

ON THE ACTIVATION OF IDIOMS' PARTS

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INTRODUCTION: BACKGROUND AND EXPECTATIONS

Extensive work has been done in the past several decades in linguistics regarding the mechanisms by which representations of idiomatic expressions (henceforth, “idioms”) are stored, accessed, and processed. This paper intends to establish a rudimentary, but foundational and important point about the activation-status of parts of idioms when and after they are processed. In developing models to help explain how the human language capacity deals with idioms in a given language all model-makers must, expressly or impliedly, take into consideration the role of parts of idioms.

Idioms, or “string[s] of two or more words for which meaning is not derived from the meanings of the individual words comprising that string,” are present in most, if not all, human languages (Swinney and Cutler 523, Shoebottom). We use idioms to express ourselves more thoroughly, artfully, accurately, and efficiently. Concerning their storage and processing, several linguists have proposed varying theories. One such theory from the 1980s is Swinney and Cutler’s Lexical Representation Hypothesis. This hypothesis suggests that computing the meanings of idioms includes simultaneous computation of both their literal and idiomatic meanings. According to the model, idioms are stored and accessed as items in the lexicon, much like words. However, simultaneously, the literal word-by-word meaning of a given idiom is processed.

Support for Lexical Representation Hypothesis is garnered from several studies, including one which demonstrated that English speakers judged idioms to be meaningful English phrases much more quickly than they judged non-idioms to be the same. Even taken as accurate, this model still begs the question of the strength of activation of an idiom’s parts once the idiomatic meaning is extracted. When recognizing a string of words as an idiom, according to Swinney (1979), the literal meaning of the parts of an idiom, metaphor, or other non-literal phrase should be activated, but “this effect is only momentary, which suggests that people maintain only the meaning appropriate to the context,” (Gibbs 469).

Another theory, called the Hybrid Representation of idioms, suggests “idioms are connected directly to their idiomatic conceptual meaning.” That is, they are paired up between form and meaning in a (roughly) one-to-one correspondence, much like individual words in the lexicon are; also, “access [to idiom’s meanings] is mediated via the literal components of the expression” (Holsinger and Kaiser 1.1). This model is interesting because it places high importance on the “literal components of the expression.”

These two models are just two in the sea of relevant models. In relation to the work carried out for this paper, however, two main questions arise: (1) What role do the parts of an idiom play in its access and processing? *and* (2) will the parts of idioms be activated strongly enough for them to remain “hot” several minutes after exposure, or will the parts (i.e., words from within the expression) fall out of an excited state because they are not useful, having been eclipsed by the idiomatic meaning of the idiom— because they were simply means to an end.

I suspect that parts of idioms, and subsequently an idiom’s literal meaning, are important during understanding. I will bring to the forefront evidence which serves to refute Raymond W. Gibbs, Jr.’s claim, presented in “On the Process of Understanding Idioms,” that people do not compute the literal interpretations of idioms either before or at the same time as they

comprehend their figurative meanings (465). I hypothesize that parts of idioms will prove to be (substantially) activated by processing idioms in which they are contained.

METHOD

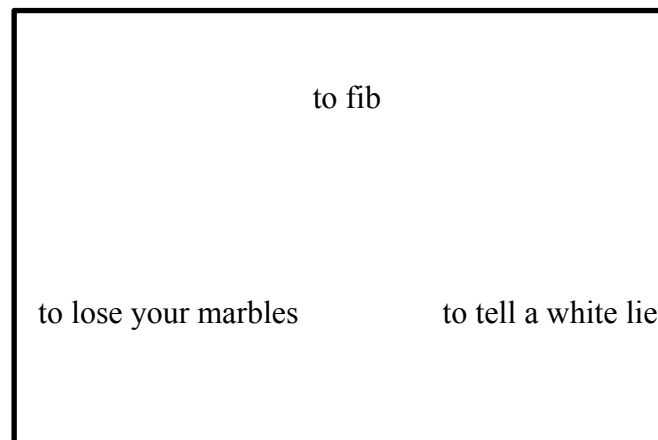
Subjects

The subjects for this study are twenty-four undergraduate students at Boston College, each whose first language is American English. These subjects were randomly split into two groups of twelve – henceforth referred to as the exposed (E) and unexposed (U) groups. The exposed group consisted of five females and seven males; the unexposed group consisted of three females and nine males.

