

AMERICAN UNIVERSITY OF BEIRUT

EXPLORATORY ANALYSIS OF THE PROSODIC  
FEATURES IN THE PRODUCTION OF COMMUNICATIVE  
INTENTIONS IN LEBANESE ADULTS AND CHILDREN

by  
MIA MOHAMAD EL HOURY

A thesis  
submitted in partial fulfillment of the requirements  
for the degree of Master of Arts  
to the Department of English  
of the Faculty of Arts and Sciences  
at the American University of Beirut

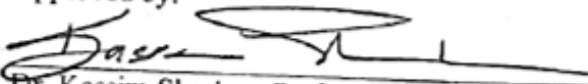
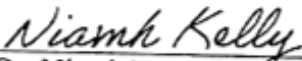
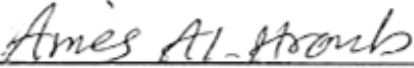

Beirut, Lebanon  
August 2022

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## ACKNOWLEDGEMENTS

Along the way to completing this thesis, I have been motivated, supported and sometimes, pushed a little, by too many people to mention here. To all those who have helped me get to this point, I would like to convey a sincere and heartfelt thank you.

I would like to thank Dr. Niamh Kelly who made this work possible. Her endless support, guidance, advice and care have carried me through all the stages of writing my thesis. I would also like to thank my advisor Dr. Kassim Shaaban and my committee members Dr. Anies AlHroub and Dr. Lina Choueiri, for the helpful comments and suggestions they have given.

To my Dad and my Mom, without you I would not be where I am today.  
To my husband Ali, words fail to express how grateful I am to have you, my partner through thick and thin.

To my little angel in heaven, for watching over me and teaching me the true meaning of strength and resilience. And finally, to my rainbow baby girl, I hope your mama always makes you proud.

ABSTRACT  
OF THE THESIS OF

Mia Mohamad El Houry      for      Master of Arts  
Major: English Language

Title: Exploratory Analysis of the Prosodic Features in the Production of Communicative Intentions in Lebanese Adults and Children

In interpersonal communication, the speaker is always trying to convey an intention. Recent studies have highlighted the importance of prosody and the role it plays in the way communicative intentions are conveyed (Papafragou, 2018; Hellbernd & Sammler, 2016); particularly because prosody facilitates the comprehension of utterances. The main goal of communication lies in the intentions that are normally identified by interlocutors and influence how they react to speakers. Listeners infer these intentions based on the assumption that speakers are abiding by the rules or maxims that govern a collaborative exchange of information. The current study is motivated by the lack of data on prosody and intention recognition in Arabic speaking adults and children, particularly native speakers of Lebanese Arabic. The current study is a controlled experiment aimed at exploring the general patterns in how Lebanese adults (18 to 60-year-olds) and children (6 to 15-year-olds), whose L1 is Lebanese Arabic, produce isolated words while conveying three different intentions: criticism, warning and wish. Results revealed that adults and children produce the three intentions similarly and share similar prosodic patterns.

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# CHAPTER I

## INTRODUCTION

Human speech, in addition to being the major tool of oral communication, provides a glimpse into another person's mind, emotions and attitudes, among other things. In any social interaction, the way we sound when we talk, shout, sing, laugh, cry and even sigh provides much valuable information to the listener (Brück, Kreifelts, & Wildgruber, 2011). The ability of the listener to decode what the speaker is saying and to go beyond the actual meaning of what is being said was considered by Papafragou (2018) to be the foundation of human communication. Hellbernd and Sammler (2016) termed this the “why” of a conversation, otherwise known as the communicative intention of the speaker. Usually, during any interpersonal communication, the speaker tries to convey an intention (Ben Mocha & Burkart, 2021). How such an intention is interpreted is not yet fully understood, and such a gap needs to be filled in order for linguists, philosophers and psychologists to better understand the mechanisms of human communication.

Pragmatics theories suggest that listeners take into account all relevant and significant clues when trying to decode speakers' communicative goal (Ladd, 2008). Particularly, they rely on pragmatic inference which takes into consideration the context in which the conversation is taking place as well as the common ground between speakers and listeners (Hellbernd & Sammler, 2016; Tanenhaus et al., 2015). Recent studies have also highlighted the importance of prosody in facilitating the comprehension of utterances as well as its importance in the way communicative intentions are conveyed (Papafragou, 2018; Hellbernd & Sammler, 2016). Prosody consists of linguistic and paralinguistic cues that are global properties of speech signals

(Ladd, 2008) such as “variations in pitch, loudness, timing or voice quality of an utterance” (Hellbernd & Sammler, 2016, p. 71). These cues, which are essential components of the rhythm of the language, are involved in conveying paralinguistic messages and can modify the communicative content of a message (Hellbernd & Sammler, 2016; Ladd, 2008).

The prosodic realization of a particular utterance can enrich, modify and in some instances, completely change its semantic context. According to Vlčková-Mejvaldová (2006), prosody is capable of being the only conveyor of meaning of a lexical unit. Most research done on the development of prosodic patterns and intention production is mostly Western-centered (Esteve-Gibert & Prieto, 2013; Hellbernd & Sammler, 2016). Thus, more research is needed to investigate the development of prosodic patterns in intention production in children and adults whose native language is not a European language.

The following thesis is an exploratory analysis aimed at investigating prosody in the context of Lebanon, particularly prosody and the production in colloquial Lebanese Arabic of three different communicative intentions– criticism, warning and wish - in adults and children who are ESL (English as a second language) or FSL (French as a second language) speakers and whose L1 is Lebanese Arabic. The available data in the literature has shown that children have higher  $f_0$  ranges than adults and more variability in their production contours (Saindon, et al., 2017). Additionally, according to Ruytenbeek (2021), negative state remarks, such as those expressing discontent, anger, and criticism have higher  $f_0$  and have a rising  $f_0$  contour or as he stated it a “late pitch peak” (p.138). Busso (2009) also found that  $f_0$  contours falls towards the end of the

sentence: he describes it as pitch declination that happen particularly in emotions like boredom and wish.

Thus, the proposed exploratory analysis was motivated by the lack of data on intentions produced in colloquial Lebanese Arabic for both adults and children. The goal was to explore if production of intention in speakers of colloquial Lebanese Arabic is similar or different to that found in the literature of western languages. The following hypotheses were investigated:

- 1) Children have higher f0 ranges than adults and have more variability in their contours,
- 2) Criticism and warning, produced in colloquial Lebanese Arabic, have higher mean f0 and have a rising f0 contour because they are considered negative state remarks,
- 3) Wish, produced in colloquial Lebanese Arabic, has lower mean f0, lower f0 range, a falling contour and longer word duration for both adult and children,
- 4) There is an effect of gender for adults on mean f0: males have lower mean f0 than females for the three different intentions.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### **A. Introduction**

On a daily basis, we experience events that demonstrate how some emotions are associated with certain voice characteristics and vocal patterns. For example, if someone calls us from a distance, we can infer from the sound of their voice whether or not they are happy to see us, surprised that we are there or angry at us. Speakers' voices may sound soft when calm or in love, loud or harsh when angry or might tremble when upset or nervous. Many researchers (Brück, Kreifelts, & Wildgruber, 2011; Johnstone & Scherer, 2000; Scherer, Johnstone & Klasmeyer, 2003) claimed that the human voice has specific acoustic patterns that may show a distinction between different types of emotions.

This study aims to examine the relationship between age, gender as well as distinctive prosodic features associated with the production of three intentions in speakers of Lebanese Arabic using a production experiment. The literature review describes studies related to emotional expression from facial expressions to vocal expressions and highlights how certain patterns of acoustic cues are now being used to identify different affective states (Brück, Kreifelts & Wildgruber, 2011).

#### **B. Prosody and Emotion Expression**

##### ***1. Prosody***

The articulatory system is basically the same for speakers of different languages and contrastive features of all the languages are largely based on the same universal set of phonetic and phonological material (Féry, 2017). Therefore, the same variations of the fundamental frequency (labeled 'f0' and is the frequency at which our vocal folds

vibrate in voiced sounds) are seen across speakers with slight changes due to the difference in every person's physiology. The major difference pertains to the conventions of linguistic prosody which vary across different languages and contribute to the different melodies and rhythms of speech (Belyk & Brown, 2014). When a speaker says a word, like 'cool', many features are involved in that simple utterance. For instance, this word could be said in a soft way or a loud way, with a pitch pattern that starts low and ends high or vice versa, it could be said with a voice quality that is either particularly breathy or particularly creaky (Cruttenden, 1997). The way a word is uttered is also affected by psychological and physiological factors such as different emotions, stress, strain, and illness. These variations in pitch (falling or rising) are called 'intonation' and are used by the speaker to give shape to utterances (Gussenhoven, 2004). Intonation is part of prosody alongside rhythm and stress. Cutler, Dahan and Van Donselaar (1997) claimed that prosody is "an intrinsic determinant of the form of spoken language" (p.141). When listeners hear an utterance, they process variations that are prosodically determined. Thus, the prosodic structure of this utterance affects the duration, the amplitude and the fundamental frequency. Prosody has many definitions and is used in different ways and within the field of Linguistics: some researchers believe that prosody is "the structure that organizes sound" (Fujisaki, 1997), others view prosody as a synonym for suprasegmental features consisting of "pitch, tempo, loudness, and pause" (Cutler et al., 1997; Féry, 2017).

Prosody is how linguistic units that form an utterance are systematically organized during the speech production process (Fujisaki, 1997). Specifically, on the perceptual level, prosody consists of the melodic and rhythmic aspects of speech



(Nooteboom, 1997) that play a role in conveying linguistic, paralinguistic, and non-linguistic information (Belyk & Brown, 2014; Fujisaki, 1997).

## **2. *Intonation***

The terms prosody and intonation are sometimes mixed and used interchangeably because they are under the umbrella of ‘suprasegmental phonology’ which also includes “tonal structure, pitch accents, phonological boundaries, duration, and intensity” (Féry, 2017, p.4). However, prosody is a broader term that encompasses rhythm and duration, while intonation is purely variation in the pitch of an utterance (fundamental frequency). Intonation plays a very important role in speech production and perception (Gussenhoven, 2004). Different intonation patterns convey different attitudes and emotions and signal different grammatical information by distinguishing between the different types of sentences and questions. Additionally, intonation has an undeniable structural linguistic function (El Zarka, 2017): it plays a role in structuring the information conveyed by the speaker by focusing attention on important elements of the spoken message (known as ‘accentuation’ which involves making some parts of the speech more prominent than others). This is done to facilitate cognitive processing of the listener which helps regulate conversational interactions (Nordquist, 2020; El Zarka, 2017).

Intonation is also involved in signaling different accents: different pitch contours as well as other suprasegmental features particularly duration, intensity, and rhythm are what distinguish different accents from one another (El Zarka, 2017). The rhythm of the Arabic language is assumed to be stressed-governed. Chahal and Hellmuth (2014) used the terms ‘stress’ to denote prominence at the word level and ‘accent’ to indicate a

“stressed word that bears an intonational pitch accent” (p. 2). A few researchers have looked at intonation in Arabic. Hellmuth (2006) looked at intonation in Egyptian Arabic (EA) and found that there is an intonational pitch movement ‘pitch accent’ in EA that is associated with almost every content word. De Jong and Zawaydeh (1999) examined vowel qualities, durations and f0 patterns of speakers of Jordanian. However, little has been done on Lebanese Arabic intonation: the only available work has been done by Chahal (2001) and by Chahal and Hellmuth (2014) in which the focus was mainly on the intonation of the Tripoli dialect. Thus, this sets up the current research interest related to prosody and its relation to the production of intentions in speakers of Lebanese Arabic.

### ***3. Expression of Emotion and Pitch Contours***

The expression of emotions in humans and animals have been scientifically studied since Darwin first wrote about it in 1872 (Bryant, 2020). Darwin inspired many researchers to look at how emotions can be detected through facial expressions (Ekman, 2009). Results of these research revealed the existence of innate systems of emotional responses common to all human beings. Facial expressions of different emotions are recognized universally across different cultures, age, gender or ethnicity (Scherer et al., 2019). Compared to the facial expression of emotions, little attention has been given to the vocal expression of emotions. This is unfortunate because a person’s way of speaking is influenced by the emotions they are feeling (Paeschke et al., 1999). Only a small, though growing, number of studies, have attempted to identify the presence of distinctive vocal features related to specific emotions that listeners use when inferring an expressed emotion (Johnstone, 2017; Bryant, 2020). However,

acoustic analyses of the recorded speech that were used by most of these studies were very simple and have resulted in the failure to discover vocal patterns that were specific to the emotions they were targeting. Additionally, many of those studies obtained contradictory results due to large variety of emotions they were trying to investigate at once as well as different methodological strategies (Paeschke et al., 1999).

Recently, sophisticated analysis techniques have been used and met with more success (Frühholz & Belin, 2018; Johnstone, 2017; Kamiloğlu, Fischer & Sauter, 2020). Vocal emotions were defined by Bryant (2021) as “modulation of acoustic properties of vocalizations associated with affective communication” (p.25). These include non-linguistic emotional utterances such as laughing and crying, as well as affective prosody like voice quality, pitch, loudness, and speech rate, which interact with verbal content in speech. Up to the late 1990s, studies on emotional vocal expression concluded that there are differences in the acoustical patterns across different emotions; however, these differences seem to indicate only one dimension of physiological arousal (Johnstone & Scherer, 2000; Scherer, Banse & Wallbott, 2001; Kamiloğlu, Fischer & Sauter, 2020). Consequently, emotions that have a negative valence like boredom and sadness were characterized by a low  $f_0$  and low intensity, whereas emotions that have positive valence such as joy, anger, and fear were expressed with a raised  $f_0$  and high intensity (Johnstone, 2017).

Research has shown that  $f_0$  contours are capable of conveying information about a certain emotional state (Busso, et al., 2009; Ruytenbeek, 2021). Recordings of sad or bored utterances (little excitation) have been found to have a lower pitch (Juslin & Laukka, 2003; Paeschke, et al., 1999). Contrarily, recordings of happy, fearful, wishful and angry utterances (high excitation) were found to have a higher pitch level, a wider

pitch range and more variability in their contours (Busso, et al. 2009; Paeschke, et al., 1999). Paeschke, Kienast and Sendlmeier (1999) looked at how different prosodic features, particularly f0 contours, can be used to distinguish between basic emotions such as happiness, sadness, fear, anger, disgust and boredom. They measured additional features such as mean f0 and f0 range. Results of their experiment confirmed a connection between mean f0 and emotional content. Sadness and boredom had a lower mean f0, less variation in f0 contour; while disgust, anger, fear and happiness had higher mean f0 (stated in order, from least to highest increasing mean f0), greater fluctuation of f0 range as well as a more variation in the f0 contours. They also found that fear was associated with a falling f0 contour, sadness and boredom had rising f0 contours, and happiness, disgust and anger had more occurrences of rise-fall f0 contours. Findings of Paeschke et al. (1999) were also supported by Juslin and Laukka (2003) and Scherer (2003) and Bänziger and Scherer (2005). They found that certain emotions influence f0 levels, mean f0, f0 range, intensity and the relative duration of speech segments.

Even though emotions do not necessarily need another person to be displayed (Hellbernd & Sammler, 2016), they are still closely related to communicative intentions in the sense that they are both actions. Both emotions and intentions do something (emotions do not always result from something) and they both accomplish a certain goal by adhering to constitutive rules (Spackman, 2002). Therefore, just like emotions, uttering a statement while trying to convey a certain intention also affects f0 levels, mean f0 and f0 contours.

