Iconization of Sociolinguistic Variables:
The Case of Archetypal Female Characters in Classic Hollywood Cinema[1]

Sunwoo Jeong

Stanford University

Abstract

This study examines the interaction between linguistic variables and other semiotic resources in the visual media. It argues that many of the suprasegmental variables in classic Hollywood cinema iconically and sound-symbolically represent the major archetypes of the era, namely, the femme fatale, the dumb blonde, and the screwball heroine. It also argues that other visual, cinematic devices worked to actively develop and fortify this iconic relation. Due to this iconization process, the underlying ideologies behind the linguistic variables were more easily naturalized, enabling their wider dissemination. The evidence for this argument comes from acoustic and statistical analyses of pitch and voice quality variables produced by actresses portraying the three archetypes. The quantitative approach combined with additional qualitative analyses of relevant pitch contours and film scenes show the systematic difference between the archetypes in the usage of these variables, and demonstrate the iconic link between linguistic variables, archetypes, and film imagery.

1. Introduction

Films can become potent vehicles for language variation and change. Functioning as a medium that formulates novel associations between the visual and the auditory symbolic resources, films not only have the power to reflect and further propagate the common linguistic practices of the era, but also continually recreate social meanings attached to various linguistic practices and the different personae that use them, thus actively shaping the dominant language ideologies of the time. This was especially the case for the films made during the Golden Age of Hollywood (1927–1963), in which several strands of distinctive film genres, featuring highly stylized stereotypical female characters, were emerging as important cultural phenomena. Film viewers at the time were repeatedly exposed to genre-defining female characters such as *femmes fatales* in film noir, *screwball heroines* in screwball comedies, and *dumb blondes* in musical and romantic

---

comedies. The high degree of consistency in the narrative/stylistic conventions of these film genres often induced the viewers to also make generalizations about the consistencies in the ways the three types of female characters speak, crucially in conjunction with how they behave, and what the implications of their behaviors mean in the social context of their time.

This paper argues that systematic variation in suprasegmental linguistic cues such as pitch, prosody, and voice quality was employed by the actresses from the classic Hollywood era to index the three prominent film archetypes mentioned above. More importantly, It also argues that the choice of these variables was not arbitrary in that they created an iconic tie with the archetype that they purportedly indexed. Combined with other visual cinematic devices that fortified this iconic relation, the underlying ideologies behind these linguistic variables were more easily naturalized, enabling wider dissemination of these feminine archetypes and their distinctive speech styles.

The evidence for this argument comes from acoustic and statistical analyses of pitch and voice quality variables produced by the actresses portraying the three archetypes in 15 genre-representative films. A series of quantitative analyses combined with additional qualitative analyses of relevant pitch contours and film scenes will be presented in order to establish the systematic differences between the archetypes in the usage of these variables, and also to validate the iconic link between linguistic variables, archetypes, and film imagery.

2. Iconicity and iconization

Before diving into the actual data, a brief overview of the works on linguistic iconicity seems appropriate, in order to further motivate this study, and also to set the background for discussing the iconicity of linguistic variables in the cinema. The term iconicity has been used in a variety of ways in linguistics and can encompass multiple types of qualitatively different phenomena. However, most uses of the term start from Peirce's tripartite distinction of signs (Peirce 1998), based on how form (in the case of language, speech sounds) is linked to meaning: icons, indices, and symbols. Although many prior works in modern linguistics, especially since Saussure (1989), have focused on linguistic signs as instantiations of symbols whereby the link between form and meaning is arbitrary, researchers have also continually considered cases whereby non-arbitrary links between form and meaning in language come into play, be they indexical (an existential relationship; Silverstein 2005), or iconic (a likeness relationship).

With respect to iconic relationships, a wide gamut of phenomena ranging from diagrammatic iconicity in syntax (cases where the structural composition of the meaning is reflected in the structural composition of the form; Haiman 1980) to iconicity in sound symbolism (Sapir 1929) has been studied. In the sound symbolism literature, some of the studies have been mainly concerned with denotational meanings (e.g. the tendency for round vowels to correlate with round objects, known as the *bouba-kiki* phenomenon; Maurer, Pathman, and Mondloch 2006, among others), whereas others have been concerned more with social meanings linked to certain variables (e.g. the use of fronted vowels by preadolescent girls to signal sweetness and innocence; Eckert 2010). In terms of the dimensions of similarity between form and meaning, some studies have focused more on cases where the similarity stems from the articulatory domain (e.g. the correlation between an oily persona and the curling of the tongue i.e. rhoticization; Zhang 2008), whereas other studies have focused on cases where the similarity stems primarily from the acoustic or auditory domain (e.g. the correlation between high acoustic frequency and small size; Ohala 1994).

With this backdrop in mind, the present paper focuses particularly on the ideological underpinnings of iconicity, what Irvine and Gal (2000) refer to as the process of iconization. According to them, iconization denotes a process whereby "linguistic features that index social groups or activities" come to be perceived as "iconic representations of them, as if a linguistic feature somehow depicted or displayed a social group's inherent nature or essence" (Irvine and Gal 2000: 37). Crucially, this iconization process binds the linguistic image and the social image "together in a linkage that *appears to be* inherent" (Irvine and Gal 2000: 38, my emphasis). The most noteworthy part of this definition of iconicity, and its potential difference from the meaning of iconicity delineated in other works, is that the term emphasizes the conventional nature of finding iconicity in language. Iconicity does not simply arise from a pair of meaning and form that comes readily equipped with convenient similarities. The creation of an iconic link between a social meaning and a linguistic variable arises from a process whereby the similarity between the sound and the social meaning is actively picked out and the potential differences between the two are ignored, most often to suit ideological purposes. This state of affairs is summarized by the claim that "[i]t takes an active ideological, hence semiotic, process to create a similarity, and the necessary concomitant of similarity: differentiation" (Gal 2013: 34).

Acknowledging that iconicity in language, especially iconicity related to social meanings, is created from an active semiotic process is crucial to better understanding the mechanism

underlying language variation and change. This is because the metadiscursive activity of finding inherent similarity between a social persona and a set of linguistic variables often facilitates the stabilization of the social meanings attached to the variables and creates a major impetus to their wider propagation as a stylistic package. Studies in the previous literature have shown the potentially important role that iconization plays in endowing the variables with particular social meanings (Zhang 2008; Eckert 1991, among others) and stabilizing the associations between them. However, it is often hard to pin down the exact contextual factors that come into play in triggering the formulation of the iconic link in the language user's mind, because one cannot fully observe the situational and cultural context in which such links have been made the same way one can document the resulting linguistic practice and people's perception of such practice.

