2010). For instance, the meaning of one of the classic garden path sentences, '*The florist sent the flowers was pleased*', can be semantically clear if the sentence pauses between the word, '*flowers*' and the main verb phrase '*was pleased*'.

Another role of prosodic parsing that has received attention is 'focus interpretation' (Schafer, 1997, 1998). Simply put, 'pausing' patterns contribute to the interpretation of highlighted information in utterances. For instance, the sentence, '*this room √ is draughty*' can be interpreted differently depending on different parsing patterns. If the same sentence is said with two parsings ('*this room √ is √ draughty*') with the elongated verb '*is*', it could send the message of '*this room is REALLY draughty'*. This particular role of prosodic parsing can provide insights into how Korean students' multiple parsing patterns are related to their pragmatic difficulties in conveying emotional intentions in spoken messages.

In speaking the simplistic declarative sentences, Korean students were likely to use multiple parsing between words (e.g. '*she √ is √ confident*') whereas American students tended to pause only between the verb and adjective (e.g. '*she's √ confident*') emphasising the emotional state. Specifically, Korean students used the prosodic parsing pattern without differentiating the duration of each word; therefore, each word in the emotional utterances was highlighted. This rather 'dispersed' or 'overly emphasised' focus pattern, which resulted in the multiple parsing without the modulation of word duration might contribute to creating

either a ‘monotonous’ or ‘too serious’ tone when Korean students express their emotion in spoken messages.

The use of pitch variations in expressing emotion in utterances

The second area that showed a significant difference between the American and Korean groups in the production of emotional utterances was the use of pitch variations. The present study showed that Korean students’ negative utterance pitch patterns were similar to that of their neutral utterances, indicating that Korean students were less likely to change the pitch variations when producing negative utterances. In addition, interestingly, Korean students’ pitch patterns in the positive utterances resembled American students’ neutral utterance pitch variations. This suggests that Korean students’ positively valenced utterances can come across as ‘neutral’ to American students. In other words, when Korean students express their positive intentions, Americans can interpret it as ‘neutral’ because of Korean students’ monotonous pitch contours.

Pitch-related acoustic parameters, such as F0 range, duration, and energy have been known to be associated with the perception and the production of affective information. Among these parameters, a plethora of studies have paid attention to the relationship between F0-related pitch modulations and emotions (Bulut & Narayanan, 2008, Ladd, 1996; Murray & Arnott, 1993; Protopapas & Lieberman, 1997: Scherer, 2003). These studies showed that speakers use a larger range of pitch when expressing emotions such as ‘anger’ or ‘happiness’ (Murray & Arnott, 1993) rather than neutral speech. Murray and Arnott (2003) especially showed that the speakers expressing ‘happiness’ used a larger F0 range with irregular movement whereas they utilised smaller F0 modulations and downward inflection when expressing ‘sadness’. Put simply, L1 speakers of English are likely to use the ‘ups and downs’ of intonation to emphasise the emotional information in the spoken message.

In Korean language, however, prominence is associated with the location of a word: The Intonation Phrase (IP) boundary tone, which refers to the boundary tone of the highest prosody unit, of the phrase's final syllable signals the pragmatic meaning of a sentence (Jun, 2002; MacDonald, 2011). That is to say, for Korean speakers, the use of pitch variations is less likely to be one of the main channels to express their emotional intentions. The difference between English and Korean of the intonation system, therefore, can influence Korean students' use of pitch variations when speaking English because L1 prosodic transfer is a crucial factor in second language prosody learning (Rasier & Hiligsmann, 2007).

As mentioned earlier, Korean students' positively intended emotional utterances can come across as 'neutral' to Americans due to Korean students' relatively monotonous pitch use. This particular phenomenon can raise pragmatic issues in intercultural communications because Korean students' positive utterances can be interpreted as 'insincere' or 'emotionless' due to their neutral intonations. Teaching Korean learners how to utilise pitch variations in English, therefore, can help Korean learners increase their pragmatic competence in using English. Suggestions for instructional strategies to teach pitch variations are discussed in Chapter 8.

7.4 Limitations and directions for future research

The present study is limited in a number of ways. Prior to discussing the limitation of each task, issues related to the emotional sentence content and the participants need to be mentioned. The emotional sentence used the gender biased subject, '*she*'. The female subject could have evoked a stronger emotional response from female participants of this study. Gender difference, however, was not the subject of investigation for this study; thus, the influence in using the female subject, '*she*' could have been confounded in the performances of participants.

Concerning the English proficiency of Korean participants, this study used total English proficiency test scores for measuring Korean participants' English proficiency level, not section scores such as speaking or listening tests. Since the level of proficiency in one section does not necessarily correspond to the level of proficiency in other sections, it would have been more valid to use listening test scores for the perception task and speaking test scores for the production task than using the composite scores. Additionally, participants did not take the TOEIC test on the same day. Thus, it was possible that the test scores at the time of study inaccurately portrayed current level of English proficiency. Although the English proficiency scores were mostly collected within a year of the tasks, it would have been ideal to measure participants' English proficiency section scores on the same day that the assessments were given. Thus, future research may consider using more reliable measures relevant to their task performances for participants' English proficiency. In addition, despite the criteria set for recruiting a homogeneous group of Korean students without depression and with a TOEIC score above 600, two Korean participants whose Beck Depression Inventory scores indicated mild depression and one participant whose TOEIC score was 580 were included in this study. This was done partly because the other characteristics of these three students met the criteria. However, the results of the study would have become more robust if the data from the three students were not included.

The lack of inter-rating of the qualitative data, namely the adjective description data as well as the stimulated recall interview data, can weaken the reliability of the qualitative analysis. Although the researcher followed a set of criteria when classifying the adjective and interview data, not having a second perspective on the interpretations of the qualitative data might have led to subjective judgement on the categorisation. The researcher was aware of this weakness, but simply could not afford to hire another skilled rater due to the lack of

financial resources. In order to increase the reliability, future research should consider inter-rating.

Aside from the aforementioned, there are also limitations with each task. The present study attempted to examine the actual perception and production of emotional utterances rather than 'processing' aspects. Therefore, in the process of designing and conducting the tasks representative of the perception and production of emotional utterances, some factors, which weakened the validity of the tasks, were inevitably involved. First, this study intended to measure emotional intonation based on the assumption that participants can 'pretend' as if they are using the selected emotional sentences in a real life situation. The authenticity of their speech production, therefore, could have been largely affected by their ability to 'act'. Thus, investing naturalistic data, such as recordings of conversations over an extended period of time, may help avoid the confounding variable of participants' ability to 'act'.