### **C. Speech Act Theory and Intention**

Any utterance that is being communicated might go beyond its actual meaning in many ways. Speakers are able to, without speaking indirectly, figuratively and without even using ambiguous expressions, mean something completely different from what they said without making it explicit (Bach, 1994). This is where looking at the underlying intention of the utterance being communicated is important. The two theories that attempt to explain the way intentions are interpreted are the Speech Act theory and pragma-linguistic theories. Speech acts were defined as “the action performed by language to modify the state of the object on which the action is performed” (Cicognani & Maher, 1997, p.2). Speech acts express the following: the communicative intention of a speaker, the different ways these communicative intentions are expressed and the relevance of the communicative intention to the topic that is being discussed (Hidayat, 2016). Austin (1975) provided methods for examining the effect and force of an utterance thereby paving the way for the analysis of language. According to him, there are two types of statements in speech acts: constatives and performatives. Constative statements could either be descriptive or could state something that is true or false (Bach, 1975). Contrarily, a statement is performative when nothing is being stated or described, rather when an act is being performed. Performatives were divided into three categories: the first category pertains to locutionary speech acts which are utterances in which something meaningful is being stated. An example of this could be “The box is heavy” which is a statement describing the actual condition of the box. The second category is the illocutionary act which is basically the speaker’s intention: in other words, it entails the specific purpose that the speaker has in mind (Azimova, 2021). The same example “The box is heavy” can be illocutionary when its underlying intention is a request to help lift the box up. Finally,

the third category is then a perlocutionary act which is when an utterance said by a speaker, under specific circumstances, causes an effect on the thoughts or actions of the listener. When the statement “The box is heavy” is uttered while the speaker is lifting the box, it is considered a perlocutionary act. Thus, according to Speech Act Theory, the intention the speaker is trying to communicate when they utter and utterance is considered an illocutionary act.

“Communication is a process in which intention is formed, expressed, and interpreted” (Kecskes, 2019, p.117). “Functionality” is what makes intention an essential element of communication: there is always an underlying function, reason, or goal behind the utterance. Thus, without intention, there would not be any need to communicate. According to Searle (1983), intentions are prerequisites to communication alongside perception, desire and belief. Intentions are dynamic and constantly changing: they are the main organizing force, alongside attention, in the process of communication (Kecskes, 2019). Even though an intention is individual, private, and, in some instances, pre-planned, the fact that it is considered an antecedent to action makes it also emergent and a social action (Searle, 1983). When speakers start a conversation, their intention is private and pre-planned because its heard in their minds. As the conversation progresses, the emergent and social aspects of intention emerge: speakers’ intentions are generated and expressed throughout the conversation. From the perspective of the listeners, speakers’ intentions are either processed at the same time with the utterances or after the utterances have been said. In particular situations, the function of an intention is to guide a conversation. This is where the emergent aspect of intention comes in: it is co-constructed by the listeners and speakers in the “dynamic-flow” of conversations (Kecskes, 2019, p.118).

## **D. Pragmatics**

### ***1. Pragmatic Theories***

Pragmatics has been considered the fourth component of language, with syntax, semantics, and phonology (Skarakis-Doyle & Mentis, 1991). According to Rondal et al. (1999), language is not only based on grasping structural aspects such as lexical, syntactic, and so on, but it also consists of the proper usage during communication (Gentilleau-Lambin, et al., 2019). These are ‘pragmatic abilities’ that gradually develop and evolve throughout a person’s life and are affected by their unique experiences (Coquet, 2005). In the process of acquiring language, children use pragmatic information from their environment and use it to communicate with others and express their intentions (Clark & Amara, 2010). Pragmatics refer to the communicated meanings that are contextually derived: they are viewed as a way to recognize intentions by “inferentially reconstructing the meaning the speaker had in mind and wanted to convey, beyond the literal meaning of an utterance” (Papafragou, 2018, p.167). There are many pragmatic theories that are currently being cited in the literature. Some are based on the theoretical framework set forth by Grice, others are intention-based and a few of them are driven by the existence of a cooperation between the speaker and listener (Kecskes, 2014).

One of the most influential theories of pragmatics was set forth by Grice (1975). Grice claimed that there is a collaborative effort in every communication. Such an effort is governed by “maxims” (specific rules). In a collaborative exchange of communication, speakers are expected to follow the Maxim of Quantity, which is to be as informative as possible; the Maxim of Quantity, which is to be truthful in the

information they are trying to convey; and the Maxim of Relation and Maxim of Manner in which the information being conveyed should be clear and relevant to the exchange. On the other hand, the listener in that exchange is expected to infer the intentions of the speaker who is being cooperative and abiding by the maxims (Grigoroglou & Papafragou, 2017). Grice (1975) also suggested that speakers must clearly state evidence of their intention in order to persuade the listener. However, the sociocultural interactional approach (discussed below) criticized this perspective asserting its failure to incorporate instances of meanings that can be unintentionally communicated. Grice also disregarded the fact that listeners can figure out meanings without taking into account the speakers' intentions (Kecskes, 2019). Speakers might also intentionally keep their intention covert and communicate something else to listeners as in the case of lying or deceit (Dynel, 2011).

Other pragmatic theories, also intention-based and driven by a cooperation between the speaker and listener, consider that the purpose of communication is "recipient design and intention recognition" (Kecskes, 2019, p.113). According to the Relevance Theory (RT) developed by Sperber and Wilson (1986), both speakers and listeners build a model of each other's knowledge relevant to the context of the situation they are in which creates a link between the structure of the intention of the speaker and the structure of the intention of the listener whereby enabling the coordinating role of intentions (Taillard, 2002). This coordinating role of intention is built around the fact that there are two levels of intentions: informative and communicative. In the informative level, the speaker is trying to inform the listener of something. On the communicative level, the listener has to correctly recognize the informative intention of the speaker to consider that the communication was successful. Additionally, the notion



of 'relevance' entails a trade-off between cognitive effects and processing effort: the input become more relevant as the ratio of effects to effort increases. Thus, this notion claims that we are constantly trying to maximize relevance: we seek to get the most out of cognitive outcomes with the least amount of processing work possible. As a result of this pressure in selection to increase cognitive efficiency, we have developed processes to identify potentially pertinent inputs and process them in the most cost-effective manner (Sperber & Wilson, 2000).

This cognitive drive for relevance is used in all communication, but particularly in language communication. Sperber and Wilson (2000) claimed that an utterance evokes particular expectations of relevance in its addressee, including expectations about the results it will produce and the mental effort it will require. A basic assumption about an utterance's optimal relevance is that it is the most relevant thing the speaker could have said while taking into consideration the speaker's preferences and abilities, and that it is, at a minimum, relevant enough to warrant processing. The fact that utterances carry this presumption drives a specific comprehension procedure, which, in an effective communication, narrow down the number of possible interpretations to only one. In essence, it allows a hearer to explore interpretations in order of their accessibility (i.e., to take the path that requires the least amount of effort) and to stop as soon as he finds one interpretation that meets his expectation of relevance.

There are two pragmatic theories also worth mentioning: the cognitive-philosophical approach and the sociocultural interactional approach to pragmatics. The cognitive-philosophical approach to pragmatics claims that an intention is a mental state of the speaker which strengthens communication. However, the sociocultural interactional approach considered an intention to be a construct that is post-factum,

mutually achieved in the course of a dynamic conversation where sociocultural factors play the leading role (Kecskes, 2019).

The study of pragmatics in Arabic is not a recent development (Salih, 2010). The Arabic language has a significant number of expressions and verbs whose meanings can determine the possible illocutionary forces of an utterance (AlKhalifa, 2007). Within the frame of speech act theory, Arab scholars, such as Ibn Fares (1964) and Al Sakaki (1980) - who have contributed to the evolution and development of pragmatics - claimed that the concept of performatives and constatives was realized hundreds of years ago, while investigations of pragmatic meaning were considered an essential part of the general meaning (Salih, 2010). These investigations were driven by scholars' need to understand Qur'anic verses which are full of pragmatic utterances in which messages are expressed in forms that are not usually used for those purposes. For example, question – type utterances, which are normally used to ask for information, are used to warn people of misbehaviors and the consequences expected otherwise.

(يونس: ٩٩) ﴿وَلَوْ شَاءَ رَبُّكَ لَأَمَنَّ مِنَ فِي الْأَرْضِ كُلَّهُمْ جَمِيعًا ۖ أَفَأَنْتَ تُكْرِهُ النَّاسَ حَتَّىٰ يَكُونُوا مُؤْمِنِينَ﴾

“And had your Lord willed, those on earth would have believed - all of them entirely. Wilt thou then, [O Muhammad], compel mankind against their will, to believe? ” (The Holy Qur'an, 10:99). However, these linguistic issues were incorporated within the general theory of rhetoric.

## **2. Pragmatic Development**

In regards to pragmatic development, two questions have intrigued linguists, psychologists and cognitive scientists: How are pragmatics acquired? How do children learn to bridge the gap between what words and sentences mean semantically and the

intended meaning of the utterance? (Coquet, 2005). Researchers were also interested in finding out whether young children are able to reason about the intentions of others and how such an ability develops as children grow older (Papafragou, 2018). Recently, new experimental paradigms have led to major shifts in examining the way pragmatics develop. Developing pragmatic competence was found to rely on the use of intention recognition which facilitates the discovery of semantic meaning: the child consults the speaker's non-linguistic cues such as eye-gaze, gestures or mental state in order to derive the meaning of new words (Papafragou et al., 2007). However, this ability to make inferences remains fragile and somewhat task-dependent: when the task involves inferring the meaning indirectly, such as from figures of speech, infants and even older children face great difficulties in deriving meaning and understanding such utterances (Papafragou, 2018). This does not deny the fact that children are capable of “remarkable complex reasoning about the social world” (Grigoroglou & Papafragou, 2017, p. 3). And this ability starts as early as when they are infants: they become pragmatically competent when they are able to form the link between the meaning of words and sentences and what the intention behind what speakers are trying to communicate by uttering these words and sentences in certain contexts (Papafragou, 2018). As they grow up, they add to their repertoire the ‘when’ and ‘how’ to take up certain “elements of context pertinent to the interpretations of particular words” (Clark & Amara, 2010, p.445).

## **E. Communication of Intentions**

### ***1. Communicative Intentions in Adults***

Hellbernd and Sammler (2016) claimed that the main goal of communication lies in the intentions that should be identified by interlocutors and influence the way in which they react to speakers. They looked at both production and perception and conducted three experiments that provided results highlighting the different ways information about the communicative intentions of German speakers are conveyed by prosody. Their first experiment took into consideration the acoustics features that express six intentions: criticism, doubt, naming, suggestion, warning and wish. They analyzed duration, pitch rise, f0 and spectral features of participants' responses to short scenarios they had to read that conveyed different intentions. They focused particularly on two non-words (*Diem* and *Dahm*) and two words (*Bier* and *Bar*) and compared the responses of participants to those given by two voice coaches and two trained native German speakers. They found that participants accurately classified the correct intention for both non-words and words. Building on their first experiment which mostly involved production, the researchers focused on the perception of stimuli in their second experiment. They found that participants were able to accurately perceive and identify speech categories for both words and non-words. Participants were also able to correctly identify the communicative intention only using prosody as a cue. Interestingly, the speech intention 'criticism' was found to be confused with 'doubt', thereby making it the intention that was identified least reliably by the participants. This confusion was claimed to be caused by an overlap between these two conceptually related pragmatic categories as well as acoustic similarities (revealed in the multiple regression analysis) suggested that speakers' prosodic recognition of intention may be influenced by another variable: their emotions during the task.

These results were based on the ratings of each participants' emotions after the first two experiments. Thus, the third experiment built on the first two and participants were only asked to indicate the extent to which the stimuli they are presented with sounded like one of the given categories of the speech acts. This way allowed them to measure the extent to which intentions can be recognized when variable "emotion" was not taken into account because participants were not asked to rate their emotions. A multiple regression analysis confirmed a link between the acoustics and perception of speech act stimuli: speakers used clear configurations of prosodic features for the different intentions and listeners were motivated by prosodic features to search for the intended meanings in the utterance. Results also revealed that even though emotional connotations are important, they do not systematically influence the recognition of communicative intentions.

Prosody was shown to be a powerful communicative tool employed by listeners to decode "the unspoken meaning and intention of the speaker and that may determine their respective conversational reaction" (Hellbernd & Sammler, 2016, p.80). It was suggested that adult listeners face some challenges in relating prosody to certain intentions, especially because intentions vary with context and with the pitch contours that are constantly changing depending on the speakers' gender, age, social background, accent and the speech conditions in which the conversation is taking place (Tanenhaus, et al., 2015). Thus, the research done by Hellbernd and Sammler (2016) presents two great limitations. The first one pertains to the fact that their sample only consisted of female speakers. Earlier studies have found that female speakers are better than male speakers in decoding nonverbal language and the nature of this difference is yet to be known (Banziger et. al, 2011; Gulabovska & Leeson, 2014; Hall, 1978; Rosenthal et al.,

1979). The second limitation is that the researchers' have focused only on one age group: adults in their twenties. This brings us to the following question: How does intention recognition develop? And why are pitch contours that are constantly changing so developmentally important?

## ***2. Intentional Communication in Children***

Pitch contours are acquired before segments (Clark & Amara, 2010). Infants were found to use prosodic cues as a mean to express intentionality during the babbling stage (Esteve-Gibert & Prieto, 2013). Infants are able to demonstrate their ability to comprehend words, even when they are unable to produce them yet (Clark & Amara, 2010). They start by using gestures and their gaze to get the attention of others or to get an object. Esteve-Gibert and Prieto (2013) built on previous research (Trevvarthen, 1990; Papaeliou et al., 2002) in which vocalizations of infants (only exposed to English) and their babbling were found to express emotions in communications as well as intentionality. Their aim was to investigate if, and how, infants express intentionality using prosodic cues even before they are able to produce words. Their study involved recording the same Catalan infants at different ages 7, 9 and 11 months and analyzing their pitch contours, pitch ranges and duration in order to study how prosody develops vis-a-vis the emergence of communicative intention. This study was also the first to focus on the development of prosody in babbling children - who are exposed to a language other than English - while also taking into consideration pragmatics.

They gathered data from the same children over a period of 4 months, using the same materials and setting allowed the researcher to observe the development of communicative vocalizations. One aspect of this study that strengthened the data

collection and analysis procedure was the way in which the two types of vocalizations, communicative (when the child was interacting with an adult by either pointing or reaching the desired item, or engaging in eye-contact with the adult) and investigative (vocalizations that occurred while the child had an object in hand and was inspecting it or while s/he was completing a certain task), were operationally defined. This also led to higher inter-rater reliability scores. Their results also revealed that infants are able to communicate intentionally and express distinct pragmatic functions even before they are able to produce their first words.

As infants grow older, at the stage in which they start producing one-word utterances, their production is very similar to that of adults, in terms of the pitch contours used to express various pragmatic intentions (Esteve-Gibert & Prieto, 2013). However, children also start becoming aware of the different situations and contexts that are important to them, especially when trying to understand different communicative intentions. This awareness stems from the child's reliance on what they learn from others. By preschool years, children become better at distinguishing between speakers who are trustworthy and who are more likely to provide them with reliable information from those who are not (Harris, 2012; Koenig & Doebel, 2013). Mills (2013) mentioned that this is termed "selective trust". Mills also addressed another important concept by Sperber et al., (2010) namely that children learn during their preschool years and it is "epistemic vigilance" (p.404) which is the ability to focus on filtering out accurate information from misinformation.