This is why films become a particularly rich source of data with respect to the process of iconization. In cinema, the linkage between the linguistic and the social image can be more consciously initiated, mediated, and fortified by the actual imagery on screen: various visual, cinematic devices such as mis-en-scène, shot compositions, lighting, etc., can work to naturalize the potential link between the linguistic cues and the characters/personalities of the archetypes that they index. Although in reality, the relationship between the two is in no way inherent or set in stone, the pseudo-inherent link between the two can be subtly suggested and fortified throughout the film's visual narrative. In the subsequent sections (particularly in section 5), I discuss how such an active semiotic process seems to be happening in many of the films from the Golden Age of Hollywood, focusing specifically on the film noir. Before embarking on a more in-depth qualitative analysis of the data I will first outline the methods used in collecting the data (section 3), and present a comprehensive quantitative analysis of the data (section 4).

3. Methods

3.1. Selection of films and actresses

The data for this study were collected from 15 classic Hollywood films. Several criteria were devised for choosing the appropriate data set, as follows. First, great effort was taken to maximally select highly representative, canonical films of each genre that follow major genre conventions noted in the film studies literature (Grant 1986; Kuhn and Radstone 1990). Such conventions were mainly stylistic for the film noir featuring femmes fatales, and thematic for the screwball comedies featuring screwball heroines. The range of films that portray the dumb blonde archetype (predominantly musical comedies, but also occasionally romantic comedies)

was slightly more heterogeneous than the range of films portraying femmes fatales and screwball heroines. However, the dumb blonde archetype did demonstrate highly consistent, stylized behaviors across different films. Therefore, regarding this archetype, the focus was more on whether the archetype fit certain stereotypical behavioral characteristics often noted in the film studies literature (Kuhn and Radstone 1990).

More specific details on the stylistic, thematic, and character-related conventions for each film genre or archetype are as follows: First, femmes fatales are "central to the intrigue" of the film noir, and are furthermore "usually not placed safely in any of the familiar (female) roles" (Kaplan 1998: 16), unlike the female characters in other film genres such as Westerns, where women play highly typified supporting roles. Also, although the overt work of the film noir is often claimed to be the attempted "restoration of order" (Place 1998: 48) through the exposure and the destruction of the sexual, manipulating woman, many critics also concede that "it is not the inevitable demise that the spectators remember but rather their strong, dangerous, and above all, exciting sexuality" (Place 1998: 48). This is most likely because the style of these films subtly contradicts their conventional narrative content or interacts with it to produce a unique and powerful image of the female character. Indeed, many critics have claimed that film noir is more interested in style than theme (Shrader 1986: 181), which is why the argument for the iconization of linguistic variables will become perhaps the most compelling for the case of femme fatale compared to the two other archetypes: because film noir as a genre is tightly defined by stylistic conventions, the visual and stylistic resources have a greater capacity to influence the film and the spectators than other film genres that put less emphasis on their visual techniques.

The recurring stylistic conventions of film noir have been heavily influenced by its cinematic precursor, German expressionism, and they are as follows: Monochromatic lighting with emphasis on shadows (they are often strategically cast onto faces and walls), frequent appearances of dark, deserted spots such as alleyways, and preference of straight lines or striations over curves (compositions made out of vertical or horizontal stripes from train tracks, window blinds, grocery aisles, street lamp posts, etc.). Also, the majority of the scenes are lit for night, and the actors and setting are often given equal lighting emphasis (Shrader 1986: 176), as opposed to the lighting emphasis on the actors over the setting in other conventional film genres. Finally, compositional tension is preferred to physical action (Shrader 1986: 176), as opposed to a related film genre, namely gangster film, that prefers dynamic physical actions. To demonstrate these stylistic conventions, representative scenes from a film noir canon, *Double Indemnity*

(Wilder 1944; Stanwyck's performance in this film has been used as a part of the data sample) have been presented in Figure 5 in the Appendix (top two shots).

Compared to the film noir and the femmes fatales, the main characteristics that define screwball comedies and screwball heroines are thematic rather than stylistic. Above all, the screwball comedy as a distinctive genre is characterized by a female that dominates the relationship with the male central character, whose masculinity is challenged (Gehring 1986: 85), and the two protagonists usually engage in a humorous battle of the sexes. Screwball heroines thus have intriguing connections with the femmes fatales, since both archetypes challenged (in different ways) the conventional behaviors often associated with women of their era and worked towards creating alternative images of women.

Finally, dumb blondes figure quite prominently in several seminal musical comedies (e.g. Marilyn Monroe in *Gentlemen Prefer Blondes*), and they are most unambiguously defined by "their combination of overt 'natural' sexuality (of which they may or may not be aware) with a profound ignorance and innocence manifest in an inability to understand even the most elementary facts of everyday life" (Kuhn and Radstone 1990: 47). Thus, the source of the so-called dumb blonde humor has often been attributed to the character's "lack of understanding of what is 'obvious' to ordinary people" (Kuhn and Radstone 1990: 47). With respect to stylistic conventions of musical comedies featuring dumb blondes, they often create stark contrast to the conventions governing film noirs by their frequent use of vibrant, extravagant colors and warm, heavy lighting on the central characters.

Having paid particular attention to choose the films that fit closest to the major genre conventions defined above, great effort was taken to also choose the actresses that were amenable to the study of intra-speaker variation, i.e. actresses that portray more than one archetype across different films. For example, iconic femmes fatales such as Marlene Dietrich (Bell 2011) were initially considered, but actresses such as Marilyn Monroe or Barbara Stanwyck, who portrayed more than one archetype among the three archetypes in question (Monroe as a femme fatale and a dumb blonde, Stanwyck as a femme fatale and a screwball heroine), were preferred. Adopting this criterion, one noteworthy observation emerged during the selection process: there seemed to be several actresses who portrayed both the femme fatale and the screwball heroine, or who portrayed both the femme fatale and the dumb blonde, but no actress who portrayed both the dumb blonde and the screwball heroine. This state of affairs gives a certain insight to the underlying ideologies behind each archetype and the connections between them. It is likely that

the highly sexualized nature of the femme fatale connects her in some way to the dumb blonde archetype (although the way that they are sexualized is very different), and her dominating and norm-breaking character in turn connects her to the screwball heroine archetype.

A final consideration in selecting the data involved the date of production, in order to restrict the influence of sound change. Although the heydays of the film genres did not exactly coincide (for example, screwball comedy flourished the most in the 1930s and film noir in the 1940s), only films from the 1940s and 1950s were included, and this sometimes meant choosing less canonical films that fell under the appropriate time period rather than more famous ones that fell outside it. Table 1 summarizes the final list of films included in the data set.