Second, the settings for the perception task could not be controlled. Although both groups were in a typical row classroom configuration when participating in the perception task, the test environment differed slightly in terms of the size of the classrooms. In addition to the difference in the class size, for American participants, the researcher visited two different sessions of the same class held in the same classroom. The perception task for the Korean group, however, was done in two different classrooms, and the size of one classroom was larger than the other. Thus, in order to minimise the influence of the different task environments, an identical test setting is recommended for future research.

Third, Korean students performed the production task in English while responding to the stimulated recall interview in Korean. Korean participants were allowed to answer in Korean in the stimulated recall task to help them use their cognitive capacity to recall from memory rather than to formulate English sentences. The discrepancy between the language of encoding (using English in the production task) and the language of retrieval (remembering

their thoughts and feelings in Korean in the stimulated recall task), however, could have interfered with their performance in the stimulated recall interview because bilinguals' emotional reactions tend to be more intense when the language of encoding and retrieval is matched (Marian & Kaushanskaya, 2004).

Lastly, one of the weaknesses of this study has to do with 'the training effect'. The repetition of the same tasks could have impacted the performances of participants. It is possible that participants paid more attention to the regulations of their intonation patterns as they repeated the production task. This happened because the task used the simplistic declarative sentence; thus, again, future studies may consider using more naturalistic data to increase the task validity.

CHAPTER 8

CONCLUSION AND PEDAGOGICAL IMPLICATIONS

The present study investigated Korean students' pragmatic difficulties in using English intonation in the context of communication with emotion. The pragmatic difficulties were examined on four different levels: (1) the perception of emotion words when reading, (2) the perception of emotional utterance when listening, (3) the production of emotional utterances when speaking, (4) the internal cognitive and affective processes involved when speaking emotional utterances. From the word perception level, Korean participants experienced a lesser degree of emotional valence when reading emotion words compared to the American group. Korean students also were less likely to recognise English prosodic cues as semantic components when they listened to emotional utterances. On the production level, Koreans also used a different parsing pattern and utilised a narrower range of pitch variations, which can contribute to diminishing the pragmatic force of their spoken messages. Korean students also tended to recall contexts that were less personal and specific when producing emotional utterances. All these aspects led to Korean students' pragmatic difficulties in communicating emotion in English.

Given the fact that the emotional utterances used in this study were simplistic declaratives, these findings suggest that the pragmatic difficulties that Korean students experience when using English in perceiving and expressing emotion would be even greater when they use a more complicated form of spoken messages. Based on the findings of this study, implications and recommendations to facilitate pragmatic skills and knowledge for second language learners are proposed. In particular, the remainder of this chapter highlights the importance of the teaching and learning of word connotations and prosodic cues as the

areas of second language pragmatics and discusses instructional strategies to improve students' pragmatic competence in the two areas.

Teaching and learning English word connotations

Korean participants in this study represented those whose English proficiency level is higher than intermediate, according to TOEIC proficiency test scores. On average, they have spent longer than ten years studying English without interruptions. The vocabulary test results also showed that these students had fairly good vocabulary knowledge. Their knowledge about vocabulary, however, seemed to be limited to understanding the definitions of words. In other words, they were likely to understand what each word denotes, but less likely to understand the connotations of the word. For instance, most Korean college students understood the literal meaning of two words, '*skinny*' and '*slim*' as English words describing a person with a relatively low body mass. They, however, are less likely to recognise that these two words are placed at the opposite ends of the emotional valence spectrum. The word, '*skinny*' has a negative connotation whereas the word, '*slim*' implies an aesthetically desirable state. Thus, Korean students may misuse the negative word, '*skinny*' for complimenting appearance.

The ability to understand the connotations of words, which include different degrees of valence and intensity of words, is crucial pragmatic knowledge. If one does not have full awareness what his or her words imply, this may lead to inappropriate interpretations of intended messages as shown in the previous example. In addition to communicative situations, the issue of understanding word connotations can also yield practical implications. For an example, International General Certificate Secondary Education (IGCSE) Language-A papers require an extensive knowledge of word connotations in comprehending and analysing texts in the exams. In my own experience of teaching IGCSE international students, I have

found that the ability to grasp subtle nuances conveyed through word choice was positively related to their overall writing skills. The knowledge of word connotations, the affective dimension of words, therefore, plays a crucial role in improving second language writing skills as well.

In South Korea, vocabulary teaching and learning has focused on memorising the sound and spelling of English words along with the translation equivalent word in Korean. Test-oriented teaching and learning styles have promoted vocabulary knowledge that is only useful for reading comprehension tests or producing a short highly-structured argumentative essay. Thus, students' English vocabulary size, rather than understanding connotations of words, has been considered as the indicator of good vocabulary knowledge. In order to facilitate students' knowledge in word connotations in English, instruction and curricula that provide examples of words in contexts are required. In particular, teaching students that words that semantically mean a similar concept with different degrees of emotional valence and intensity is important. This can help students to 'use' English more effectively. For instance, the words, '*surprised*', '*shocked*' and '*flabbergasted*', all refer to an emotional state where experiencing an unexpected situation. The degree of valence and intensity of these three words vary, however. Explanations of how words with a similar meaning can have different positive or negative connotations and a different degree of intensity can thus help students to use English words effectively.

Teaching and learning English prosodic cues

Prosodic cues (or suprasegmental prosody) are crucial for speech intelligibility and comprehensibility. Prosodic cues that are internally and externally produced help interlocutors to effectively communicate their intentions and emotions. Teaching "socially-

acceptable" (Chun, 2002, p. 83) pronunciation including prosodic cues, therefore, is imperative to help students with L2 pragmatic skills.

However, second language instruction has paid less attention to improving students' suprasegmental prosodic competency. Most instruction in second language teaching has concentrated on correcting segmental errors. Minimal pair exercises are one of the typical examples of segmental-focused instruction. Although these segmental-related instructional methods help students with increasing their awareness of errors in their pronunciation, the segmental feature-focused methods rarely facilitate the use of prosodic cues. In order to teach suprasegmentals, instruction that particularly deals with pronunciation at the sentential and suprasentential level is required.