Aiming to understand the role of prosody and context in how French-speaking children aged between 5 and 9 years understand expressive utterances, Aguert et al. (2010) conducted two experiments. Expressive utterances are speech acts that serve the

communicative function of expressing a psychological state related to oneself or others. These include statements such as *thank you*, *congratulations*, *condolences*, as well words that express joy, sorrow, praises or criticisms. The researchers' basic claim was that young children use situational context in order to understand language, especially when nonliteral language is involved (such as when they are faced with indirect requests, idioms, and sarcasm). Their goal was to find out if schoolchildren use prosody or situational contexts as cues to interpret expressive utterances. To achieve their goal, they asked the following questions: what happens if lexical content was removed and the only available cues were prosodic and situational ones? Would the bias in the children's understanding of expressive utterances persist?

A computer-based program was designed to examine the previous questions, in which verbal interactions between two characters were simulated. They simulated nearly natural situations that contained 12 stories about a duck and a rabbit engaging in everyday situations. The children were presented with pictures on a computer and they heard pre-recorded stories that varied according to different situational contexts and different prosody. Situational contexts were categorized into positive and negative: positive such as decorating a Christmas tree and negative such as getting lost at night in a forest. Children were asked to express how they feel in each of these situational contexts. The prosody part of the experiment involved the children hearing "pseudo-utterances" recorded by adults that were also categorized into positive and negative (situations in which the main character was feeling good versus situations in which the main character was feeling bad). The experiment also included ratings of 14 adults who were asked to hear the set of utterances from the situational contexts and then rate the



prosody of the pseudo-utterances on a Likert scale (0 being very negative and 5 being very positive).

Results showed that when 5 and 7-year-old children interpret speakers' intentions, they used situational context more than prosody when the utterances did not have lexical content. These results are different than those obtained with adults because adults always give more weight to prosody. Interestingly though, 9-year-olds were found to rely on both situational and prosodic cues equally. Yet, one of the limitations of the first experiment was that the researchers failed to eliminate prosodic cues from the situational context. So, it left the reader wondering if the 5 and 7-year-old children were unaware of prosody or were they able to perceive prosodic cues and simply ignored them? Their second experiment considered this factor and repeated the first experiment without a situational context. They found that 7 and 9-year-old children were both capable of inferring the speaker's intention based on negative and positive prosody. But, 5-year-olds can only interpret prosodic cues when they are negative (when one of the characters is feeling bad).

## CHAPTER III

### METHODS

#### **A. Rationale**

The current exploratory analysis examines the relationship between gender, age, as well as distinctive prosodic features associated with the production of three intentions. To test if children have higher f0 ranges than adults and have more variability in their contours; if the *criticism* and *warning* intentions, produced in colloquial Lebanese Arabic, have higher mean f0 and have a rising f0 contour because they are considered negative state remarks; if the *wish*, produced in colloquial Lebanese Arabic, has lower mean f0, lower f0 range, a falling contour and longer word duration for both adult and children; and if there is an effect of gender for adults on mean f0: males have lower mean f0 than females for the three different intentions, quantitative methods have been used to generate data. A production experiment was conducted aiming at exploring how adults (18 to 60-year-olds) and children (6 to 15-year-olds) whose L1 is Lebanese Arabic, produced three different intentions in colloquial Lebanese Arabic: criticism, warning and wish of three nonsense words in isolation. The data collected for adults and children were analyzed descriptively.

#### **B. Adult Production**

##### ***1. Participants***

Twenty-three adults were recruited for this category. The inclusion criteria were the following: aged between 18 and 60, native language is Lebanese Arabic, able to fluently read and speak Arabic. The exclusion criteria were if these individuals code-

switch on a daily basis, prefer to use an L2 in their daily life to express themselves, if they are unable to read Arabic or if they have any speech and/or hearing problems. Participants were recruited via posts on different social media platforms, such as Facebook, Twitter and Instagram as well as word of mouth. Upon agreeing to take part in the study, participants were asked to read and sign the informed consent and fill a short questionnaire about their personal information such as their age, gender and their L1 and L2 (if any) as well as their level of education. Participants who matched the inclusion criteria (done after checking their filled questionnaire) were included in the study. Participants whose answers to the questionnaire revealed that they use an L2 regularly and more often than their L1 were not recorded.

A total number of 23 participants participated in the analysis. However, after data collection, recordings of four participants had to be discarded: three were due to background noise that rendered the recording unanalyzable and one was because the recordings sent were incomplete. The questionnaire data revealed that participants who took part of this exploratory analysis were aged between 21 and 31 years. The distribution of participants - whose recordings were used in the analysis - across the different Lebanese areas was as follows: 37% of the participants are from Beirut, 32% from the South Governorate, 21% from Keserwan and 10% from Bekaa (figure1). When it came to education, 16 out of 19 participants (84%) had a university degree or higher and 3 participants (16%) have not completed their education yet, but are holders of high school diplomas. When it came to languages spoken, 7 out of 19 participants (37%) spoke Arabic, French and English; 10 out of 19 participants (53%) spoke Arabic and English; 2 out of 19 participants spoke Arabic and French (10%).

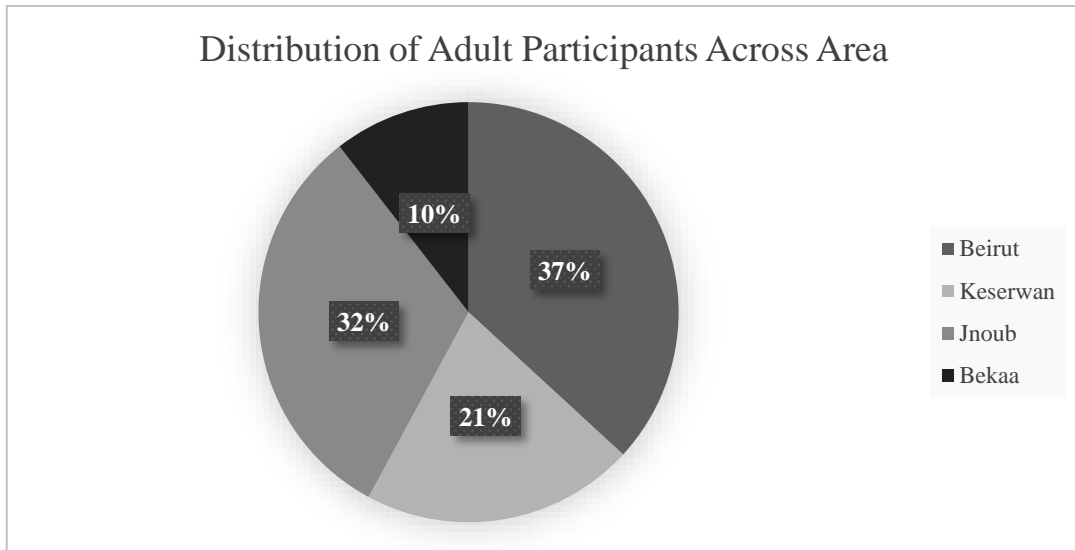


Figure 1: Pie Chart of The Distribution of Adult Participants Across the Different Areas of Lebanon

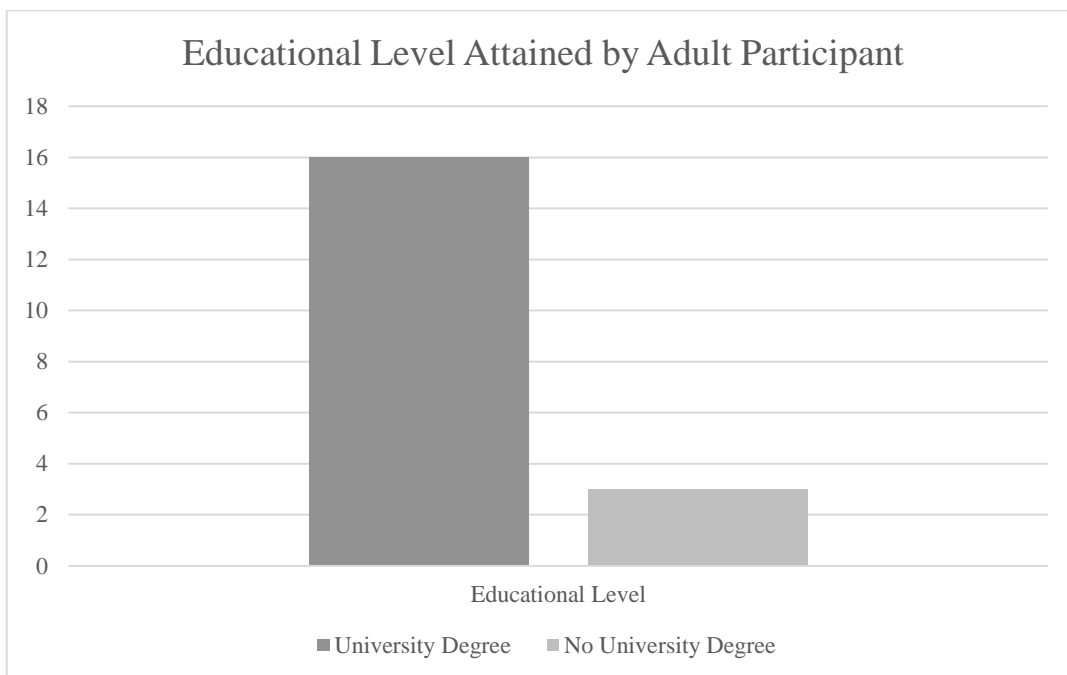


Figure 2: Bar Chart of the Educational Level of Adult Participants

## 2. Design and Procedure

Three statements for the criticism, warning and wish intentions were devised, and each statement included a nonsense word as the target word. Inspired by Hellbernd and Sammler (2016) as well as Aguert, et al., (2010), nonsense, monosyllabic words

were chosen specifically because they are easier to decode by children and are independent of the child's semantic comprehension of the word itself. These nonsense words are: wan, neem and roon. The structure of the monosyllabic nonsense words consist of a sonorant, a vowel and another sonorant. These words were also chosen after taking into consideration the issue of diglossia in Lebanon in which two vernaculars are present: Fus'ha, which is used in official documents and formal texts, and the Lebanese vernacular, used in daily interactions and conversations. After becoming familiar with the illustrations and statement, both adults and children were recorded in two conditions: reading the full statement while trying to convey the given intention and reading the target word in isolation. Participants were not informed that only the words in isolation were used for the analyses.

Below are the statements devised for each category. There were 3 categories, 3 statements and 3 nonsense words:

a. Criticism/enti2ad

انتقاد

- Rima halla2 ma fina nrouh njeeb el **wan** ريمة هلق ما فينا نروح نجيب ال - وان
- Jad, t2akhar el wa2et, ma feek tekol **neem** جاد، تأخر الوقت ما فيك تاكل نيم
- Sana khallaste kel el **roon** سنا خلصتي كل ال-رون

b. Wish/tamanne

تمني

- Lyom ktir 7abbe eshtere **wan** اليوم كتير حابي اشتري وان
- Ya ret fiye ekol **neem** يا ريت فيي اكل نيم
- 3abele eshrab kebbeyit **roon** عباله اشرب كبابيت رون

c. Warning/tenbeeh

تنبيه

- Sana 7a tekesre el **wan** سنا ح تكسري ال-وان
- Rima 7a twa23e el **roon** ريمة، ح توقعي ال-رون

- Jad 7a te7ro2 el **neem**

جاد، حتحرق الـنيم

A meeting was first held with each participant via Zoom, in which they were introduced to three characters: Sana, Jad, and Rima. Then, they were be presented with three illustrations of the nonsense word. Under each illustration, a written description of the nonsense word was given and they were asked to read the description (Figure 3).

For example, a *neem* is a dessert that consists of a brownie sandwich with ice-cream in the middle and cookies on top. ( نوع من الحلو ع شوكولا ب نص في بوظة وعليها في بسكوت من فوق.

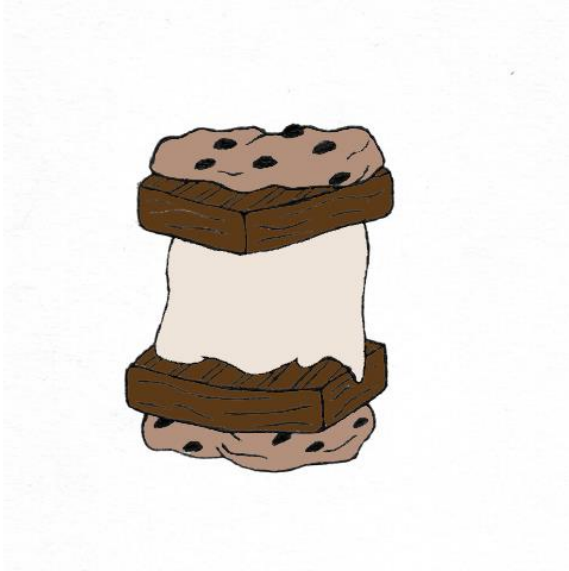


Figure 3: Example of the illustration and the caption for “neem”

Neem: No3 men el helo 3a chocolate bi nossa fi bouza w 3laya baskot mon fo2

نوع من الحلو ع شوكولا ب نص في بوظة وعليها في بسكوت من فوق

After getting familiar with the characters and the nonsense words, participants were then presented with 9 illustrations, under each a statement that they will be asked to read in Lebanese Arabic - written in both Arabic and Arabic in Latin Script (Arabizi, which is highly used on social media) - while matching the given intention (Figures 4 and 5).

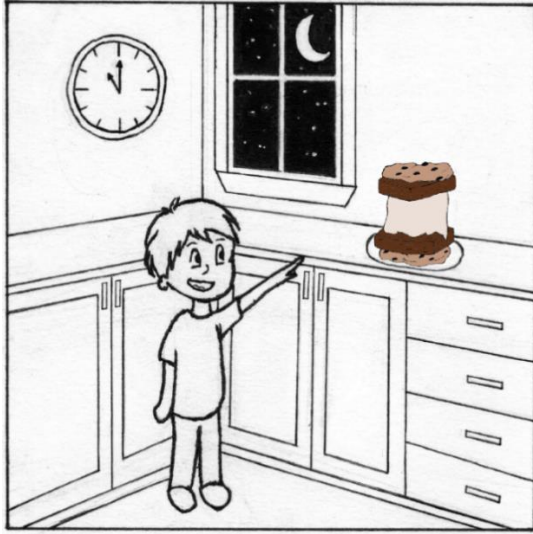


Figure 4: Example of an illustration from the category “criticism”:  
Jad t2akhar el wa2et, ma feek tekol **neem**  
جاء، تأخر الوقت ما فيك تاكل نيم

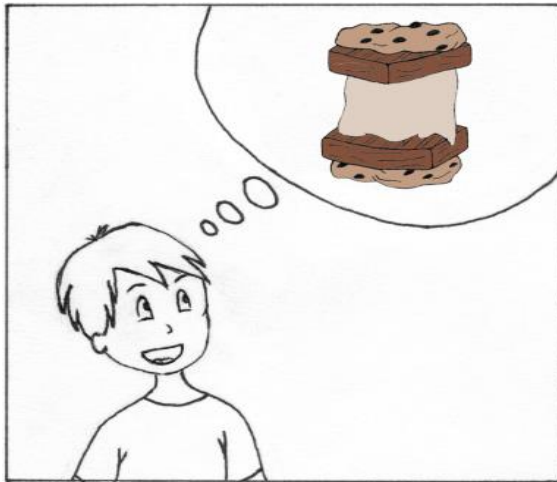


Figure 5: Example of the illustration for the category “wish”:  
Ya ret fiye ekol **neem**  
يا ريت فيي اكل نيم

In order to obtain stimuli that are representative of typical language use, participants, who were all non-actors, relied on their intuition to express the intention in a way that could be understood by an imaginary interlocutor. Participants were asked to imagine themselves as the speaker and read the statements before the start of the experiment and to practice if need be. They were asked to use any voice recording app

on their phones to record themselves saying the nonsense word in isolation while trying to convey the corresponding intention. The meeting with them ended and the recordings were sent via email or Whatsapp alongside the informed consent form and filled-in questionnaire. Given that this is not spontaneous speech, to check if participants were succeeding, recordings were compared to that of a professional actress who was recorded prior to the start of the experiments. Her recordings acted as a baseline data and guided the process of data measurement.