Materials

The materials for this study are:

1. forty slides, each containing a potential literal interpretation and two common American English idioms, in which each idiom from a pool of twenty idioms appeared as the correct answer to this matching task exactly two times, an example of which is below and the full set of which is in appendix 1



2. four slides each containing a set of items used in an unrelated “distractor task,” the full set of which is in appendix 2
3. twenty slides, each containing a one syllable (two to three character) stem, which stem was previously encountered as the first part of an element of the idiom-options on each slide in materials item #1, an example of which is below and the full set of which is in appendix 3; all sixty four of which slides were in the medium of a Microsoft Power Point presentation
4. twelve copies of an answer sheet consisting of forty numbered spaces, corresponding to the forty slides mentioned above, which answer sheet is in appendix 4
5. twelve copies of a two-sided answer sheet for the above-mentioned unrelated “distractor task,” which answer sheet is in appendix 5
6. twenty-four copies of a four-page answer sheet, each with twenty spaces corresponding to the above-mentioned (item #3) stem slides, which answer sheet is in appendix 6

Procedure

The procedure for this study consisted of three discrete phases. The exposed group (group E) completed phases one, two, and three; the unexposed group (group U) completed only phase three.

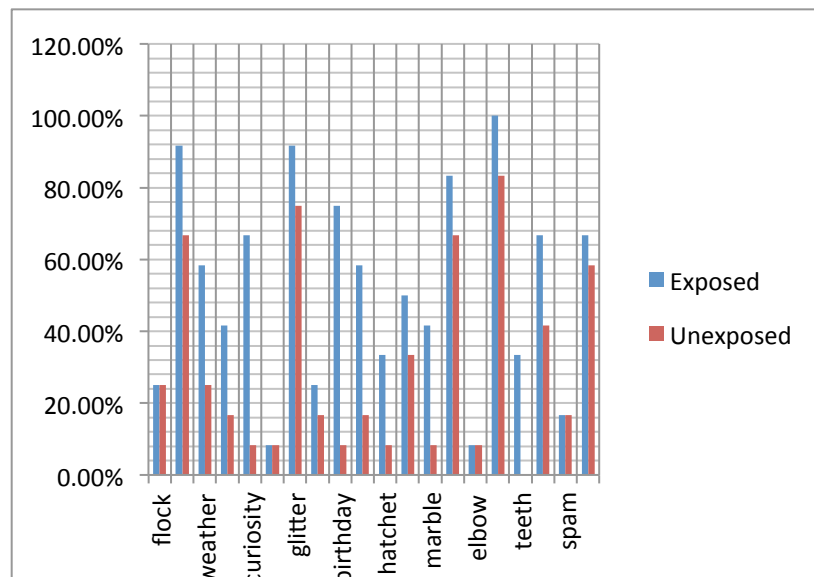
Phase 1 consisted of showing all twelve participants in group E the forty idiom-containing slides. Members of group E were instructed to select the idiom of the two idiom-options present on a given slide, which best corresponded to the literal meaning provided at the top of the slide. This was a self-timed task, which most participants completed in less than five minutes.

Phase 2 consisted of showing all twelve participants in group E the four “distractor task” slides and having them complete a simple matching task between sets of words on the slides and on the “distractor task” answer sheet (materials, item #5). This took participants about five minutes each and was also self-timed.

Phase 3 consisted of showing all twenty-four participants of both groups E and U the twenty stem slides. Participants were instructed to write as many words as they could think of before the next slide took the place of the previous one on the monitor. This switch was accompanied by an alerting “ding” sound. Each slide was displayed for twenty-four seconds. The built-in timer of the program Microsoft Power Point timed this phase automatically. Participants were instructed that proper nouns (e.g., names) and word forms (e.g. “bed” and “beds”) were acceptable responses.

RESULTS

In short, it was found that members of group E were much more likely to produce an answer to the stem-completion task that had come from an idiom to which they were previously exposed. Importantly, at debriefing, no participant indicated that he or she had been aware that the stems corresponded to words from within the idioms to which he or she had been previously exposed. For nineteen of the twenty stems (95% of the stems) the corresponding word to which the subjects in group E were exposed appeared as an answer to the stem-completion task. Across all stems, an average of 52% of the participants in group E produced the target word (i.e., the corresponding word to which they had been exposed in phase 1); an average of 30% of participants in group U wrote the word which corresponded to the intra-idiomatic words that participants of group E saw. For ten out of the twenty stems, previous exposure to a corresponding idiom increased production by 25% or more. The below graph presents how often each target word was produced in both the exposed condition (i.e. by group E); and in the unexposed condition (i.e. by group U):