The material that is used for teaching prosodic cues should contain comprehensive linguistic information, which includes pragmatics, specific contents, use, meaning, and syntax. In other words, the presentation of the class material should be presented as complete utterances in contexts. For instance, a brief speech from a well-known speaker from the media can be presented to demonstrate suprasegmentals. In the presentation, the specific suprasegmental features that the speaker applied to 'highlight' intentional and emotional information can be explained. In the review of the presented speech, teachers can also revisit specific sentences that demonstrate prosodic phrasing, connected speech as well as the use of pitch variations. Another instructional strategy that can be utilised in teaching prosodic cues is that teachers can compare different prosodic features between students' first and second language. The comparisons between prosodic features of the L1 and English will help students recognise differences in the two languages. This strategy will be especially useful for students whose first language is significantly different from English in terms of the structures of intonation.

The present study compared differences in the perception and production of English emotional intonation between Americans and Koreans. The selection of the two groups was based on the accessibility of participants, not necessarily on the concept of native-speakers norms. This study views the American group, not necessarily as the norm, but as a group of speakers who are more proficient and effective speakers. The issue with word connotations can occur amongst non-native speakers with different levels of proficiency. The more proficient learners are in a second language, the higher their awareness of word connotations is in the second language: they not only understand the definitions but the nuances of English vocabulary.

The issue of the use of prosodic cues, on the other hand, has to do with being an effective speaker. For instance, a renowned Korean public figure with exceptionally good English vocabulary and flawless syntactic structure was ineffective at presenting his ideas orally due to fragmented parsing patterns. For this reason, integrating elements of prosodic cues use into instructional materials and wider curricula is recommended. Although there may be resistance to curriculum implementation, teaching Korean students word connotations as well as the use of English prosodic cues should be part of English curriculum so that students can effectively 'use' English, not just 'study' it. Otherwise, students may acquire English that is only useful for taking tests, limiting the opportunities to learn English as a communicative tool.

The topic of this study was chosen to contribute to increasing the visibility of the pragmatic issues that are rarely visited in the area of second language learning. The empirical evidence provided by this study highlights that the difficulties occur on all perceptual and productive levels. It is crucial, therefore, that pragmatic difficulties receive more attention in both learning and studying a second language.

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APPENDIX 1: INFORMATION SHEET

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

15 Norham Gardens, Oxford OX2 6PY
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Director Professor Ernesto Macaro

An investigation of Korean learners' difficulties in using English intonation to express emotion: Production and Perception

Information for Participants

Invitation

You are being invited to take part in a research study. Before you decide to participate, it is important to understand why the research is being conducted and what your participants entails. Please take time to read the following information carefully. Please ask if there are any aspects of the projects that are unclear or if you would like more information. Take time to decide whether or not to take part.

What is the purpose of the study?

The study aims to investigate whether Korean students experience difficulties in using English intonation to express emotions. This study aims to create the emotional word and sentence stimuli that will be used for the main study.

What will happen during the study?

If you agree to participate in this study, you will complete: (1) a language history questionnaire, (2) The Beck Depression Inventory-II, (3) Vocabulary size test, and (4) a word rating survey. It will approximately take 60 minutes to complete all four tasks.

What will happen to the results of this study? Will my taking part in this study be kept confidential?

The results of this study will form the basis of an Oxford doctoral thesis. The results of this study may be published in a peer-reviewed journal and presented at conferences, but only group data will be reported. If you wish to obtain a copy of the published results, please inform the researcher. All the collected information during the course of this study will be kept strictly confidential. The collected data will be stored as long as it has academic value. In addition, you will not be identified when the results of the study are presented in any publications and reports

Do I have to participate in this study? What are the possible benefits and risks of taking part?

It is your decision to take part in this study. You can decide to stop participating at any time. You do not need to answer questions you do not wish to. There are no known risks to taking part. Your participation, as part of this study, will benefit those who are involved in teaching and learning English as a foreign or a second language by providing valuable information about whether Korean learners of English experience difficulties in using English intonation to express their emotions.

Who is organising this study?

This study is organised as an independent student research in conjunction with the Department of Education, the University of Oxford.

Contact for further information

Should you have any further questions about this study, please feel free to contact: Moon Kyoung Cho, Department of Education, 15 Norham Gardens, Oxford, UK OX2 6PY. moon.cho@education.ox.ac.uk. Your inquiries are most welcome.

Thank you very much for taking the time to read through the information.

APPENDIX 2_ INFORMED CONSENT FORM

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

15 Norham Gardens, Oxford OX2 6PY
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Director Professor Ernesto Macaro

Research Consent Form

Title of research: An investigation of Korean learners' difficulties in using English intonation to express emotion: Production and perception

Researcher: Moon Kyoung Cho

This consent form establishes that you have read and understood what taking part in this study will involve. Please check all boxes that apply.

☐ I confirm that I have read and understood the information sheet and have the opportunity to ask questions about the study. I have also received satisfactory answers to questions.

☐ I understand that my participation in this study is voluntary that I am free to withdraw at any time, without giving any reason, and any data already collected will be discarded.

☐ I understand that any information that I give will only be used anonymously and I will not be identified when the results of the study are presented in any publications and reports.

☐ I understand who will have access to identifying information provided, how the data will be stored and what will happen to the data at the end of the project.

☐ I understand that this study has been approved by, and received ethics clearance through, the University of Oxford's Central University Research Ethics Committee.

☐ I agree to voluntarily participate in this study.

Name of Participant:_____ Email:_____
Signature:_____Date:_____
Name of Researcher:_____
Signature and Date:_____

APPENDIX 3_LANGUAGE HISTORY QUESTIONNAIRE

Language History Questionnaire
(Adapted from Li, Zhang, Tsai, & Puls, 2013)

Please provide your contact information below

Name : _____
Email:_____

Please answer the following questions

1. Age : _____

2. Sex: Male / Female

3. If you have lived or travelled in other countries for more than three months, please indicate the name (s) of the country or countries, your length of stay, the language(s) you learned or tried to learn, and the frequency of your use of the language while in that country according to the following scale (circle the number in the table):

Never	Rarely	Occasionally	Sometimes	Frequently	Very Frequently	Always
1	2	3	4	5	6	7

Country	Length of Stay (cumulative)	Language	Frequency of Use
			1 2 3 4 5 6 7
			1 2 3 4 5 6 7
			1 2 3 4 5 6 7
			1 2 3 4 5 6 7

4. Write in the box the age at which you first learned English in terms of speaking, reading, and writing, and the number of years you have spent learning English.