### ***3. Stimulus Recording***

Recordings of 57 words in isolation were analyzed – 3 tokens per speaker for 19 speakers - using the software Praat (Figure 6). Pitch range was set between 75 and 500 hertz for female speakers and between 50 and 300 hertz for male speakers because male speakers are known to have lower-pitched voices (Pépiot, 2014). After setting the pitch range, an analysis of the following acoustic features was made through Praat:

- a. duration of the target word measured in seconds,
- b. mean intensity of the target word in decibels (dB) obtained manually
- c. mean fundamental frequency (f0) in hertz (Hz) obtained manually
- d. f0 at onset and offset of the target word,
- e. f0 maximum and f0 minimum of the target word.

F0 in figure 3 is represented by the blue line on the spectrogram. F0 onset is the first blue point of the line and f0 offset is the last blue point. These two are important because they help in confirming whether the contour is rising or falling. F0 maximum is the highest blue point and f0 minimum is the lowest point of the curve. F0 maximum and minimum are useful in determining the f0 range.



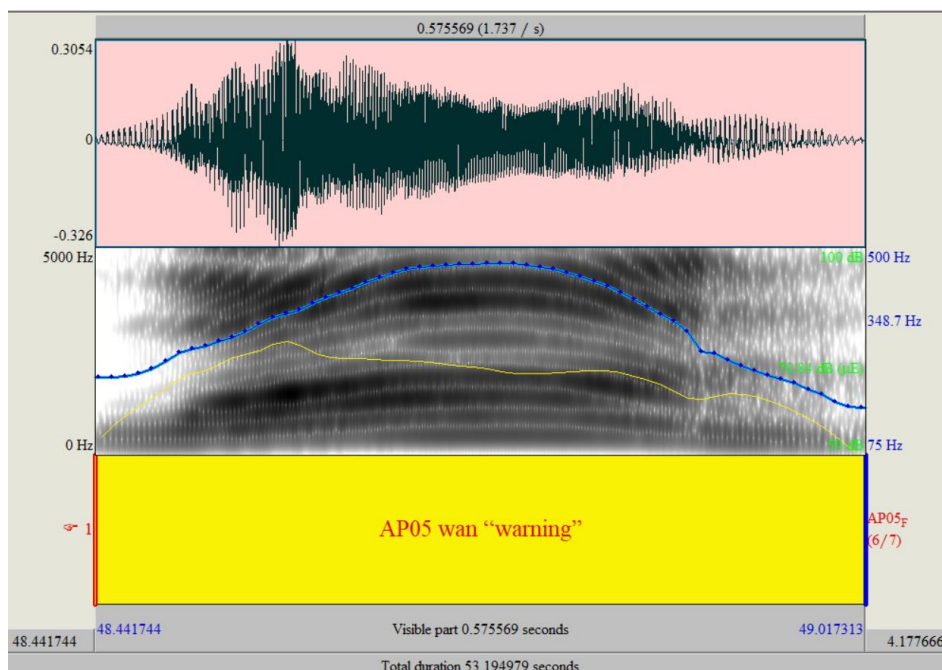


Figure 6: Spectrogram of the word wan in the "warning" category by adult speaker 5

An excel sheet was created and contained duration of the target word, mean intensity of the target word, mean f0, f0 range, f0 maximum and f0 minimum of the target word, as well as Peak delay, generally measured as the distance in time from f0 onset to the peak (f0 max) (Xu, 2001), calculated by using the following formula:

$$\text{Peak delay} = ((f0\text{maxtime} - \text{wordonsettime}) \times 1000) / (\text{wordduration}) \times 100$$

## C. Children's Production

### 1. Participants

Fifteen children, aged between 6 and 15 years were recruited. This age range was chosen based on the results of Aguert et al. (2010) and also chosen because most screening tools for pragmatic language impairment specifically target this age group (Gentilleau-Lambin et al. 2019). Children in that age range were all able to read and this facilitated the data collection procedure. The exclusion criteria, identified by asking the

children's parents to fill a questionnaire prior to starting the recording process, were the same as those for adults: if children code switch on a daily basis while communicating with parents, siblings and friends, if their parents use an L2 at home with them, if they are unable to read Arabic or if they have any developmental, speech and/or hearing problems.

The recordings of six participants had to be discarded due to background noise and the recordings of 9 participants were used for the analysis. The demographic distribution of children across areas of Lebanon was as follows: 5 out of 9 children were from the South Governorate (56%), 3 out of 9 children were from Beirut (33%), and 1 child was from Keserwan (11%). All the children that participated are enrolled in schools and all the parents of the children who participated are university graduates. The languages spoken by children and their parents were Arabic and French (4 out of 9) and Arabic and English (5 out of 9). All of the parents of the children who participated answered that they spoke colloquial Lebanese Arabic exclusively at home with their children.

## ***2. Design and Procedure***

Children were recruited through their caregivers who were recruited via word of mouth and through posts on social media platforms. A meeting was held with caregivers via zoom in which they were shown the parental consent form as well as the questionnaire that they had to fill on behalf of their children. Upon agreeing to allow their child/children to participate and filling the questionnaire, a meeting was held with the children in which the assent form was read to them. Caregivers recorded the responses of their children and sent them via email or Whatsapp. The data collection procedure was very similar to that of the adult production. Children were first

introduced to the characters, then they were presented with the illustrations of the nonsense word. The researcher went over the description of the nonsense words with them. Children were also asked to explain to the researcher what they think criticism (enti2ad), warning (tanbeeh/ta7zeer) and wish (tamanne) mean before the start of the data collection. Data of the children's responses to what they think each intention means was taken and the children who were not able to recognize any of these intentions were not recorded. Children were also allowed practice trials and were allowed to ask questions when they did not understand the instructions that were on the PowerPoint that contained the stimuli.

### ***3. Stimulus Recording***

A total of 27 tokens – 9 tokens per speaker - were analyzed using the software Praat (Figure 7). Pitch range was set between 150 and 750 hertz for children since they are known to have a high-pitched voice. After setting the pitch range, an analysis of the following acoustic features was made: target word duration and mean intensity, mean f0, f0 onset and offset as well as f0 maximum and minimum.

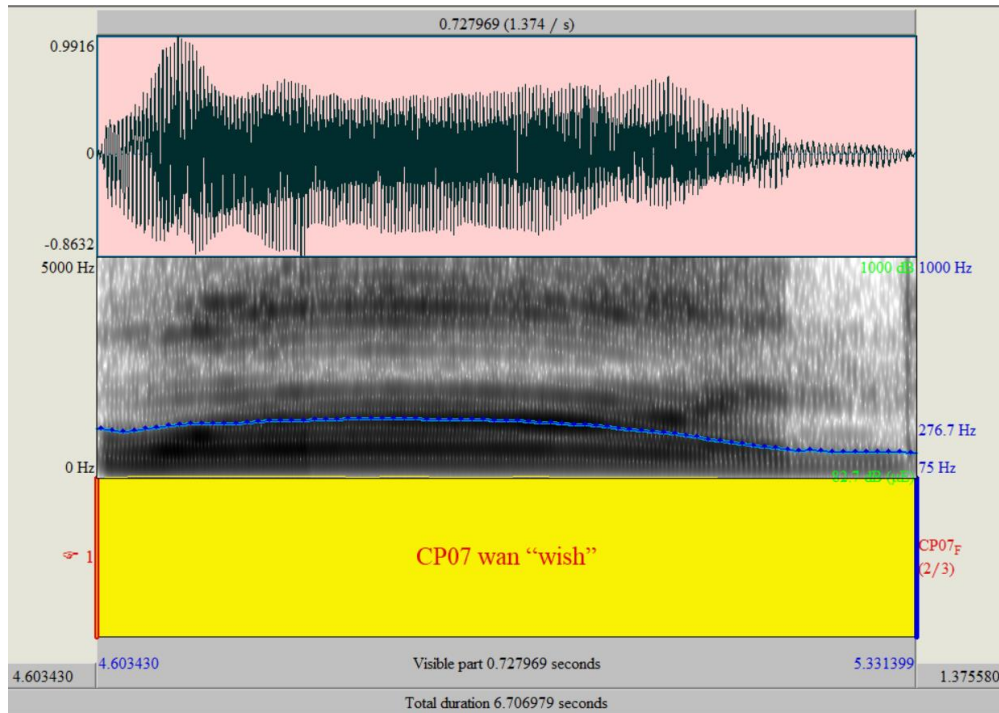


Figure 7: Spectrogram of the word wan in the "wish" category by child speaker 7

#### D. Exploratory Analysis

For the systematic analysis of the data, duration of the target word, mean intensity of the target word, mean f0, f0 range, f0 maximum and f0 minimum of the target word were first studied using the PRAAT tool. Sample descriptives were executed using frequencies and percentages for gender and mean and standard deviations for age. Then, a comparison of the patterns of the three intentions (*criticism*, *warning*, and *wish*) and word duration, word intensity, mean f0 and f0 range across the three nonsense words (*wan*, *neem*, and *roon*) that were produced in isolation, was first made. In addition, the patterns of intention on word duration, word intensity, mean f0, f0 range was studied for children and adults separately. Finally, the relation between intention and type of contour was studied for children and adults separately.

The association between intention and type of contour was examined. After the analysis was done, a comparison between children's and adults' production was made. The production of each intention category of adults was taken as the baseline of comparison. Each intention was looked at separately: the goal was to have a general idea if there are any similarities or differences in the ways adults and children produce the same categories even though the sample size for children is smaller. Additionally, a comparison of the contours for each intention was done for adults versus children.

### **E. Limitations**

As a result of the COVID-19 pandemic, face-to-face interactions were limited. This made it difficult to reach more participants. Even when various accommodations were made (such as no time limit, practice as much as needed...), many participants failed to send all the required recordings, sent recordings that were incomplete, or with a lot of background noise. Another limitation pertained to the quality of the audio recordings. Recordings had to be made via each participant or caregiver's phone and were sent via email which lowered the quality of the recordings. As a result, a total of 82% of recordings were used and 18% were discarded for adults, and a total of 60% of the recordings were used and 40% discarded for children. Because a high percentage of recordings was discarded for children, the comparison of patterns between adult and children was rendered un-generalizable. Results of the analysis did not also allow a clear comparability between genders due to the higher number of females participants. Consequently, an analysis of the different patterns was only done.

Three other limitations pertains to the generalizability of the analysis: due to the small sample size, the results obtained do not represent the entire Lebanese population and can only be generalized across the participants in this analysis. The second

limitation to generalizability is the fact that this was also a controlled experiment elicited through the production of isolated words rather than an analysis of the production of natural speech. Finally, the third limitation pertains to the ability to read which was one of the inclusion criterion: the population recruited for this analysis was limited only to people who can read.

## CHAPTER IV

### RESULTS

#### A. Sample Descriptives

A total of  $N = 28$  speakers completed this experiment ( $N = 19$  adults and  $N = 9$  children). For the sample of adults, around one-third (31.6%) of participants were males, while around two-third (68.4%) were females. Furthermore, the age of adults ranged between 21 and 31 with mean age ( $M = 25.89$ ). For the sample of children, one-third (33.3%) of participants were males, while two (66.7%) third were females. Moreover, the age of children ranged between 6 and 15 with mean age ( $M = 10.89$ ).

Table 1: Gender Distribution among the Adults and Children Samples

		N	%
Adults	Male	6	31.6%
	Female	13	68.4%
Children	Male	3	33.3%
	Female	6	66.7%

Table 2: Descriptive of Age among the Adults and Children Samples

	N	Minimum	Maximum	Mean
Adults	19	21	31	25.89
Children	9	6	15	10.89

#### B. Patterns for Word Duration, Word Intensity, Mean f0 and f0 range

##### 1. Criticism

The results for word duration, word intensity, mean f0, and f0 range, across the three target words (*wan*, *neem*, and *roon*) for the criticism intention were looked at first. Mean word duration was calculated by adding the durations of the all same target words for all participants and dividing it by the total number of words for the same stimuli of the same intention. This was also done for mean intensity, mean f0 and f0 range, for all

the words in the *criticism* intention. The same general patterns, available in table 3 below, were found for word duration, word intensity, mean f0, and f0 range across the three words (*wan, neem, and roon*) (Table 3).

Table 3: Patterns for Word Duration, Word Intensity, Mean f0 and f0 Range across the Three Target Words (Wan, Neem, and Roon) for the Criticism Intention

	Wan	Neem	Roon
	Mean	Mean	Mean
Word Duration	596.93	600.11	614.93
Word Intensity	73.90	73.59	74.31
Mean f0	275.11	264.52	277.07
f0 range	145.09	154.56	139.48

## 2. Warning

The results for word duration, word intensity, mean f0, and f0 range, across the three target words (*wan, neem, and roon*) were compared for the warning intention. Mean word duration was calculated by adding the durations of the all same target words for all participants and dividing it by the total number of words for the same stimuli of the same intention. This was also done for mean intensity, mean f0 and f0 range, for all the words in the *warning* condition. The results showed that there were similar patterns in word duration, word intensity, mean f0, and f0 range across the three words (*wan, neem, and roon*) (Table 4).

Table 4: Patterns for Word Duration, Word Intensity, Mean f0 and f0 Range across the Three Target Words (Wan, Neem, and Roon) for the Warning Intention

	Wan	Neem	Roon
	Mean	Mean	Mean
Word Duration	540.93	546.57	540.29
Word Intensity	76.33	76.60	77.05
Mean f0	326.27	332.84	328.77
f0 range	39.92	6.58	34.90



### 3. *Wish*

The results for word duration, word intensity, mean f0, and f0 range, across the three target words (*wan*, *neem*, and *roon*) for the wish intention were examined. Mean word duration was calculated by adding the durations of the all same target words for all participants and dividing it by the total number of words for the same stimuli of the same intention. This was also done for mean intensity, mean f0 and f0 range, for all the words in the *wish* intention. The results showed that, for the wish intention, there were similar patterns in word duration, word intensity, mean f0, and f0 range across the three words (*wan*, *neem*, and *roon*) (Table 5).

Table 5: Patterns for Word Duration, Word Intensity, Mean f0, and f0 range across the Three Words (Wan, Neem, and Roon) for the Wish Intention

	Wan	Neem	Roon
	Mean	Mean	Mean
Word Duration	772.21	804.04	799.43
Word Intensity	70.73	72.66	71.40
Mean f0	229.09	243.62	242.51
f0 range	-36.90	-36.03	-6.92

As such, there were no notable differences in word duration, word intensity, mean f0, and f0 range, across the three words (*wan*, *neem*, and *roon*) for the three intentions (criticism, warning, and wish).