Table 1. List of films used for the dataset

Dumb blonde	Femme fatale	Screwball heroine
Marilyn Monroe	Marilyn Monroe	Rosalind Russell
Some Like It Hot (1959)	*Niagara (1953)*	*His Girl Friday (1940)*
Kim Novak	Kim Novak	Katharine Hepburn
Phffft! (1954)	*Vertigo (1958)*	*Adam's Rib (1949)*
Lana Turner	Lana Turner	Myrna Loy
Slightly Dangerous (1943)	*The Postman Always Rings Twice (1946)*	*The Bachelor and the Bobby-Soxer (1947)*
Jayne Mansfield	Lauren Bacall	Lauren Bacall
Kiss Them for Me (1957)	*The Big Sleep (1946)*	*Designing Woman (1957)*
Marie Wilson	Barbara Stanwyck	Barbara Stanwyck
My Friend Irma (1949)	*Double Indemnity (1944)*	*Ball of Fire (1941)*

3.2. Selection and analysis of the data

The specific tokens that were used for the linguistic analyses were collected by extracting 30 to 50 utterances per film for each actress portraying a single archetype. Extractions were exhaustive for most of the films, under the condition that utterances had optimal sound quality. Hence, only utterances produced indoors, involving no background music and minimal background noise were chosen. For a few films that featured long dialogues, the extraction was capped to the first 50 utterances of a given actress. This was done to ensure the comparability in the number of tokens between the actresses and the archetypes. Utterances ranged from 1.09 seconds to 4.86

seconds. The sound extraction was done using the DVD Audio Extracter, with a 22050Hz sampling rate and 16-bit quantization.

For the acoustic cues related to pitch and intonation, three measurements were collected: the maximum F0 value of the utterance, the minimum F0 value of the utterance, and the F0 standard deviation of the utterance (in order to examine pitch variability). Sentence type (declarative, wh-interrogative, polar interrogative, exclamative) was also coded as a relevant linguistic factor.

For the acoustic cues related to voice quality, the H1-H2 values of the *vowels* of each utterance were collected. The H1-H2 value calculates the difference in amplitude between the first harmonic and the second harmonic of a sound, and is a measure of the spectral tilt of a given sound (Gordon and Ladefoged 2001). Higher H1-H2 value is correlated with breathiness, lower H1-H2 value is correlated with creakiness, and modal voice is situated in between. When collecting the H1-H2 values of each vowel, several linguistic factors such as the F0 and F1 value of the vowel, the position of the vowel in the utterance and the log duration of the vowel were coded as well.

All the values were extracted and collected using Praat (version 5.3.57, Boersma and Weenink 2013) and for the H1-H2 value, a relevant Praat script (Chad Vicenik, phonation-measurement, modified to include other linguistic factors such as F1) was used. Waveforms, spectrograms and pitch tracks were also inspected manually for each audio file, in order to check for errors from automatic calculation and also to conduct additional qualitative analyses.

To these data, a series of linear mixed effect models were fitted, using the *lme4* package (Bates et al. 2015) in *R* (R Development Core Team 2008). For the pitch variable data, F0 standard deviation, maximum F0, and minimum F0 were set as the dependent variable in respective models. In all the models, archetypes and sentence types were included as independent variables, and actresses were included as a random effect. Likewise, a series of linear mixed effects models was fitted to the voice quality variable data (H1-H2 data) as well, with H1-H2 value as the dependent variable. In this model, archetypes, F0, F1, vowel position in the utterance (tripartite distinction: utterance initial vs. medial vs. final), and log duration of the vowel were included as independent variables, and actresses were included as a random effect. Since *lme4* itself does not generate *p*-values, the *p*-values were generated after the regression analysis by bootstrapping through a Markov Chain Monte Carlo method.

4. Results

4.1. Inter-speaker variation: pitch

This section presents the analysis of the pitch and intonation related variables. First, the analysis of the F0 standard deviation data shows that the femme fatale archetype has significantly lower pitch variability than the two other archetypes. The linear mixed effect models that corroborate this finding are presented in tables 2 and 3 in the Appendix. As can be seen from the models, the difference in F0 standard deviation values between the femme fatale and the dumb blonde archetype was significant (table 2: B = -28.264, s.e. = 2.379, t = -11.883, p < 0.001). Likewise, the difference in F0 standard deviation values between the femme fatale and the screwball heroine archetype was significant as well (table 3: B = -25.578, s.e. = 2.839, t = -9.009, p < 0.001). In contrast, no meaningful difference in F0 standard deviation emerged between the dumb blonde archetype and the screwball heroine archetype. As for the linguistic factors that had been coded, sentence type turned out to be a relevant predictor, showing that exclamatives and wh-interrogatives had significantly higher F0 standard deviation values (i.e. more pitch variability) compared to declarative sentences. There was no significant interaction between archetype and sentence type.

To summarize, the statistical analyses show that low pitch variability (as will be seen in more detail later, this is correlated with monotonous intonational contours and minimal pitch accents) definitively sets aside the femme fatale from the two other archetypes and is one of the main defining characteristics of the femme fatale archetype. On the other hand, the screwball heroine and the dumb blonde archetype seem to have comparable degrees of pitch variability (both use highly fluctuating intonations).

With respect to the maximum F0 values, there were graded thresholds for each archetype: the dumb blonde had the highest F0 upper threshold, the screwball heroine the second highest, and the femme fatale the lowest. This difference in maximum F0 values according to archetype was significant across all pairs of archetypes (see tables 4 and 5 in the Appendix for these results).

The pattern was less graded for the minimum F0 values. Only the dumb blonde archetype had significantly higher minimum F0 values compared to the two other. This suggests that the dumb blonde archetype is differentiated from the other two archetypes in that her pitch rarely drops to a low value. In contrast, both the screwball heroine and the femme fatale seem to use low pitch drops in the utterances (tables 6 and 7 in the Appendix summarize these results).

4.2. Intra-speaker variation: pitch

The previous subsection showed that there are several noteworthy distinctions in pitch related variables such as minimum F0, maximum F0, and F0 standard deviation values between the three different archetypes, and that such distinctions are generalizable across multiple actresses. Crucially, it also showed that this effect of archetype in each statistical model is above and beyond the effect of individual actresses, since actresses have been included as a random effect.

At this point, zooming in to the level of intra-speaker variation may give additional corroboration to this state of affairs. Does the distinctive patterning of pitch variables depending on the archetype reliably hold within a single actress as well? Figure 1 below confirms that it does.

Figure 1. F0 standard deviation (in Hz): intra-speaker variation
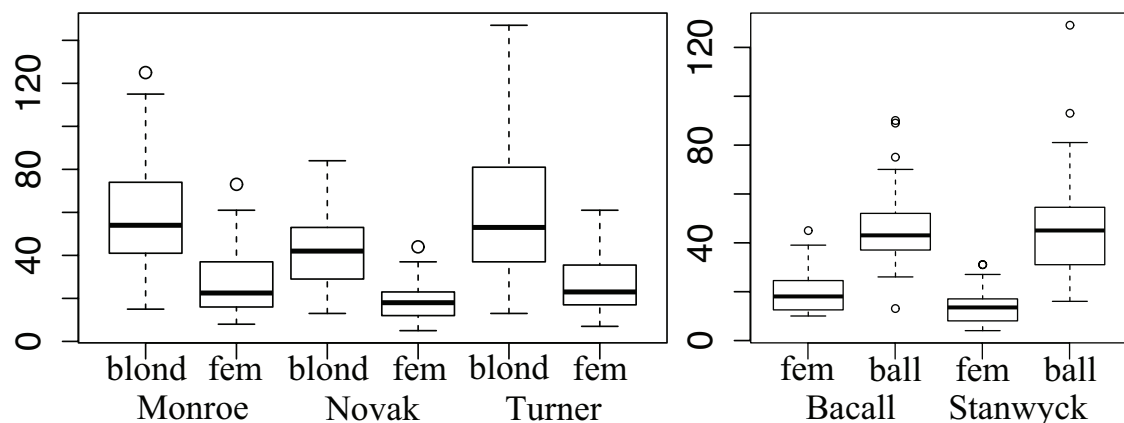
The left side of Figure 1 shows the F0 standard deviation values of actresses that portray both the dumb blonde and the femme fatale archetype. (The dumb blonde archetype is labeled as 'blond' and the femme fatale archetype is labeled as 'fem'.) The systematic lowering of F0 standard deviation when portraying the femme fatale is observed across all three actresses, Monroe, Novak, and Turner, and the similarity in their patterns is striking. The patterns suggest that all three actresses systematically adjusted their speech styles, such that they became highly monotonous with respect to pitch variation, whenever the actresses portrayed the femme fatale archetype. Likewise, the right side of Figure 1 shows the F0 standard deviation values of