One final result involved the development of an index to measure how activated a given word was for a given participant. On each participant's answer sheet, if the target word appeared first, then the participant got a score of ten for that stem; if the target word was written second, then the participant got a score of nine for that stem; and so on. If the target word was not written at all for a given stem, then the participant got a score of zero for that stem. The scoring for this is summarized in the below table:

first	10
second	9
third	8
fourth	7
fifth	6
sixth	5
seventh	4
eighth	3
ninth	2
tenth	1
after tenth word, or not at all	0

Since there were twenty stems, if a participant wrote each target word down first, his or her score would have been $(10 \times 20) = 200$; if a participant wrote every step down third, his or her score would have been $(8 \times 20) = 160$; and so on. The results for the indices of primed-ness for each subject in both groups are summarized below:

Group E	1	2	3	4	5	6	7	8	9	10	11	12	avg.
	93.50	119.00	77.00	80.00	84.00	58.50	93.00	101.00	134.00	50.00	95.50	98.50	90.33
Group U	13	14	15	16	17	18	19	20	21	22	23	24	avg.
	64.00	43.00	39.00	29.00	65.00	43.50	81.00	46.00	55.00	32.00	53.00	60.00	50.88

The average index for group E was 90.33 of 200, or 45%; the average index for group U was 50.88, or 25%.

DISCUSSION

The priming effect recorded throughout this experiment demonstrates that parts of idioms are important in the processing of idioms. Prior to, simultaneously to, or after arriving at the idiomatic meaning of an expression, people activate in their language processing system the entries for parts of idioms. This suggests, but does not guarantee, that the literal meaning of a given idiom is considered briefly and unconsciously (unconsciously, because when a speaker hears "he kicked the bucket," he or she does not think consciously of the notion of kicking or of the notion of a bucket). At least the first steps toward extracting the literal meaning of an idiom are taken, in that the meanings of (or at least, lexical entries for) an idiom's parts are activated.

If it were the case that the parts of an idiom were not activated, then a priming effect would not be so clearly visible in an experiment such as the proceeding one. Note that these

finding are only significant in that they essentially rule out a model in which an idiom is processed *purely* as a discrete lexical unit with no (or even “with little”) consideration given to that idiom’s parts. It does not, however, rule out a system like the Lexical Representation Hypothesis, in which both literal and idiomatic meanings are simultaneously computed. These findings suggest that the literal meaning is rather significant, in that it can still cause tractable priming effects several minutes after exposure.

A third type of model which these results, taken alone, *could* possibly suggest is a model in which the meanings of idioms are retrieved only from the literal meanings of its parts. Fortunately, linguistics in preceding decades have disproved this as a possibility— perhaps most notably Swinney and Cutler, who showed that idioms are recognized as sensible English phrases quicker than their non-idiomatic grammatical counterparts (like “kick the pail”).

Future Considerations

Three elements I would change about my experimental design if I were to repeat it or a similar experiment would be to: (1) control for gender, (2) stick to a VxN format for my idioms, and (3) engineer a way to prevent “backtracking.” I would consider controlling for gender to see if there is a potential difference between how males’ and females’ brains process idioms (possible connection to theories about differing levels of creativity, linguistic flexibility, etc.). I would refine my idioms to all follow a similar pattern in a general effort to regularize my experiment more thoroughly. Such a VxN format, where V is a verb, x is an article or possessive pronoun, and N is a noun, can be seen in Holsinger and Kaiser’s experiment (2.2). Lastly, by “backtracking,” I mean to find a way to answer the possible objection that those subjects who seemed to be primed to write words they had previously seen in idioms only did so by recalling the idioms, then thinking of their parts. This type of top-down process is unlikely, though, because subjects would have to use a part of the idiom to find it in the catalogue of the idioms they had just seen; moreover, no subject reported realizing that the stems corresponded to words within the idioms he or she had just seen.

If I were to revise the procedure, I would include stems in phase 3 which corresponded to the *idiomatic* meaning of the idioms. For example, I might include the stem “ne-,” for the word “neighborhood,” from the idiom “(from) the wrong side of the tracks.” This would allow for greater analysis of the priming effect in general and an evaluation of the comparative “priming power” of literal and idiomatic meanings of idioms. It would be quite striking if words related to the idiomatic meanings of idioms were primed, especially if participants were never directly exposed to their form.

Also, concerning a general linguistic principle that the beginnings of *words* are more important than later sounds or letters, it would be interesting to control for and investigate if words toward the beginning of a given idiom were more likely to prime themselves in a stem completion task later. This would create a parallel to the models for speech processing, which so strongly suggest that the first few letters of a word are significantly more important than later letters, or to typological models regarding word order in various languages (which suggest that elements which are more critical to communication and comprehension tend to be placed toward the beginning of sentences).

