

FDG ANALYSIS OF THE INTONATIONAL FEATURES IN MONOLOGUES OF SOCIAL CRISES

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This study attempts to analyze the intonational features in six monologues of social crises relying on Hengeveld and Mackenzie's FDG approach. The study investigates a number of intonational features e.g. pitch movements, pitch height, pitch words, and tempo and their distribution in a top-down hierarchy of six phonological units to show how these particular features of intonation contributes to the meaning and to the organization of discourse. The phonological analysis of tones, different pitch levels, tone units, prominent words, and various patterns of speaking rates disclose more significant information associated to the discourse of social crises e.g. the multiplicity of pitch movements, an overall propensity for a higher pitch level, variation in tempo, phonological/grammatical correspondence, and the correlated use of more than one phonological features to propagate stronger effects. The unresolved nature of crisis reflects deeply on the organization of discourse units and their internal phonological features.

1. Introduction

Inherent phonological features permeate through the spoken discourse of social crises for the turbid nature of social crisis is manifest in spoken rather than written discourse. Phonological features such as pitch movements, tempo, and loudness are authentic manifestations of the characteristics of social crises e.g. unexpectedness, uncertainty, threat, incredulity, and the need for changing old systems¹. These phonological features of intonation² are integral part of speech production because they contribute to the meaning of utterances, organization of

¹ For more about the characteristics of social crisis see Sceger et al (1998) and Venette, S. J. (2003).

² In this study, the term 'phonological' is used synonymously with 'prosodic' to cover the hierarchical organizational structure of utterance as described in prosodic phonology in Nespor and Vogel (1986); Selkrik (1984); Hayes (1989) and later in Hengeveld & Mackenzie (2008) and Halliday et al (2008). Nespor and Vogel prosodic phonology is concerned with the phonological structure or domains of utterance above the syllable and the foot levels. Nespor and Vogel prosodic phonology is not to be confused with Firthian prosodic phonology where Firth takes the phoneme as a central segmental unit at the expenses of other structures (Firth, 1948). Nolan (2006, 437) also indicates when the term 'phonology' is used with respect to intonation, it refers to contrastive linguistic units underlying the continuously variable melody of speech and these units can function in context to convey meaning.

discourse and even to lexical distinctions (Clark et al, 2008, 328). The present study approaches these intonational features by analyzing the articulatory output of six monologues which represent different types of crises e.g. food, unemployment, environment, child custody, health insurance, and education. These unresolved crises, which have strong negative impacts on society, are the center of attention to the speaker who is trying by every means to uncover their dangers, convince the listener of the seriousness of the problems, and propose solutions.

The goal of this study is to analyze the phonological features in the monologues of social crises such as pitch movements (e.g. tone, tone units, prominent syllables/words, tempo, and pitch height) in an attempt to show how the speakers in the monologues focus on certain information representative of the characteristics of social crises. The study investigates the above intonational features as part of the phonological structure of spoken discourse in the monologues by describing the hierarchical phonological levels (e.g. the utterance and the intonational phrase) to interpret the functions and the meanings of these phonological features in their natural settings. The study attempts also to show the correspondence of some of these phonological aspects to other lexical as well as syntactic aspects.

2. Data

The data consists of six monologues for six different American speakers, males and females. The term *monologue* is used to refer to the spoken discourse of an individual speaker "without any overt textual contribution to a second party" (McCarthy 1994, 16), i.e. in a sense antonymous to conversational discourse. The crises in the six monologues touch six predicaments as they appear in the following order (food, unemployment, environment, child custody, health insurance, and education). Each speaker is projecting his/her crisis addressing the public over a related issue to either his/her personal crises (e.g. child custody and unemployment) or impersonal crises (e.g. food, environment, health care, and education). Both personal and impersonal crises have their strong negative impacts on society. They are all selected according to their representation of ideal cases of people talking about their crucial unstable situations or conditions of extreme danger or difficulty.

The data is composed of six pre-recorded monologues, some of them are excerpts from self-recorded and self-published discourses on YouTube, and some others are portions of televised lectures or TV programs uploaded to the internet. In spite of the fact that the monologues are pre-recorded, they do not lack impulsiveness and spontaneity.

All the monologues are given the label (M) followed by the numbers (one to six) in the order described above. The discourses in the monologues are transcribed and processed into utterance acts. Every utterance act is broken into smaller units and sub-units according to the top-down fashion of Hengeveld and Mackenzie (2008) in their approach to functional discourse grammar (FDG) which will be described in section (3). The utterances are numbered in each monologue and their pitch movements are transcribed in separate contours¹. A double slant lines (//) is used to mark the beginning and the end of each utterance to refer to a full pause and a single one (/) is used in the place of shorter pause to separate smaller units of discourse within the utterance.

The intonation in the contours is transcribed primarily depending on pure auditory means and revised with the help of some speech software (Speech Analyzer and Transcriber) to guarantee accuracy of description. For giving accurate results, the reliance on spectrographic readings increases particularly on the analyses of the acoustic parameters of tempo (e.g. duration), pitch height and loudness². The transcripts of the monologues and the contours are appended as well as other relevant information about the monologues, their sources, speakers, and duration (see Appendices A and B).

3. Procedure

The analysis of the phonological aspects of pitch, tempo and loudness in the monologues of social crises hinges upon Hengeveld and Mackenzie's Functional Discourse Grammar *FDG* (2008), the phonological approach of in particular. Hengeveld and Mackenzie (2008, 428-9) propose a hierarchical phonological structure of six layers - or *units* - to start with the utterance and ends with the syllable³. The units are given here in order followed by their labels:

¹ A simple stylized pitch curves are used as a convenient way for reading the melody in the utterances in Appendix (A). However, a more theoretical system of transcribing the contours are applied in the examples relying on Hengeveld and Mackenzie's operators for describing pitch movements in phonological units (see the following section).

² The correspondence between spectrographic analysis (physical) and phonological analysis (linguistic) as two levels of representation is extensively discussed by several linguists, for example (Hirst & Di Cristo 1998, 1-44; Ladd and Cutler 1983, 1-10).

³ The six phonological levels of Hengeveld and Mackenzie are based on seven levels proposed by Naspor and Vogel (1986) and eight levels by Auer (1993). In Halliday & Greaves' systemic functional linguistics (2008) this hierarchy of units is known as 'rank scale'.

Utterance (U), Intonational Phrase (IP), Phonological Phrase (PP), Phonological Word (PW), Feet (F), and Syllable (S). Every higher unit consists of one or more lower unit. For instance, an utterance (U) consists of one or more intonational phrase (IP), and the intonational phrase (IP) consists of one or more phonological phrase (PP), and so is the case with the other lower units. For describing the spoken discourse of the monologues of social crises, it is essential to determine the properties of these six phonological unites, their boundaries, and other significant terminology associated to them as follows:

1. The *Utterance* (U) is the largest stretch of speech covered by the phonological level. It is usually followed by a full pause to determine the end of its topic. The typical utterance is "a self contained group of Intonational Phrases" (Hengeveld & Mackenzie 2008, 430). However, it can be composed of one intonational phrase of one word.
2. The *Intonational Phrase* (IP) is a shorter unit, lower than the utterance¹. It contains a nuclear tone or more on one or more syllables, and it is separated from other intonational phrases by a shorter pause than the pause which usually separate two utterances. One of the significant functions of the intonational phrase is "to bundle up the stream of speech into information chunks" (Carr 2008, 79).
3. The *Phonological Phrase* (PP) contains one nuclear syllable which is more prominent than the other surrounding stressed syllables. This prominent syllable is the primary location for the global fall or rise within the intonational phrase. The Phonological phrase can be one word with a nuclear syllable or more words with one nuclear syllable.
4. The *Phonological Word* (PW) corresponds roughly to the morpho-syntactic word². A phonological word can be one word of one prominent syllable, a disyllabic or a polysyllabic word of which only one syllable is prominent.
- 5- The *Foot* (F) is an intermediate layer between the syllable and the phonological word. Each foot contains one strong syllables and other weaker syllables. The terms *trochaic Feet* and *iambic Feet* are respectively used for distinguishing the strong first syllable from the strong last syllable.

¹ In British tradition, the intonational phrase is more or less synonymous with one tone group or tone unit composed of a nuclear tone, a head, and a prehead (Crystal 1969; Halliday, 1970, O'Connor and Arnold 1973, Cruttenden, A. 1997).

² Nespore and Vogel (1986, 141) redefined the morpho-syntactic word into the phonological word to distinguish a word such as "arise" from the phrase "a rise".

6. The *Syllable* (S) is the last layer in the hierarchy where phonemes group into syllables. The syllable consists of three parts: an onset, a head and a coda. The head and the coda form the rhyme. The rhyme has two distinct moraic structures: biomoraic and monomoraic rhymes, the first yield heavy syllables (for long vowels) and the second yields light syllables (for short vowels).

For descriptive purposes, some global operators for pitch movements (e.g. falling and rising) and pitch height (e.g. low, mid, and high) are used. Pitch movements are represented by the operators with lower case labels (f) and (r). They are placed initially before the label of the Utterance e.g. (rU) and (fU), the Intonational Phrase e.g. (rIP) and (fIP) and the Phonological Phrase e.g. (rPP) and (fPP). Syllables may be characterized by high or low pitch. Pitch height is shown by the operators (h) and (l) respectively. These operators precede the label for the Phonological Phrase (hPP) and (lPP), the Feet (hF) and (lF), and the Syllable (hS) and (lS).