## C. Intention on Word Duration

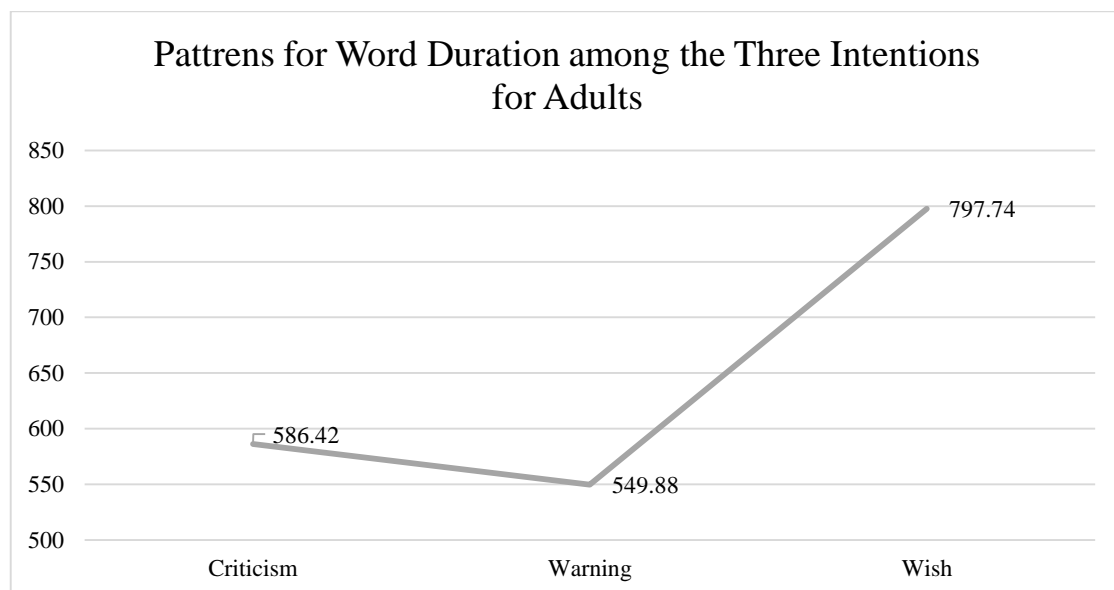
### 1. *Adults*

While no statistical tests were run due to this being an exploratory rather than confirmatory analysis, some clear patterns were noted in the data. Adults in the *wish* condition had longer word duration compared to their word duration in the *criticism* condition and *warning* condition (*Mean Difference* = 211.32 and *Mean Difference* =

247.86 respectively). Additionally, the difference in word duration between *criticism* condition and *warning* condition was minor one (*Mean Difference* = 36.54) (Table 6).

Table 6: Patterns for the different Intention on Word Duration in ms for Adults

	Criticism	Warning	Wish
	Mean	Mean	Mean
Word Duration	586.42	549.88	797.74

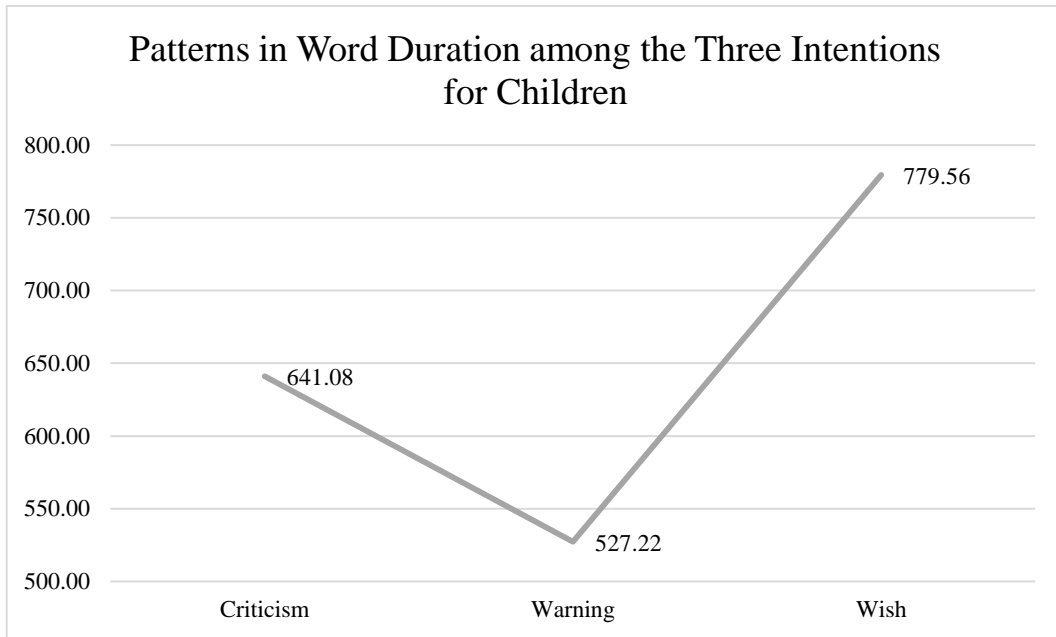


## 2. Children

Children in the *wish* condition had longer word duration compared to their word duration in the *criticism* condition and *warning* condition (*Mean Difference* = 138.48 and *Mean Difference* = 252.33 respectively). There were also no notable differences in word duration between *criticism* condition and *warning* condition (*Mean Difference* = 113.85) (Table 7).

Table 7: Patterns for the different Intention on Word Duration in ms for Children

	Criticism	Warning	Wish
	Mean	Mean	Mean
Word Duration	641.08	527.22	779.56



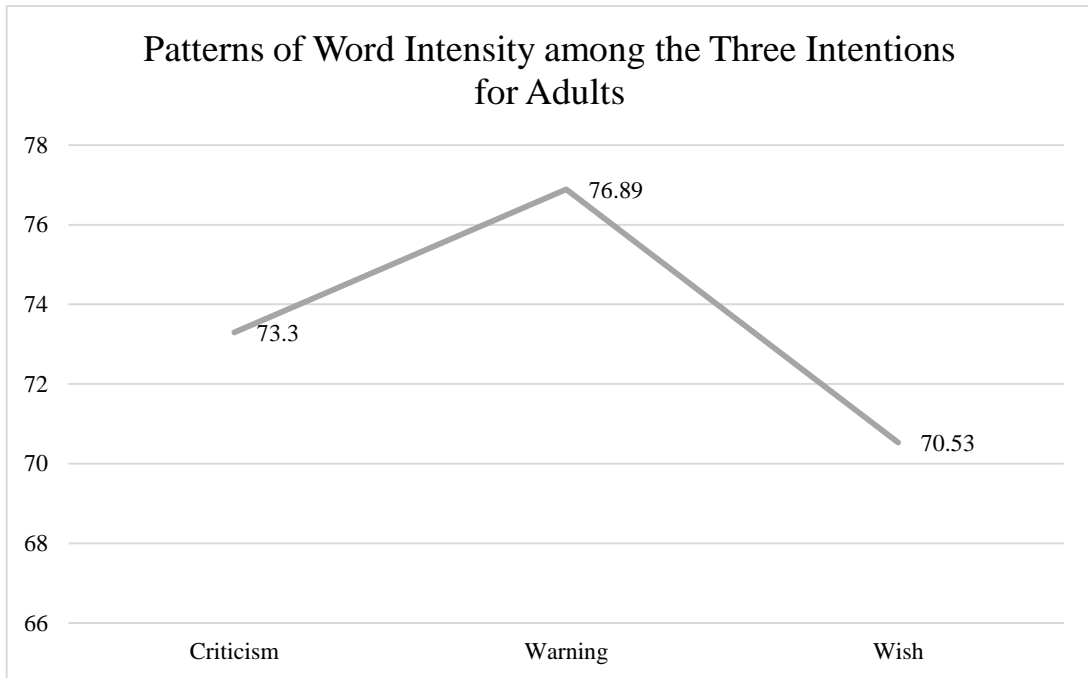
#### D. Intention and Word Intensity

##### 1. Adults

The patterns noted in the data revealed that adults in the *warning* condition had higher word intensity compared to their word intensity in the *criticism* condition and *wish* condition (*Mean Difference* = 3.58 and *Mean Difference* = 6.35 respectively). Adults were also found to have higher word intensity in the *criticism* condition compared to their word intensity in the *wish* condition (*Mean Difference* = 2.77) (Table 8).

Table 8: Patterns of Intention on Word Intensity for Adults

	Criticism	Warning	Wish
	Mean	Mean	Mean
Word Intensity	73.30	76.89	70.53

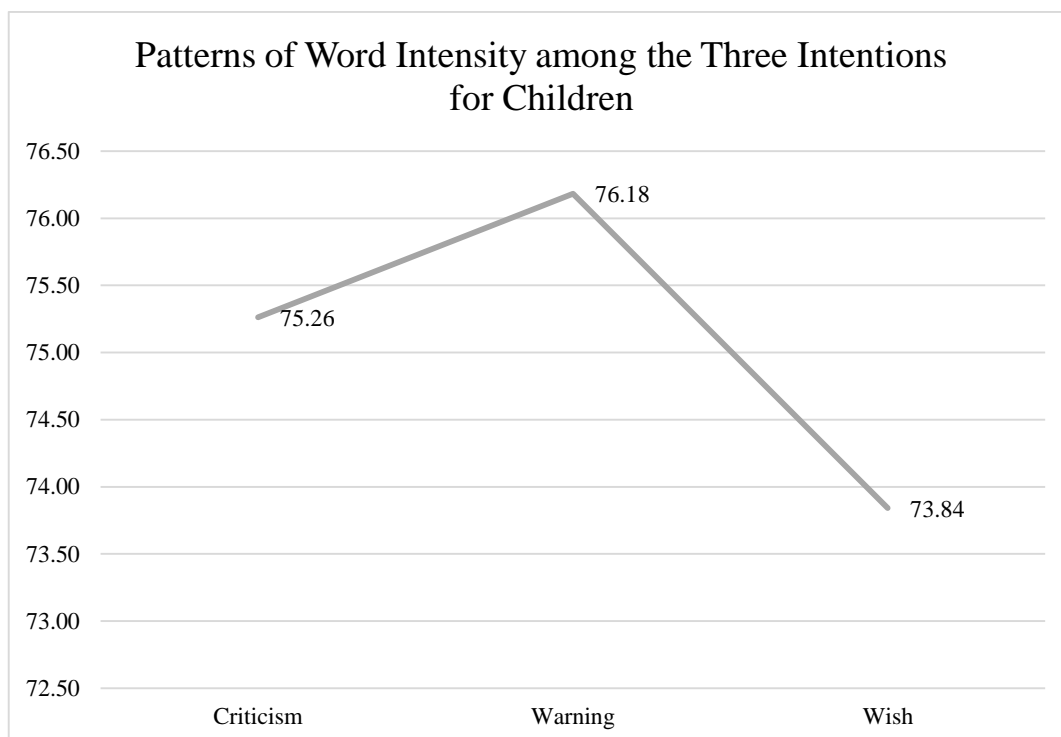


## 2. Children

Children in the *warning* condition had higher word intensity compared to their word intensity in the *wish* condition (*Mean Difference* = 2.34). There were no notable differences in word intensity between the *criticism* condition and both the *warning* condition and *wish* condition (*Mean Difference* = -0.92 and *Mean Difference* = 1.42 respectively) (Table 9).

Table 9: Patterns of Intention on Word Intensity (in dB) for Children

	Criticism	Warning	Wish
	Mean	Mean	Mean
Word Intensity	75.26	76.18	73.84



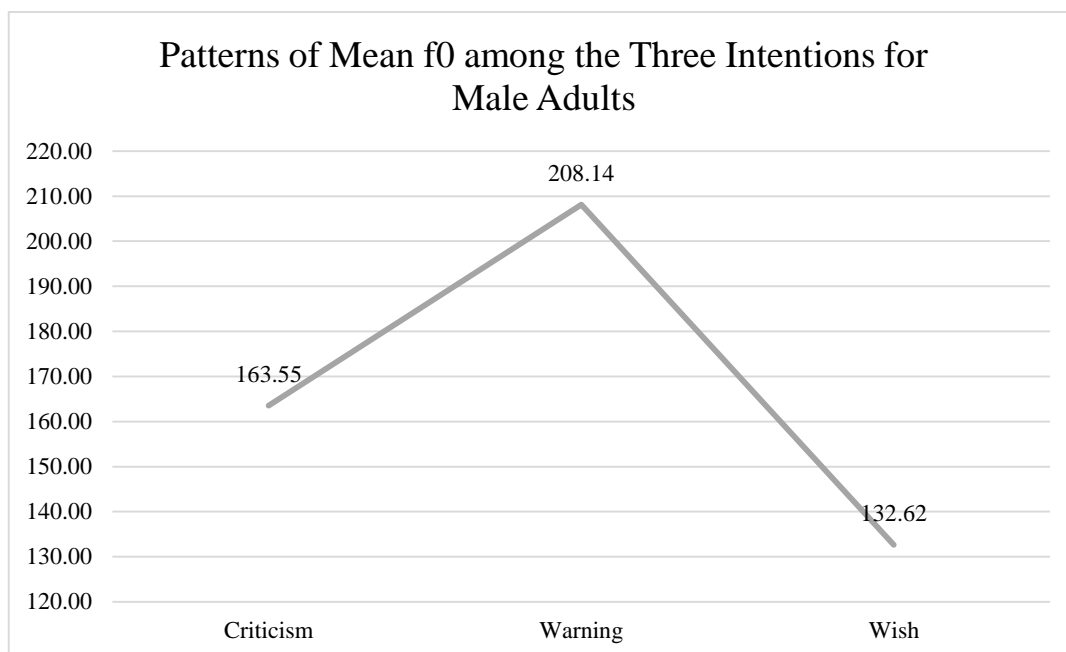
## E. Intention on Mean f0

### 1. Male Adult Speakers

The patterns were noted in the data showed that male adults in the *warning* condition had higher mean f0 compared to their mean f0 in the *wish* condition (*Mean Difference* = 75.52). There were also no major differences in mean f0 between the *criticism* condition and the two conditions *warning* and *wish* (*Mean Difference* = 44.59 and *Mean Difference* = 30.93 respectively) (Table 10).

Table 10: Patterns of Intention on Mean f0 for Male Adults

	Criticism	Warning	Wish
	Mean	Mean	Mean
Mean f0	163.55	208.14	132.62

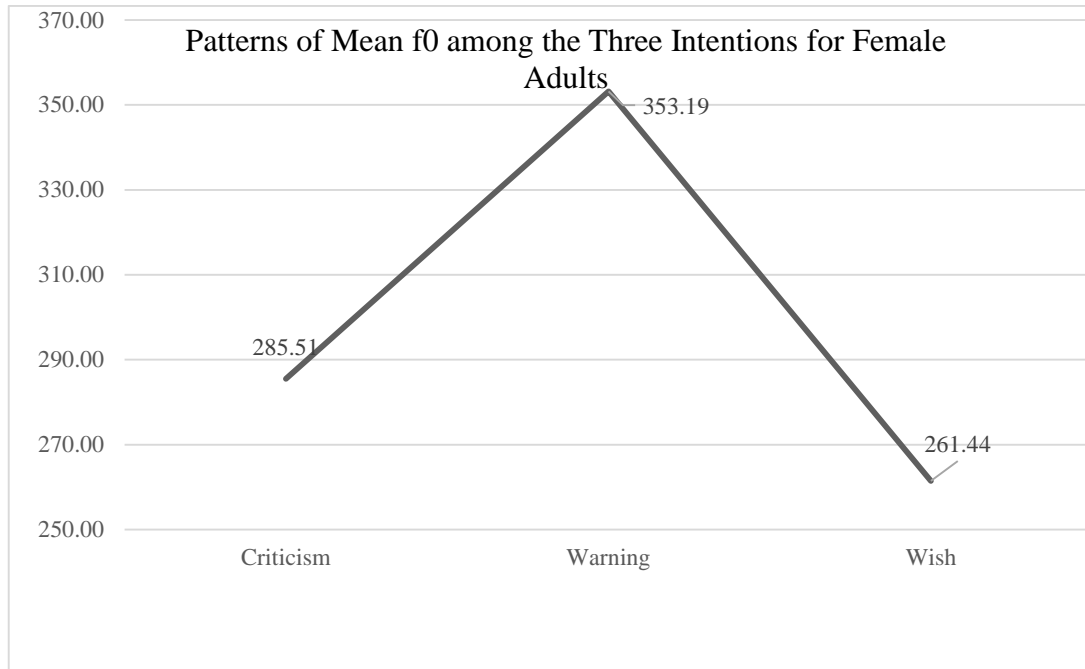


## 2. Female Adult Speakers

The results showed that female adults in the *warning* condition had higher mean  $f_0$  compared to their mean  $f_0$  in the *criticism* condition and *wish* condition (*Mean Difference* = 67.68 and *Mean Difference* = 91.75 respectively). There were no major differences in mean  $f_0$  between the *criticism* condition and the *wish* condition (*Mean Difference* = 24.08) (Table 11).