actresses that portray both the femme fatale and the screwball heroine archetype. (The screwball heroine archetype is labeled as 'ball'.) Again, the systematic lowering of the F0 standard deviation values when portraying the femme fatale archetype is observed across both actresses, Bacall and Stanwyck. Similar to the pattern of F0 standard deviation, Minimum F0 and Maximum F0 values also showed comparable systematic adjustments at the level of intra-speaker variation. (The relevant graphs have been omitted for space reasons, but they closely resemble the consistency observed in Figure 1.)

4.3. Variation in voice quality

The statistical analysis of the H1-H2 data shows that both the femme fatale archetype and the dumb blonde archetype have significantly higher H1-H2 (i.e. breathier voice) than the screwball heroine archetype. The results of the regression models with H1-H2 value as the dependent variables corroborate this observation (see table 8 (baseline: screwball heroine) and table 9 (baseline: dumb blonde) in the Appendix). On the other hand, the difference in H1-H2 between the dumb blonde archetype and the femme fatale archetype failed to show significance. This suggests that breathy voice may index both the femme fatale and the dumb blonde, differentiating them from the screwball heroine.

All of the linguistic factors that had been coded (F0, F1, vowel position, log duration of the vowel) turned out to be significant predictors of the H1-H2 value as well. We will not go over them in detail, except for the effect of vowel position and its interaction with archetype: the analysis shows that H1-H2 is significantly lower in utterance final positions for screwball heroines (the vowels are creakier) whereas H1-H2 is significantly higher in utterance final positions for dumb blonds and femmes fatales (the vowels are breathier). In other words, the effect of vowel position on H1-H2 works in opposite directions for screwball heroines on the one hand, and femmes fatales and dumb blondes on the other.

The data pattern above is noteworthy in two respects. First of all, breathiness seems to appear in linguistically unexpected (but due to this unexpectedness perhaps perceptually more salient) positions for dumb blondes and femmes fatales, since studies show that creaky voice is more likely to occur in utterance-final positions (Klatt and Klatt 1990) than breathy voice. This suggests that breathy voices that appear in utterance final positions for dumb blonde and femme fatale are stylistically motivated. On the other hand, since utterance final position is a predictable position for creak to occur, one is led to wonder whether the robust occurrence of creak in

utterance final position for the screwball heroines is a stylistic phenomenon or is just a reflection of natural linguistic tendencies.

A second noteworthy point that can be drawn from this interaction pattern is that the femmes fatales and the dumb blondes not only pattern together in their overall preference for breathy phonation, but also in the more specific way they distribute such cues in a given utterance to maximize the stylistic effect that they want to convey.

To summarize, the result of the series of linear mixed effects models on H1-H2 data suggests that the hypothesis that actresses in general use voice quality differently to portray distinct archetypes is correct. It also shows that the effect on voice quality according to archetype is above and beyond the effect on voice quality according to individual actresses (because again, actresses have been included as a random effect). In other words, all the actresses seem to have undergone systematic adjustments in their phonation when portraying different archetypes.

Similar to pitch-related variables, the inter-speaker variation in voice quality delineated above was again transparently replicated at the level of intra-speaker variation as well. Barbara Stanwyck and Lauren Bacall both systematically produced breathier voice when portraying the femme fatale, compared to when they were portraying the screwball heroine, whereas Kim Novak, Lana Turner, and Marilyn Monroe all maintained comparable range of H1-H2 values across their portrayal of the dumb blonde and the femme fatale archetypes. (Again, the relevant graphs have been omitted for space reasons, but they closely resemble the consistency observed in Figure 1.)

4.4. The distinctive packaging of suprasegmental variables

Zooming back out to the bigger picture, the overall patterning of the variables delineated in the previous subsections seems to show that the correlation between one variable and a given archetype is not always exclusive or isolated, so that the same kind of acoustic cue can be used to index multiple archetypes depending on what other kinds of acoustic cues it combines with. For example, breathiness seems to signal both the dumb blonde archetype on the one hand and femme fatale on the other, depending on whether it combines with low pitch and monotonous intonational contour in the first case, or high pitch and fluctuating intonational contour in the other. Figure 2 summarizes the partially overlapping distributions of the relevant variables for each archetype.

This pattern is noteworthy in that it seems to further corroborate the findings in the previous literature which suggest that it is ultimately the distinctive packaging of numerous variables that works to create a social meaning, rather than the individual variables in and of themselves (Podesva 2011; Eckert 2008; and Moore 2004, among others).
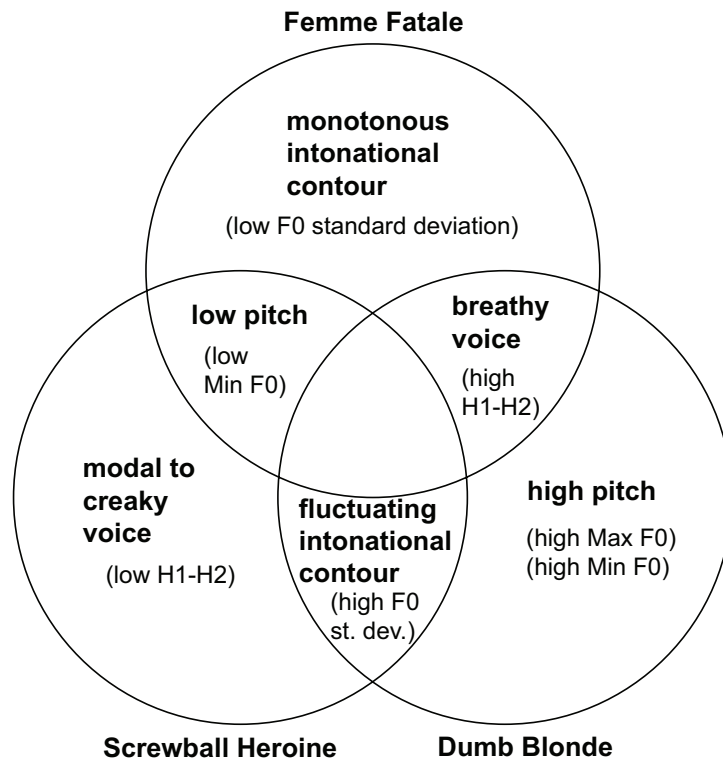
Femme Fatale

monotonous intonational contour

(low F0 standard deviation)

low pitch
(low Min F0)

breathy voice
(high H1-H2)

modal to creaky voice
(low H1-H2)

fluctuating intonational contour
(high F0 st. dev.)

