A psycholinguistic point of view: are idioms really relevant for theories of language comprehension?

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Idioms are one of the most challenging phenomenon for theories of language for many reasons:

► they behave at the same time as words and as larger-than-words chunks;
► Their meaning must be learned;
► Their meaning is sometimes unrelated to the composing words (e.g., “by and large”) and sometimes related (e.g., “skate on thin ice”)

(Nunberg et al., 1994).

Do we already know how idioms are acquired, represented, understood and produced?

Yes and No

Two classes of models:
1. Lexical Look-up Models:
Idioms as semantically empty long words stored in the mental lexicon;
Direct access to idiomatic meaning;
Horse race between the 2 meanings: the figurative one is faster since no compositional analysis is performed.

-Idiom List Hypothesis (Bobrow & Bell, 1973)
-Lexical Representation Hypothesis (Swinney & Cutler, 1979)
-Direct Access Hypothesis (Gibbs, 1980, 1986)
2. Non-Lexical Models:

No separate lexical representation; Activation of the literal meaning of the constituent words at least up to idiom recognition; Syntactic analysis of the idiom string.

- Configuration Hypothesis (Cacciari & Tabossi, 1988; Tabossi & Zardon, 1993)
- Hybrid Hypothesis (Titone & Connine, 1999).

Configuration Hypothesis:

► Idioms are mentally represented as configurations formed by the constituent words. No duplication of information;
► Idioms are processed as any other linguistic string up to a point (*idiomatic key*) -- that triggers the emergence of the corresponding idiomatic configuration (e.g., build castles in the air; see the stars);
► The position of the key determines how early or late is activated the idiomatic meaning (but context effects).

Essere al 7° cielo= to be in 7th heaven (very happy)

Essere al 7° piano= to be at the 7th floor

Essere al 7° cielo

Essere al 7° piano

settimo
cielo

piano

al
The idiom's key: a point of idiom quasi-"uniqueness" after which the probability of the fragment to continue idiomatically is extremely high.

- What can constitute a key (in an idiom's canonical word order and in neutral contexts):
  - A specific constituent (e.g., "cielo");
  - A type of determiner (e.g., la vs. un);
  - An unfrequent verb (e.g., "ficcare il naso");
  - A group of constituents or a syntactic construction (e.g., "dargliela su");
  - A missing element (e.g., the Det in "costruire castelli in aria");
  - The implausibility of the literal action (e.g., "fare un buco nell'acqua").

What we know so far:

1. The comprehension of an idiom does not require any special processing mode;
2. During idioms processing, word meaning is activated up to their uniqueness/recognition point (and sometimes even later);
3. The syntactic analysis is obligatory;
4. The contextual information affects the time course of idiomatic interpretation.

Controversial issues:

1. Whether idiomatic meaning is always activated as a "first choice";
2. Whether the activation of an idiomatic meaning suspends the literal processing of the remaining string;
3. The effect of contextual information on idioms processing;
4. The role of the recognition point (the key): does it really affect the time course of idiomatic meaning activation?
5. Whether on-line idiom processing is indeed sensitive to the idiom's semantic structure (semantic transparency);
6. The syntactic diversity of idioms.

Outline of the study:

- Exp. 1:
  - Ease of integration of idiomatic vs. literal interpretation of ambiguous idioms in idiomatic vs. literal contexts;
  - Ambiguous idioms=they possess a well-formed plausible literal meaning;
  - early vs. late key idioms (e.g., "to keep the mouth shut" vs. "to cut the rope");
  - Reading times of critical segment.
Early vs. late key idioms

- Completion tests used to identify the point after which the string is perceived as idiomatic.

  Ex. “Tagliare la corda” (To cut the rope = to escape)
  Sergio ha tagliato…. (No idiom)
  Sergio ha tagliato la…. (No idiom)
  Sergio ha tagliato la corda (corda=Key) ➔ Late key, late predictability of the idiomatic meaning

  Tenere la bocca chiusa (To Keep the mouth shut = to not reveal a secret)
  Sergio ha tenuto…. (No idiom)
  Sergio ha tenuto la…. (No idiom)
  Sergio ha tenuto la bocca…. ➔ Idiom! (Bocca=Key)
  Early key, early predictability of the idiomatic meaning

Exp. 2:
activation of idiomatic interpretation (early vs. late key idioms) depending upon the literal vs. idiomatic nature of the preceding context;

Cross-modal lexical decision times

Experiments 1 and 2:
the role of comprehender characteristics

To assess the extent to which individual speed of reading/processing affects idioms comprehension

Speed of reading correlates with general language comprehension skills in normal subjects

(Word recognition: Seidenberg, 1985; Sabatini, 2002; Text comprehension: Sabatini, 2002; Mendelsohn, 2001; Comoldi & Colpo, 1998)

Experiment 1

Tagliare la corda (To cut the rope= to escape)
Late key (=late predictability)

Literal interpretation
The lady said that / Sergio had cut the rope / in order to open the fragile packet / received from Bologna.