Table 11: Patterns of Intention on Mean  $f_0$  for Female Adults

	Criticism	Warning	Wish
	Mean	Mean	Mean
Mean $f_0$	285.51	353.19	261.44

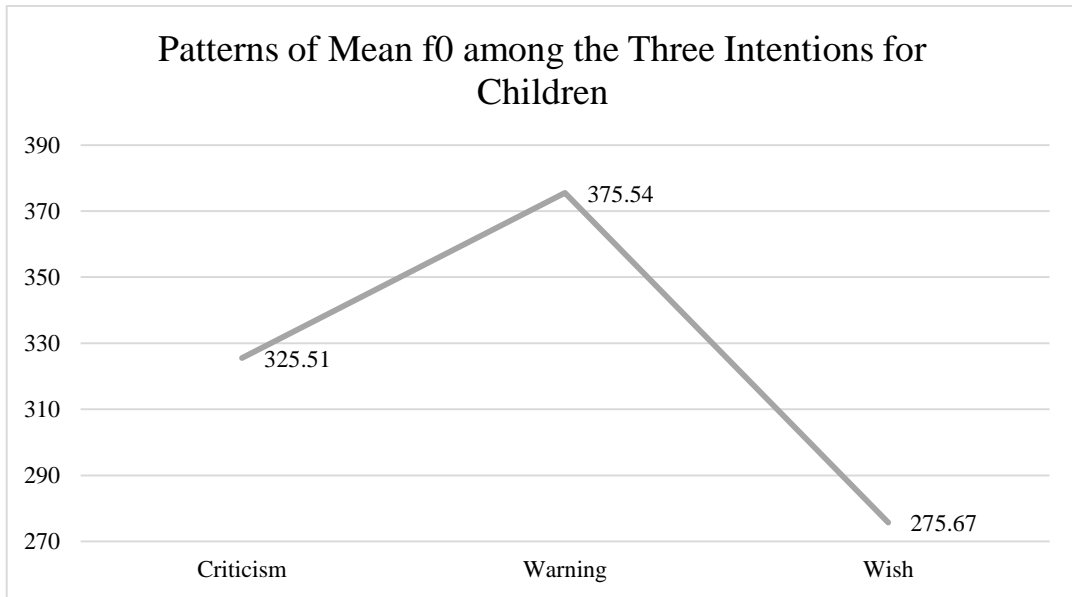


### 3. Children

The results revealed that children in the *warning* condition had higher mean f0 compared to their f0 in the *wish* condition (*Mean Difference* = 99.87). No major differences were found in mean f0 between the *criticism* condition and both the *warning* condition and *wish* condition (*Mean Difference* = -50.03 and *Mean Difference* = 49.8) respectively (Table 12).

Table 12: Patterns of Intention on Mean f0 for Children

	Criticism	Warning	Wish
	Mean	Mean	Mean
Mean f0	325.51	375.54	275.67



## F. Intention and f0 Range (max – min)

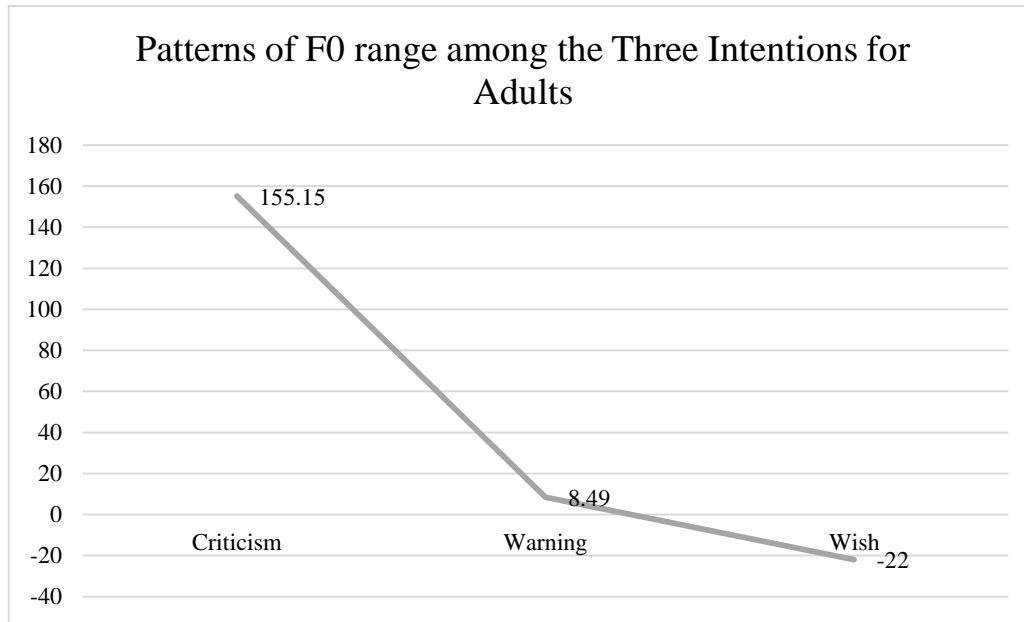
### I. Adults

Adults in the *criticism* condition had higher f0 range compared to their f0 range in the *warning* condition and *wish* condition (*Mean Difference* = 146.66 and *Mean Difference* = 177.15 respectively). There were no major differences in f0 range between the *warning* condition and *wish* condition (*Mean Difference* = 30.48) (Table 12).

Table 13: Patterns of Intention on f0 Range for Adults

	Criticism	Warning	Wish
	Mean	Mean	Mean
f0 range	155.15	8.49	-22.00



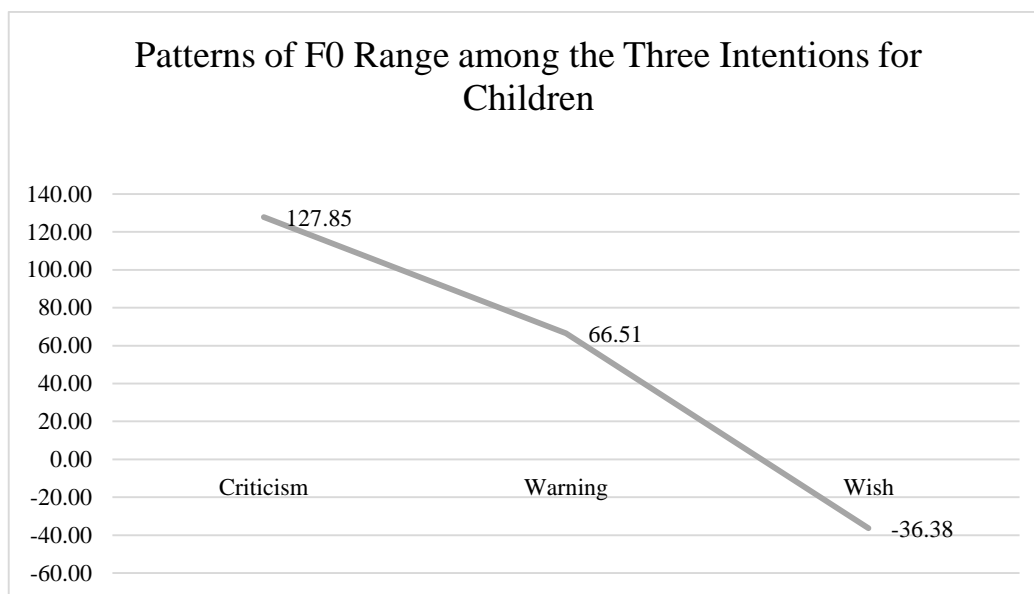


## 2. Children

Children in the *criticism* condition were found to have higher f0 range compared to their f0 range in the *wish* condition (*Mean Difference* = 164.22). There were no notable differences in mean f0 between the *warning* condition and the *criticism* condition (*Mean Difference* = 61.33) but a minor difference in mean f0 between the *warning* condition and the *wish* condition (*Mean Difference* = 102.89) (Table 13).

Table 14: Patterns of Intention on f0 Range for Children

	Criticism	Warning	Wish
	Mean	Mean	Mean
f0 Range	127.85	66.51	-36.38



## G. Relation between Intention and Contour

### 1. Adults

Each target word (*wan*, *neem*, and *roon*) was looked at separately within the same intention as different words had different contours. Four adults (speakers # 7, 8, 13, and 14) had rise-fall-rise contour. Speaker #7 was a male, 24 years old, saying the nonsense word “wan” while trying to criticize. Speaker #8 was a female, 28 years old, saying the words “wan” and “roon” with the intent to criticize. Speaker #13 was a male, 27 years old, saying the word “wan” in the warning intention. Speaker #14 was a female, 27 years old, saying the word “wan” with the warning intention.

For adults, most of the criticism intention had a rise contour (72.2%; Figure 8), while the vast majority of the warning intention had a rise-fall contour (89.1%; Figure 9). Finally, the majority of the wish intention had a rise-fall contour (61.4%; Figure 10) followed by the fall contour (33.3%; Table 15; Figure 11).

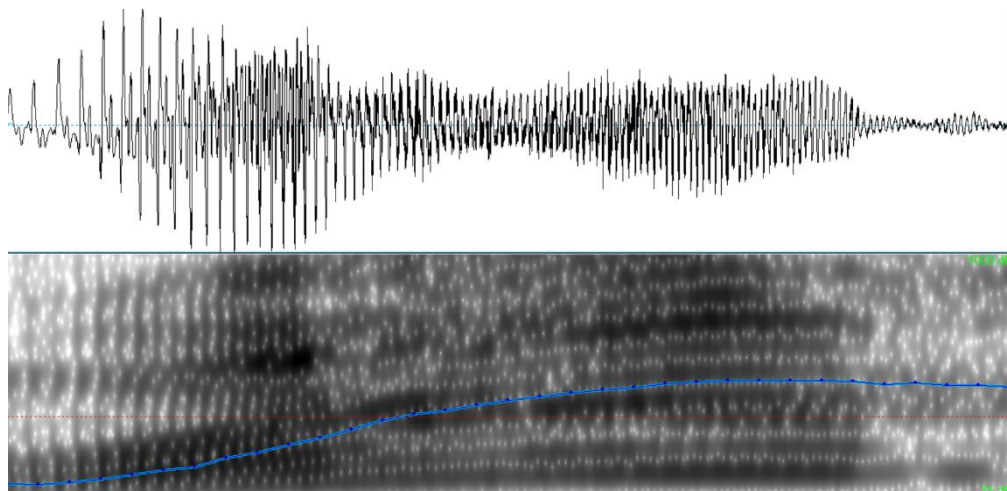


Figure 8: Rising contour of the word wan for the criticism intention of a male adult speaker

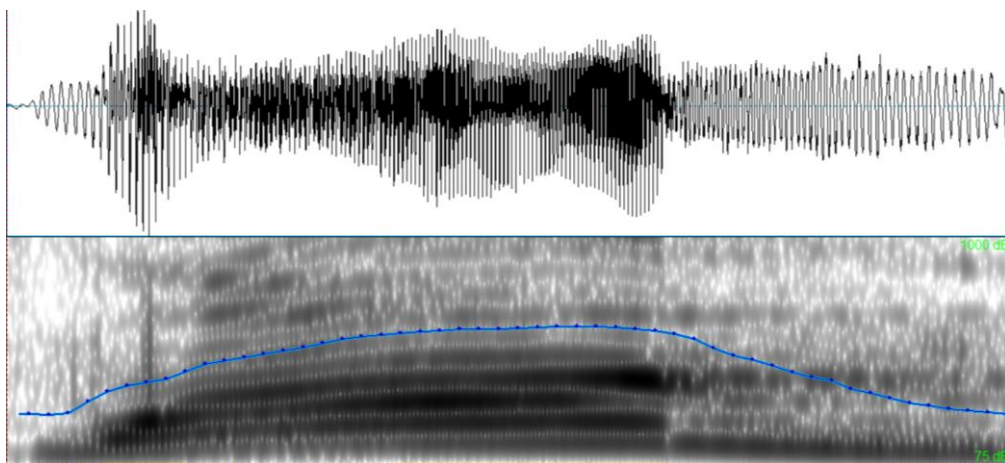


Figure 9: Rise-fall contour of the word wan for the warning intention of a female adult speaker

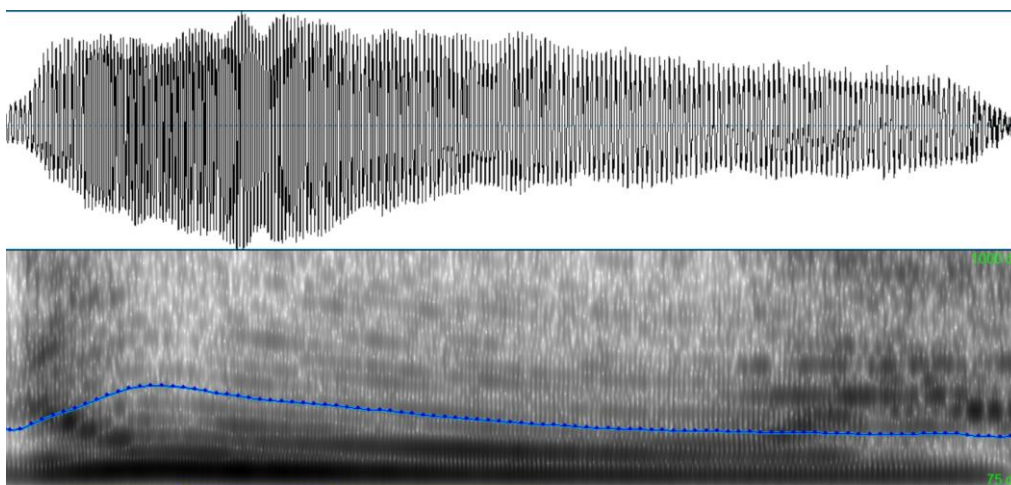


Figure 10: Rise-fall contour of the word roon for the wish intention of a female adult speaker

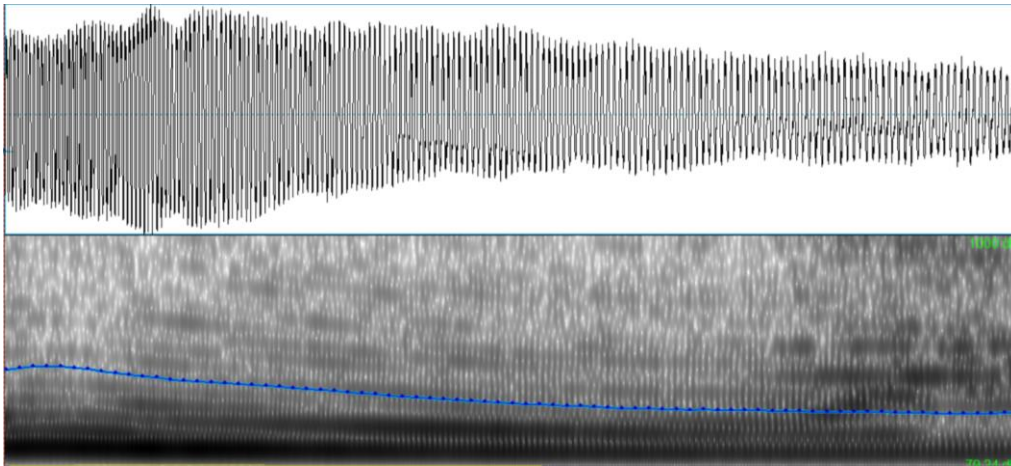


Figure 11: Fall contour of the word neem for the wish intention of a female adult speaker

Table 15: Relation between Intention and Contour for Adults

Adult	Fall N (%)	Rise N (%)	Rise Fall N (%)
Criticism	2 (3.7%)	39 (72.2%)	13 (24.1%)
Warning	0 (0%)	6 (10.9%)	49 (89.1%)
Wish	21 (12.7%)	48 (28.9%)	97 (58.4%)

## 2. Children

One child (speaker #27) had a rise-fall-rise contour. This child was a female, 13 years old, was saying “roon” while trying to convey a wishing intention. For children, most of the criticism intention had a rise contour (59.3%; Figure 12) followed by the rise-fall contour (33.3%), while the vast majority of the warning intention had a rise-fall contour (81.5%; Figure 13). Finally, the majority of the wish intention had a fall contour (65.4%; Figure 14) followed by rise-fall contour (30.8%; Table 16; Figure 15).

