1.0 Introduction
This study is premised on the idea that there might be a significant relationship between utterances including discourse markers and the speaker’s choice of a nuclear tone (a pitch change of the most prominent syllable in an intonation group) of those utterances.

The purpose of this study is to show whether or not a discourse marker ‘but’ is suitable for a certain nuclear tone e.g. falling, rising, fall-rise, rise-fall and level tone by using data drawn from movies.

2.0 Theoretical Background
2.1 Relevance theory (Sperber and Wilson 1986/1995)
Relevance theory explains how people understand utterances, introducing ‘principles of relevance’:
- Cognitive principle of relevance
  Human cognition tends to be geared to the maximisation of relevance.
- Communicative principle of relevance
  Every act of ostensive communication communicates a presumption of its own optimal relevance. (Sperber and Wilson 1995:260)
‘Relevance’ can be interpreted to get the most effective information for a hearer with the least effort in communication.

There are three types of utterances that have ‘relevance’:
1) utterances adding a new assumption (or knowledge) to a hearer’s cognitive environment (i.e. the whole set of assumptions),
2) utterances providing evidence for a hearer’s assumption and strengthening the assumption,
3) utterances contradicting a hearer’s assumption and eliminating the assumption.
2.2 Procedural meaning and conceptual meaning (Blakemore 2002)

In the relevance theoretical framework, it is assumed that linguistic form encodes either of two types of meanings: procedural meaning or conceptual meaning (nouns, verbs, adjectives, and adverbs). Blakemore mentions that the former includes ‘constraints on all aspects of inferential processing’ (2002: 4) and the latter any concept or representation. A piece of the linguistic form procedurally encoded acts as a guide for a hearer to understand an utterance. Examples of linguistic form procedurally encoded are discourse markers (‘but’, ‘so’, ‘well’…) and interjections (‘huh’, ‘oh’…).

2.3 The procedural meaning of ‘but’ (Blakemore 2002)

‘But’ activates ‘an inference that is linked to the cognitive effect (i.e. ‘relevance’) of contradiction and elimination’ (Ibid. : 100). So, after ‘but’, the following utterance or a part of an utterance contradicts and eliminates a hearer’s assumption. In other words, ‘but’ acts as a guide for a hearer to eliminate an existing assumption. Example:

(1) New York was the windiest city in the United States today, but Chicago had light wind.
(2) It is always windy in Chicago.
(3) There’s a pizza in the fridge, but leave some for tomorrow.
(4) The hearer can eat the whole pizza.

(Blakemore 2002: 102, 109)

In the utterance (1), using ‘but’ contradicts and eliminates an assumption (2), which the hearer is thought to have by the speaker. Likewise, the use of ‘but’ contradicts and eliminates an assumption (4).

2.4 Imai’s (1997, 2002) claim

Imai mentions that intonation, especially a nuclear tone encodes a procedural meaning; a falling tone represents ‘default’ on selecting a tone, a rising tone ‘reserving judgement on something’. ‘It is the principle of relevance that enables the hearer to determine what that something is and how it is related to the utterance being produced’ (1997: 69).

However, although procedural meanings are mentioned, Imai relates the nuclear tones not to any guide or constraint to understand utterances but to their
representations. It seems that this claim leads to a paradox that nuclear tones encode procedural meanings but they represent certain meanings, i.e. they encode conceptual meanings. If nuclear tones encode procedural meanings, they are supposed to act as a guide to the hearer’s comprehension of utterances as a discourse maker plays a role in introducing one of the three types of ‘relevance’. Otherwise, one will have to think that nuclear tones do not encode any procedural meaning or that there are different types or levels of procedural meanings. Before jumping at a conclusion, let us see the relationship between discourse markers, which plausibly encodes procedural meanings, and the nuclear tones of utterances including them.

3.0 Data Analysis

3.1 Procedure
1) From two movies, utterances including ‘but’ were dictated, and a nuclear tone of an utterance before ‘but’, of ‘but’ itself if any, and of an utterance after ‘but’ were also observed.
2) The utterances were classified in terms of their sentence types (e.g. declarative, yes/no interrogative, wh-interrogative, imperative).

