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GENERAL ATTITUDINAL MEANINGS IN RP INTONATION

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ABSTRACT

The article takes a cognitive view of the attitudinal meanings of RP intonation. A summary statement is included about previous authors' views on attitudes conveyed by pitch direction. Data on intonation patterns concentrating on pitch level are followed by the labels of emotional attitudes from phonetic literature. These descriptive labels are brought into correlation with a large number of metaphoric phrases and fixed collocations and expressions which give a clue to structural metaphors for emotional attitudes. In this way, strict regularities in correspondences have been found between the triangle made up of nucleus + head variations, emotions as labelled in phonetic literature, and EMOTION IS TEMPERATURE metaphors. Metonymy also plays a part: emotion stands for a bodily sensation felt during the emotion. These regularities are believed to underlie and govern the use of intonation tunes.

Expressing one's general emotional attitude by means of varying pitch level is seen as a conjunction of two interrelated principal analogies: EMOTION = TEMPERATURE (metaphorically and metonymically) and VOICE PITCH = TEMPERATURE (in terms of the effect of vibrations of air molecules), which produces the expression of EMOTION by means of VOICE PITCH. Specifically, attitudes associated with a pleasant high temperature (warm) are conveyed by means of a combination of a high head and a high nucleus. The combination of the high head and the low nucleus emanates coolness (typically pleasant low temperature, untypically unpleasant low temperature). Attitudes associated with unpleasant low temperature (cold) are produced by a joint effect of a low head and a low nucleus, while associations with unpleasant high temperature (hot) are expressed as a unity of a low head and a high nucleus.

1. Introduction

Leaving aside grammatical and discoursal meanings of English intonation, which have far fewer problems and controversies, attitudinal meaning[1] has re-

[1] Discoursal meaning is mainly to do with the nuclear placement and it presents parts of utterances as pieces of old and new information. Grammatical meaning is concerned with sentence types

mained elusive in spite of considerable efforts by phonologists and phoneticians and their awareness of the paramount importance of its elucidation (cf. Crystal 1969 in Coulthard 1977: 116; O'Connor – Arnold 1973: 287). However, the principles governing the use of pitch variation must be basically simple and transparent if young children can master most of them so easily. With the lack of a general, abstract vision of the attitudinal meanings of intonation, long lists of local meanings have to be posited, which in teaching intonation require the teacher to present a lengthy explanatory input with very little performance output on the part of the student (Currie – Yule 1982: 229). Therefore, we shall be primarily concerned with the abstract meanings of nuclear and pre-nuclear tones,[2] although local meanings will be given due care. In fact, it is through the analysis of the latter and their generalisation that the former can be reached.

Nuclear tones have both pitch direction and pitch level. The meanings of pitch direction (falling or rising) have already been adequately described in English phonetics, as the following brief overview shows.

2. The meanings of nuclear pitch direction

The consensus of phoneticians is that the falling nucleus generally conveys an impression of definiteness, completeness, certainty and finality, while the rising nucleus is associated with non-finality and indefiniteness (Armstrong – Ward 1931: 9, 20; Christophersen 1956: 186; Cruttenden 1997: 90; Halliday 1967 in Coulthard 1977: 18; Heffner 1964: 223; Kingdon 1958: 9; O'Connor – Arnold 1973: 47, 73).

Lakoff and Johnson (1980) have added a cognitive dimension to this issue when discussing the typically rising intonation of questions. "This is coherent with the orientational metaphor UNKNOWN IS UP; KNOWN IS DOWN" (Lakoff – Johnson 2003: 137). The adjectives used by phoneticians (O'Connor – Arnold 1973 and Gimson 1970) to describe the speaker's attitude conveyed by intonation tunes are in harmony with the claims above, as shown in the following data,[3] in which only the

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(statement or question), defining or non-defining clauses and similar grammatical matters. Attitudinal meaning conveys emotional attitude on the speaker's part as regards the subject matter or the interlocutor, and depends on pitch quality. It is well known that there are other suprasegmental devices for signalling moods, like range of intonation, key, register, overall loudness, and tempo (Cruttenden 1997: 89; Gimson 1970: 284), as well as non-linguistic signals, like facial expression.

[2] The theory propounded here draws on the traditional British intonational analysis in terms of the nucleus and the head (introduced by H. E. Palmer and in line with R. Kingdon), as applied in O'Connor and Arnold's (1973) contours analysis. Their book is "an extremely practical manual of English intonation" (Jassem 1983: 695).

[3] As a source for information on attitudes, O'Connor and Arnold (1973) are more reliable than Gimson (1970) because the former, in dedicating a whole book to the subject of intonation, are much more comprehensive. However, Gimson is indispensable as he is the only one to analyse all

information about the nucleus seems to be relevant for our purpose. However, for the sake of objectivity, data on heads has also been included.

FALLING NUCLEUS

no head + low-fall nucleus: *categorical* (O'Connor – Arnold 1973: 48)

Example: *What's your name*? || ˛*Johnson*.

Categorical is in the same group as *downright* and *definite* in Spooner (1999), which speaks of the falling character of the low-fall (falling is "moving down" and "definiteness" is the well-known association of the falling nucleus).

RISING NUCLEUS

high head + low-rise nucleus: *expecting* (O'Connor – Arnold 1973: 63)

Example: (Hullo, darling.) [1]*What have you˚got ˛there?*

The attitude of expectance generates a rising nucleus in accord with indefiniteness.

no head + low-rise nucleus or no head/high head + high-rise nucleus: *tentative* (Gimson 1970: 280; O'Connor – Arnold 1973: 201-2)

Examples: ˛*Possibly*.
It's snowing.|| ´*Much?*
Where's my newspaper? || *You* [1]*want it´ back?*

high head + high-/low-rise nucleus: *incredulous* (Gimson 1970: 281), *disbelieving* (O'Connor – Arnold 1973: 63, 158)

Example: He's broken his leg.|| [1]Broken his´ leg?