Idiomatic interpretation
The lady said that / Sergio had cut the rope / in order to escape from the police / arrived after the robbery.

- Task: Reading for comprehension
- Time for reading critical segment
- Ss= University students (age range: 20-25 years)
- 40 Familiar idioms with a literal counterpart;
  - Syntactic structure:
    V NP: 10 with early and 10 with late key
    V NP (PP) (PP): 10 with early and 10 with late key
    (at least one of the constituent in parentheses was present);
  - Speed of reading:
    fast and slow readers [Rt < 45th percentile, Ss=26, and Rt> 55th percentile, Ss=26]

Effects of the speed of reading:
- 555 msec difference between fast vs. slow readers (1406 vs. 1961; Fs & Fi)
  No speed-accuracy trade off.

- Slow and fast readers:
  With early key idioms, both types of readers are faster in reading the idiomatic segment than the literal one;
  Garden path effect on literal segment: the idiomatic string was already interpreted figuratively.

Results: Type of Segment X Key Position X Speed of Reading (F, & F.)

Slow readers:
When preceded by a late key idiom, the idiomatic segment is read slower than the literal one;
Garden path effect on idiomatic segment.

Slower in inhibiting/suppressing the literal interpretation just assigned or in activating the idiomatic interpretation? Or both?
Fast readers:
- no difference between literal vs. idiomatic segment when preceded by a late key idiom.
  
Idiomatic meaning already available after last word together with the literal analysis: equal ease of integration in appropriate contexts.

Cont.d Exp. 1

To sum up:
1. The idiomatic meaning of early key idioms is always activated by fast and slow readers (vs. Colombo 1983, 1988);
   
   Once the idiom’s key has been processed, the idiomatic configuration emerged (as predicted by Non-Lexical Models and vs. Lexical Look-up Models);
   
2. No effect of idiom length;
3. The speed of reading modulates ease of integration and ambiguity resolution of late key idioms.

Experiment 2

Tagliare la corda (To cut the rope = to escape)

Idiomatic Target: Fuga (Escape)

Literal context
The warehouseman could not undo the tight knot and he had to cut the rope.

Idiomatic context
The robber did not have enough time for cracking the safe and he had to cut the rope.

• Task: Cross-modal lexical priming. Idiomatic target visually presented in two positions:
  1→ no idiomatic activation (Control), 2→ possible idiomatic activation

Cont.d Exp. 2

- 24 Familiar idioms with a literal counterpart, as in Exp.1;
- Syntactic structure:
  V NP: 9 with early and 9 with late key
  V NP (PP) (PP): 3 with early and 3 with late key;
- Target position (control vs. idiom offset).
- The target word: associated only to the idiomatic meaning and not to literal constituents.
- Speed of processing (lexical decision) measured as in Exp. 1 (Ss=35 + Ss=35).
Cont. d Exp. 2

Results: Target Position X Key Position X Speed of Processing (F & Fii)

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<thead>
<tr>
<th>Target Position</th>
<th>Key Position</th>
<th>Speed of Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Early Key</td>
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</tr>
<tr>
<td>1800</td>
<td>Late Key</td>
<td>2800</td>
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</tbody>
</table>

Cont. d Exp. 2

Speed of processing:
- 543 msec difference between fast vs. slow deciders/readers (F & Fii) (as in Exp. 1)

Fast readers are quicker at idiom offset than at control position only for early key idioms.
→ The idiomatic meaning of late key idioms requires time to be activated (as in Cacciari & Tabossi, 1988).

Slow readers are faster at idiom offset for both early and late key idioms.

WHY?

Response rate annuls the difference between early vs. late key idioms in slow readers!

Early key→ early predictability of the idiomatic meaning
Tenere la bocca chiusa (To keep the mouth shut = to not reveal a secret)
TARGET: SECRET

...... Sergio ha tenuto la bocca chiusa_{2}/response

Late key→ late predictability of the idiomatic meaning
Tagliare la corda (To cut the rope = to escape)
Target: ESCAPE

...... Sergio ha tagliato la corda_{3}/response
To sum up:
1. The idiomatic meaning of early key idioms is always activated at the end of the idiom by both fast and slow subjects. Once the idiom's key has been processed, the idiomatic configuration emerged;
2. The activation of idiomatic meaning of late key idioms only in slow readers is due to their delay in answering;
3. Individual speed of reading/processing changes the response pattern.

General conclusions

Literal and figurative meaning activation of ambiguous idioms is modulated by:
1. The position of the idiom key;
2. Individual comprehension skills as reflected by speed of reading/processing → a basic comprehender characteristic (see also WM span, attentional skills etc).

Our results are consistent with Non-Lexical Models that posit that linguistic processing and configuration assembly contribute to idiom recognition.

How about the horse race posited by Lexical Look-up models? Not confirmed!