high pitch
(high Max F0)
(high Min F0)

Screwball Heroine   **Dumb Blonde**

Figure 2. Distribution of the variables according to each archetype

Another observation that can be drawn from the pattern above is that the overlapping variables between the archetypes sometimes seem to index what are perceived to be salient shared characteristics between the archetypes. For example, as will be argued in more detail later, the use of low pitch by the femme fatale and the screwball heroine seems to index some kind of non-normative femininity, a trait that is shared by both archetypes. Likewise, the use of breathy voice by the femme fatale and the dumb blonde seems to index the highly sexualized nature of the two archetypes. This state of affairs leads one to wonder whether some sets of variables are amenable to a kind of compositional analysis whereby a certain variable that is a part of a larger, cohesive constellation of variables can come to index a particular trait or subcomponent of a broader social meaning.

To recapitulate this section, differences in pitch and voice quality variables such as high pitch, low pitch variability, breathiness, etc. seem to have been systematically used by the actresses to index certain archetypal characters in the Hollywood movies of the 1940s–50s. In the next section, I argue that the selection of these variables by the actresses was not arbitrary in that it constructed an iconic relationship with each archetype.

5. Iconization and archetypes

5.1. Iconization and femmes fatales

The stylistic conventions of the film noir mentioned in section 3, as well as the imagery of the femme fatale created by these cinematic devices, are inextricably linked to the nature of linguistic variables (especially pitch related variables) used by the femme fatale. The suprasegmental linguistic variables of the femme fatale investigated in this paper, such as low pitch, low F0 standard deviation, and breathy voice, all iconically represent and fortify the transgressive and liberating character of the femme fatale and the somber, monochromatic imagery of film noir.

First of all, low pitch is iconically linked to the authority and the power that the femme fatale exerts to the male protagonist, as well as her image as a breaker of the social norms. Importantly, this potential iconic link between the variable and the archetype may have not been as easily taken up by the viewers had it not been for the salient film imagery of film noir. The dark lighting, somber atmosphere, and various aesthetically placed shadows in the film noir all serves to fortify and cement this association between the archetype and the linguistic variable.

In a similar vein, low pitch variability (that has been shown to be the defining characteristic of the femme fatale in the statistical analysis in the previous section) is correlated with the calm, unflinching, and unperturbed character of the femme fatale. Low pitch variability is often manifested as flat, monotonous, and non-undulating intonational contour. Hence, the frequent appearances of straight lines (as discussed in section 3, and epitomized in the top two shots of Figure 5 in the Appendix) rather than curves in film noir may also further strengthen the iconic link between the femme fatale and her monotonous intonational contours.

To give a more concrete example, intonational contours of two declarative sentences of similar length spoken by Kim Novak as a femme fatale in *Vertigo* (left) and as a dumb blonde in *Pffft!* (right) are presented in Figure 3 below. The lack of salient pitch accent and the general monotonicity in the intonational contour on the left is striking (one may also contrast this with the highly fluctuating intonational contour of Marilyn Monroe as a dumb blonde in the subsequent

section), and is reminiscent of the play with flat, horizontal striations of shadows in respective films (again, demonstrated in the top two shots of Figure 5 in the Appendix).
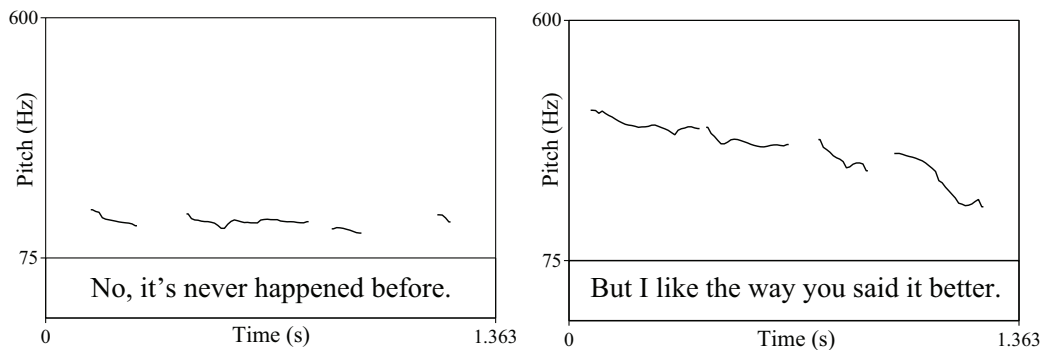
Figure 3. Pitch contours of Novak as a femme fatale (left) / dumb blonde (right)

At this point, one might think that the monotonous intonational contours that are manifest in the speech of the femme fatale archetype are not as perceptually salient as the highly fluctuating intonational contours used by the dumb blonde or the screwball heroine archetype. However, I argue that the relatively unchanging pitch track of the femme fatale is just as salient to the ear, if not even more so. This is because normative speech has a certain degree of pitch variation by default. Also, the default status of human speech is to have (pitch) declination within an intonational phrase. Declination refers to the gradual lowering of F0 within an intonational phrase, and the universality of such declination pattern in speech has been frequently noted in works such as Pierrehumbert (1979). The utterances produced by the femme fatale archetypes do not even seem to have much of a declination (the contour is almost completely level, instead of slanting slightly downwards as time progresses), and this anomaly may convey extra saliency to the listeners. The intonational contours of Novak as a dumb blonde with a natural (or slightly exaggerated) declination slope and that of Novak as a femme fatale without any such declination slope (presented above in Figure 3) in producing declarative sentences summarizes this state of affairs.