The attitudes of tentativeness and disbelief (incredulity) are also in compliance with the well-known indefiniteness of the rising nucleus.

no head + low-rise nucleus: *diffident*, *pleading* (Gimson 1970: 280), and *exhorting* (O'Connor – Arnold 1973: 62)

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combinations of nuclei and heads.

Example: *˛Careful*.

Idioms and common associations recorded in dictionaries of synonyms corroborate the widely accepted view of the attitudinal meaning of falling and rising nuclei. Diffident is classified in Waite (2002) among uncertain and doubtful, and in Spooner (1999) as doubtful and unsure, which is the result of the *rising* direction. Pleading and exhorting also apparently depend on the rising pitch direction due to their association with indefiniteness.

FALL-RISE NUCLEUS

According to O'Connor and Arnold (1973: 66), the compound fall-rise tone "draws particular attention to one element for the purpose of contrast, and at the same time shows an intention to continue the utterance". Local meanings of fall-rise include concession, grudging admission, reluctant or defensive dissent, corrections, apologies and tentative suggestion, astonishment, surprise, interest, concern, and warning, usually with urgency (1973: 66-72). According to Cruttenden, the group of meanings most typical of fall-rise can be summed up by the word "reservations" and includes what might be called "emphatic contrast" and "contradiction". It is limited to declaratives (1997: 100). For instance, *I'm not going to perform˘ anywhere* (= 'I'm going to perform but not in any place'). *˘All of them didn't pass the exam* (= 'Some of them passed the exam but not all') (Cruttenden 1997: 101). A: *I can't understand it*. B: *˘Can't you?* ('Yes, you can't but you should.') A: *Didn't Smith and Jones go?* B: *˘Smith¸ went* (but Jones didn't). (O'Connor – Arnold 1973: 170).

Another group of meanings include 'self-justification', 'appeal' and 'warning'. Conceivably, fall-rise may be analysed as conveying a general final + non-final attitude because the speaker starts with a clear and definite opinion about the interlocutor's message ('yes (I agree)/no (I don't agree)'), and, in an afterthought, proceeds with a reservation (= 'but…'; cf. Cruttenden 1997: 101). Halliday's neutral and reduced fall-rise with meanings 'only if', 'if but not otherwise', 'if…, then probably', 'if (but it won't happen)', 'it's possible', 'it's possible, but unlikely', 'that (but no more) is possible', (in commands) 'at least do this' (Halliday 1970: 111 in Currie – Yule 1982: 228) basically all boils down to the 'yes/no but…' attitude.[4] On the other hand, the rise-fall combination im-

[4] Brazil's primarily discoursal distinction between fall and fall-rise is highly problematic because the labelling of tones as "referring" and "proclaiming" appears to be very much post hoc (Cruttenden 1997: 107) and the discoursal function of intonation is usually conveyed by the place of nucleus rather than by its character. A similar view to Brazil's is taken by Gussenhoven (2004), who treats fall, fall-rise and rise as matters of topic and comment, while Wells (2006: 87-91) has taken on their approaches.

plies that the speaker is greatly impressed, disclaiming responsibility or challenging (O'Connor – Arnold 1973: 78-82), which is tantamount to a non-final + final combination, to be aptly paraphrased as 'but yes' (impressed) or 'but no' (disclaiming or challenging). E.g. A: *I don't like to keep reminding him*. B: *But you damn well ought to*! (Cruttenden 1997: 100). According to Gimson (1970: 28), rise-fall can convey the attitude of indignation.

3. Emotions as represented in conceptual metaphors and metonymies

Pre-nuclear pitch accents have been given marginal attention by Cruttenden because he believes that they "generally only modify the meaning associated with the nuclear tone" (1997: 55). However, he is aware that "there is a 'grumbling' overtone when no high pitch accent precedes whereas there is a 'soothing' overtone when a high pitch accent does precede the [low-rise] nucleus". When preceded by a high pitch accent with declaratives, the low-rise sounds 'patronizing' (1997: 97). In addition, the 'reassuring' meaning of low-rise with a high head is present with *wh*-interrogatives and imperatives (1997: 99).

In an attempt to systematize the attitudes, we shall take into consideration both nuclear pitch level (apart from pitch direction, which has been dealt with here) and pre-nuclear pitch, the latter being essential, as it often contributes much to the meaning of the nucleus, rather than merely modifying it. Unlike most other authors, we shall resort to a cognitive view of the subject.

An investigation into the meaning of intonation on associative lines has been carried out by Uldall (1964). Her subjects were speakers of American English, who were asked to associate intonation contours with any one of a set of opposed adjectives from Osgood's "semantic differential" scale. The "pleasant/unpleasant" factor was found to be by far the strongest, and a number of other emotional meanings were employed (authoritative/submissive, impatient/patient, timid/confident, deferential/arrogant, etc). Unfortunately, these findings have not been pursued or built upon, and they are too vague to offer a comprehensive and systematic insight.