In the monologues of social crises, the description of the above six units are dependent primarily on pauses and "topic-related structural units"¹ (Thomson 1994, 65-6). The utterance is usually followed by a longer pause which functions as the end of its topic. In some other less frequent cases, the utterance is followed by a shorter pause that marks the end of its topic. For lower units e.g. IP and PP, the pauses are often shorter than those which mark the end of the majority of utterances. Shorter or longer pauses are sometimes used to separate certain prominent words which are of relevant significance to the overall topic of discourse. Significant words of this type are often marked with a pre-pause and a final pause, a pitch movement, or a high pitch.

Within the above organizational hierarchy, FDG focuses on certain phonological features such as pitch variation (e.g. pitch movements and pitch height), prominence (e.g. stress, lengthening of certain syllables, and tempo).

The analysis of pitch variation covers four domains: pitch movements (tones), pitch height (low, mid, high), global tones, and pitch word types. Pitch movements are represented by various types of tones (e.g. rising, falling, rise-falling, and fall-rising) on various phonological units with particular focus on the higher three units: the utterance, the intonational phrase, and the phonological phrase. Pitch height is also used for describing these units of spoken discourse.

¹ Thomson's topic-related structural units of spoken discourse are also identified by Brown and Yule (1983, 101) as 'partones', the first syllable 'par-' is derived from paragraph.

The term *global tones* refers to the starting and the closing pitch movements of the utterance. Both qualitative and quantitative analyses are used to illustrate the various types of starting and closing tones, their frequencies in the six monologues, and their discourse functions on the utterance level. Tone and global tones will be handled in section (4).

The study also handles various types of *pitch words* either word-based tones or syllable-based tones. Laver (1994, 155) distinguishes between *word-based tones* (the lexical tone, i.e. standard patterns of pitch over a variable number of stressed or unstressed syllables) and *syllable-based tones* (the syllable tones, i.e. pitch over the syllable). Prominence on the phonological words is achieved via two ways: extra high pitch on word-based and syllable-based tones and stress. Pitch words and stressed words share the following features: altered pitch, lengthening, and increase in loudness. However, pitch words are said with a greater change in pitch, loudness and length of time than stressed words particularly the pitch words with stressed syllables. The significance of pitch words is that they allow the interpretation of utterances in discourse because extra pitch is usually placed on valuable and relevant words. In section (5), the various types lexical and functional pitch words (e.g. monosyllabic, disyllabic and polysyllabic words), associated tones, and functions will be investigated.

In section (6), the analysis of the variation in speaking rates or *tempo* reveals four basic patterns of tempo in the six monologues. The analysis also shows how the counterpoints of tempo (e.g. slow, medium, and quick) correlate with other intonational features (e.g. pitch height) and discourse features (e.g. IP length, and the types of new and given information). The study of tempo also handles the continuity of discourse which is represented mainly by pauses and hesitation to show their significant distributions and functions.

FDG analysis using the above hierarchy of phonological units allows more flexibility in dealing with the units of discourse for several reasons. The first reason is that these phonological units are equivalent to grammatical and semantic units. For instance, the phonological unit of the utterance, as a topic-related structure, is seen as both a lexico-grammatical and a semantic unit. Similarly, other lower tone units e.g. the intonational phrase and the phonological phrase pertain to lower lexico-syntactic (e.g. the clause, the phrase) and also to semantic units (e.g. information units). The phonological word (with both its segmental and prosodic features¹) is roughly correspondent to the 'morpho-syntactic' word (MacCnuzee et

¹ Dixon and Aikhenwald (2002, 14-18) distinguish the segmental features of the phonological words (e.g. the syllable) from the prosodic features (e.g. nasalization and palatalization).

al 2008, 443), and the place of the nuclear syllable on words are determined by semantic features, for example of topic and comment (Palmer 1996, 157).

In the above sense, FDG analyzes the phonological form of the utterances in the monologues of social crisis. Phonological forms are represented by the six phonological units with the intonational features of pitch variation, prominence and tempo to attribute their functions to linguistic information which is significant in comprehending the discourse of social crises.

The second reason for the flexibility of the phonological description of discourse using the six phonological units is that all these six phonological units can be represented in a typical utterance which includes one or more intonation phrase, and other lower units down to the phoneme can also be described. Likewise, in natural discourse, the utterance may consist of only one word with a nuclear syllable surrounded by two full pauses. This one-word utterance can be represented as an IP which in turn can be described by the rest of lower units. Consequently, the hierarchical phonological units allow the description of various types of actual utterances in natural discourse, and other phonological aspects of pitch and prominence are also described in every unit. The following three examples illustrate the flexible representation of the phonological hierarchy in describing three utterances of various lengths

- (1) a. //Hey/people always ask me/hey/why are you buying gold/you can't eat it// (M1: I¹)
- b. (U₁: (IP₁: [(PP₁: /'heɪ/ (PP₁))] IP₁)) (IP₂: [(PP₂: /pɪˈpɪl/ (PP₂)) (PP₃: /'ɔːlweɪz/ (PP₃)) (PP₄: /'æsk mi/ (PP₄))] IP₂)) (IP₃: [(PP₅: /'heɪ/ (PP₅))] IP₃)) (IP₄: [(PP₆: /waɪ/ (PP₆)) (PP₇: /əɪ 'ju/ (PP₇)) (PP₈: /'bɑːn 'gəʊld/ (PP₈))] IP₄)) (IP₅: [(PP₉: /ju 'kænt/ (PP₉)) (PP₁₀: /tɪ t/ (PP₁₀))] IP₅)) (U₁))

The first three higher units are represented in the above utterance. The above example consists of one utterance with five IPs. The first IP includes one PP, the second IP includes three PPs, the third IP has only one PP, the fourth IP has three PPs, and the last IP has two PPs. Other lower phonological units could be represented according to the requirements of analysis. The following two-word utterance can be represented with four phonological units: one U, one IP, one PP with two PW

¹ The label 'M' refers to 'Monologue' followed by the number of the monologue and utterance in Appendix Appendix (A).

- (2) a. //that's correct// (MI: 5)
 b. (fU₁: (IP: [hPP₁: (PW₁: /ðæts/ (PW₁)) (IPW₂: /kə'rekt/ (PW₂)) (PP₁))] IP))(U₁))

The next one-word utterance can be represented down to the syllable:

- (3) a. //look// (MI: 4)
 b. (rU₁: (IP₁: (PP₁: (PW₁: [(S₁: /lʊk/ (S₁)] PW₁)) PP₁)) IP₁)) U₁))

As is clear in the above three examples, FDG analysis allows more flexibility than other approaches in dealing with utterance boundaries. The utterance may consist of one or more IP; the IP may consist of one or more PP in a top-down fashion to the syllable. The system of global operators for transcribing pitch movements and pitch height could be added to the flexibility of this model.

4. Analysis of data

The above FDG approach is used for analyzing the intonational features of the utterances in the monologues of social crisis to decode their distinctive discourse features. The following sections handle the intonational features of pitch variation (represented by tone, tone units and global tones), prominence (represented by prominent pitch words) and tempo.

5. Tone

The study of tone covers two linguistic functions of pitch movements: tone units and global tones. It is of considerable importance to start with describing the various types of pitch movements in the six monologues particularly on tone units of higher levels such as the utterance, the intonational phrase, and the phonological phrase to identify the overall significant features of pitch and their distribution in various units in the discourse of social crisis.

Global tones examine both starting and closing pitch movements on the utterance level to show the significant starting and closing tones and their pitch height and their various functions in discourse. The following analysis of tone units and global tones are indexical of the general intonational features and discourse information in the monologues of social crises.

5.1 Tone units

Consider the following utterance

- (4) a. //we also have an education crisis of the first degree// (M6: 1)
 b. (rU₁: [(rIP₁: [(PP₁: /we/ (PP₁)) (fPP₂: /also have/ (PP₂)) (rf PP₃: /an edu'cation crisis/ (PP₃)) (rPP₄: /of the first/ (PP₄)) (rf PP₅: /de'gree/ (PP₅))] (IP₁)] (U₁))

Example (4) is composed of one U which is also one IP of five PP. It is remarkable that all the PPs start with low rising tones except for PP₂ that starts with a falling tone. However, the PPs with the prominent nuclear stress are falling for example: *also* in PP₂ which is the highest falling tone in the whole utterance, the accented falling syllable *-tion* in *education* in PP₃, and *-gree* in *degree* in PP₄ is also falling. The latter two nuclear syllables *-tion* and *-gree* with the falling tones are preceded by a gradual low rise on the first two syllables *-educa-*, and a low rise on the first syllable *de-* which is also preceded by a gradual low rise on *of the first* in PP₄.

The highest falling pitch in the whole utterance in (4) is on *ALso*, followed by lower falling pitches on the syllables *-tion* and *-gree*. The phonological word *crisis* (the tail of PP₃) is not prominent; it is characterized by the lowest level tone in the whole utterance. *Crisis* is not prominent phonologically although it is distinguished syntactically. It is the head of the NP in PP₃, and it is also the object of the whole clause. The other two words *education* and *degree* are adjectival elements, *education* modifies *crisis*, and *degree* is the head of the adjectival phrase that also qualifies *crisis*. Consequently, all grammatical elements in the utterance that are related to *crisis* - the word of central focus in grammar - feature a falling tone, and the transitive verb phrase *have* in PP₂ is also characterized by a global falling tone which is an extension of the preceding most prominent falling tone on *also*.