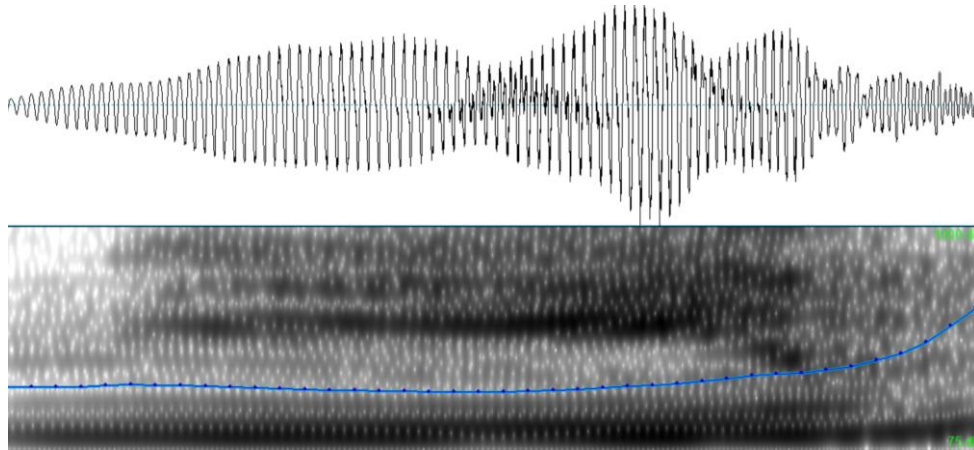


Figure 12: Rise contour of the word neem for the criticism intention by a male child speaker

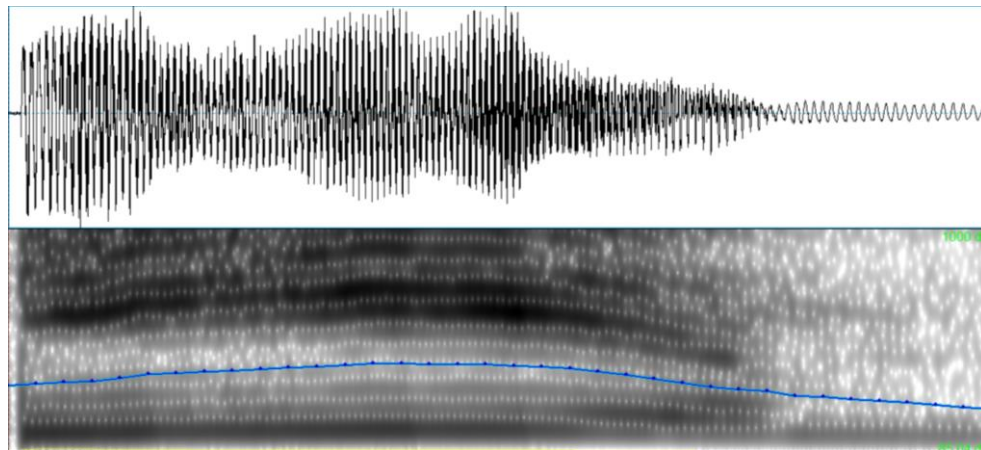


Figure 13: Rise-fall contour of the word neem for the warning intention by a female child speaker

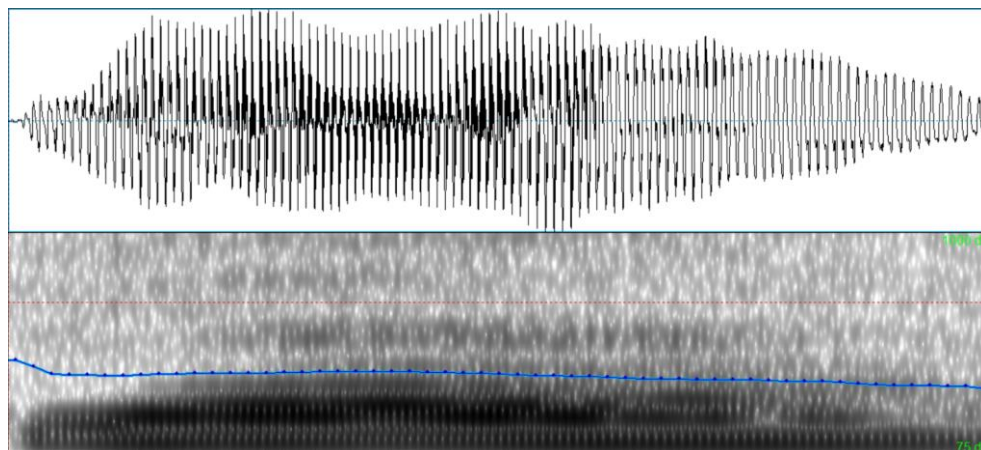


Figure 14: Falling contour of the word wan for the wish intention by a male child speaker

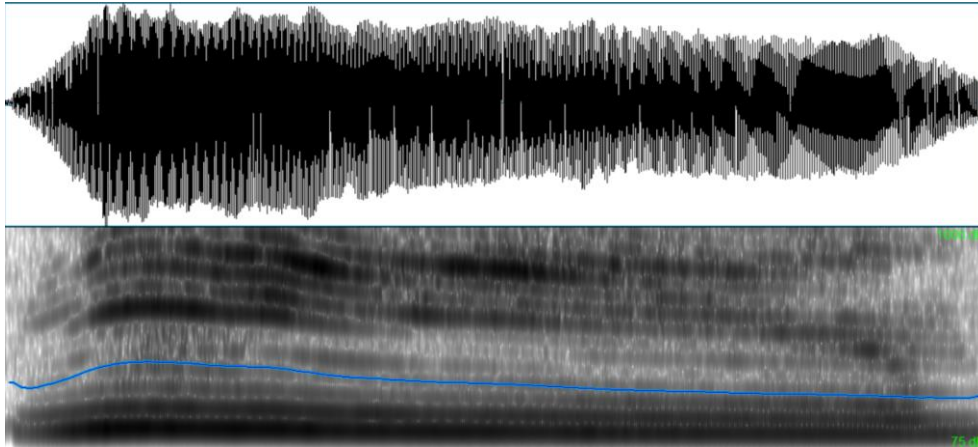


Figure 15: Rise-fall contour of the word neem for the wish intention by a female child speaker

Table 16: Relation between Intention and Contour for Children

	Fall N (%)	Rise N (%)	Rise Fall N (%)
Criticism	2 (7.4%)	16 (59.3%)	9 (33.3%)
Warning	1 (3.7%)	4 (14.8%)	22 (81.5%)
Wish	17 (65.4%)	1 (3.8%)	8 (30.8%)

## CHAPTER V

### DISCUSSION

As speakers, we pursue many goals during our daily interactions with others: we share or acquire new information, we try to persuade, to request, to criticize, to compliment, to warn, to express a feeling, to wish for something, etc. Thus, there is always a purpose in mind when we talk to someone, and regardless of this purpose, we want the addressee to actually understand the intention behind what we are saying (Dänzer, 2017). A person's way of speaking is influenced by the underlying intention behind the utterance – the illocutionary act – which can be inferred by variations that are prosodically expressed. The aim of the current exploratory analysis was to examine these prosodic patterns. The production experiments done with adults and children whose L1 is Lebanese Arabic revealed the general acoustic features and the different intentions, and, despite the several limitations, is the first work to examine this in Lebanese Arabic.

#### **A. Participants Demographics**

The age range of the 19 adult participants was between 21 and 31 years. The majority of the participants were from Beirut and the South Governorate, while the minority were from Keserwan and Bekaa. The majority of adult participants had a university degree or higher and most of them spoke 2 or more languages. All the participants claimed that they use Arabic exclusively on a daily basis and that they rarely code switch.

The age range of children who participated in the analysis was between 6 and 15 years. The majority of the children were from the South Governorate, while the rest were from Beirut and Keserwan. All the children that participated are enrolled in schools and all the parents of the children who participated are university graduates and they are all multilingual, speaking 2 or more languages.

### **B. Intention and Word Duration**

Children and adults in the *wish* condition had longer word duration compared to the other intentions. *Criticism* had the shortest word duration for both children and adults (average of 527 ms for children and 586 ms for adults). There were no major differences in word duration between the *criticism* and *warning* conditions for children; however, for adults, word duration for both *criticism* and *warning* was very close (586 ms and 549 ms respectively).

These patterns are the opposite of the findings by Esteve-Gibert and Prieto (2013) as well as the findings by Hellbernd and Sammler (2016). The word duration values across pragmatic intentions in these studies revealed that expressions of discontent showed the longest duration while expressions of satisfaction had a lower mean duration (Esteve-Gibert & Prieto, 2013). Additionally, German speakers had longer word duration for the *criticism* condition and shortest word duration for both *wish* and *warning* conditions (with no significant difference between *warning* and *wish*) (Hellbernd & Sammler, 2016). The results of the current analysis thus indicate that there might be cross-linguistic differences in the acoustic cues associated with particular intentions.



### **C. Intention and Word Intensity**

When it came to the words in the *warning* condition, a higher mean word intensity was found, for both adults and children, compared to the words for other intentions. For adults, words in the *criticism* condition had higher word intensity compared to that of the *wish* condition. These results align with findings by Johnstone (2017) and Hellbernd and Sammler (2016) who found that *warning* had the highest mean intensity followed by *criticism* and *wish*. This is mainly due to the fact that warning another person evokes a higher intensity due to the fact that it is more urgent (Westman & Walters, 1981).

### **D. Intention and f0**

#### **1. Mean f0**

Mean f0 was considered the most important acoustic cue for the accurate categorization of emotions (Pichora-Fuller et al., 2016). Children producing words in the *warning* condition had higher mean f0 compared to their f0 in the *wish* and *criticism* conditions. For adults, even though there was a discrepancy between the number of males and females, mean f0 for male and female speakers were looked at separately because f0 in Hz cannot be pooled across genders and to see if there are any differences across genders. The obtained patterns align with the findings by Hellbernd and Sammler (2016): words in the *warning* condition had higher mean f0 compared to the words in the *wish* condition. *Wish* had the lowest mean f0 compared to the other two conditions. However, even though for female adult speakers the difference between *wish* and

*warning* was also significant, their mean f0 was not as high as it was with adult male speakers.

The patterns found do not align the prediction by Johnston (2017) and by Hoicka and Gattis (2012). Johnston (2017) claimed that emotions with negative valence are characterized by a lower mean f0. Since *criticism* was considered by Hellbernd and Sammler (2016) to be perceived negatively, thus having a negative valence, it should have had a lower mean f0 compared to *wish* (considered to have a positive valence). Hoicka and Gattis (2012) also found that intentions with positive valence tend to have a higher mean f0. Accordingly, *wish*, an intention viewed as having a positive valence, was expected to have a higher mean f0.

## **2. F0 Range**

There were similar patterns for f0 range for adults and children: in the *criticism* condition both had a wider f0 range compared to their f0 range in the *wish* and *warning* conditions. These results are similar to Esteve-Gibert and Prieto (2013) in which they also found an effect on intention on f0 range, no effect of age and a larger f0 range in expressions of discontent.

Scherer (1979) found that high arousal emotions are characterized by an increased f0 range whereas low arousal emotions are characterized by a lower f0 range. Thus, in an attempt to analyze the patterns found further, even though *criticism* and *warning* have a negative valence, they are considered to be expressed with high arousal because *criticism* is a negative statement and *warning* intends to warn someone of a potential danger (Hellbernd & Sammler, 2016). On the other hand, *wish* could be considered to be expressed with low arousal because the words and statements chosen in the current experiment were designed in a way in which the person feel calm while

wishing (Clark, Milberg & Erber, 1984). This perspective explains the patterns obtained.

### **E. Intention and Contour**

Rodero (2011) claimed that both f0 level and contour type are important elements; however, the shape of the contour is more accurate in determining emotions and intentions than the pitch level. After looking at the different pitch contours of the production data for adults and children, there seemed to be an association between intention and type of contour. For children, most of the words for the *criticism* intention had a rise contour, followed by the rise-fall contour. Almost all the words of the *warning* intention had a rise-fall contour, while the majority of the words expressing the *wish* intention had a fall contour, followed by rise-fall contour. The same contour patterns was also found in adults: most of the words expressing the *criticism* intention had a rise contour, the vast majority of the words in the *warning* intention had a rise-fall contour. Finally, the majority of the words for the *wish* intention had a rise-fall contour, and the others had a fall contour.

Results of the contour obtained for the *warning* stimuli were also similar to Hellbernd and Sammler (2016) in which they found that the *warning* stimuli “had the most arched pitch contour with a salient peak in the middle of the word as is appropriate for the urgent nature of a warning” (p75). Results for both *criticism* and *warning* also align with findings by Bänziger (2005) in which he found that expressions with negative valence (just like *criticism* and *warning*) showed a falling movement of f0 (falling contour) or a rise-fall contour with an early f0 peak followed by a progressive decline. However, Bänziger (2005) found that expressions that are associated with a more positive valence (like *wish*) are more likely to have a rising contour.

The differences between the patterns found in adults and children pertain to children having words with a fall-rise contour for *criticism*, whereas this pattern was not evident in adults. Additionally, for the *wish* intention children had more falling contours and less rise-fall contours, whereas adults had more rise-fall contours and less falling contours. These patterns are interesting because they might be connected with word duration. Kelly (2021) discussed text-to-tune adjustment, where segments get lengthened in order to fit a specific contour. Mead (2007) defined text-to-tune alignment as the “coordination of two distinct rhythmic structures: linguistic prominence (stress) and rhythm” (p.1). Generally, a rise-fall contour will take more time than a rise contour or fall contour. Similar results were also found in speakers of Catalan and Spanish where the rise-fall contour caused the syllable to lengthen (Prieto & Ortega-Llebaria, 2009). Thus, there is a dynamic interaction between “intonational realization strategies” and word duration (Kelly, 2021, p.4). However, this explanation only explains the patterns found for adults and not for children, because for children, the longest word duration was for words in the *wish* intention which was predominantly fall rather than rise-fall. Future studies could examine tonal alignment particularly because they will provide more details on variations in the contours that can be observed across age, gender and the different dialects of Lebanese Arabic.