5.2. Iconicity and dumb blondes

As has already been shown by the quantitative analyses from section 4, the most notable characteristic of the speech of the dumb blonde is her extremely high pitch voice (significantly higher F0) and her high pitch variability (significantly higher F0 standard deviation). Qualitative

analysis of her pitch contours further corroborates this observation: dumb blondes have highly fluctuating intonational contours, as can be seen from the right side of Figure 4 below, where the pitch contour of a sample declarative utterance of Marilyn Monroe as a dumb blonde in *Some Like It Hot* is presented. In stark contrast with the absence of pitch rise on the left (where the same actress portrays a femme fatale in *Niagara*), the pitch of the main accented word *lovely* on the right soars up to nearly 800 Hz.
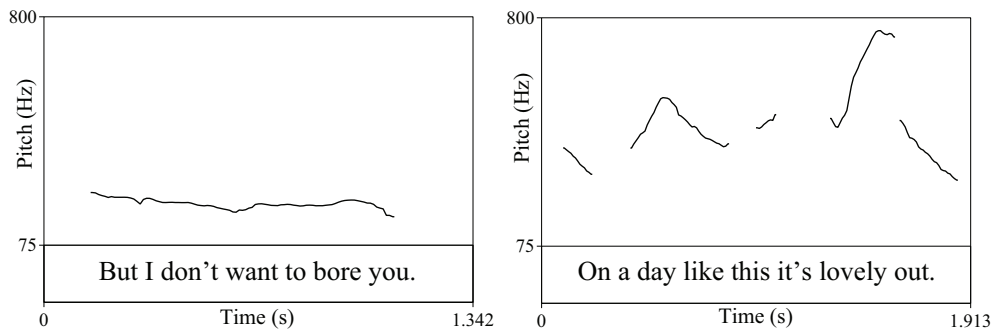

Figure 4. Monroe as a femme fatale (left) / dumb blonde (right)

Just as the flat, monotonous intonational contour of the femme fatale is iconically linked to her unflinching composure and the somber, angular composition of the film noir, the undulating pitch contour of the dumb blonde is again directly and iconically linked to her naively enthusiastic and buoyant character and the warm, hazy, and sometimes scintillating lighting of musical comedies. Also, whereas the sexuality of the femme fatale is mostly represented by the imagery of her lean and straight ankles and legs (the introduction of the femme fatale in film noirs most often occur with her legs and feet entering into the frame and the camera panning up; e.g. *The Postman Always Rings Twice, Double Indemnity*, etc.), that of the dumb blonde is predominantly represented by the imagery of her bouncy and curvy bust section. Hence, one can find many instances of close-up bust shots that accentuate the voluminous breasts of the female character in musical comedies featuring dumb blondes, the type of shots that cannot be easily found in film noir or screwball comedies.

Undulating intonational contour is not the only kind of acoustic cue that is iconically linked to the dumb blonde archetype. The frequent use of extremely high pitch by dumb blondes also iconically links her speech to her elated mood and childlike behavior (high pitch is correlated with smaller vocal folds and subsequently, smaller size: e.g. children). One may also find a correlation between the upper body parts (the bust section) and high pitch in the dumb blonde, in

contrast to the correlation between the lower body parts (the legs) and low pitch in femme fatale. Examples of the usage of bright and warm lighting and the emphasis on the bust section for the case of dumb blondes are presented in Figure 5 in the Appendix (lower left).

5.3. Iconicity and screwball heroines

It has been noted that femmes fatales and screwball heroines share a certain similarity in that they both deviate from more conventional images of women from their era. This explains their shared usage of low pitch (as manifested by their significantly lower Maximum F0 and Minimum F0 values compared to the dumb blonde archetype), and in both cases, the usage of low pitch seems to iconically represent their shared tendency to deviate from more conventionally feminine behaviors.

However, a potential difference in the strategic usage of low pitch can also be observed between the screwball heroine and the femme fatale, in that the use of low pitch by the former archetype is quite often juxtaposed with the use of relatively high pitch by the male protagonist (such use of non-normatively gendered pitch by the two protagonists consequently lead the two to have comparable pitch ranges), a juxtaposition that is not found in film noir. This juxtaposition of relatively comparable pitch ranges by the two protagonists in the screwball comedy is directly reflected and further emphasized in many scene compositions where the two characters are butting heads with each other and their silhouettes are juxtaposed in equal size and standing. Figure 5 in the Appendix (lower right) presents scenes from the film *Adam's Rib* where such compositions occur. In addition, the frequent use of low pitch and creaky voice by screwball heroines is also iconically represented by the masculine attire that screwball comedy heroines quite often don in films, a type of clothing that is certainly not worn by any femme fatale or dumb blonde.

It has been shown that screwball heroines strategically use low pitch, and that this use of low pitch is in some way comparable to, but also different from the use of low pitch by the femmes fatales. What more clearly differentiates screwball heroines from femmes fatales is the observation that they have high pitch variability (comparable to that of the dumb blondes) that leads them to utilize relatively high pitch in their utterances as well, if the need arises. This is expected, because their interaction with the male protagonist unfurls in an overtly assertive manner, most often as heated discussions, as opposed to femme fatale's covert and rather muted domination of the male protagonist. Hence, the high pitch variability of the screwball heroines

does not seem to reflect enthusiasm or naiveté as in the case of dumb blonde, but rather seems to reflect emotional assertiveness, and in many cases, anger.

6. Discussion and Conclusion

This study examined several suprasegmental cues such as pitch, intonation, and voice quality of the speech of representative actresses in the Hollywood movies of the 1940s and 1950s, in order to elucidate whether the difference in the use of these suprasegmental variables index pivotal archetypal characters of the era, such as the dumb blonde, the femme fatale, and the screwball heroine. The paper showed that the dumb blonde archetype is characterized by high pitch, high degree of fluctuation in intonational contour, and breathy voice. It also demonstrated that the femme fatale archetype is characterized by low pitch, low degree of fluctuation in intonational contour (reflected by her monotonous intonation lacking a declination pattern) and breathy voice. Finally, it also observed that the screwball heroine archetype is characterized by low pitch and wider pitch range, high degree of fluctuation in intonational contour, and modal to creaky voice. This tendency for suprasegmental cues to correlate with archetypes was shown to hold both at the level of intra-speaker variation and also at the level of inter-speaker variation. Crucially, the paper also argued that the choice of linguistic variables depending on the archetype is not arbitrary in that it creates an iconic tie with the character of the archetype and the visual imagery on screen. Via this process of iconization, linguistic variation comes to be situated within the broader semiotic system of the film, and the implicit ideological message it conveys is fortified by the film imagery.

This process of iconization also naturalizes the link between the linguistic and the social image, providing the viewers with plausible reasons as to why certain types of people may speak in certain ways. Such a process of iconization in films has important repercussions to real life communication in many respects. First, it facilitates the metalinguistic awareness of the linguistic variables and the specific social meanings attached to them among the viewers: anyone could adopt these linguistic features, and the implicit social meanings and ideologies behind them would be easily understood by the peers. To put it differently, the iconic nature of the linguistic variables in films helps to reinforce the tacit consensus of the meaning of the linguistic features and the implications behind them.

The iconization process in films is crucial to instigating changes in the form-meaning associations as well. This is because cinematic archetypes have the power to subtly subvert, and

not just transfix, the ideological underpinnings of a stereotype and thus change the potential social meanings attributed to the stereotype and its speech style. Various works in the film studies literature (Gehring 1986; Dyer 1998) point out that the three archetypes mentioned above, i.e. femme fatale, screwball heroine, and dumb blonde, are noteworthy because they not only worked within, and concretized the imposed gamut of female stereotypes, but also subtly negotiated and pushed forward the boundaries of static representations of women as 'the Other' in the cinema to construct relatively more nuanced female representations: for example, the burlesquing of the dumb blonde performance in films such as *Gentlemen Prefer Blondes* allowed for the introduction of underlying astuteness and manipulativeness of the character (albeit as a gold digger) into the existing imagery of the dumb blonde as a sexual, but innocent *ingenue* (Cook 1979).