It has become common knowledge that the target domain of human relationships, such as intimacy, emotional relations and reactions, has a source domain in the sense of touch (Lee 2001: 6), or, to be more precise, in the sensation of temperature. This varies between the principal metaphors EMOTION IS BODILY TEMPERATURE (e.g. in *boil with rage*) and EMOTION IS WEATHER (cf. Goatly 1997: 63). The latter can manifest itself as the polysemy 'air surrounding people' + 'interpersonal relations' in some lexemes. Thus, the noun *climate* has a secondary meaning 'prevailing trend of opinion or public feeling' (*OERD*) (as in *the present economic climate*; *the current climate of opinion*, *emotional climate*). *Atmosphere* can mean 'the pervading tone or mood of place or situation, esp. with reference to the feelings or emotions evoked' (*OERD*) and there is a

phrase *barometer of feeling*. *Blow hot and cold* (*about something*) is an informal way of saying that somebody often changes his/her opinion, sometimes being very enthusiastic and at other times expressing no interest at all. A smile that is *sultry* has strong sexual feelings, while a *frosty* look suggests that somebody does not approve of something.

Lakoff and Johnson (1980) were the first to systematize conceptual metaphors, like AFFECTION IS WARMTH, EXCITEMENT IS HEAT, LOVE IS FIRE. They showed that our conceptualization of the cognitive models which revolve around emotive categories is based on metaphors with TEMPERATURE as the target.[5] Lakoff (1987: 381-383) has postulated a general metonymic principle: THE PHYSIOLOGICAL EFFECTS OF AN EMOTION STAND FOR THE EMOTION[6]. Since metonymies cannot provide the conceptual structure of emotions all by themselves, they have to be supported by the conceptual potential supplied by metaphor. The interaction between metonymy based on body heat and heat metaphors is a classic case of such a link (Ungerer – Schmid 1987: 133).

The following is a selection of instances of verbal physiological metonymies and conceptual metaphors for EMOTIONS ARE/STAND FOR TEMPERATURE from various sources, but mostly from Kövecses (1986) and Lakoff (1987).

AFFECTION IS WARMTH: *The fire has gone. She feels warm all over when her husband comes home from work. They created a warm family home for themselves and their children. She wasn't worth warming to*; *warm applause/congratulations/thanks/welcome/reception/affection*; *a warm person*; *hot reception* (*hot* is here with a positive evaluation); *a clement person* ('merciful', like *clement weather*).

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[5] The autonomic nervous system activity that corresponds to anger is an increase in skin temperature (Ekman – Levenson – Friesen 1983 in Lakoff 1987: 39). "When informants in psychological tests were asked to describe what they feel when they are angry, sad or happy they always included physiological experiences, like increase in body temperature, change of pulse rate, palpitations of the heart or the production of sweat and tears. In other words, they establish a link between emotions and physiological symptoms, which are regarded as the cause, or more often, as the effect of the emotions in question" (Ungerer – Schmid 1996: 131). "ANGER, JOY and LOVE can cause an increase in body temperature (though with ANGER this would be irritating heat, while with JOY it takes the form of comfortable warmth..." (Ungerer – Schmid 1996: 132, 133).

"[Lakoff and Johnson (2003: 257)] suggest that when we make physical association between affection and warmth, the part of the brain which deals with emotion and the part which deals with temperature are activated simulatenously. As a result, the two parts develop neural connections, and there is thus an actual neural structure for the AFFECTION IS WARMTH metaphor" (Knowles – Moon 2006: 72).

[6] "The 'body heat produced by anger' can be viewed as a metonymy: BODY HEAT FOR ANGER. Thus, we have the following chain of conceptualization: ANGER produces BODY HEAT (metonymy); BODY HEAT becomes HEAT (generalization); HEAT is used to understand ANGER (metaphor); the metaphor ANGER IS HEAT is a case where the source domain of heat emerges from the target domain of anger through a metonymic process" (Kövecses 2002: 156-157 in Knowles – Moon 2006: 58-59).

EXCITEMENT IS HEAT: *The fiery passion died down and gave way*; *It was a torrid love story* (like *torrid weather*); *You make my blood boil*; *You really have the hots for her, don't you? We had a blazing row*; *heat of passion*; *a hot-blooded woman*; *burning enthusiasm/interest/desire*; *eyes/face ablaze with anger/excitement*; *to kindle jealousy/aspirations*; *to extinguish a spark of hope*; *to extinguish the memory of something*.

LOVE IS FIRE: *My heart is on fire. He was burning with love. He is consumed by love*; *She set my heart on fire. There were sparks. She is his latest flame. The fire* (*of love*) *slowly went out. That kindled love in his heart. I don't want to get burned again.* ('to fall in love and be disappointed'); *I just melted when she looked at me. She carries a torch for him* ('She secretly adores him').

ANGER IS FIRE: *Those are inflammatory remarks. What you said inflamed him. He was breathing fire. Your insincere apology just added fuel to the fire. After the argument, he was smouldering for days. He was doing a slow burn. That kindled my ire. He was consumed by his anger. Her anger suddenly flamed. She was red-hot with anger.*

ANGER IS HEAT OF A FLUID IN A CONTAINER: *You make my blood boil. She simmered down. I had reached boiling point. Let him stew. She was seething with rage. His anger welled up inside him. She was bursting with anger. She got all steamed up. She was fuming. He gave vent to his anger. He just exploded. She erupted. She flipped her lid. She hit the roof. I blew my top*.

ANGER IS BODY HEAT: *Don't get hot under the collar. Billy's a hothead. They were having a heated argument. He's hot-tempered*.

LACK OF AFFECTION IS COLDNESS: *Why are you so cold to me? The reception we got was icy*; *a cold look/welcome/reception*; *a cold fish* 'a person showing no emotion'; *a cold person*; *give somebody the cold shoulder* 'treat somebody in an unfriendly way'; *bleak face* (like *bleak winter*); *frosty relations*; *a frigid heart/silence/smile*; *a glacial stare*.