#### **F. Global Prosodic “Signatures”**

Adults and children whose L1 is Lebanese Arabic were found to have similar prosodic patterns across the different stimuli and the different intentions. Mean intensity, mean f<sub>0</sub>, together with pitch range were influential acoustic features when it came to speakers’ usage of prosody as a channel of communication to convey their

intentions. While more in-depth research is needed to cover more areas of Lebanon and different dialects, and while the data obtained can only be generalized across the participants who participated in the analysis, it is reasonable to assume that there might be prosodic “signatures” which are prominent, distinguishable and possibly even culturally learned by speakers from a young age.

Additionally, it was suspected that there would be differences between the production of adults and children, particularly children under 8 years old, because they have not fully developed pragmatic awareness yet; patterns found in the analysis support Papaeliou et al. (2002)’s findings in which the expressing intentionality develops very early on without even understanding what intentionality means. The three children under 8 who participated in the production experiment of this thesis were not able to explain what *criticism*, *warning* and *wish* meant. This could mainly be due to the fact that they were not familiar with the lexicon in Arabic (انتقاد تحذير تمنى) because it was not until they saw the pictures and read the full statement that they were able to produce the intention. This brings up an important fact: children can learn by imitation. Even though they might not understand what intentions are, they may express them by mimicking another person’s prosodic patterns to express themselves. Children might imitate another person’s way of speaking without understanding the underlying strategies this person is using in an effort to reproduce the other’s goal-directed utterance (Carpenter et al., 2002).

## **G. Implications**

The patterns in the data revealed that prosody is important for speakers as a channel of communication to convey their intentions. Previous similar studies by

Hellbernd & Sammler (2016) and Tanenhaus, et al. (2015) suggested that intentions vary with context and with the pitch contours that are constantly changing depending on the speakers' gender, age, social background, accent and the speech conditions in which the conversation is taking place. Even though the recordings used for the current analysis were mostly of females (similar to Hellbernd & Sammler's), were not spontaneous productions of the intentions and despite the other limitations, interesting patterns that have not been examined before were observed. The present analysis sets the ground towards future research on the prosodic cues during successful interpersonal communications in the Arabic language by both adults and children.

## CHAPTER VI

### CONCLUSION

Action theories of language proposed that intentions that underlie speakers' utterances drive and are at the core of interpersonal communication. Speakers do not always literally express their intentions: a speaker will not usually say "I am about to criticize you now" or "I will warn you by saying the following statement" before saying what they intend to say. Rather, they use a variety of cues to differentiate among the communicative intentions they are trying to convey. Thus, this raises the question of how the underlying meaning of an utterance is transmitted from speaker to listener. In this thesis, intentions were conceptualized in terms of speech acts for which prosody provided a channel of non-verbal transmission.

Acoustically, speakers who participated in this analysis and whose L1 is Lebanese Arabic were found to use distinct prosodic features for the three communicative intentions with similar patterns across age and gender. Additionally, intentions considered to possess a positive valence are conveyed by Lebanese Arabic speakers with a lower mean  $f_0$  and intentions with negative valence have a higher mean  $f_0$  which contradicts with findings for mean  $f_0$  for other languages. Even though speakers in the current analysis were conscious of the intention they were trying to convey, these findings are important, especially in the context of Lebanon, where there is not any research done on the production of communicative intentions in either adults or children whose L1 is Lebanese Arabic.

The result of this analysis can only be generalized across speakers who participated in this analysis. Thus, a study that looks at the same acoustic features in the production of different communicative intentions, with a larger sample size across

different areas of Lebanon would yield more accurate, generalizable data. A study that also looks at the importance of the same acoustic features in intention recognition (i.e.: perception) in adults and children might provide interesting insight into the importance of these measures for perception, but that was beyond the scope of the current study.



## APPENDIX A

**Title:** Production of Communicative Intentions

**Conducted By:** Mia El Houry

Of the American University of Beirut, Dept of English, Telephone: 70174862

### Consent document

We are asking you to participate in a **research study**. Please read the information below and feel free to ask any questions that you may have.

#### A. Project Description

1. In this study, you and 10-15 other adults will be asked to look at cartoon illustrations and then read aloud the statement or word that are written on the bottom of the illustration while trying to convey a given intention.
2. You must be able to read Arabic and must not have any speech or hearing problems.
3. Participants in this study are recruited through a message that is shared by word of mouth, Whatsapp messages or posts on different social media platforms.
4. The goal of the study is to gather linguistic data on the production of three intentions (criticism, warning and wish) in adults and children whose main language is Lebanese Arabic.
5. Your responses will be recorded.
6. The estimated time to complete this study is approximately 30-45 minutes.
7. You will be asked to fill a questionnaire prior to the start of the experiment on your age, gender and language usage.
8. The recordings will be used for acoustic analysis.
9. If you refuse to be tape-recorded, you will be excluded from the study

#### B. Risks and Benefits

1. Your participation in this study does not involve any physical risk or emotional risk to you beyond the risks of daily life.
2. You have the right to withdraw your consent or discontinue participation at any time for any reason.
3. Your decision to withdraw will not involve any penalty or loss of benefits to which you are entitled. Discontinuing participation in no way affects your relationship with AUB.
4. You receive no direct benefits from participating in this research; however, your participation does help researchers better understand the sound system of Lebanese Arabic.

#### C. Confidentiality

Your name or other identifiers will not be attached to your answers so that your confidentiality can be maintained.

Your privacy will be ensured in all data resulting from this study.

To secure the confidentiality of your responses, your name and other identifying information will never be attached to your answers. All the recordings and the collected data from this study will be maintained in a secure locked drawer in a locked office or will be kept in the PI's password protected computer and will only be accessed by the research team. Data will be monitored and may be audited by the IRB while assuring confidentiality. Your name or other identifying information will not be used in our reports or published papers. You will receive a copy of this consent form.

**Contact Information**

- 1) If you have any questions, you are free to ask them now.  
If you have any questions or concerns about the research you may contact me at [mmh71@mail.aub.edu](mailto:mmh71@mail.aub.edu) or at 70174862 or Dr. Niamh Eileen Kelly at [nk114@aub.edu.lb](mailto:nk114@aub.edu.lb)
- 2) If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about research or your rights as a participant, please contact the AUB Social & Behavioral Sciences Institutional Review Board (SBSIRB) at AUB: [irb@aub.edu.lb](mailto:irb@aub.edu.lb), or at 01350000 ext. 5445.

**E. Participant rights**

Participation in this study is voluntary. You are free to leave the study at any time without penalty. Your decision not to participate in no way influences your relationship with AUB. Refusal or withdrawal from the study will involve no loss of benefits to which you are otherwise entitled nor will it affect your relationship with AUB/AUBMC You will also receive a copy of the consent form.

I have read the above information and have sufficient information to make a decision about participating in this study. I consent to participate in the study.

Participant: \_\_\_\_\_ Date: \_\_\_\_\_

Researcher: \_\_\_\_\_ Date: \_\_\_\_\_

## APPENDIX B

**Title:** Production of Communicative Intentions

**Conducted By:** Mia El Houry

Of the American University of Beirut, Dept of English, Telephone: 70174862

### **Permission for Child to Participate in Research**

**This is a permission form for your child/child for whom you are legal guardian to participate in a research study.** It contains important information about this study and what to expect if you decide to permit your child/child for whom you are legal guardian to participate.

**Your child's participation is voluntary.**

**Participants will be provided with a copy of the consent form.**

Please consider the information carefully before you decide to allow your child to participate. If you decide to permit participation, you will be asked to sign this form and will receive a copy of the form.

**The purpose of this study** is to compare how adults and children who speak Lebanese Arabic produce three intentions (criticism, warning and wish).

**Recruitment method** will involve a message that is shared by word of mouth, Whatsapp messages or posts on different social media platforms. Fifteen to twenty children are needed to participate in the study.

**The procedure** will involve asking each child to look at cartoon illustrations and then say the statement that is written on the bottom of the illustration while trying to convey a given intention. Please note that your child must be able to read Arabic and must not have any speech or hearing problems. Responses will be recorded.

**Participation of** your child will be around 30 minutes. You should be present at the beginning of the interview after which the researcher will commence data collection with your child. You also have the freedom to attend the experiments with your child as long as you don't interfere in any way during the recording process. Your child may leave the study at any time. If you decide to stop your child's participation in the study, there will be no penalty to you, or your child and you will not lose any benefits to which you are otherwise entitled. If you refuse that your child is tape-recorded, your child will be excluded from the study. Your decision will not affect your future relationship, or that of your child, with AUB.

**Risks and Benefits:** Please understand that the participation of your child is entirely on a voluntary basis and you have the right to withdraw your consent and your child will discontinue participation at any time without penalty. There are no risks beyond those

of everyday life. You will be asked to fill out an anonymous questionnaire about your child's language background. This information will be kept secure in a locked drawer in the primary investigator's office (hard copies) and on a password-protected computer (soft copies). The audio recordings will be identified by a number only. There are no direct benefits to participants in this study but your contribution will help linguists to understand the sound system of Lebanese Arabic.

**Confidentiality and Privacy Protections:**

Efforts will be made to keep your child's study-related information confidential. All the recordings and the collected data from this study will be maintained in a secure locked drawer in a locked office or will be kept in the PI's password protected computer and will only be accessed by the research team. Data will be monitored and may be audited by the IRB while assuring confidentiality. No names of individual children will be disclosed in any reports or presentations of this research.

**There are not any incentives or payments for your child's participation.**

**Participant Rights:**

**Refusal or withdrawal from the study will involve no loss of benefits to which you are otherwise entitled nor will it affect your relationship with AUB/AUBMC.** You may refuse to allow your child to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you are a student or employee at AUB, your decision about whether or not you allow your child to participate in this research will not affect your grades or employment status.

If you choose to allow your child to participate in the study, you may discontinue his/her participation at any time without penalty or loss of benefits. By signing this form, you do not give up any personal legal rights you or your child may have as a participant in this study.

The Social & Behavioral Institutional Review Board responsible for human subjects research at

AUB has reviewed this research project and found it to be acceptable, according to applicable Lebanese and U.S. federal regulations and AUB policies designed to protect the rights and welfare of participants in research.

**Contacts and Questions:**

For questions, concerns, or complaints about the study you may contact **Dr. Niamh Eileen Kelly**

**Email:** [nk114@aub.edu.lb](mailto:nk114@aub.edu.lb)

**Telephone:** +353879703950

For questions about your child's rights as a participant in this study or to discuss other study related concerns or complaints with someone who is not part of the research team, you may

contact the AUB Social & Behavioral Science Institutional Review Board

**Email :** [irb@aub.edu.lb](mailto:irb@aub.edu.lb)

**Telephone:** +9611350000 ext :5445

**Signing the consent form**

I have read (or someone has read to me) this form and I am aware that I am being asked to give permission for my minor child (or child under my guardianship) to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to give permission for my child/child under my guardianship to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

\_\_\_\_\_  
Printed name of subject

\_\_\_\_\_  
Printed name of person authorized to give permission for  
permission for minor subject/participant  
applicable)

\_\_\_\_\_  
Signature of person authorized to give  
subject/participant (when

\_\_\_\_\_  
Relationship to the subject

\_\_\_\_\_  
Date and time

**Investigator/Research Staff**

I have explained the research to the parent or legal guardian of the child subject/participant before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the parent/legal guardian of the child participant/subject.

\_\_\_\_\_  
Printed name of person obtaining permission

\_\_\_\_\_  
Signature of person obtaining permission

\_\_\_\_\_  
Date and time

## APPENDIX C

**Title:** Production of Communicative Intentions

**Conducted By:** Mia El Houry

Of the American University of Beirut, Dept of English, Telephone: 70174862

### **Child Assent**

- You are being asked to be in a research study. Studies are done to find better ways to treat people or to better understand how kids think about things or how kids and adults may behave at different times.
- This form will tell you about the study to help you decide whether or not you want to participate.
- You should ask any questions you have before making up your mind. You can think about it and discuss it with your family or friends before you decide.
- It is okay to say “No” if you don’t want to be in the study or if you don’t want to be recorded. If you say “Yes” you can change your mind and quit being in the study at any time without getting in trouble.
- If you decide you want to be in the study, an adult (usually a parent) will also need to give permission for you to be in the study.
- You must be able to read Arabic and must not have any speech or hearing problems.
- You will receive a copy of this form.
- Your responses will be recorded.

### **1. What is this study about?**

I look at the ways in which 15 Lebanese adults and 15- 20 Lebanese children whose first language is Lebanese Arabic produce three intentions: criticism, warning and wish by reading short statements corresponding to different illustrations containing a nonsense word. This is done in order to see if there are differences and similarities in the way children and adult speakers of Lebanese Arabic produce these intentions.

### **2. What will I need to do if I am in this study?**

You will have look at an illustration and then read a word while trying to match your intention to the given one. And then you will have to listen to a word recorded by an adult and say which intention the adult is trying to convey. All your recording will be kept in a password protect computer and will only be accessed by the research team. All your recordings will be monitored and may be audited by the IRB while assuring confidentiality,

### **3. How long will I be in the study?**

Your participation is expected to take 20 minutes. You can stop at any time or take as much breaks as you would like.

### **4. Can I stop being in the study?**

Your participation is voluntary and you may stop being in the study at any time without any consequence. Discontinuing participation in no way affects your relationship with AUB or AUBMC. If you refuse to be tape recorded, you will be excluded from the

study. Refusal or withdrawal from the study will involve no loss of benefits to which you are otherwise entitled nor will it affect your relationship with AUB/AUBMC.

**5. What bad things might happen to me if I am in the study?**

Your participation in this study does not involve any risks. Your participation might take a long time, but if you feel that you need a break or you need to stop, you can do that without any consequence.

**6. What good things might happen to me if I am in the study?**

Your participation will not directly benefit you. It will benefit the scientific field in general because there aren't any available data on this topic.

**7. Will I be given anything for being in this study?**

You will not be receiving any incentive for participating in this study.

**8. Who can I talk to about the study?**

If you have any questions, you are free to ask them now. If you have questions, concerns or complaints about this research study later, you may contact me at [nk114@aub.edu.lb](mailto:nk114@aub.edu.lb), ext. 3102. If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about research or your rights as a participant, please contact the AUB Social & Behavioral Sciences Institutional Review Board (SBSIRB) at AUB: [irb@aub.edu.lb](mailto:irb@aub.edu.lb), ext. 5445.

**Oral assent form**

I have read (or someone has read to me) this form. I have had a chance to ask questions before making up my mind. I want to be in this research study. Y/N

**Investigator/Research Staff**

I have explained the research to the participant before requesting the signature above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

---

Printed name of person obtaining assent

---

Signature of person obtaining assent

---

Date and time

**This form must be accompanied by an IRB approved parental permission form signed by a parent/guardian.**

## APPENDIX D

### Background Questionnaire

**Please fill in the below questionnaire:**

1. Age: \_\_\_\_\_

2. Gender: \_\_\_\_\_

3. Please list the languages you speak:

\_\_\_\_\_

4. Please state your education level (specify whether in progress or completed):

\_\_\_\_\_

5. Do you have any hearing problems?

\_\_\_\_\_

6. On a day-to-day basis, what do you generally speak?

\_\_\_\_\_

#### **For Parents ONLY:**

1. Age of your child: \_\_\_\_\_

2. Gender of your child: \_\_\_\_\_

3. Please list the languages you speak to your child at home:

\_\_\_\_\_

4. Please list the languages your child speaks at home:

\_\_\_\_\_

5. Does your child have any hearing problems?

\_\_\_\_\_

6. On a day-to-day basis, what language do you use to communicate with your child?

\_\_\_\_\_



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