Age first learned English			Number of years spent learning English (cumulative)
Speaking	Reading	Writing	

5. Circle the language(s) used by your teachers for general instruction (e.g. history, math) at each schooling level.

Primary/Elementary School :	Korean	English	Korean & English
Secondary/Middle School:	Korean	English	Korean & English
High School:	Korean	English	Korean & English
College/University:	Korean	English	Korean & English

6. Rate your current ability on reading, writing, speaking, and listening for English according to the following scale (circle the number in the table):

Very poor	Poor	Fair	Functional	Good	Very good	Native-like
1	2	3	4	5	6	7

Reading	Writing	Speaking	Listening
1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7

7. If you have taken a standardized English proficiency test (e.g. TOEFL, IELTS), please indicate the name of the test and the score.

Test	Total Score	Reading	Writing	Speaking	Listening

8. Estimate, in terms of hours per day, how often you are currently engaged in the following activities in English. If you don't use English in the listed activities, write down "0".

Activities	Hours
Listen to radio/listen to music/ watching TV or movies, video clips :	(hrs)
Reading for fun (e.g. reading magazines, novels) :	(hrs)
Reading for work/study:	(hrs)
Reading on the internet (e.g. Facebook, Twitter, blogs):	(hrs)
Writing emails to friends or family:	(hrs)
Writing emails for work/ writing articles or papers for study or work:	(hrs)
Other (specify):	(hrs)

9. Estimate, in terms of hours per day, how often you speak English currently with the following people.

Family members	Friends	Classmates	Co-workers

10. Do you mix words or sentences from Korean and English in your own speech (e.g. saying a sentence in English but use a Korean word or phrase in the middle of the sentence or saying a sentence in Korean but use a English word or phrase in the middle of the sentence)

____ Yes ____ No

11. How often do you use English for the following activities? Circle the number in the table according to the scale below.

Never	Rarely	Occasionally	Sometimes	Frequently	Very Frequently	Always
1	2	3	4	5	6	7

Arithmetic (e.g. count, add)	1	2	3	4	5	6	7
Remember numbers (e.g. telephone)	1	2	3	4	5	6	7
Dream	1	2	3	4	5	6	7
Think	1	2	3	4	5	6	7
Talk to yourself	1	2	3	4	5	6	7
Express anger or affection	1	2	3	4	5	6	7

12. If there is anything else that you feel is interesting or important about your language background or language use, please comment below.

APPENDIX 4: THE BECK DEPRESSION INVENTORY II

The Beck Depression Inventory-II

Choose the one statement, from among the group of four statements in each question that best describes how you have been feeling during the past few days. Circle the number beside your choice.

1	0	I do not feel bad.
	1	I feel sad much of the time.
	2	I am sad all the time.
	3	I am so sad or unhappy that I cannot stand it.
2	0	I am not particularly discouraged about the future.
	1	I feel discouraged about the future.
	2	I do not expect things to work out for me.
	3	I feel that the future is hopeless and will only get worse.
3	0	I do not feel like a failure.
	1	I feel I have failed more than I should have.
	2	As I look back on my life, I see a lot of failures.
	3	I feel I am a total failure as a person.
4	0	I get as much satisfaction out of things as I used to.
	1	I don't enjoy things the way I used to.
	2	I get very little pleasure from the things I used to enjoy.
	3	I can't get any pleasure from the things I used to enjoy
5	0	I don't feel particularly guilty.
	1	I feel guilty over many things I have done or should have done.
	2	I feel guilty most of the time.
	3	I feel guilty all of the time.
6	0	I don't feel that I am being punished.
	1	I feel I may be punished.
	2	I expect to be punished.
	3	I feel I am being punished.
7	0	I feel the same about myself as ever
	1	I have lost confidence in myself.
	2	I am disappointed in myself.
	3	I dislike myself.
8	0	I don't criticize or blame myself more than usual.
	1	I am more critical of myself than I used to be.
	2	I criticize myself for all of my faults.
	3	I blame myself for everything bad that happens.

9
0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.

10
0 I don't cry any more than I used to.
1 I cry more now than I used to.
2 I cry over every little thing.
3 I feel like crying, but I can't.

11
0 I am no more restless or wound up than usual.
1 I feel more restless or wound up than usual.
2 I am so restless or agitated that it's hard to stay still.
3 I am so restless or agitated that I have to keep moving or doing something.

12
0 I have not lost interest in other people or activities.
1 I am less interested in other people or things than before.
2 I have lost most of my interest in other people or things.
3 It's hard to get interested in anything.

13
0 I make decisions about as well as ever.
1 I find it more difficult to make decisions than usual.
2 I have much greater difficulty in making decision than I used to.
3 I have trouble making any decisions.

14
0 I do not feel I am worthless.
1 I don't consider myself as worthwhile and useful as I used to.
2 I feel more worthless as compared to other people.
3 I feel utterly worthless.

15
0 I have as much as energy as ever.
1 I have less energy than I used to have.
4 I don't have enough energy to do very much.
5 I don't have enough energy to do anything.

16
0 I have not experienced any change in my sleeping pattern.
1 a. I sleep somewhat more than usual.
b. I sleep somewhat less than usual.
2 a. I sleep a lot more than usual.
b. I sleep a lot less than usual.
3 a. I sleep most of the day.
b. I wake up 1-2 hours early and can't get back to sleep.

17
0 I am no more irritable than usual.
1 I am more irritable than usual.
2 I am much more irritable than usual.
3 I am irritable all the time.

18

0 I have not experienced any change in my appetite.
1 a. My appetite is somewhat less than usual.
b. My appetite is somewhat greater than usual.
2. My appetite is much less than before.
b. My appetite is much greater than usual.
3. I have no appetite at all.
b. I crave food all the time.

19

0 I can concentrate as well as ever.
1 I can't concentrate as well as usual.
2 It's hard to keep my mind on anything for very long.
3 I find I can't concentrate on anything

20

0 I am no more tired or fatigued than usual.
1 I get more tired or fatigued more easily than usual.
2 I am too tired or fatigued to do a lot of the things I used to do.
3 I am too tired or fatigued to do most of the things I used to do.

Thank you for your participation.

APPENDIX 5: THE WORD RATING SURVEY (KOREAN)

단어 의미 설문조사서

연락처를 적어주세요.