In conclusion, combined with the media's power to reach a wide range of audience and affect the diffusion of linguistic variables (Stuart-Smith et al. 2013), the iconization of linguistic variables in classic Hollywood cinema most likely had a great impact on the construction of linguistic style in real life communication as well, due to their ability to negotiate the link between a given set of variables and the social meanings attached to them, as well as their greater potential to develop into more stable registers (in the sense of Agha 2003) and ultimately be consumed as easily accessible stylistic resources. Parts of such stylistic resources persist in the performances of contemporary female stereotypes as well (for instance, the present day cougar archetype adopts low, breathy voice just like the femme fatale archetype from the classic Hollywood era), and diverse creative permutations of them can also be observed in instantiations of stylistic practices in real life speech.

References

Agha, A. 2003. The Social Life of Cultural Value. *Language and Communication* 23: 231–273.

Bates, D., Maechler, M., Bolker, B. and Walker, S. 2015. Fitting linear mixed-effects models using *lme4. Journal of Statistical Software* 67 (1): 1–48.

Bell, A. 2011. Falling in love again and again: Marlene Dietrich and the iconization of non-native English. *Journal of Sociolinguistics* 15 (5): 627–656.

Boersma, P., and Weenink, D. 2013. *Praat: doing phonetics by computer.* Version 5.3.51. Retrieved Sept. 23, 2016 from http:///www.praat.org.

Cook, P. 1979. Feminism and cinema: Star signs. *Screen* 20 (3): 80–88.

Cukor, G. 1949. *Adam's Rib*. Metro-Goldwyn-Mayer.

Donen, S. 1957. *Kiss Them for Me*. Twentieth Century-Fox.

Dyer, R. 1998. Resistance through charisma: Rita Hayworth and Gilda. In *Women in film noir*, E.A. Kaplan (ed.), 91–99. London: British Film Institute.

Eckert, P. 1991. Social polarization and the choice of linguistic variants. In *New Ways of Analyzing Sound Change,* P. Eckert (ed.), 213–231. San Diego: Academic Press.

Eckert, P. 2008. Variation and the indexical field. *Journal of Sociolinguistics* 12: 453–476.

Eckert, P. 2010. Affect, sound symbolism, and variation. *University of Pennsylvania Working Papers in Linguistics* 15 (2): 70-80.

Gal, S. 2013. Tastes of Talk: Qualia and the moral flavor of signs. *Anthropological Theory* 13 (1-2): 31-48.

Garnett, T. 1946. *The Postman Always Rings Twice*. Metro-Goldwyn-Mayer.

Gehring, W.D. 1986. *Screwball Comedy: A Genre of Madcap Romance*. New York: Greenwood.

Gordon, M., and Ladefoged, P. 2001. Phonation types: A cross-linguistic overview. *Journal of Phonetics* 29 (4): 383–406.

Grant, B.K.. 1986. *Film Genre Reader*. Austin: University of Texas Press.

Haiman, J. 1980. The iconicity of grammar: Isomorphism and motivation. *Language* 56 (3): 515–540.

Hathaway, H. 1953. *Niagara*. Twentieth Century-Fox.

Hawks, H. 1940. *His Girl Friday*. Columbia Pictures.

Hawks, H. 1941. *Ball of Fire*. RKO Radio Pictures.

Hawks, H. 1946. *The Big Sleep*. Warner Bros.

Hitchcock, A. 1958. *Vertigo*. Universal Pictures.

Irvine, J.T., and Gal, S. 2000. Language ideology and linguistic differentiation. In *Regimes of Language: Ideologies, Polities, and Identities*, P. V. Kroskrity (ed.), 35–84. Santa Fe: SAR.

Kaplan, E.A. 1998. Introduction to 1978 edition. In *Women in Film Noir*, E.A. Kaplan (ed.), 15–19. London: British Film Institute.

Klatt, D.H., and Klatt, L.C. 1990. Analysis, synthesis, and perception of voice quality variations among female and male talkers. *The Journal of the Acoustical Society of America* 87 (2): 820–857.

Kuhn, A., and Radstone, S. 1990. *The Women's Companion to International Film*. London: Virago Press.

Marshall, G. 1949. *My Friend Irma.* Paramount Pictures.

Maurer, D., Pathman, T. and Mondloch, C.J. 2006. The shape of boubas: Sound-shape sorrespondences in toddlers and adults. *Developmental Science* 9 (3): 316–322.

Minnelli, V. 1957. *Designing Woman*. Metro-Goldwyn-Mayer.

Moore, E. 2004. Sociolinguistic style: A multidimensional resource for shared identity creation. *The Canadian Journal of Linguistics/La Revue Canadienne de Linguistique* 49 (3): 375–396.

Ohala, J.J. 1994. The frequency codes underlies the sound symbolic use of voice pitch. In *Sound Symbolism*, L. Hinton, J. Nichols, and J.J. Ohala (eds), 325–347.Cambridge, U.K.: Cambridge University Press.

Peirce, C.S. 1998. *The Essential Peirce: Selected Philosophical Writings*. Indiana University Press.

Pierrehumbert, J. 1979. The perception of fundamental frequency declination. *The Journal of the Acoustical Society of America* 66 (2): 363–369.

Place, J. 1998. Women in film noir. In *Women in film noir*, E.A. Kaplan (ed.), 47–58. London: British Film Institute.

Podesva, R.J. 2011. Salience and the social meaning of declarative contours: Three case studies of gay professionals. *Journal of English Linguistics* 10 (5): 1–32.

R Development Core Team. 2008. *R: A Language and Enviroment for Statistical Computing.* Vienna, Austria: R Foundation for Statistical Computing. Retrieved Sept. 23, 2016 from http://www.R-project.org.

Reis, I. 1947. *The Bachelor and the Bobby-Soxer*. RKO Radio Pictures.

Robson, M. 1954. *Phffft!*. Columbia Pictures.

Ruggles, W. 1943. *Slightly Dangerous*. Metro-Goldwyn-Mayer.

Sapir, E. 1929. A study in phonetic symbolism. *Journal of Experimental Psychology* 12 (3): 225.

de Saussure, F. 1989 [1916]. *Cours de Linguistique Générale*. Wiesbaden: Otto Harrassowitz.

Shrader, P. 1986. Notes on film noir. In *Film Genre Reader*, B. K. Grant (ed.), 229–242. Austin, Texas: University of Texas Press.

Silverstein, M. 2005. Axes of evals. *Journal of Linguistic Anthropology* 15 (1): 6–22.

Stuart-Smith, J., Pryce G., Timmins, C. and Gunter, B. 2013. Television can also be a factor in language change: Evidence from an urban dialect. *Language* 89 (3): 501–536.