LACK OF EXCITEMENT IS COOLNESS: *Their relationship has cooled recently*; *This relationship is getting lukewarm. Keep cool! He has a cool head. Cool down!*; *cold-blooded* 'without much emotion or pity', *in the cold light of day* 'When you think reasonably and soberly'.

4. Emotions as represented in labels in phonetic literature matched with fixed temperature expressions

Adjectives that describe speakers' attitudes in phonetic literature on RP intonation refer to emotions activated in discourse due to the attitude to the interlocutor or to the topic. Since there is an obvious correlation between the speaker's emotional attitudes and the corresponding type of temperature, we can systematize such correspondences by presenting the descriptive attitudinal adjectives

given by O'Connor and Arnold (1973), Gimson (1970) and other British phoneticians, and finding the closest or synonymous equivalents in the lexical field of temperature together with figurative expressions that speak of the kind of associated temperature. These adjectives will be preceded by data on the main intonation elements, in order to keep intonational form on file.

a)
high head + high-fall nucleus:

*lively (*O'Connor – Arnold 1973: 125) and *warm*, *brisk*, *businesslike*, *involved*, *participating*, *considerate* (O'Connor – Arnold 1973: 54)

Examples: A: *Here. Use my pen*. B: [1]*Thank you˚ very` much.*| [1]*Mine seems to be ˚out of` ink.*

Becoming more lively and participating can be expressed by the phrasal verb *warm up*. Lively in the superlative is *ardent* or *hot-blooded* and in informal style a passionate person is *hot stuff. Warm* in this group of attitudinal adjectives speaks for itself, as in *a warm welcome*, and O'Connor and Arnold said, "This lightness of the High Drop is often an indication of *warmth*, of a desire not to appear cool towards the listener" (1973: 54). A brisk and businesslike tone (according to *OALD* s.v. *brisk*) shows a desire to get things done quickly; so it has also to do with activity and liveliness conjoined with the energetic quality of the falling tone.[7]

The phrasal *warm up* is used for people who become enthusiastic, animated and involved. If you *warm to* (*towards*) *something*, you become more involved in it.

A *warm-hearted* or, simply, *warm* person is someone who is considerate and benevolent.

high head + high-rise nucleus:

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[7] When referring to behaviour, the adjecive brisk has two distinct meanings with opposite connotation: 1. 'quick, lively' (a brisk pace; brisk trade), which is positive and 2. 'curt, peremptory', which is negative (a brisk manner) (*OERD*). Its connotation when referring to temperature is only positive: 'cold but pleasantly fresh' (brisk wind/breeze/weather) (*OALD*). Arnold and O'Connor (1973) use brisk in a positive context "The High Drop … avoids the seriousness and urgency of the Low Drop, and such questions sound brisk, businesslike, considerate, not unfriendly". It does not seem unnatural to associate friendly stimulation of a brisk and businesslike attitude with the invigoration and enlivenment of the wind in the phrase a brisk wind (cf. *OERD*).

uncritical (O'Connor – Arnold 1973: 202), *questioning but lacking any suggestion of disapproval or puzzlement* (O'Connor – Arnold 1973: 201), *polite protesting* and *rejecting accusation* (Bald 1979: 98)

Examples: A: *Oh, take it away*. B: *You're* [1]*not interested?*
A: *Take it home*. B: [1]*Take it home?* (*Is that wise?*)

An uncritical person tends to be *warm-hearted* and a North American old-fashioned slang interjection expressing approval is *Hot dog!* Questioning is in tune with the high-rise nucleus, while lack of disapproval is redolent of *warmth*. Protesting and rejecting accusations in figurative speech are certainly felt as negative rather than positive. However, these attitudes are eclipsed by the attitude of politeness, which can be described as typically *warm*.

The temperature adjectives in paraphrases are *warm* (most frequently) and *hot* (occasionally), both with a positive connotation. In conclusion,

HIGH HEAD + HIGH NUCLEUS = 'WARM'

b)
high head + *low*-fall or *low*-rise nucleus:

polite (Gimson 1970: 278, 280); According to Bald (1979: 98), *I beg your pardon* with a low-rise nucleus and a high head implies sincere and *polite* apology taking responsibility.

Examples: [1]*Put it* [1]*over* there.
[1]*What's the time?*

Polite can be brought into association with pleasantly *cool*. The following examples from *COBUILD* illustrate the point that politeness is compatible with low temperature, but also that unpleasantly low temperature is not typical in this case. *"It's yours," I said, politely, but coldly.* (s.v. *cold*); *Relations were cool and polite* (s.v. *cool*).
high head + low-fall nucleus:

considered (O'Connor – Arnold 1973: 48), *controlled* (O'Connor – Arnold 1973: 53), *phlegmatic*, *mild* (Gimson 1970: 279), *neutral*, *matter-of-fact but interested*, *peremptory* (Gimson 1970: 278); *serious* (O'Connor – Arnold 1973: 49, 50), *weighty* (O'Connor – Arnold 1973: 48), *intense*, *urgent* (O'Connor – Arnold 1973: 106), *impatient* (Gimson 1970: 278)

Examples: *I* [1]*hope it'll be a ˎlesson to you*.
[1]*Are you ˎgoing?*

If you are considered, controlled and not excited, you *keep a cool head*, and if you do not want to be excited any longer, you must *cool down*. The phrase *in cold blood*, meaning 'considered', obviously has an association with low temperature, but instead of positive, it is negative. *Cool* can be defined as controlled and self-confident. "Phlegmatic" is associated with *cool* and *cold* in Spooner (s.v. *cool*). The expression *speak with an icy calm*, the speaker being phlegmatic and controlled, also attests to a fuzzy borderline between cold and cool. "Mild" is associated with pleasantly *cool*. "Neutral" can be found in the group with "uninvolved" (McLeod 1984; Waite 2002 s.v. *neutral*), which is explained in (c) as *cold*, since it has a low head in the tune. It also appears in a small section together with "unemotional" (Waite 2002 s.v. *neutral*), which is treated as low temperature in (g). Matter-of-fact is said or done without showing any emotion, especially in a situation in which you would expect somebody to express their feelings (*OALD* s.v. *matter-of-fact*), which tends to be associated with negative cold, but here it is combined with *interested*, which leaves us with a moderated *cool*.