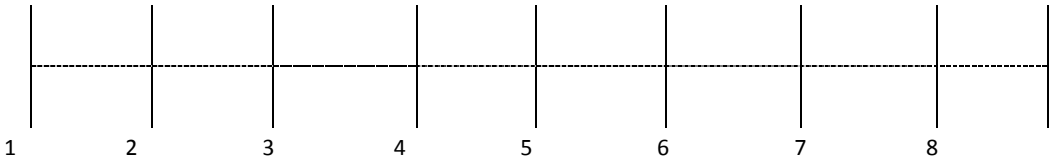
성명: _____ Email:_____

단어 의미조사 설문지안내문

각각의 주어진 단어마다 세가지 질문에 답해주세요. (1) 주어진 단어를 영어로 번역해 주시기 바랍니다. 번역시 본인이 생각하기에 가장 의미가 가까운 단어 하나를 적어주세요. (예: Apple→사과)

(2) 단어의 의미가 좋고 나쁨에에 대하여 숫자 1 과 9 사이에 해당하는 번호를 적어주세요. 예를 들어, '짜증나는' 는 '3' 혹은 '4'에 해당하는 부정적인 의미를 가지고 있는 반면, '기쁜'은 '7' 혹은 '8 에 해당하는 긍정적인 의미를 담고 있다고 할 수 있습니다.

부정/긍정도:

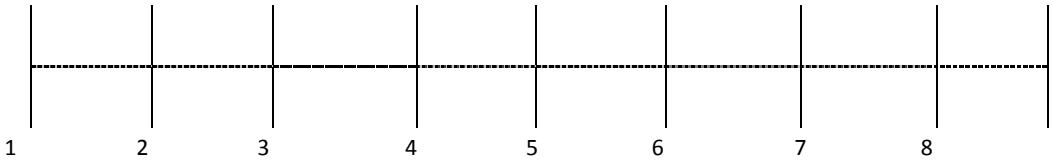


매우부정적 **중립적인**

매우 긍정적

(3) 단어가 주는 느낌의 강하기 정도에 대해 숫자 1 과 9 사이에 해당하는 번호를 적어주세요. 예를 들어, '충격적인'은 '7' 혹은 '8'에 해당하는 느낌의 강도를 갖고 있다고 할 수 있는 반면, '나른한'은 '1' 혹은 '2'에 해당하는 느낌의 강도를 담고 있다고 할 수 있습니다.

느낌의 강도:



매우 약함 **중립적인**

매우 강함

예시 : 사과 **:** **Apple** 부정/긍정도 : 5

느낌의 강하기 정도 : 1

I. 긍정/부정의 정도 :

a. 주어진 단어의 뜻을 단어 바로 밑에있는 밑줄위에 적어주세요. 단어의 뜻을 모르는 경우에는 'X' 표시를 빈 칸에 해주세요.

b. 각각의 단어를 읽었을때 느끼는 긍정적인 느낌 혹은 부정적인 느낌의 정도를 위에 주어진 1 – 9 (1: 매우 부정적, 5: 중립적, 9: 매우 긍정적) 정도로 표시해 주세요.