3.2 Results
3.2.1 Sentence types
- Of 64, seven samples have ‘but’ at the beginning of utterances.
- Of 64, 56 sentences before ‘but’ are declaratives and only one is yes/no interrogative.
- Of 64, 61 sentences after ‘but’ are declaratives and three are wh-interrogatives.

(5) Sentence types of sentences before/after ‘but’

<table>
<thead>
<tr>
<th></th>
<th>Sentence before ‘but’</th>
<th>Sentence after ‘but’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declarative</td>
<td>56</td>
<td>61</td>
</tr>
<tr>
<td>Yes/no interrogative</td>
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<td>-</td>
</tr>
<tr>
<td>Wh-interrogative</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>
3.2.2 Types of nuclear tones
- Of 64 utterances including ‘but’, only seven have nuclear tones on ‘but’ itself.
- Of seven samples having nuclear tones on ‘but’, six are level tones, and one is a falling tone.
- Of 56 declaratives before ‘but’, 48 have falling tones, five fall-rise, two rising, and one level. One yes/no interrogative has a rising tone.
- Of 61 declaratives after ‘but’, 56 have falling tones, three fall-rise, and one rising. Three wh-interrogatives have falling tones.

(6) Types of nuclear tones put on ‘but’

<table>
<thead>
<tr>
<th>Tone Type</th>
<th>Count</th>
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<tbody>
<tr>
<td>Falling</td>
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<tr>
<td>Level</td>
<td>6</td>
</tr>
</tbody>
</table>

(7) Types of nuclear tones of declaratives before ‘but’

<table>
<thead>
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<th>Tone Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falling</td>
<td>48</td>
</tr>
<tr>
<td>Rising</td>
<td>2</td>
</tr>
<tr>
<td>Fall-rise</td>
<td>5</td>
</tr>
<tr>
<td>Level</td>
<td>1</td>
</tr>
</tbody>
</table>

(8) Types of nuclear tones of declaratives after ‘but’

<table>
<thead>
<tr>
<th>Tone Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falling</td>
<td>56</td>
</tr>
<tr>
<td>Rising</td>
<td>1</td>
</tr>
<tr>
<td>Fall-rise</td>
<td>3</td>
</tr>
</tbody>
</table>

3.3 Comments on the results
It seems that the choice of a nuclear tone has to do not with the existence of a discourse marker ‘but’, but with sentence types before/after the discourse marker. Since utterances after ‘but’, contradicting and eliminating a hearer’s assumption are likely to go with declaratives, falling tones are mainly chosen. Although some utterances have their nuclear tones on ‘but’, it is difficult to conclude that a certain
tone has a significant relationship with that discourse marker.

4.0 Conclusion

In terms of ‘but’, the choice of nuclear tones seems to be irrelevant to the procedural meaning, namely introducing an utterance which contradicts and eliminates an hearer’s existing assumption. This leads to either of two conclusions:

1) nuclear tones do not encode procedural meanings,
2) nuclear tones do encode procedural meanings, but they are different from those of discourse markers.

It seems to me that the first conclusion is wrong because of the fact that the use of a fall-rise often forces a hearer to make an inference. For instance (the arrows indicate the direction of pitch change of tone),

(5) A: What a lovely voice!
   B: Yes, she has a lovely \(\downarrow\)\(\uparrow\)voice.  (O’Connor and Arnold 1973)

After hearing the B’s utterance, which includes a fall-rise, A is likely to infer one of the following conclusions:

(6)a. B does not think much of her as an actress.
   b. B thinks that she is not good-looking.
   c. B does not like her.

If the B’s utterance had a falling tone, A would not start to make an inference from the utterance. Therefore it is assumed that a fall-rise encodes a kind of procedural meaning (i.e. forcing a hearer to make an inference). This kind of procedural meaning is different from that of discourse markers in that the latter is related to the type of their following utterances’ ‘relevance’ (adding a new assumption, strengthening an existing assumption, or eliminating an existing assumption). There seems to be a lot of room for argument on this topic.

References