Peremptory means 'demanding to be obeyed immediately'. "Serious", "weighty", "intense", and "urgent" in this field, just like "peremptory", can be accounted for by the definite, falling nuclear tone conjoined with a low pitch. One would expect "impatient" to be associated with negative, as in Spooner (1999), but patience may form a separate parameter, independent of the evaluative scale (cf. the summary results of Uldall's aforementioned investigation). It seems that the high head (in contrast with a possible low head) adds a note of restraint, thus toning down the speaker's urgency. In a word, this tone group seems to be ambivalent between positive and not positive.

high head + low-rise nucleus:

reassuring, *self-confident* (O'Connor – Arnold 1973: 62, 158), *encouraging* and *soothing* (O'Connor – Arnold 1973: 65), *sympathetic* (O'Connor – Arnold 1973: 158); *bright* (in interjections: O'Connor – Arnold 1973: 158)
Example: *Well ˌdone!*

The idea of self-confidence is contained in the expression *play it cool*. You reassure, encourage, or soothe somebody when they are worried or afraid; so in fact you want to make them feel *less cold*. However, what is just as important is what the reassuring person feels; he or she must be *cool-headed* and not in a flurry of excitement. Sympathetic is like soothing and reassuring in being in-

tended to have a thawing effect. Bright is similar to *lively* and *brisk*, which were identified as "warm" in (a), but here interjections are involved, which create an effect of brightness even with a low tone.

The temperature adjectives are *cool* (usually) and *cold* (rarely), mostly with favourable connotations.[8] In summary,

HIGH HEAD + LOW NUCLEUS = 'COOL'

c)
low head + *low*-fall/rise nucleus:

resigned (Gimson 1970: 281, 289), *routine request*, *routine cross-examination* (Gimson 1970: 281), and *bored* (Gimson 1970: 279, 281)

Examples: ˌ*What are we ˌgoing to˜ do?*
It's ˌall ˌright. It's ˌnot imˌportant.

Resigned is 'willing to calmly accept something unpleasant or difficult that you cannot change' (*OALD*). Calmness leads to an association with coolness, but the feature "unpleasant" indicates *cold*. If you want somebody to feel resigned and discouraged, you *pour/throw cold water on something* that he or she intends to do. When *routine* is used as an evaluative adjective, it is disapproving and means 'ordinary and boring' (*OALD*), so *cold* again is the most likely association. A routine action is done without preparation, and *to do something cold* means 'do without preparation'. Very bored is *bored to death*, death definitely being associated with *coldness*.

low head + low-fall nucleus:

blunt, *sarcastic*, *perfunctory*, *uninvolved*, *uninterested*, *routine greeting* (Gimson 1970: 279), *unconcerned* (Gimson 1970: 289), *surly* (Gimson 1970: 279)
Example: *It's ˌall we could ex˜pect*.

In American English slang, *cold turkey* is an idiom referring to blunt statements or blunt treatment (*OERD*). *Sarcastic* cannot be friendly and warm; it is rather *cold*, and Spooner connects it to "sharp" and "cutting". An action is perfunctory if it is done without real interest or feeling, so it belongs in the same category. If you are uninvolved or unconcerned with something you leave it *out*

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[8] "Something that is cool has a temperature that is low but not cold" (*COBUILD* s. v. *cool*).

in the cold. An unconcerned person does something in *cold blood* and with *a cold heart*. You *cool down* or *cool off* if you lose interest in something. Somebody who is not interested in doing something immediately *puts it in cold storage*. *To leave somebody cold* is 'not excite or interest somebody', while *left out in the cold* is 'ignored by a group'. *To pour cold water over something* is to show little interest in it and *to go cold on the deal* is to lose interest. *Something leaves somebody cold* if it does not interest them. Routine is easily associated with *cool* or even *cold*, as mentioned above. Somebody who is *as cold as marble* is capable of surly treatment. Surly is 'bad-tempered and rude' (*OALD*), so it must be even more negative than *unconcerned*.

low head + low-rise nucleus:

deprecatory, *resentful* (O'Connor – Arnold 1973: 58), *disgruntled* (Gimson 1970: 281), *guarded* (O'Connor – Arnold 1973: 143), *threatening* (Gimson 1970: 281), *peremptory* (Gimson 1970: 279), *frosty rejection* (Bald 1979: 98)

Example: A: *What a charming person she is!* B: *She's ˌquite good ˌlooking*.

To deprecate is 'to feel and express strong disapproval of something' (*OALD*), while *disgruntled* is 'annoyed or disappointed because something has happened to upset you' (*OALD*). Both deprecatory and disgruntled denote a feeling of a dissatisfied person. Fury combined with a guarded attitude leads to *a cold fury*. Very serious threatening may *make someone's blood cold* and he or she may *go cold all over*. When you dislike something, you are resentful of it and you are *cold* towards it. Perfunctory has been mentioned in the previous group, and here the greeting entails a rising tune. Peremptory means 'demanding to be obeyed immediately', and mention of the association with coldness has already been made. Frosty rejection as a term by itself indicates the connection with *cold* and finality.