1 Wise :
의미:_____ 긍정 부정도 :_____

2 Blanket:
_____ 긍정 부정도 :_____

3 Anger:
_____ 긍정 부정도 :_____

4 Door:
_____ 긍정 부정도 :_____

5 Satisfied:
_____ 긍정 부정도 :_____

6 Delight:
_____ 긍정 부정도 :_____

7 Engine:
_____ 긍정 부정도 :_____

8 Closet:
_____ 긍정 부정도 :_____

9 Confident:
_____ 긍정 부정도 :_____

10 Pillow:
_____ 긍정 부정도 :_____

11 Table:
_____ 긍정 부정도 :_____

12 Lively:
_____ 긍정 부정도 :_____

13 Hatred:
_____ 긍정 부정도 :_____

14 Violent:
_____ 긍정 부정도 :_____

15 Window:
_____ 긍정 부정도 :_____

16 Free:
_____ 긍정 부정도 :_____

17 Insecure:
_____ 긍정 부정도 :_____

18 Rug:
_____ 긍정 부정도 :_____

19 Brave:
_____ 긍정 부정도 :_____

20 Road:
_____ 긍정 부정도 :_____

21 Useless:
_____ 긍정 부정도 :_____

22 Bright:
_____ 긍정 부정도 :_____

23 Mad:
_____ 긍정 부정도 :_____

24 Joy:
_____ 긍정 부정도 :_____

25 Humiliate:
_____ 긍정 부정도 :_____

26 Plate:
_____ 긍정 부정도 :_____

27 Kettle:
_____ 긍정 부정도 :_____

28 Lucky:
_____ 긍정 부정도 :_____

29 Floor:
_____ 긍정 부정도 :_____

30 Pain:
_____ 긍정 부정도 :_____

31 Loneliness:
_____ 긍정 부정도 :_____

32 Cupboard:
_____ 긍정 부정도 :_____

33 Cheer:
_____ 긍정 부정도 :_____

34 Chair:
_____ 긍정 부정도 :_____

35 Misery:
_____ 긍정 부정도 :_____

36 Bored:
_____ 긍정 부정도 :_____

37 Building:
_____ 긍정 부정도 :_____

38 Kitchen:
_____ 긍정 부정도 :_____

39 Thrill:
_____ 긍정 부정도 :_____

40 Bookshelf:
_____ 긍정 부정도 :_____

41 Cruel:
_____ 긍정 부정도 :_____

42 Drown:
_____ 긍정 부정도 :_____

43 Happy:
_____ 긍정 부정도 :_____

44 Computer:
_____ 긍정 부정도 :_____

45 Terrific:
_____ 긍정 부정도 :_____

46 Sad:
_____ 긍정 부정도 :_____

47 Grief:
_____ 긍정 부정도 :_____

48 Toaster:
_____ 긍정 부정도 :_____

49 Kind:
_____ 긍정 부정도 :_____

50 Train:
_____ 긍정 부정도 :_____

51 Hurt:
_____ 긍정 부정도 :_____

52 Passion:
_____ 긍정 부정도 :_____

53 Adorable:
_____ :_____

54 Sick:
_____ :_____

APPENDIX 6: THE PILOT STUDY RESULT OF THE EMOTION WORD RATING SURVEY

Table 1

Valence_Positive words

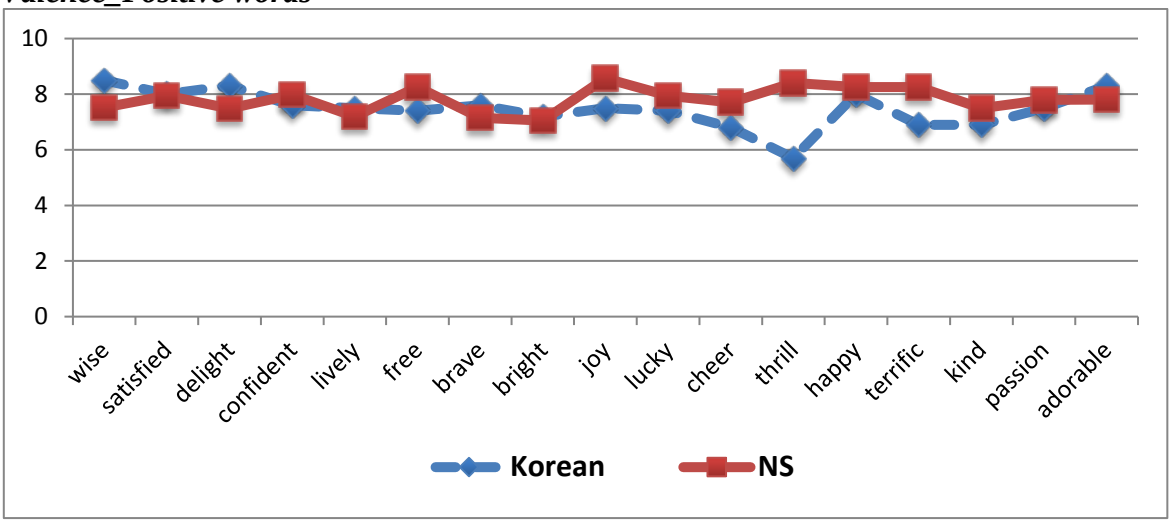


Table 2

Valence_Negative words

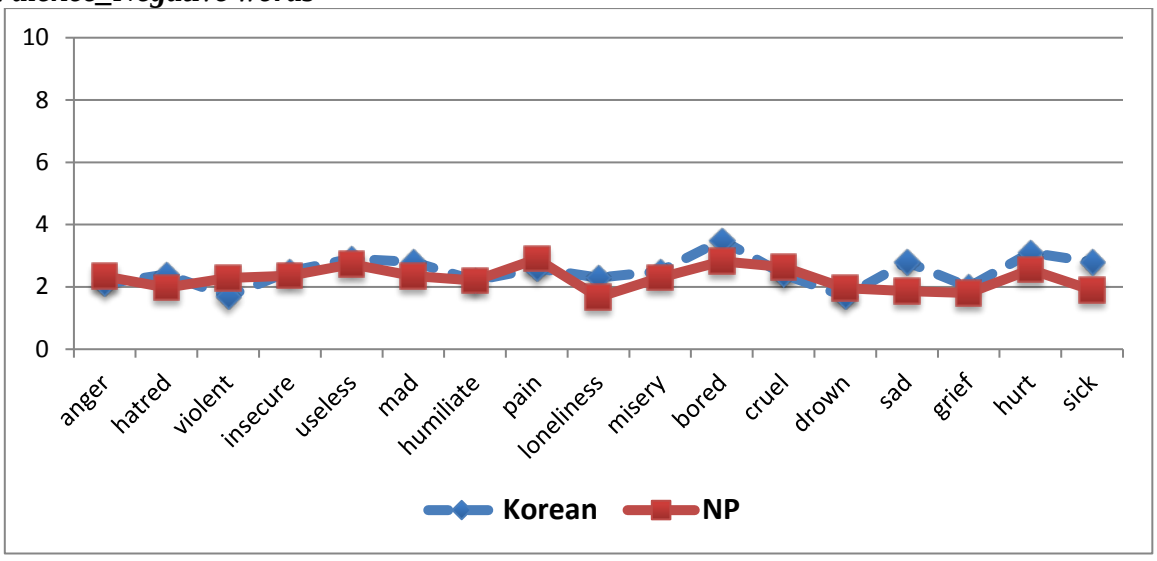


Table 3

Intensity_Positive words

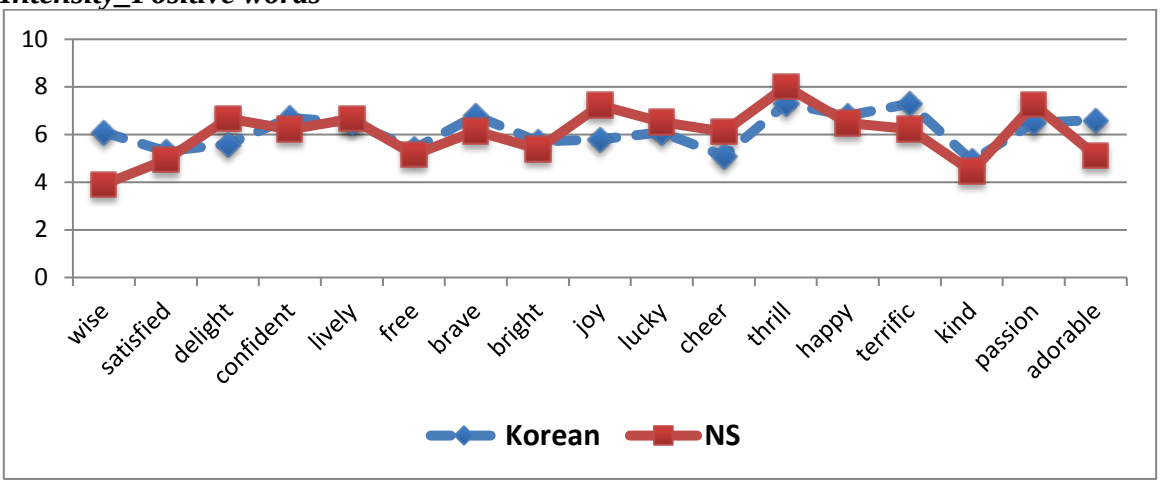
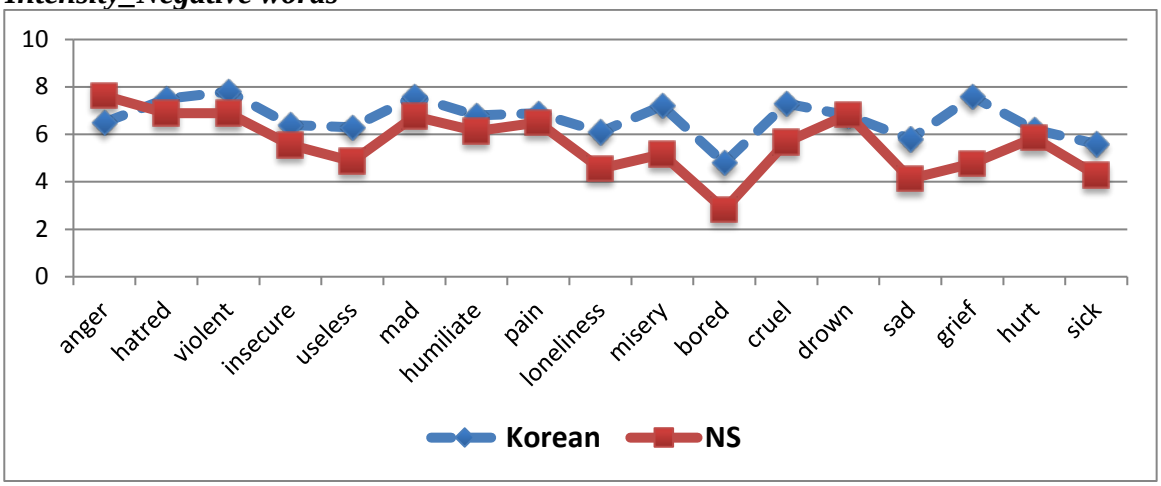