The following utterance in example (5) is composed of two IPs:

- (5) a. //I think it's such a scary time/because// (M2: 1)
 b. (rU₁: [(rIP₁: [(PP₁: /I 'think / (PP₁)) (rPP₂: / it's 'such / (PP₂)) (rPP₃: /a 'scary/ (PP₃)) (rPP₄: /time/ (PP₄))] (IP₁)) (fIP₂: [(PP₅: /be'cause/ (PP₅))] (IP₂))] (U₁))

Similar to the utterance in (4), the utterance in (5) starts with a low rise and ends with a high fall. The first four PPs in IP₁ also start with a low to mid-rise on (/i, it, a, and the first phoneme in /t-aim/) and ends with a mid-fall to high on (*think, such*, the last phoneme in /skeər-i/, and the last phoneme in /taɪ-m/). A rise-fall-rise-falling tone is given to *scary* with a little lengthening of the phonemes /-eər/ followed by a mid-fall on the last phoneme /t/. In the fourth PP in IP₁, *time* is also given a mid-rise falling tone where the vowel /-aɪ/ is also lengthened.

The pitch on *be-cause* in the second IP is falling, with a high fall on the first unaccented syllable *be-* and the second accented syllable *-cause* which is marked with a sharp fall. The nuclear syllable *-cause* and the nucleus in the PP₂ on *such* are the most prominent falling pitches in the whole utterance.

The sharp fall on *such* and the falling tones at the end of *scary* and *time* are concomitant with the grammatical functions of these words because *such* is a predeterminer for the noun head *scary time*. The verb *think* is given a mid-falling tone exactly like *have* in the utterance in example (4). The two falling tones on *because* anticipates the frustration of the speaker which is revealed in the next two clauses in the following utterance in example (6), particularly in the negative verb phrase *don't know* which is also characterized by two successive falling movements.

- (6) a. //we don't know/where the/light at the end of the (M2: 2)
tunnel/is/is//
- b. (rU₁: [(IP₁: [(PP₁: /we 'don't 'know/ (PP₁))] (IP₁))] (rIP₂: [(PP₂: / where / (PP₂)) (PP₃: /the/ (PP₃))] (IP₂)) (rIP₃: [(PP₄: /light at the 'end/ (PP₄)) (fPP₅: /of the 'tunnel/ (PP₅))] (IP₃)) (rIP₄: [(PP₆: /is/ (PP₆))] (IP₄)) (rIP₅: [(PP₇: /is/ (PP₇))] (IP₅)) (U₁))

The above utterance in (6) starts with a low rising tone and ends with a high rising tone - unlike the previous two examples which end with falling tones. It consists of five IP's with seven PPs. The first IP which is an independent clause starts with a low rise and ends with a high fall on the verb phrase *don't know*. The next dependent clause starts with a high rise on *where* in IP₂ and ends with two high rising tones on *is is* in IP₂ and IP₃ of which the last tone is the higher. Although the dependent clause is declarative, it still keeps the standard rising tone for question in English. However, interrogation is achieved by the use of rising tone on the end of the clause like any typical question in English. The interrogation is metaphorical

and provides no new information. It reflects the devastating emotional status of the speaker which is represented by the contrast of rising and falling tones.

There are six rising nuclear syllables in the dependent clause: *where*, *light*, *end*, *turn-el*, *is*, and *is*; and four falling tones are on the grammatical elements (*the* in PP₃, *at the* in PP₄, and *of the* in PP₅) and the last weak syllable in *turn-el*. The former phonological contrast is also represented lexico-grammatically. The rising tone is given to lexical words which make up the content of the clause and represent the speaker's ideal intention of hope to get out of the crisis. The falling tones are given to the grammatical elements. For example, the accented article *the* in PP₃ is made prominent by the speaker by pronouncing it as /ði/ to stress its referential function to the current frustrating situation of the crisis. Hope versus current situation is represented grammatically as well as phonologically. The current situation is represented grammatically by the negation in the first independent clause in the utterance while hope is represented by the metaphorical question. The same equation of contrast is also represented phonologically by the rising tone for the lexical elements that signify hope vs the falling tone for grammatical elements that signify current situation.

The contrast of falling and rising tones functions in a different way in the following example

- (7) a. //no evidence/was presented/to change custody// (M4: 1)
- b. (rU₁: [(IP₁: [(PP₁: /no 'evidence/ (PP₁))] (IP₁))] (fIP₂: [(PP₂: /was pre'sented/ (PP₂))] (IP₂))] (rIP₃: [(PP₃: /to 'change/ (PP₃))] (fPP₄: /custody/ (PP₄))] (IP₃))(U₁))

The utterance in (7) is composed of three IPs. As is always the case in almost all utterances in the data, the above utterance starts with a mid-rising tone on *no* and ends with a falling tone on *custody*. Each intonational phrase represents also a grammatical unit for example IP₁ is a NP which functions as the subject of the sentence, IP₂ is a VP, and IP₃ is an infinitive phrase which functions as a noun object. The first IP - the subject - consists of two tones, a rising tone on *no* and the first syllables in *evidence*, and a falling tone on *-ence*, the last syllable. The same pattern is repeated on the last IP₄ - the object - where PP₃ is rising and PP₄ is falling. The second IP for the verb phrase *was presented* is falling.

It is notable that the grammatical elements in the subject and the object in the above utterance (the negative particle *no* and the infinitive *to change*) receive a rising pitch, and the lexical noun heads *evidence* and *custody* end with a falling

pitch. The rising tone on functional elements and the falling tones on lexical elements in the current example are opposite to the use of tones in example (6). The rising tone on *no* raises the query of the speaker 'why is there no evidence...?', whereas the rising tone on the catenative¹ infinitive *to change* represents the resolution and hope *to change custody*. The falling tone on *custody* is an expression of loss of hope and resolution to change, while the rise-fall on *evidence* represents the controversy, and the falling tone on the past passive VP *was presented* in IP₂ confirms the speaker's loss of hope and resolution to change.

Longer IPs are used in the following utterance

- (8) a. //we have no practical plan/for refreezing the arctic/for refreezing the tundra/ for turning those dead forests back into living ones/ok//
(M3: 5)
- b. (rU₁: [(IP₁: [(PP₁: /we have/ (PP₁)) (fPP₂: /no practical/ (PP₂)) (rPP₃: /plan/ (PP₃))] (IP₁)) (IP₂: [(rPP₄: /for refreezing/ (PP₄)) (rPP₅: /the arctic/ (PP₅))] (IP₂)) (IP₃: [(rPP₆: /for refreezing/ (PP₆)) (rPP₇: /the tundra / (PP₇))] (IP₃)) (IP₄: [(rPP₈: /for turning / (PP₈)) (rPP₉: /those/ (PP₉)) (fPP₁₀: /dead forests/ (PP₁₀)) (rPP₁₁: /back/ (PP₁₁)) (fPP₁₂: /into living ones/ (PP₁₂))] (IP₄)) [(IP₅: [(fPP₁₃: /ok/ (PP₁₃))] (IP₅)) (U₁))

The utterance in (8) comprises five IPs of different lengths of which the first four IPs are relatively longer than the other IPs in the previous examples (4:7). The length of the IP is usually associated to the increase of the number of pitch movements and hence the increase of the number of the PPs. Nevertheless, the different lengths of IPs do not affect the resemblance in tone distribution, for all the first four IPs begin with a low rising tone, and three of them (IP₁, IP₂, and IP₄) end with a falling tone also, exactly like the whole utterance that starts with a low-rise and ends with a low-fall. This resemblance of tone distribution in the beginning and at the end of different IPs is due to the resemblance of grammatical structures in these units.

The second, third, and fourth IPs are all prepositional phrases with the same structure (Prep + Present Participle + NP). Each phrase starts with a low rise on *for* to continue gradually on the first syllables in *refreezing* in IP₂ and IP₃ and the first syllable in *turning*, and the high falling tone starts from the second syllable in each word.

¹ Catenative verbs are characterized by their tendency to describe mental processes and resolutions (KolIn 1994: 113).

The heads of the prepositional *the arctic* and *the tundra* are to some extent of similar tone movements. The article in both of them are given a low falling tone and the first syllables in *arc-tic* is rising and the second syllable is falling with a mid-pitch range where both syllables in *tun-dra* are rising, and the high rise increases on the second syllable. The difference in the tones on the second syllables in each word seems reasonable where the speaker reflects the inability to refreeze the *arctic* (because of being vast) or even the *tundra* (which is narrower). Therefore, the falling tone on *-tic* indicates the unquestioned inability for refreezing as believed by the speaker whereas the rising tone on *-dra* reflects the query of the speaker that "why are they unable to refreeze the tundra?"

The answer to the former question is resolved in IP₁ *we have no practical plan*, where the subject and verb *we have* in PP₁ are rising and the object *plan* is also rising high. The rising tone for the subject verb and object, the basic elements of the sentence, reflect the speakers negative expectations for the *plan* itself which is recurred by the inability of refreezing and returning (which are given rise-falling tones) in the prepositional phrase in PP₂, PP₃, and PP₄ which are qualifying the *plan*. This inability is also negated by the speaker in the second phonological phrase in IP₁ *no practical* where the negation in *no* is confirmed by a high falling tone and the modifier *practical* is given a rise-fall to indicate the speaker's strong feeling of approving the uselessness of the plan.