The greeting ˌ*Good ˌmorning* was described as polite but perfunctory (Gimson 1970: 281), but it seems that *good* should be interpreted as a low prehead rather than a low head. This is quite probable because here a monosyllabic word occurs in a conventional phrase, which leads to the further possibility to replace /ʊ/ by /ə/, and even to elide the whole word.

The most frequently used temperature adjective in this group is *cold*, and less often *cool*, the associations invariantly being negative. To sum up,

LOW HEAD + LOW NUCLEUS = 'COLD'

d)
low head + *high*-fall nucleus:

critical (O'Connor – Arnold 1973: 74), *protesting* (O'Connor – Arnold 1973: 73, 191)

Examples: *Yes but ˌI ˋdon't!*
Well ˌdon't be so ˋrude to her in ˌfuture.

This association of angry, indignant, and protesting with *heat* stems naturally from the conceptual metaphor ANGER IS HEAT. *To give somebody a roasting* in British English is to be critical.

The syllable *good* in ˌ*Good* `*morning*, which was described as a bright, cheerful greeting (Gimson 1970: 279) seems to be the low prehead rather than the low head. The same greeting has been marked as (ˈ) *good* `*morning* in Wells (1990 s.v. *good*).

low head + high-rise nucleus:

indignant (Gimson 1970: 281); *concern*, *apprehension* (Gimson 1970: 281)

Example: ˌ*What ˈme?*

Concern in Gimson (1970: 281) was evidently used with the meaning 'worry', since it was followed by 'apprehension'. With the similar meaning of 'anxious interest in the successful result of an undertaking', it is couched in expressions *have many irons in the fire* and *strike while the iron is hot*. While these expressions cannot be taken as evidence that concern is directly represented as *heat*, interestingly enough, hot iron is mentioned in both, so there seems to be at least a hint of this association. Moreover, *make hay while the sun shines* conveys the same attitude with the same indirect association with heat.

The only temperature adjective emerging here is *hot*, which has a negative connotation. Therefore,

LOW HEAD + HIGH NUCLEUS = 'HOT'

The lack of data on one of the two most important intonational elements or alternate patterns with the same attitudinal adjectives indicates that the missing or alternating data does not contribute to attitudinal meaning and should consequently be ignored, as in the following:

e)
high head + high-fall or low-rise nucleus:

airy (O'Connor – Arnold 1973: 54, 65), *friendly* (O'Connor – Arnold 1973: 54, 64), *interested* (O'Connor – Arnold 1973: 63, 64, 125)

Example: *It tastes* [1]*very* ˈ*nice*.
[1]*Right you* ˌ*are*.

The evaluative feature "positive" is part of the definition for *airy*, *friendly* and *interested*. A friendly person is *warm-hearted*, which is positive. Hence,

HIGH HEAD + HIGH-FALL OR LOW-RISE NUCLEUS = '*POSITIVE*'

However, high head + low-fall nucleus can be either positive or negative (cf. (b)).

Identical labels that are found across different tunes cannot be used as criterial when deciding on the correlation between form and meaning. Thus, "sceptical" occurs as a label with low head + low-rise as well as with high head + high-fall. The "sceptical" realized by means of the low head and the low-rise is actually to be interpreted 'sceptical with a negative and doubtful attitude', while the "sceptical" with the high head and the high-fall is 'decidedly benevolently sceptical'. The attitude "surprised" occurs with low head + high-fall, high head + high-fall, high head + low-rise and no head + high-fall. These variations are to be interpreted as having to do with rather general attitudinal categories, which allow for more than one tune for one and the same attitude, or with factors other than intonation. Such vagueness of labels used by phoneticians to depict attitudes is rather rare.

The lack of the head sometimes leads to ambiguity, which is disambiguated in the context. In some cases it tends to be interpreted as having a negative effect. Thus, "[I]f the Low Drop [i.e. a tune with a low fall nucleus] has no head, it typically conveys *detachment*, a *lack of involvement* in the situation. This may be variously interpreted as *coolness*, *dispassionateness*, *reserve*, *dullness*, and possibly *grimness* or *surliness*, on the part of the speaker" (O'Connor – Arnold 1973: 48). For the low-fall "with no preceding high pitch accent, an additional meaning of 'non-committal' or even 'grumbling' is conveyed..." (Cruttenden 1997: 97). But "[i]f there is no head and the High Fall nuclear tone occurs on the *wh*-word, there is no detachment or flatness as with the Low Drop. On the contrary, the questions sound *bright* and *interested*" (O'Connor – Arnold 1973: 55). Such matters slightly complicate the overall picture. Therefore, in utterances without a head, only the attitudinal meanings of the nuclei will be given attention.

f)
no head + *high*-fall nucleus:

energetic, *insistent*, *excited*, *hearty greeting*; *indignation*, *incredulity*, *angry*, *indignant* (Gimson 1970: 279)

Examples: ˈ*What a surˌprise!*
ˈ*Good ˌmorning!*
ˈ*How can ˌshe?*

This fits the conceptual metaphors very well: ANGER (and its hyponym indignation, as in (d)) AND EXCITEMENT ARE *HEAT*, AFFECTION (hearty greeting) IS *WARMTH*. Being energetic and insistent is absolutely in agreement with a high-falling nucleus (Cf. *a heated argument*, in which both sides energetically insist on being right).