Vicenik, C. Phonation-measurement (Praat Script). Retrieved Oct. 18, 2016.

Wilder, B. 1944. *Double Indemnity*. Paramount Pictures.

Wilder, B. 1959. *Some Like It Hot.* United Artists.

Zhang, Q. 2008. Rhotacization and the 'Beijing Smooth Operator': The social meaning of a linguistic variable. *Journal of Sociolinguistics* 12 (2): 2012.

Appendix

Table 2. F0 standard deviation: Linear mixed effect model 1 – Fixed effects

	Estimate	Std. Error	t value	pMCMC	Pr(>|t|)	
(Intercept)	49.166	3.304	14.880	0.0001	0.0000	
independent	-2.686	3.458	-0.777	0.3980	0.4377	
femmefatale	-28.264	2.379	-11.883	0.0001	0.0000	***
sentence_ex	20.323	3.035	6.697	0.0001	0.0000	***
sentence_wh	9.526	2.715	3.509	0.0010	0.0005	**
sentence_yn	-2.636	2.178	-1.210	0.2294	0.2267	

Table 3. F0 Standard deviation: Linear mixed effect model 2 – Fixed effects

	Estimate	Std. Error	t value	pMCMC	Pr(>|t|)	
(Intercept)	46.480	3.328	13.969	0.0001	0.0000	
dumbblonde	2.686	3.458	0.777	0.3752	0.4377	
femmefatale	-25.578	2.839	-9.009	0.0001	0.0000	***
sentence_ex	20.323	3.035	6.697	0.0001	0.0000	***
sentence_wh	9.526	2.715	3.509	0.0008	0.0005	**
sentence_yn	-2.636	2.178	-1.210	0.2200	0.2267	

Table 4. Max F0: Linear mixed effect model 1 – Fixed effects

	Estimate	Std. Error	t value	pMCMC	Pr(>|t|)	
(Intercept)	392.242	20.087	19.528	0.0001	0.0000	
independent	-50.192	14.204	-3.534	0.0002	0.0004	**
femmefatale	-154.235	9.166	-16.827	0.0001	0.0000	***
sentence_ex	97.652	11.292	8.648	0.0001	0.0000	***
sentence_wh	20.154	10.102	1.995	0.0514	0.0465	*

sentence_yn	13.106	8.108	1.616	0.1182	0.1066

Table 5. Max F0: Linear mixed effect model 2 – Fixed effects

	Estimate	Std. Error	t value	pMCMC	Pr(>|t|)	
(Intercept)	342.050	20.150	16.976	0.0001	0.0000	
dumbblonde	50.192	14.204	3.534	0.0006	0.0004	**
femmefatale	-104.043	11.289	-9.216	0.0001	0.0000	***
sentence_ex	97.652	11.292	8.648	0.0001	0.0000	***
sentence_wh	20.154	10.102	1.995	0.0514	0.0465	*
sentence_yn	13.106	8.108	1.616	0.1182	0.1066	

Table 6. Min F0: Linear mixed effect model 1 – Fixed effects

	Estimate	Std. Error	t value	pMCMC	Pr(>|t|)	
(Intercept)	200.357	8.330	24.052	0.0001	0.0000	
independent	-55.192	6.842	-8.607	0.0001	0.0000	***
femmefatale	-51.100	4.479	-11.408	0.0001	0.0000	***
sentence_ex	22.699	5.564	4.079	0.0002	0.0001	***
sentence_wh	3.234	4.978	0.650	0.5262	0.5162	
sentence_yn	18.554	3.995	4.644	0.0001	0.0000	***

Table 7. Min F0: Linear mixed effect model 2 – Fixed effects

	Estimate	Std. Error	t value	pMCMC	Pr(>|t|)	
(Intercept)	145.165	8.366	17.352	0.0001	0.0000	
dumbblonde	55.192	6.842	8.607	0.0001	0.0000	***
femmefatale	4.092	5.477	0.747	0.3058	0.4553	
sentence_ex	22.699	5.564	4.079	0.0002	0.0001	***
sentence_wh	3.234	4.978	0.650	0.5262	0.5162	
sentence_yn	18.554	3.995	4.644	0.0001	0.0000	***

Table 8. H1-H2: Linear mixed effect model 1 – Fixed effects

	Estimate	Std. Error	t value	pMCMC	Pr(>|t|)
(Intercept)	-4.2978	1.8646	-2.305	0.0262	0.0213

	Estimate	Std. Error	t value	pMCMC	Pr(>|t|)	
independent	-7.9114	1.8478	-4.282	0.0001	0.0000	***
femmefatale	1.3844	2.0259	0.683	0.5138	0.4944	
F0	0.0367	0.0040	9.155	0.0001	0.0000	***
u_position_i	-3.8012	0.8535	-4.454	0.0001	0.0000	***
u_position_m	-9.1874	0.6870	-13.373	0.0001	0.0000	***
F1	-0.0025	0.0007	-3.253	0.0014	0.0012	**
logdur	-2.1584	0.6664	-3.239	0.0010	0.0012	**
indepn:f0	-0.0239	0.0061	-3.917	0.0001	0.0001	***
femme:f0	0.0050	0.0077	0.655	0.5086	0.5127	
indepn:u_i	5.0900	1.2832	3.967	0.0001	0.0001	***
femme:u_i	-0.0888	1.3146	-0.068	0.9654	0.9461	
indepn:u_m	13.4125	1.0136	13.232	0.0001	0.0000	***
femme:u_m	2.0453	1.0669	1.917	0.0544	0.0554	

Table 9. H1-H2: Linear mixed effect model 2 – Fixed effects

	Estimate	Std. Error	t value	pMCMC	Pr(>|t|)	
(Intercept)	-12.2093	1.8646	-2.305	0.0001	0.0000	
dumbblonde	-7.9115	1.8478	-4.282	0.0001	0.0000	***
femmefatale	9.2959	2.0259	0.683	0.0001	0.0000	
F0	0.0128	0.0040	9.155	0.0070	0.0063	**
u_position_i	1.2888	0.8535	-4.454	0.1864	0.1801	
u_position_m	4.2251	0.6870	-13.373	0.0001	0.0000	***
F1	-0.0025	0.0007	-3.253	0.0010	0.0012	**
logdur	-2.1584	0.6664	-3.239	0.0012	0.0012	**
dumbb:f0	-0.0240	0.0061	-3.917	0.0001	0.0001	***
femme:f0	0.0291	0.0077	0.655	0.0002	0.0004	***
dumbb:u_i	-5.0900	1.2832	3.967	0.0001	0.0001	***
femme:u_i	-5.1789	1.3146	-0.068	0.0001	0.0002	***
dumbb:u_m	-13.4125	1.0136	13.232	0.0001	0.0000	***
femme:u_m	-11.3672	1.0669	1.917	0.0001	0.0000	***

Figure 5. Scenes from *Double Indemnity* (Wilder 1944), *Some Like It Hot* (Wilder 1959), and *Adam's Rib* (Cukor 1949)