In IP₄, the gradual falling tones on *dead forests* in PP₉ and *into living ones* in PP₁₁ recur the duality of the inability of restoration and the impractical plan. The two rising tones on *those* in PP₈ and *back* in PP₁₀ functions textually. The demonstrative pronoun *those* refers to *dead forests* as an expected example for the impracticability of the *plan* (which receives also a high rising tone). The rising tone on *back* is related to the rising tone on the first nuclear syllable in *turning* for the two words make up the phrasal verb *turn back* which are also related to *plan* as basic components of the adjectival phrase which qualifies it. Thus, the rise-falling tones on *turning* and *refreezing* represent the expected practical plan -though it is an impossible solution as believed by the speaker, which is opposite to the real negated *practical* plan in PP₂. It is notable that the same rise-falling tone is also given to *practical* in PP₂ to represent the contrast between the expected practical plan (hope) and the negative impractical plan (reality) which set up the subject of the speaker's criticism.

The last IP *ok*, the shortest IP in the utterance, is characterized by very low falling tone to indicate finality and frustration.

Example (9) is a long complex utterance of several clauses

- (9) a. //what/we should hear/is something about how/we can provide health insurance coverage/the forty seven million Americans who are currently uninsured// (M5: 1)
- b. (rU₁: [(IP₁: [(PP₁: /what/ (PP₁))] (IP₁)) (rIP₂: [(PP₂: /we should/ (PP₂)) (fPP₃: /hear / (PP₃))] (IP₂)) (rIP₃: [(PP₄: / is something about how/ (PP₄))] (IP₃)) (IP₄: [(fPP₅: /we can/ (PP₅)) (rPP₆: /provide/ (PP₆)) (rPP₇: /health/ (PP₇)) (fPP₈: /insurance coverage/ (PP₈))] (IP₄)) (rIP₅: [(PP₉: /the forty seven / (PP₉)) (fPP₁₀: /million Americans/ (PP₁₀)) (fPP₁₁: /who are currently/ (PP₁₁)) (fPP₁₂: /uninsured/ (PP₁₂))] (IP₅)) (U₁))

The above utterance starts with a mid-rise falling tone on *what* and ends with a distinctive mid-fall-rise-falling tone on *uninsured*. It consists of five IPs of which four of them (IP₁, IP₂, IP₃, and IP₅) start with a mid or low rise on the weakest syllable and end with low or high fall, and the fifth IP₄ ends with a mid-fall though it starts with a mid-fall. The utterance is conceivable if the tones on these five IPs are redistributed into (subject + predicate) or (recommendation + process of a course of action). The first and second IPs constitute the subject *what we should hear* (the recommendation) and the rest of the utterance is the predicate (the process of the recommendation), viz. in IP₃, IP₄ and IP₅. The rise-fall on *what* in IP₁ is also applied to *something*, the predicative object. The subject and the dependent verb *we should* with two rising tones establish the recommendation while the main verb *hear* with the high fall refers to the negative real event of (what we should hear but we really don't). The fall on *about how* in IP₃ emphasizes the negative expectation represented by the fall on *hear*. The falling tones on PP₈, PP₁₀ and PP₁₁ are given for the same previous reason and it also expresses the negative fact that (no insurance coverage for millions of Americans now). The rising tone on *the forty seven* in PP₉ indicates the speaker's surprise of the enormous number of *uninsured* people which is also new information. The former negative fact are represented grammatically by the use of the negative suffix *un-* which receives a mid-fall in *uninsured*, followed by an extra high pitch on the second and third syllables *-insur-* trailed by a fall on the last syllable *-ed*. This fall-rise-falling tone expresses the speaker's strong disapproval of and objection to the current situation which is taken as a base for establishing her recommendation.

The tones on the first three PPs in IP₄ are crucial in comprehending the process of recommendation. In PP₅, a mid-falling tone was given to *we* and a higher one was given to *can*. The referential function for the pronoun (*we*) determines the use of falling or rising tones. In IP₂, *we* takes a low-rising tone to

refer to the speaker (the recommender) and other American people whereas *we* in IP₄ is given a mid-falling tone to refer to the decision makers (the processors of the recommendation) who only have the power to provide a health insurance coverage for the Americans. The rising tone on *can* retrieves the same rising tone of the recommendation in *we should* in IP₂. The controversial process of recommendation is expressed by *provide* (rise-fall) where the falling pitch is on the nucleus on the second syllable. The rise on the first syllable refers to the expected achievement in the recommendation which is also represented by the high rise on *health* in PP₇; the fall on the nucleus indicates loss of hope which is based on real ground. Loss of hope also corresponds to the gradual fall on *insurance coverage* in PP₈.

The correspondence between the phonological functions of rise-falling tones and pitch height and the lexico-grammatical functions is obvious in the following example

- (10) a. //now/I do believe/you should/prepare/and buy some food/for emergencies/ for/ long term /survival// (MI: 8)
- b. (rU₁: [(IP₁: [(PP₁: /now/ (PP₁))] (IP₁)) (IP₂: [(fPP₂: /I do/ (PP₂)) (rPP₃: /believe/ (PP₃))] (IP₂)) (IP₃: [(fPP₄: /you should/ (PP₄))] (IP₃)) (IP₄: [(rPP₅: /prepare/ (PP₅))] (IP₄)) (rIP₅: [(PP₆: /and buy/ (PP₆)) (fPP₇: /some food/ (PP₇))] (IP₅)) [(rIP₆: [(PP₈: /for emergencies/ (PP₈))] (IP₆)) (rIP₇: [(PP₉: /for long term/ (PP₉))] (IP₇)) (rIP₈: [(PP₁₀: /survival/ (PP₁₀))] (IP₈))] (U₁))

The above example subsumes five rise-falling tones on *believe* in IP₂, *prepare* in IP₄, *emergencies* in IP₆, *long-term* in IP₇, and *survival* in IP₈. These five words are distributed in the utterance as follows: *believe* is the main verb in the utterance while the other four words are in the direct object of the clause '*you should ... survival*' where *prepare* is the main verb in the direct object, *emergencies* is the NH for the adverb that qualifies the verbs *prepare and buy* in IP₅, *long-term* and *survival* (Adj + NH) are also the nominal elements for the adverb phrase that qualifies the same verbs.

The above lexic-grammatical distributions correspond to the rise falling tone and pitch height to confirm the speaker's positive recommendation. The rise-fall on *prepare* expresses the speaker's strong feeling of approval of his recommendation particularly when preceded by *I do* with an extra high pitch on *I* and a mid fall on *do*. Therefore, the (S+V) *I do* with the falling tones confirms the recommendation. The rise-falling tone on *believe* consists of declaring belief

(rising) and emphasizing it (falling). Consequently, when the recommendation starts with *you should* (S+V) in IP₃ showing a gradual mid to low fall, this gradual fall can be explained as extension for the confirming tone on *I do believe*.

The strong feeling of approval which is conveyed by the rise-falling tone is also extended to *prepare* in IP₄. It is remarkable that the grammatical symmetry of the structure (S + Aux. V + V) in both (*I do - believe*) and (*you should - prepare*) is equivalent to the intonational symmetry which is a falling tone for the subjects and the auxiliary verbs and a rise-falling tone for the main verbs. The only difference between the two symmetries is that *I do believe* in the first clause is higher in pitch range than *you should prepare* in the second clause. The higher pitch on the first structure *I do believe* could be justified in terms of the differences of the lexico-grammatical functions between the first and second structures. The first structure refers to the speaker (*I*) and his strong belief (*do believe*) whereas the second structure refers to the addressee (*you*) and the act of recommendation (*should prepare*).

In IP₅, *and buy* in PP₆ is rising and *some food* in PP₇ is falling. Although *prepare* and *buy* are two co-coordinated verbs for the second clause, a rise-falling tone is given to *prepare* and a rising tone is given to *buy*. As mentioned before, the rise-falling tone on *prepare* represents the speaker's act of recommendation that receives his strong approval and belief while the rising tone on *and buy* represents the way the recommendation has to be carried out. The falling tone on the object *some food* indicates the final goal of recommendation. The three rise-falling movements on *for emergencies*, *for long-term*, and *survival* are all qualifying elements for showing the reasons on which the speaker establishes his strong approval in the former structures *I do believe* and *you should prepare*.

The analyses of the above seven examples reveal the use of six tones, three of them are simple tones (falling, rising, and low level) and the other three are compound tones (rise-fall, fall-rise-falling, rise-fall-rise falling). In almost all examples, the falling tone is used to indicate frustration, loss of hope, negative current situation, finality or reaching a final resolution. The rise tone is used for raising questions (e.g. 7), indicating hope (e.g. 6), representing the speakers' recommendation or explaining how recommendation is to be carried out (e.g. 7, 10). The low level tone (for instance *crisis* in 4) is used to indicate the speaker's non-committal¹ attitude towards unsolved situation.

The rise falling tone is used for indicating the speaker's strong feelings of refusal and denial of the current situation or a proposed negative plan (e.g. 5, 8, 10).

¹ See the system of key in Halliday & Greaves (2008, p. 50).