Incredulity expressed by a fall rather than a rise seems to be a mismatch. It must be borne in mind that the meaning of an utterance is the sum of the intonation contour effect and the verbal meaning of lexical and grammatical units, so the attitude of incredulity may stem from sources other than pitch direction. The examples Gimson gave for incredulity are *Why?* and *How can she?* with the nucleus on *how*, and the label "incredulity" is coupled with "surprise" and "indignation". So it seems that it is the grammatical meaning of the *wh*-question that governs the attitude of incredulity, while the high-fall nucleus without a head carries the attitude of indignation (as in (f)).

no head + *high*-rise nucleus:

eager and *enthusiastic* (Gimson 1970: 281)

Example: *Coffee?* (= 'Will you have some more coffee?' or 'Did you say coffee?')

Eager is readily associated with *warm* and *hot*. Enthusiastic can be vividly depicted as *hot-headed.* This leads to the formula

HIGH NUCLEUS = 'HIGH TEMPERATURE'

g)
no head + *low*-fall nucleus:

grim (O'Connor – Arnold 1973: 48), *hostile* (O'Connor – Arnold 1973: 50), *cold* (O'Connor – Arnold 1973: 53), *cool*, *dull*, *dispassionate* (O'Connor – Arnold 1973: 48), *curt*, *distant*, *unexcited*, *unmoved*, *testy* (Gimson 1970: 278), *flat* (O'Connor – Arnold 1973: 106), *uninterested* (O'Connor – Arnold 1973: 52), *unsurprised*, and *unemotional* (O'Connor – Arnold 1973: 53), *detached* (O'Connor – Arnold 1973: 48, 50; Gimson 1970: 278), *self-possessed* (O'Connor – Arnold 1973: 53)

Example: A: *I've found a way to do it*. B: *How?*

Grim is like *surly* in (c), while *curt* is linked with "peremptory" in *WNDS*, which is a descriptive adjective met also in groups (b) and (c), i.e. *cool* and *cold*. A person who is not friendly is called *a cold fish*, and *to cold-shoulder somebody* or *to give somebody a cold shoulder* is to treat him or her in an unfriendly way. When something has such an effect on somebody that he or she remains unmoved, unsurprised, unexcited or uninterested, it *leaves them cold*. Dull is synonymous with uninteresting. Being hostile or uninterested can also be depicted as *cool*, while uninterested has already been explained as *cold* in (c). Flat is together with uninteresting and unexciting in Spooner (1999), and with downright and categorical in McLeod (1984). A detached person is unemotional, showing a lack of feeling, and *cold-hearted* is an expression for somebody not showing any love or sympathy for others. An emotionally distant or detached person is *cold*, and if it is to a high degree, *as cold as ice*. Telephoning somebody who is a stranger in order to sell something is *cold-calling*. When somebody *plays it cool* or is *as cool as a cucumber* or *has a cool head* or *is cool-headed*, they are calm, unexcited, self-possessed, dispassionate, unsurprised, and unemotional. If you want somebody to become unexcited, you may say to him or her: *Cool it!* or *Cool down*! If you remain unexcited**,** you *keep your cool*. Testy is like *impatient* (see (b)).

no head + *low*-rise nucleus:

casual acknowledgment (in interjections: O'Connor – Arnold 1973: 143), *diffident*, *indifferent*, *grudging*, *pleading* (Gimson 1970: 280), and *exhorting* (O'Connor – Arnold 1973: 62)

Example: A: *Have you heard about Max?* B: *,No*.

A casual atmosphere is friendly and relaxed in Waite (2002), but since interjections are typically emotive and pronounced in high tones, to find a low-rise nucleus in an interjection is to emphasize *coolness* in the attitude. "Diffident" is 'not having much confidence in oneself' (*OALD*). "Pleading" means 'in an emotional way that shows that you want something very much but are not certain that somebody will give it to you' (*OALD*) and "exhorting" is 'trying hard to persuade somebody to do something' (*OALD*), which typically implies a lack of confidence in the success. The expression *to have/get cold feet* suggests coldness as a prevalent sensation when somebody has no confidence in realizing their plan. In British English, when a person stops being indifferent, he or she *comes in from the cold*. Grudging is like disgruntled in (c), which is *cold*.

no head + *low*-fall, *low*-rise nucleus:

calm (O'Connor – Arnold 1973: 53; Gimson 1970: 278; O'Connor – Arnold 1973: 62)

Examples: ˏ*Get it* ˌ*then*.
ˌ*Careful*.

When you have had time to think calmly about something, you do it *in the cold light of the day*.

low head + *low*-rise nucleus:

disapproving (O'Connor – Arnold 1973: 143) in *yes-no* questions

Example: *D'you mean that* ˌ*seriously?*

Low-rise can sound disapproving with both a high head ('cool') and a low head ('cold') because cool can connote a negative low temperature just like cold. A rising tone conveys a you-should-have-done-something-else attitude ('there is more to your action'), while a low pitch stands for dissatisfaction. The difference between the two has to be attributed to the difference in grammatical meanings between a yes-no question and an echoing question. The most the speaker can do to alleviate an echoing question, which by itself sounds antagonistic, is to use the high head, although he or she still remains disapproving. Therefore,

LOW NUCLEUS = 'LOW TEMPERATURE'

5. Conclusion

In discussing cognitive mechanisms in the workings of RP intonation the following relations have come to the fore: (1) EMOTIONS (tenor or target) ARE LIKE TEMPERATURE (vehicle or source) IN PRODUCING SENSATIONS (ground) or THE PHYSIOLOGICAL EFFECTS OF AN EMOTION STAND FOR THE EMOTION and (2) PITCH physically corresponds to TEMPERATURE IN PRODUCING AIR VIBRATIONS. EMOTIONS and PITCH are strongly associated by means of the common element TEMPERATURE, so that EMOTIONS come to be expressed in terms of PITCH. The association of temperature and emotion and the approximate equvialence of temperature and pitch become integrated in the expression of atitudes (emotions) by means of pitch.