Table 4

Intensity_Negative words



APPENDIX 7: PRODUCTION TASK INSTRUCTION

Production Task Instruction

Verbal Instruction Script

In this task, you will speak a sentence either in a negative or positive tone. You are encouraged to speak the sentences as if you are saying in real life situations.

Speak the sentence in the intonation matching the expression of the face emotion below the sentence in the card. You will have to only pay attention to the sentence and the happy/unhappy face emoticon.

Some cards will ask you to speak the sentence in a matching tone of voice to the meaning of the text. For example, speaking a positive sentence, '*She is happy*' in a positive tone will be a matching sentence.

Some cards, however, will ask you to speak the sentence in an un-matching tone. One example will be speaking the positive sentence, '*She is happy*' in a negative tone. When you have to speak these 'un-matching' sentences, you can think of a situation that you talk about someone you don't like. For instance, speaking '*She is happy*' in a negative tone would be a case you're unhappy about the person being happy. Or speaking '*She is sad*' in a positive tone would be when you are happy about the person being sad.

Any questions, so far?

You will record each sentence individually. Be sure to speak loudly enough for the laptop to record clearly what you say. Do not stop the recorder at any time while you're recording an individual sentence. If you have a problem with the recorder during the task, please notify the researcher immediately.

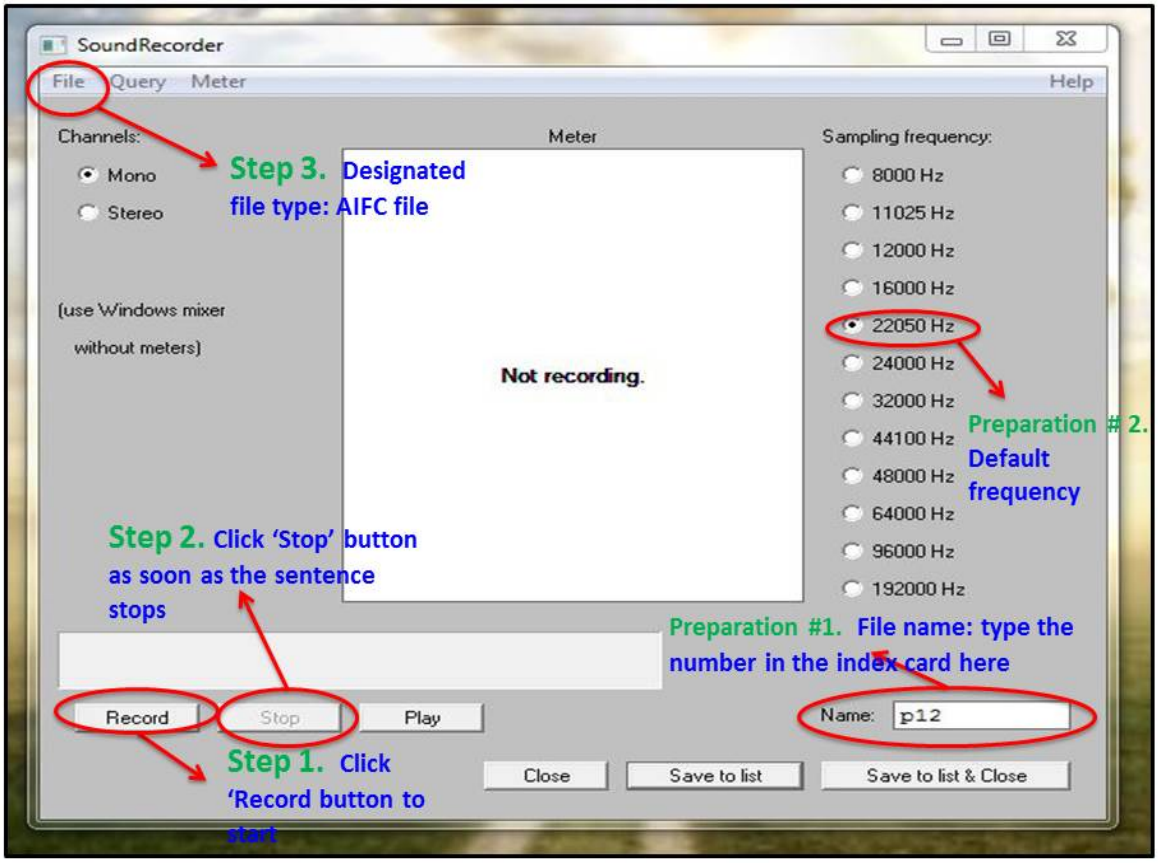
The speaking task will last approximately fifteen minutes. After the speaking task, you will be asked questions by an interviewer.

Recording instructions

1. Put the file name (one letter with two numbers) in the index card in the Name box on the Sound Recorder window (**see Preparation #1 in the picture below**).