Repeating the rise falling tone (e.g. rise-fall rise-falling) exaggerates the strong feelings of the speaker to turn the attention of the listener to serious danger (e.g. *scary* in 5). For exaggeration, the rise-falling tone is often associated with lengthening of vowels (for instance, /-a:/ in *time* and /-eə:/ in *scary* in example 5). The fall-rise falling indicates the speaker's objection and reservation towards current negative situations (e.g. 9). In general, compound tones are used when the speaker expresses his stronger feelings about certain negative issues and wants his expressions to be acknowledged by the listener while simple tones often synchronize with direct emotional reflections on showing frustration and raising hope or for indicating finality and questioning.

The description of tone units, their length, and their numbers in an utterance is essential in understanding how information is distributed in the discourse of social crises and the nature of the discourse itself. The representation of IPs in the above seven utterances shows that their distribution is subject to the number of pauses within the utterance. These pauses are determined by two factors: grammatical structure and/or prominence. The majority of pauses in the utterances (5:10) are also boundaries for grammatical units for instance: IP₁ and IP₂ in example (5) (*I think it's such a scary time/because*) are two clauses, and IP₁, IP₂, IP₃ in example (7) (*no evidence/was presented/to change custody*) are subject and predicate (v + infinitive phrase).

The phonological/grammatical correspondence of the distribution of pauses in the utterance is a regular feature for any type of discourse including the discourse of social crises. Nevertheless, some IPs are separated by pauses irrespective of the correspondence to grammatical structure such as: IP₂ in example (6) (*we don't know/where the/light at...*) is separated by two pauses, the preceding pause correspond to the beginning of the clause while the second pause is for giving prominence to the next IP, and the speaker accents the article *the* /ði/ to turn the listener's attention to the content of the following IP. In example (10), IP₃ and IP₄ (*...you should/prepare/...*) are separated by pauses also to turn the listener's attention to the act of recommendation (*you should*), stressing the importance to (*prepare*) with the rise-falling tone and the separation by two pauses.

The use of pauses for giving prominence for certain IPs explains the general increase of the number of IPs in the discourse of social crises. About twenty nine IPs and fifty five PPs are counted in the utterances in examples (4:8). Such increase signifies the overall tendency of the speakers in the monologues of social crises to highlight certain messages through the use of pauses and various tones trying by every means to communicate certain meanings and emotions to

affect the listener. The higher number of PPs within intonational phrases supports the preceding view that the speaker, under the impact of crisis and the desire to find a solution, tend to communicate various meanings and emotions to affect the listener.

The analysis of tones shows two significant features of phonological correspondence among the tones in different tone units on the one hand and between the phonological and the lexico-grammatical levels on the other hand. Phonological correspondence refers to similarity of tones in the different tone units. Similar tones can be global on the level of the utterance of one unit (e.g. 4) where the highest falling tone is given to *also* and the rest of words in the utterance are also falling with different pitch heights. In different intonational phrases, similar tones can be a result of similar grammatical structures such as the rise-falling tone on similar prepositional phrases in examples (8, 10).

The correspondence between the phonological and the lexico-grammatical levels varies in the above example. For instance, the rising and falling tones are given to content and functional words respectively in example (6) to represent the speaker's colliding emotion of hope versus current situation. In an opposite way, the rising tone on functional elements is used for raising questions and the falling tones on lexical elements are used to signify the loss of hope in example (7). In example (9), the subject with the rising tone is used for recommendation and the predicate with a falling tone represent the process of recommendation. As is clear in the above examples, the correspondence between the phonological and lexico-grammatical levels has various forms for construing different meanings and functions and these forms are usually governed by the distribution of tones and the context of the utterance.

5.2 Global tones

The previous analysis of pitch movements focuses on tones and tone units starting from the level of the utterance down to the syllable. The analysis of global tones focuses on the general starting and closing tones for all utterances in the six monologues of social crises to know how the speakers' link utterances together, start a new topic, shift to another topic, or continue in the same direction of their talks. The following table shows the total numbers of the various tones that are used as starting and closing pitch movements in all utterances in the monologues

	Rising	Falling	Total
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Tones	lr	mr	hr	lf	mf	hf	mrf	hrf	fif	r	f	rf	
Starting	17	7	6		3	5	5			30	8	5	43
Closing			5	16	9	3	7	2	1	5	28	10	43

(Table 1)

The most significant numbers are for rising starting tones (30) and closing falling tones (28). These two numbers signify that 69.77 % of the utterances in the monologues start with a simple rising tone and 65.12 % of the utterances end with a simple falling tone. Alternatively, 18.60 % of the starting tones are falling and 11.63 % of the closing tones are rising. The percentage for the rise falling tone for starting is 11.63 %, and 23.26 % is for closing.

The readings in (Table 4) generally indicate that there are three tones (rising, falling, rise-falling) which are used for starting and closing utterances. The following sections clarify the functions of each tone on both positions.

a. Starting tones

Rising starting pitch movements are generally used to start a new topic or to ask a question. However, there are various additional uses for low rising, mid-rising and high rising tones. A low rising tone, as well as other mid/high rising tones, is generally used for starting a topic.

- (11) hey people always ask me hey why are you buying gold you can't eat it
(M1: 1)

A low-rising starting tone in the next utterance is also used for adding extra details to the previous utterance in (11)

- (12) and of course everyone has heard this one (M1: 2)

The information in example (12) is not exactly on topic, but this does not mean to shift the topic in the previous utterance in (11).

A low rising tone is also used to introduce a negative statement to express the point of view of the speaker in the following two examples

- (13) there was nothing presented that would even carry any weight to change custody
(M4: 3)

- (14) there was no reason for them to change custody (M4: 2)

A high rising tone is used for topic shifting to turn the attention of the listener to a new topic

- (15) look (M1: 4)

The high rising tone is also used to start an argument in example (16) or to start a recommendation in (17)

- (16) now as far as you can't eat your gold so why buy it (M1:10)

- (17) now I do believe you should prepare and buy some food for emergencies for long term survival (M1: 8)

A med-rising tone is sometimes used to introduce an alternative view

- (18) why not storing something stable (M1:14)

To start an utterance with a falling tone indicates assertion. The speaker uses the falling tone to assert what is previously said in example (19), or to restate a point of view in an explanatory way in example (20)

- (19) That's correct (M1: 5)

- (20) I mean it could it could always be worse (M2: 5)

The mid rise falling tone is usually used to start a comparison. The speaker compares his status as a kid *in the past* to the status of kids *in the late seventies and eighties* in the following utterance

- (21) when I was a child all our test scores are always going up and we're all great kids (M6: 2)

Also, the mid rise falling tone is used to start an utterance of more than one clause where the first clause introduces the speaker's point of view which is opposite to the current situation of the crisis, and the second clause explains this point of view

- (22) what we would probably hear from President Bush though is a wonderful revision of his proposal from last year (M5: 2)

It is noticeable that a rise falling tone on *last year* is also used for closing the utterance.

b. Closing tones

Approximately the majority of utterances close with a falling tone (65.12 % for simple falling and 23.26 % for rise-falling tones). This feature is not of valuable significance to the discourse of social crises because the falling tones are used traditionally for indicating finality. However, the high falling tone and the high rising tone are of some discourse functions, for instance

- (23) I think it's such a scary time because (M2:1)

Contrary to indicating finality as is often the case for the rest of closing falling tones, the above utterance closes with a high fall on *because* for anticipating a frustrating cause. This cause is provided by the speaker in the next utterance (see example 5, p.). The anticipated cause is declared in the following example

- (24) we don't know where the light at the end of the tunnel is is (M2:2)

The utterance starts with a high rising tone to turn the attention to the anticipated cause, and it ends with high rising tone because of the interrogation in the second clause (see example 6, p.).

The high rising closing tone can be used also for referring, for example

- (25) I mean best case never as I feel like I'm on line for a job fair not you know not waiting to be given bread or something like that (M2:4)

There is a certain type of correspondence between the rising closing tone on *that* and its referential function for *that* refers to an existing danger '*not to be given bread*' or to an equivalent unknown danger '*or something like that*'.

The rise-falling tones are used for closing utterances to signal controversy. The speaker argues a certain issue by presenting his point of view which contradicts the real issue in the crisis

- (26) *ahm* ammunition can't buy food in in certain situations (M1:7)

Here the speaker disagrees with the idea that (ammunition is more important than food) which is one of the central controversial issues in the argument in the first

monologue. Controversy is represented by the rise falling tones on both *ammunition* as the central point in the issue and *situations* as the last word in the utterance to affirm his disagreement which has been already presented by the negation in *ammunition can't buy food*, that means (ammunition is less important than food). In the same way, the closing tone on *stable* in example (18) is rise-falling to signal the speaker's point of view which is opposite to the central issue of the crisis.

The former analyses reveal that the speakers in the monologues use three tones in particular (rising, falling, rise-falling) to start and to close their utterances with. These three tones have various discourse and textual functions when applied initially and finally and pitch height also has a significant role in varying these discourse functions.

Generally, the rising tone is used in the beginning of an utterance to start a topic or to ask a question, the falling tone indicates finality when used at the end of the utterance, and the rise-fall signal controversial elements if used as both starting and closing tones. Pitch height vary the functions of tones. For example, starting low rising tone are used by the speaker to add extra information to the previous utterance as in example (11), or to introduce the speaker's negative opinion as in (13, 14). Starting high rising tone is used for topic shifting to turn the listener's attention to the new topic (15). It is also used for starting an argument (16) or a recommendation (17). Starting mid-rising tone is used to introduce an alternative topic (18). Closing high rising tone is applied by the speaker to refer anaphorically to previous portions in the utterance (25), or to interrogate (24).