Having achieved a tripartite pattern consisting of the intonational form (pitch), attitudinal adjective (emotions) and associated temperature, we can now highlight

the correlation between intonational form and temperature. It follows from the material and discussion above that emotions and attitudes which are associated with a high temperature will be expressed by a high nucleus, while a low nucleus will be reserved for emotions and attitudes strongly associated with a low temperature.

Since there is a high correlation between positive temperatures and positive attitudes as well as between negative temperatures and negative attitudes, we infer that it is the head that regulates this evaluative aspect of intonational meaning, the high head being mainly used to express positive, and the low head to express negative attitudes. The term *high* in *high head* refers to high pitch and *mutatis mutandis* the same applies to *low*. To be more precise, adjectives which boil down to "warm" are always positive and their corresponding intonational patterns have a high head, while attitudes which associate with "cold" are always negative and the head is low. "Hot" is negative, always using a low head. "Cool" is ambivalent: usually positive, but sometimes negative, in either case expressed by means of the high head.

The view expounded here concurs with the findings in Mulac and Nash (1977). In this investigation of the effects of intonation on semantic ambiguity, for a sentence *I thought so* the interpretation 'and I was right' prevailed when the falling *thought* was preceded by an *I* of higher pitch, while denial was more readily inferred when the rising *thought* was preceded by an *I* of lower pitch (1977: 277-8).

Therefore, the physical basis for the two opposite degrees of head pitch seems to be the reality that high temperature is typically good, while low temperature is typically bad, which creates metonymy (HIGH TEMPERATURE CAUSES GOOD FEELING; LOW TEMPERATURE CAUSES BAD FEELING) and metaphors (GOOD EMOTIONS ARE LIKE HIGH TEMPERATURE; BAD EMOTIONS ARE LIKE LOW TEMPERATURE).

There is a deep, fundamental connection between sound and temperature beyond a mere metaphor. A number of new meanings have sprung from *cool* used in jazz, which also speaks of the association between sound and temperature, just like in the collocation *frosty voice*. When we are freezing cold, the lips vibrate typically accompanied by a low tone of voice.

According to Gene Morton, from the Smithsonian Institution (presented in a TV programme *Animal Communication* several decades ago), all aggressive tones (like snarling) are similar in being low, whereas high-pitch tones are non-aggressive for all animals including human beings. Of course, we cannot speak of verbal metonymy in the animal world, but conditioned reflexes, of which animals are capable, do have a metonymic basis. Higher animals also make use of their physical experience: higher temperature (within a limited range that does not excede temperateness) causes typically good physical sensations; low temperature causes typically bad sensations. On that basis they produce "mod-

erately high-temperature", i.e. "warm" sounds for pleasure and "low-temperature" sounds when dissatisfied, while squealing corresponds to "extremely high-temperature", i.e. "hot" sounds. Admittedly, this occurs on a simpler scale and with a much narrower range of emotions.

When we think of what sound really is, i.e. the oscillations of air molecules, we come to the essence of the issue. For higher pitch, these oscillations are more intense, just as molecules of water become agitated when water is heated. "[W]hen you get warm in front of a radiant heater (or the sun) you are behaving like a vibrational spectroscopy sample, and the molecules in your body capture the infrared radiation and vibrate more energetically" (Atkins – Clugston 1982: 52). So, when molecules of air are agitated, which also most frequently happens when a person produces high-pitch tones, there is an infinitesimal increase in temperature, which seems to be registered at least subconsciously. High pitch is realized in the same way as high temperature, while low pitch is low temperature. Variations in pitch simply repeat differences in temperature.[9] The exact physiological, neurological and psychological mechanisms involved here must as yet remain a moot point, but hopefully a theoretical basis has been formed for a future detailed discovery procedure.[10]

Using the high head instead of the low head for a positive attitude in familiar speech is redundant and takes a superfluous effort, just as shaking hands with somebody you meet every day (at least in in the Anglo-Saxon world) or using polite stereotyped phrases with family members is redundant and inappropriate. What may sound uncivil when speaking to a stranger, either in phrasing and the use of vocabulary or in the use of intonation patterns, may be the normal way of communication in an intimate style. As Gimson (1970: 278) mentioned, an utterance can be "blunt to strangers, but a common unemotional form amongst intimates". Therefore, when judging the impression that intonation patterns make on the hearer, this circumstance should be taken into account, but it does not change the basic construction of the principle on which intonation works.

One may be tempted to assume that the correlation between the pitch and tem-

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[9] If this ability to perceive differences in pitch as subtle diffrences in temperature strikes the reader as unbelievable, we should bear in mind, for instance, the many camouflage colours of the cuttlefish, which are colour blind! This also poses a vexing question still beyond scientists' understanding, but the facts remain incontestable.

[10] Zbikowski (1998: 3.4., 3.5.) made a highly relevant observation that our characterization of musical pitches in terms of "high" and "low" is basically metaphorical and that the metaphor derives from the fact that when we make low sounds, our chest resonates, while when we make high sounds, our chest no longer resonates in the same way, and the source of the sound seems located near out head (the conceptual metaphor PITCH RELATIONSHIPS ARE RELATIONSHIPS IN VERTICAL SPACE). However, this insight does not affect the explanation offered here because the correspondence between the vibration of the air molecules initated by the action of the speech organs and that caused in temperature remains the same regardless of how pitch is imagined to be metaphorically.

perature united with the correlation between emotions and temperature is universal across languages of the world. This question requires further investigation, but we can safely surmise that something along similar lines is actually involved.

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