File name: N11 ← put this in Preparation #1 box
She is ANGRY
positive tone ← Intonation
#2 ← Sentence number

2. Check the default Hz. It should be set to 22050Hz (**see Preparation #2**).
3. Silently read the sentence and the instruction for tone in the card.
4. When you are ready to speak, click the 'Record' button to start (**see Step 1**)
5. Immediately speak the sentence once you click the 'Record' button.
6. Click the 'Stop' button as soon as you finish speaking the sentence (**see Step 2**)
7. Save the file in the designated folder (**see Step 3**)



APPENDIX 8: SAMPLE SIZE CALCULATION

1. The emotion word survey

```
power.t.test(delta=0.58,sd=sqrt(2)*1,power=.8,sig.level=0.05,alter="one.sided",
type="paired")

     Paired t test power calculation

              n = 38.14704
          delta = 0.58
             sd = 1.414214
      sig.level = 0.05
          power = 0.8
    alternative = one.sided

NOTE: n is number of *pairs*, sd is std.dev. of *differences* within pairs
```

2. The production task

```
power.t.test(delta=0.79,sd=sqrt(2)*1,power=.9,sig.level=0.01,alter="one.sided",
type="paired")

     Paired t test power calculation

              n = 44.47048
          delta = 0.79
             sd = 1.414214
      sig.level = 0.01
          power = 0.9
    alternative = one.sided

NOTE: n is number of *pairs*, sd is std.dev. of *differences* within pairs
```

3. The perception task

```
power.t.test(delta=0.75,sd=sqrt(2)*1,power=.9,sig.level=0.01,alter="one.sided",
type="paired")

     Paired t test power calculation

              n = 49.03409
          delta = 0.75
             sd = 1.414214
      sig.level = 0.01
          power = 0.9
    alternative = one.sided

NOTE: n is number of *pairs*, sd is std.dev. of *differences* within pairs
```

APPENDIX 9: STIMULATED RECALL INTERVIEW VERBAL INSTRUCTION

Stimulated Recall Task

Verbal Instruction Script

Now, you are going to listen to your own voice. We call this task, 'a stimulated recall task', so basically you are trying to recall how you felt or what you were thinking when you spoke each sentence. You are NOT answering how does it sound to you now.

Does it make sense?

If you don't have anything to say, you do not have to make up things for the answer. And if you want to stop the interview for any reasons, you can stop it anytime.
For the interview, you are going to use the same recording procedure. After listening to each sentence, click the 'Record' button on the screen when you are ready to answer. And click 'Stop' button when you are done with it. The answer does not have to be long, but you can take as much as you want for answering each question.

Do you have any questions?

If you don't have any questions, please let me know when you are ready.

APPENDIX 10: THE PERCEPTION TASK ANSWER SHEET

Name:

Instruction: All speakers in this task are talking about this 'She' person. Listen to each sentence and :

1) Circle your answer about the intonation
2) Write a brief description on how the intonation of the speakers sounds to you.

Ex)

	She is terrific	Matching /Not matching	e.g.) fake, mean, happy, kind, unnatural, neutral, weird, sarcastic, I don't know, etc..

Answer

	Sentence	Intonation	How does this sentence sound to you?
1	She is lively	Matching /Not matching	
2	She is lucky	Matching /Not matching	
3	She is cruel	Matching /Not matching	
4	She is passionate	Matching /Not matching	
5	She is brave	Matching /Not matching	
6	She is passionate	Matching /Not matching	
7	She is happy	Matching /Not matching	
8	She is lonely	Matching /Not matching	
9	She is lively	Matching /Not matching	
10	She is useless	Matching /Not matching	
11	She is angry	Matching /Not matching	
12	She is lonely	Matching /Not matching	

13	She is cruel	Matching /Not matching	
14	She is humiliated	Matching /Not matching	
15	She is brave	Matching /Not matching	
16	She is miserable	Matching /Not matching	
17	She is confident	Matching /Not matching	
18	She is humiliated	Matching /Not matching	
19	She is angry	Matching /Not matching	
20	She is lucky	Matching /Not matching	
21	She is happy	Matching /Not matching	
22	She is confident	Matching /Not matching	
23	She is miserable	Matching /Not matching	
24	She is useless	Matching /Not matching	

If there is anything that you feel is interesting about doing this listening task, please comment here.

Thank you very much for your participation.

APPENDIX 11: ToBi TRANSCRIPTION CONVENTIONS

The Tone Tier

Two types of tones are marked in the tonal tier: pitch events associated with intonational boundaries (phrasal tones) and pitch events associated with accented syllables (pitch accents). The basic tone levels are high (H) in the local pitch range versus low (L) in the local pitch range.

1. **Phrasal Tones**

   Phrasal tones will be assigned at every intermediate or intonation phrase:

   L- or H- phrase accent, which occurs at an intermediate phrase boundary (level 3 and above); note that this represents a return to the notation in Pierrehumbert (1980)

   L% or H% (final) boundary tone, which occurs at every full intonation phrase boundary (level 4)

   %H high initial boundary tone; marks a phrase that begins relatively high in the speaker's pitch range. Transcribers should use %H only when a high pitch at the beginning of an utterance cannot be attributed to a H accent (H* or H+!H*) on the first or second syllable in the utterance

   L- L% for a full intonation phrase with a L phrase accent ending its final intermediate phrase and a L% boundary tone falling to a point low in the speaker's range, as in the standard `declarative' contour of American English.

   L- H% for a full intonation phrase with a L phrase accent closing the last intermediate phrase, followed by a H boundary tone, as in `continuation rise'.

   H- H% for an intonation phrase with a final intermediate phrase ending in a H phrase accent and a subsequent H boundary tone, as in the canonical `yes-no question' contour. Note that the H- phrase accent causes `upstep' on the following boundary tone, so that the H% after a H- rises to a very high value.

   H- L% for an intonation phrase in which the H phrase accent of the final intermediate phrase upsteps the L% to a value in the middle of the speaker's range, producing a final level `plateau'.

2. Pitch Accents

H* `peak accent' -- an apparent tone target on the accented syllable which is in the upper part of the speaker's pitch range for the phrase. This includes tones in the middle of the pitch range, but precludes very low F0 targets. [Corresponds to H* and H*+L in Pierrehumbert's six-accent inventory.]

L* `low accent' -- an apparent tone target on the accented syllable which is in the lowest part of the speaker's pitch range.

L*+H `scooped accent' -- a low tone target on the accented syllable which is immediately followed by relatively sharp rise to a peak in the upper part of the speaker's pitch range.

L+H* `rising peak accent' -- a high peak target on the accented syllable which is immediately preceded by relatively sharp rise from a valley in the lowest part of the speaker's pitch range.

H+!H* a clear step down onto the accented syllable from a high pitch which itself cannot be accounted for by a H phrasal tone ending the preceding phrase or by a preceding H pitch accent in the same phrase; should only be used when the preceding material is clearly high-pitched and unaccented. (Otherwise the accent is a simple !H*.)