Few falling tones are used in the beginning of utterances to indicate assertion (19) or to re-explain a point of view (20). Closing fall functions to anticipate frustrating new information in the next utterance (23) and to indicate finality for almost all utterances in the monologue. As starting tone, the rise falling is used for comparison (21), and it is used indicate two controversial elements (26).

The former study of pitch within various tone units or as global starting and closing pitch movements is essential in understanding the general features of the discourse of social crises. The following section handles the interaction of several phonological aspects e.g. tone, pitch height and stress to focus on significant information to reveal other specific features of the discourse of crises.

6. Pitch words

Pitch words form one of the most significant aspects of intonational prominence in the discourse of social crises because they represent the most prominent words in the utterances via the correlated use of tone, stress, and pitch height. The study of pitch words reveals the use of four high tones (e.g. high fall, high rise, high rise-fall, and rise-fall-rise falling). These words may have pitch movements on the syllable where the movement can be either on a stressed monosyllabic word or on a certain stressed syllable in a disyllabic or a polysyllabic word. Other pitch words are word-based tones where some particular polysyllabic words may have more than one high pitch movement of which one syllable or two may be the nucleus. In the subsequent examples, the whole utterances with their IPs will be displayed to mark the highest pitch movements on both monosyllabic, disyllabic and polysyllabic words. The following are six utterances representing the six monologues in order

- (27) //hey/people always ask me/hey/why are you buying gold/you can't eat it//
 (M1: 1)
 (U₁: [(IP₁: /hey/ (IP₁)) (IP₂: /people 'always 'ask me/ (IP₂)) (IP₃: /hey/ (IP₃))
 (IP₄: /'why are you 'buying 'gold/ (IP₄)) (IP₅: /you 'can't 'eat it/ (IP₅))] (U₁))
- (28) //ahm/I would say that/you know/it is a little disheartening/and even a little
 embarrassing/to/have/to/you know/basically you haven't to swallow your
 pride//
 (M2: 3)
 (U₁: [(IP₁: /ahm/ (IP₁)) (IP₂: /I would 'say 'that/ (IP₂)) (IP₃: /you 'know/
 (IP₃)) (IP₄: /'it 'is a 'little dis'heartening/ (IP₄)) (IP₅: /and 'even a little
 em'barrassing/ (IP₅)) (IP₆: /to/ (IP₆)) (IP₇: /have/ (IP₇)) (IP₈: /to/ (IP₈)) (IP₉:
 /you 'know/ (IP₉)) (IP₁₀: /'basically you 'haven't to 'swallow your 'pride
 (IP₁₀))] (U₁))
- (29) //here the point is/the scary point is/that at a certain/place/this becomes
 impossible for us to control//
 (M3: 1)
 (U₁: [(IP₁: /here the 'point is/ (IP₁)) (IP₂: /the 'scary 'point is/ (IP₂)) (IP₃: /
 that at a 'certain / (IP₃)) (IP₄: /'place/ (IP₄)) (IP₅: /this 'becomes im'possible
 for us to con'trol/ (IP₅))] (U₁))
- (30) //there was no/reason/for them/to change custody//
 (M4: 2)

(U₁: [(IP₁: /there was 'no/ (IP₁)) (IP₂: /reason/ (IP₂)) (IP₃: /for 'them / (IP₃)) (IP₄: /to 'change 'custody/ (IP₄))] (U₁))

- (31) //which is/a really/dysfunctional/way/of providing health insurance coverage/ for the few people who are there today// (M5: 4)

(U₁: [(IP₁: /which 'is/ (IP₁)) (IP₂: /'a really/ (IP₂)) (IP₃: /dys'functional/ (IP₃)) (IP₄: /'way/ (IP₄)) (IP₅: /of 'providing health insurance 'coverage/ (IP₅)) (IP₆: /for the few 'people who are there 'today/ (IP₆))] (U₁))

- (32) //when/I was a child/all our test scores are always going up/and we're all great kids// (M6: 2)

(U₁: [(IP₁: /when/ (IP₁)) (IP₂: /I was a 'child/ (IP₂)) (IP₃: /all our test 'scores 'are 'always going 'up/ (IP₃)) (IP₄: /and we're 'all great 'kids/ (IP₄))] (U₁))

In the preceding examples, four types of tones are used for pitch words: high fall, high rise¹, high rise-fall, and rise-fall-rise falling. These tones apply variably to lexical as well as functional words. Compare the use of high falling tones for the following monosyllabic and polysyllabic lexical and functional words:

Monosyllabic Words		Polysyllabic Words	
Lexical	Functional	Lexical	Functional
ask (27); no (30)	I, it, that, have (28); a (31)	custody (30)	always (27 & 32); even (28)

(Table 2)

It is remarkable that high falling tones on lexical words are used to assert the speaker's point of view which is opposite to the nature of the crisis. For instance, the highest falling tone in the whole utterance in (27) is on *ask* which is associated to the speaker's assertion of the fact that people care to *ask* him. The high falling tone on *ask* is supported by an equal preceding tone of the same height on the functional word *always* in the same IP in (27).

¹ High fall starts from a high pitch then falling, and high rise starts from a low or mid point to a higher point.

In (28), the highest falling tone on the functional pronouns *I* and *it* are used for the same function. The speaker also wants to assert his point of view by the use of the falling tone on *I* followed by a lower falling tone on *would*. In the same utterance, the same pattern is repeated; a high falling tone on *it* followed by a lower falling tone on *is* to represent the speaker's point of view. The assertion applied by falling tones to the functional items *I* and *it* in (28) are also supported by three other falling tones in the same utterance on the functional items: *that*, *even*, and *have*.

In (30), the highest two falling tones in the whole utterance are given to the negative particle *no* and the lexical word *custody*. The falling tone on *no* is usually counted as "a definite refusal or denial" (Clark et al 2008, 338-9). These two falling tones assert the speaker's extreme opposition to the fact of changing *custody* because custody is a central frustrating issue in the crisis.

Contrary to the distribution of high falling tones in table (2), the application of high rising tones to lexical words in table (3) increases:

Monosyllabic words		polysyllabic Words	
Lexical	Functional	Lexical	Functional
say (28); point & place (29); change (30), is & way (31).	why (27), up (32)	certain & control (29)	—

(Table 3)

The high rising tones on lexical words of both types are used for providing new information which almost match the lexical meaning of these words. For example, the high rising tone on *say* in (28) prepares the listeners for the speaker's new information (or her representation of the crisis) in the next clause. In (29), the high rising tone on *point* conveys new information which represents the speaker's opinion, and the next two rising tones on *certain place* specify the speaker's *point* of view. The rising tone on *control* at the end of the utterance in (29) predicts the impending fear of the speaker in IP₅ which represents the focal problem of the crisis. Similarly, the rising tone on *change* in (30) represents the problem in custody crisis.

In (31), *is* and *way* in IP₁ and IP₄ are characterized by the highest rise on monosyllabic lexical words in the whole utterance. Both of the mid-rise on *which* and the highest rise on *is* introduce the speaker's *way* in IP₄ by which the speaker

presents new information as his point of view of the crisis that is expressed in IP₅ and IP₆.

The rising tones on the two functional words *why* in (27) and *up* in (32) serve similar functions as those of lexical words. The rising pitch on *why* is for raising question and the other tone on *up* is equivalent to the meaning of *up* in IP₄ in (32).

The following table presents the rise-falling tones on monosyllabic, disyllabic, and polysyllabic words to show their various functions:

Monosyllabic Words		Polysyllabic & Disyllabic Words	
Lexical	Functional	Lexical	Functional
people (31); child (32)	to & pride (28); when, I & all (32).	disheartening, embarrassing, haven't, swallow (28); impossible (29); reason (30); providing (31); going (32).	—

(Table 4)

In (32), the rise falling tones on all words lexical and functional, monosyllabic or disyllabic (e.g. *I*, *child*, *when*, *all* 'which is repeated twice', and *going*) are used to express the speaker's strong disapproval of the situation. Similarly, the rise falling tone on the causative *to* which is repeated twice in (28) represents the speaker's strong disapproval 'to swallow your pride' in IP₉.

Other words of more than one syllable (e.g. embarrassing, disheartening, haven't, swallow, impossible, reason, and providing) signify controversial issues related to the topics of crises in the monologues. It is noticeable that the rise-falling tones on *embarrassing* and *disheartening* are also preceded by similar tones on *little*. Also, the rise falling tones on *haven't*, *swallow*, *impossible*, *reason*, and *providing* are all preceded by a falling tone on *you*, *to*, *becomes*, *no*, and *of* respectively.

The rise falling tone indicates controversy which is an intrinsic property of the crisis. The rise falling tone is often related to the lexical meaning of controversial words. The speaker often uses the rise falling tones to mark issues of disagreement via modification e.g. *embarrassing*, *disheartening*, and *impossible*, to declare his/her disagreement to the current negative situation e.g. *haven't* followed by *swallow* and *pride* in IP₉ in (28), to reflect the speaker's surprise of the

reason of changing custody in (30), and to criticize the way of *providing* health insurance for few *people* in (31).

A distinct tone is the rise-fall-rise falling on very few pitch words such as *scary* in (29) and *dysfunctional* in (31). The rise-fall-rise falling tone on *scary* occurs twice in two different monologues (M2¹ and M3). In both cases, *scary* is a modifier and is preceded by an article with low rise (e.g. *a* in 5, and *the* in 29) and followed by a noun head with rise falling tone or a falling tone (e.g. *time* in 5, and *point* in 29). Also in both cases, the lexical meanings of the two modifiers convey the speakers' extreme sense of danger and hence her/his extreme disapproval.

In (31), the rise-fall-rise falling tone is applied with two nuclear syllables with a high rise on *-fun-* and another rise on the final syllable *-nal* where *-fun-* is the syllable with the nuclear stress and *-nal* is the syllable with the emphatic stress. (Cf. the description of the tone on *scary* in example 5). The pitch word *dysfunctional* is also a modifier for the noun head *way* to express *disapproval* of the *way* of dealing with the crisis. The strong disapproval is also expressed by the use of pauses since *dysfunctional* and *way* are two separate IPs.

As is obvious in the above examples, the high falling tone on lexical pitch words assert the speaker's point of view, and the same tones on functional pitch words emphasize the assertion, whereas the high rising tone on lexical pitch words provide new information and/or represent expectations, and the same tone on functional words are used for the same purpose.

Generally for both lexical and functional pitch words, the rise falling tone on monosyllabic words convey the speaker's strong feeling of disapproval while the rise-falling tone on words of more than one syllable express controversy. The rise-fall-rise falling tone is distinctly used to aggravate the sense of disapproval and to turn the listener's attention to dangerous situations.

The former analysis of the types of pitch words, lexical and functional, monosyllabic, disyllabic and polysyllabic, unfolds further phonological observations about intonation in the monologues of social crises. These observations are related to the elements of tonicity (tone, stress, and pitch height) and the way tonicity is achieved in the utterance using these elements. Goldsmith 'tone-accent attraction condition' (1978) is manifest in pitch words where stressed syllables are favored with specific tones over stressed toneless syllables².

It is clear that the above pitch words are made prominent through the correlated use of the three primary elements: tone, stress, and pitch height, together

¹ See *scary* in example (5), p. 9.

² See more about tone-driven stress and the other types of interaction of tone, seniority and prosodic structure in de Lacy (2007).

with some secondary elements such as vowel lengthening. These three elements of tonicity are Lexical or functional monosyllabic words are usually characterized by different tones than other surrounding tones in the same IP or in other IPs. These words are relatively higher in pitch than other surround words because they are stressed. The same elements of tonicity are applied also to disyllabic and polysyllabic words.

The chance for polysyllabic words to have two tonic syllables per word increases in comparison to other words. The feature of two tonic syllables per word is attributed to the type of simple or complex tone assigned to these words in addition to stress. Simple tones (such as high falling and rising) are often assigned to monosyllabic and disyllabic pitch words while complex tones (e.g. high rise-falling and rise-fall-rise falling) are often assigned to polysyllabic and disyllabic words respectively. However, the preceding complex tones are distinctively used for some monosyllabic functional words (e.g. I, when, all, to) in examples (28, 32) and few monosyllabic lexical words (e.g. child, pride) in examples (28, 32). The distinctive use of rise falling tone to these monosyllabic words can be explained in terms of the speaker's strong disapproval and denial of a particular issue.

The study of pitch words also reveals that the increasing rate of stressed words is due to the application of stress to both lexical and functional words, monosyllabic and words of more than one syllable. Pitch words have two types of stressed words: lexical words and emphatic stressed. *Lexical stress*¹ refer to those words with the lexical stress which have the potential for the normal syllable location of stress while *emphatic stress* refers to the actual stressed syllables which are not normally receiving lexical stress such as pronouns, prepositions and other functional words (Laver 1994, 511). Emphatic stressed words (e.g. I, when, all, to) explain the general increase of stressed words in the monologues. The intentional use of emphatic stressed words is also responsible for the relative increase of the overall pitch range of the utterance.

The next section reveals other types of prominence in the discourse of social crises on higher levels up to the utterance.

7. Tempo

In the monologues of social crises tempo is often correlated with pitch height and length of intonational phrases. The following pattern (slow-quick) is a typical contrastive pattern of speaking rates and it is the most frequent one in the six monologues

¹ Also known as *word stress* (Clark et al 2008: 339).

- (33) // which is/ a really/ dysfunctional/ way/ of providing health insurance
coverage/ for the few people who are there today¹// (M5: 4)

The above utterance consists of six IPs of which the first four are shorter than the final ones. The speaking rate of the first four shorter IPs is slower than that of the final two longer ones. The tones of the slower IPs are characterized by higher pitch than the tones of the quicker IPs (Cf. the analysis of tones in example 31, p. 25). The former description of slow versus quick IPs reveals two types of correlated features: tempo and pitch in the one hand and tempo and length of phrase on the other. In the first type, slow rate of speaking correlates with high pitch. In the second type, short IPs correlate with slow tempo while long IPs correspond to quick tempo. These two types of correlations are frequent in almost all long utterances in the six monologues. Generally, slow tempo is usually associated to several phonological features such as high or extra high pitch, short length of IPs (i.e. more pauses), whereas quick tempo is associated with lower pitch height, longer length of IPs and fewer pauses.

The contrastive tempo (slow vs quick) reflects significant semantic and grammatical features. In the slow IPs in (33), the speaker discloses new information by expressing her negative point of view while the quick IPs represents the part of given information. Grammatically, the noun phrase (*a really dysfunctional way*) represents the part of new information and the adjectival phrases (*of providing health insurance coverage* and *for the few people who are there today*) represent the other part of given information.

The following longer utterance has the same (slow - quick) pattern of example (33) with some variation in the quick part

- (34) // my question / to those people / will be / so / what / what is / your
 /investing plan / what is / your / wealth preservation plan/just to buy
 warehouses / and warehouses of food / that will eventually spoil / or may
 be/ you can / save it / for twenty years// (M1:11)

Similar to (33), the first eleven IPs in the above utterance in (34) are slow and short and the last six IPs are quicker but they are of various lengths ranging among longer (IP₁₂), long (IP₁₃), and short length (IPs_{14,17}). The four short pauses that

¹ Double underlining indicates quick rate of speaking while normal underlining represents medium.

separate the short IPs (from IP₁₄ to IP₁₇) have no significant impact on decelerating the overall quick rate of the final four IPs.

In (33), the rate of acceleration at the quick part is constant, whereas the acceleration in tempo in (34) starts at the longest IP (*just ... food*) and increases towards the end. In both utterance in (33) and (34), the highest pitch range is marked on the slow part. However, very few words in the quick part (e.g. *spoil*) is marked with a high pitch.

As in example (33), the contrastive pattern (slow vs. quick) in (34) reflects the semantic divide between new and given information. The seek for new information is represented by the speaker's *question* in the first slow part followed by the quick part of given information in the form of *known answer* to the previous question.

The following example (35) illustrates how the repetitive pattern (slow-quick- slow-quick) is comprehensive of new information for slow parts and given information for quick ones.

- (35) //I mean/ best case/ never as I feel like I'm on line for a job fair/ not/ you
know/ not waiting to be given/ bread/ or something like that (M2:4)

It is clear that quick IPs are related to negative feelings e.g. humiliation (*I feel like I'm online for a job fair*) and slow IPs are representative of the speaker's objection to humiliation (*I mean best case ...not waiting to be given bread*) which is followed by given information in the last quick IP (*or something like that*) because it is synonymous to *bread*. The emphasis on refusing humiliation is represented by slow tempo for the IPs that indicate objection. This emphasis is also represented by the inclusion of *not* (IP₄) and *bread* (IP₇) in separate IPs with extra pitch height. Yet, the quick tempo for the longer IPs indicates the speaker's attempt to avoid humiliation at least psychologically.

The third pattern of tempo reflects the gradual acceleration starting from slow, medium to quick

- (36) //in th/they're/essentially trying/to/take me completely out of my children's
lives// (M4: 7)

The pattern (slow -medium - quick) is also a regular pattern of tempo in the monologues of social crises. Similar to other patterns in (33, 34, 35), the first four slow IPs in (36) are shorter than the last one. Also, the first four slow IPs are higher in pitch than the last longer one. Though similar to other preceding examples, the

utterance in (36) is characterized by an additional feature which is that the assignment of two rates of speaking to the last IP: the medium rate for *take me completely* followed by the quick rate for *out of my children's lives*.

The first medium half in IP₅ is characterized by higher pitch than the second quick half, and it includes *completely* which is the highest pitch word in the whole utterance. The second quick half is generally of a lower falling tone than the rest of the utterance. Whereas the last quick half starts and ends with a low falling tone the first medium half as well as all other IPs in the slower part start with a rising tone on *take* and ends with a falling tone on the last syllable on *completely*. Therefore, the change of tempo in the same IP from medium to quick rate, from extra high to low pitch reflect the speaker's shift from feeling of oppression to the feeling of complete frustration and fear to be *out of his children lives*.

Example (37) represents the following pattern (slow - quick - medium)

- (37) //if American young people /especially /young /American young people who're not already rich/ are are at least the upper middle class/are not gonna/acquire education/ they're gonna sink/ farther and farther down//
(M6: 7)

The slow-quick part in this pattern has all the features of the preceding examples of the slow-quick pattern. The first three slow IPs in this pattern - as usual - introduce the speaker's point of interest and focus on *American young people*; the third and fourth quick IPs subsume detailed information about those Americans. The last four medium IPs presents the speaker's negative expectations for the future of those Americans. The mid rate of speaking and the mid pitch height of the last four IPs tone down the negative expectation (*they're gonna sink farther and farther down*) which has already been governed grammatically as the answer of the condition (*if American young people are not gonna acquire education*). The severe negative expectation represented by the grammatical use of the conditional structure has been silenced at the end of the utterance by the phonological correspondence of medium tempo and mid pitch height. Consequently, the contrast between the grammatical representation (the content of the conditional structure) and the phonological representation of this content reflects the speaker's colliding emotions, the fear of the future of (*American young people*) and the fear of severe criticism that might be harmful for them.

The above four patterns of tempo in examples (33:37) can be reduced to two basic patterns: slow vs quick and slow-medium-quick. The quick and medium speaking rates are always subject to variation whereas the slow part is

always invariable. Variation in the quick component occurs through acceleration in the quick speaking rate itself as in example (34) and the choice of the position of the quick component. For example, it may occur at a final position after the slow and medium parts as in (36) or at a mid position between the slow and the medium parts as in (37). The position of medium speaking rate is also subject of change in the same two former examples. Variation occurs also through the repetition of the slow vs quick pattern as in (35).

It is remarkable that the slow component is always initial and the quick/medium components always follow. This remark can be explained in terms of three correlated features such as pitch height, length of IP, and information type. The slow part is composed of shorter IPs and is characterized by higher pitch range while the quick part is composed of longer IPs with lower pitch range.

The correlation of slow and quick components of tempo with pitch height and IP length is determined by the type of new and given information in each component. The speakers in the monologues often start their utterances by introducing new information about their different crises and they conclude with given information by providing comments and descriptive details which are primarily based on the new part. According to the significance of new information, it is introduced in an initial position in the utterance, broken into shorter IPs, and uttered slowly with more attention reflecting change of pitch movements and pitch height to render their effects on the listeners. As a result, the distribution of new and given information in the utterance bring about the contrasts of slow vs quick tempo, high vs low pitch, and short vs long IPs.

8. Conclusion

In this study, an array of intonational features in the discourse of social crises has been investigated to show the turbulent influence of this particular type of discourse on intonation as well as on the organization of discourse itself. The FDG approach which is adopted in this study allows both goals: the analyses of particular features of intonation and the phonological organization of the utterances in the discourse of social crises. The FDG approach is used for describing the intonational features of pitch movements, pitch height, pitch words, and tempo and investigating these features into a top-down hierarchy of six phonological unites to disclose their discourse information.

The study reveals that the tumultuous discourse of social crises is generally characterized by multiplicity of pitch movements, an overall propensity for a higher pitch level, variation in tempo, and phonological/grammatical correspondence. The observable increase in the number of nuclear tones in the

utterance is due to the increase of the number of pauses per utterance and hence the number of phonological units. The overall higher pitch level and the increase in the number of pitch words in the utterance can also be shown as a result of the multiplicity of tones within the minor tone units in the utterance. The study also reveals how certain tones (e.g. the rising and the falling tones) correspond to particular lexical or functional elements and the various ways the distribution of these tones are affected by certain grammatical structure (e.g. prepositional phrases, noun phrases, and adjectival phrases). This phonological grammatical correspondence is also evident in the patterns of tempo for new and given information which are associated to slow and quick tempo respectively. Finally, the analysis spells out in more detail the phonological/grammatical correspondence in various aspects and the correlated use of phonological features to show the kind of discourse information related to the turbid nature of crisis.

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Appendix A: Six Monologues of Social Crises.

Monologue 1:

1- // hey / people always ask me / hey / why are you buying gold / you can't eat it //

2- // and of course / everyone has heard this one //

3- // in fact / the problem / is just communist problem / you know / once / every video / ahm / by somebody / about / how can you eat your gold //

4- // look //

5- // that's correct //

6- // you can't eat the gold / but the gold / can buy food //

7- // ahm / ammunition can't buy food / in / in / certain situations /

8- // now / I do believe / you should / prepare / and buy some food / for emergencies / for long term / survival //

9- // ahm / it's / it's / a human need //

10- // now / as far as you can't / eat your gold / so why / buy it //

11- // my question / to those people / will be / so / what / what is / your / investing plan / what is / your / wealth preservation plan / just to buy warehouses /

and warehouses of food / that will eventually spoil / or may be / you can / save it / for twenty years //

12- // ahm / no / it's not realistic / in n / you know / I don't see the point / of just having warehouses / and warehouses / and putting every dollar I earn in the food //

13-// ahm / once you have /ahm / enough stores / where you folk / feel comfortable / you should be buying gold and silver / you should be looking for long

term / you should be storing your wealth / you work hard for it //


14- // why not storing something stable //

Monologue 2:


1-// I think it's such a scary time / because //

2- // we don't know/where the / light at the end of the tunnel / is / is/

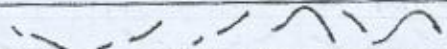
3- // ahm/ I would say that / you know / it is a little disheartening / and even a little embarrassing / to / have to / you know /



/basically you haven't to swallow your pride//




4- // I mean / best case / never as I feel like I'm on line for a job fair / not / you know /not waiting to be given / bread / or something like that //

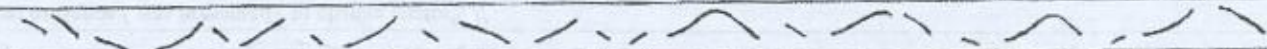


5- // I mean / it could / it could always be worse //


Monologue 3:




1- // here the point is / the scary point is / that at a certain / place / this becomes impossible for us to control //



2- //we set / this / chain of events / in motion / by putting carbon in the atmosphere / by/ running cars / and factories / and power plants//



3- // theoretically we could stop that / and we'll talk about how that might happen / in a little while //



4- // but at a certain point / even if we stop that / we won't be able to stop these other effects //

5- // we have no practical plan / for refreezing the arctic / for refreezing the tundra / for turning those dead forests back into living ones / ok //

Monologue 4:

1- // no evidence / was presented / to change custody //

2- // there was no / reason / for them / to change custody //

3- // there was nothing presented / that would / even carry any weight / to change custody //

4- // as a parent / the only thing you wanna do / is protect your children //

5- // in this legal system now / has put me in a place / where I have no power //

6- // they put it / th put / the power in the hands / of their psychologists / the kids attorney / the evaluator //

7- // in th / they're / essentially trying / to / take me completely out of my children's lives //

Monologue 5:

1- // what / we should hear / is something about how / we can provide health insurance coverage / the forty seven million Americans who are currently uninsured //

2- // what we would probably hear fro President Bush / though / is a wonderful revision of his proposal from last year //

3- // what should move people / from / the employer market / and group coverage / into the individual insurance market //

4- // which is / a really / dysfunctional / way / of providing health insurance coverage / for the few people who are there today //

Monologue 6:

1- // we also have an education crisis of the first degree //

2- // when / I was a child / all our test scores are always going up /and we're all great kids //

3- // ah / and / ah //

4- // ah / but then / somehow / in the / late seventies and eighties and nineties / test scores / started to / not to go up anymore / started to go down //

5- // and ah / this huge huge problem / many many young Americans / don't know history / don't know geography / ah / d don't know anything /

except ah I guess / how to get high / and / ah / they ah//

6- // and education / is a key element / in / forming human capital //

7- // if American young people / especially / young / American young people who're not already rich / are are at least the upper middle class /

are not gonna / acquire education / they're gonna sink / farther and farther down //

8- // the end commonwealth latter / and the whole country / is gonna see a collapse / in wealth and educa / a / a / and social mobility //

Appendix B: Description of Data.

	Title	Topic	Duration	Words	Utterances	Gender	Source
M1	Gold for dinner, the current crisis, 401K's and poor young people	food	1:15:049	219	14	male	http://www.youtube.com/watch?v=yJB-xvqd1Yo Self-broadcasted Sep 29, 2009 (Updated Date)
M2	Economic Crisis Boosts Number of People at Job Fairs	unemployment	00:26:029	88	5	female	http://www.youtube.com/watch?v=afJSjxSB1vU Part of TV program Feb 04, 2008 (This video has been removed by the user.)
M3	The Feedback Loop: Ecological Damage Soon Beyond Control	environment	00:40:960	102	5	male	http://www.youtube.com/watch?v=E_iBGl-SqFAw Broadcasted lecture on Fora.tv Bill McKibben May 6, 2009
M4	Family Court Crisis - Our Children at Risk	child custody	00:34:089	88	7	male	http://www.youtube.com/watch?v=BLA16b5WtU4 Part of TV program Jan 18, 2008
M5	The Health Care Crisis: 47 Million Can't Afford to Get Sick	health insurance	00:27:631	77	4	female	http://www.youtube.com/watch?v=L54WSXDFU48&feature=channel Part of TV report Oct 28, 2008
M6	Ben Stein - America's Education Crisis	education	00:55:170	153	8	male	http://www.youtube.com/watch?v=V8vcl17SPeM Broadcasted Lecture on Fora.tv Ben Stein Jan 24, 2008