CONCLUSION

The results of this experiment, broadly speaking, demonstrate that parts of idioms— that is, the words that compose idioms— are substantially activated when idioms are mentally

processed. The words that comprise idioms appear as results in a stem-completion task carried out by subjects who were previously exposed to idioms that contained the words whose stems were presented. Those words appear more frequently than when subjects who were not exposed to such idioms with such potential stem-completers carry out the same stem-completion task.

APPENDIX 1

40 slides, idiom exposure (phase 1)

1. die

kick the bucket
be in birthday suit

2. asking too many questions gets you in trouble

curiosity killed the cat
to have deep pockets

3. what are you thinking about

a penny for your thoughts
add insult to injury

4. to be sad

elbow grease
under the weather

5. not everything is as good as it first seems

birthday suit
all that glitters isn't gold

6. to make matters worse

to bury the hatchet
to add insult to injury

7. to make peace

bury the hatchet
under the weather

8. to have a nice appearance

to tell a white lie
to look like a million bucks

9. to go crazy

to kick the bucket
to lose your marbles

10. to be undecided

on the fence
spam

11. to fib

to tell a white lie
to feel blue

12. to be naked

birthday suit
to lose your marbles

13. a bad neighborhood

add insult to injury
wrong side of tracks

14. junk email

to have deep pockets
spam

15. to be sad

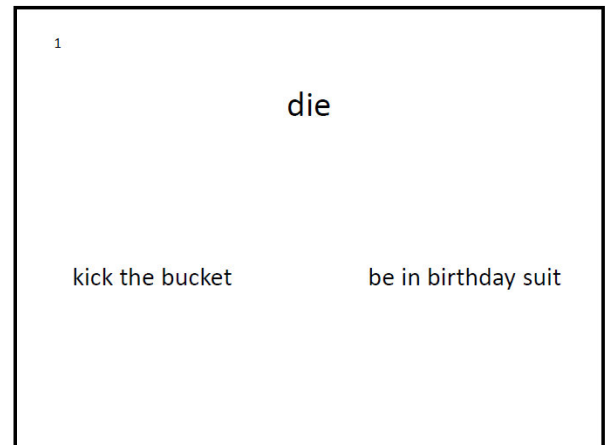
to tell a white lie
to feel blue

16. to work hard

elbow grease
curiosity killed the cat

17. friends with similar interests

look like a million bucks
birds of a feather flock together



18. to postpone coming up with a solution

a penny for your thoughts
cross that bridge when we get there

19. a close call

by the skin of your teeth
all that glitters isn't gold

20. die

to bury the hatchet
to kick the bucket

21. to make peace

spam
to bury the hatchet

22. postpone thinking of a solution

all that glitters isn't gold
cross that bridge when we get to it

23. to go crazy

to lose your marbles
to be under the weather

24. to be undecided

to look like a million bucks
to be on the fence

25. hard work

elbow grease
spam

26. to be rich

to tell a white lie
to have deep pockets

27. a close call

by the skin of my teeth
curiosity killed the cat

28. to be sad

birthday suit
to feel blue

29. junk email

spam
birthday suit

30. to fib

to tell a white lie
to lose your marbles

31. friends with similar interest

birds of a feather flock together
to be on the fence

32. to have a nice appearance

to look like a million bucks
to bury the hatchet

33. to be sad

to kick the bucket
to be under the weather

34. a bad neighborhood

wrong side of the tracks
to feel blue

35. asking too many questions gets you in trouble

a penny for your thoughts
the wrong side of the tracks

36. what are you thinking about

a penny for your thoughts
to tell a white lie

37. not everything is as good as it first seems

all that glitters isn't gold
to be under the weather

38. to make matters worse

to add insult to injury
curiosity killed the cat

39. to be naked

to be on the fence
birthday suit

40. to be rich

birds of a feather flock together
to have deep pockets

APPENDIX 2

4 slides, distractor task prompts (phase 2)

A. Albany

B. Boston

C. Dallas

D. Honolulu

E. Los Angeles

A. ink

B. keyboard

C. paper

D. swingset

E. McDonalds

A. red

B. orange

C. black

D. green

E. yellow

A. Ford

B. Listerine

C. eyeball

D. pillow

E. professor

APPENDIX 3

20 slides, stem exposure (phase 3)

(each stem displayed alone on a slide for twenty-four seconds)

1. flo-
2. mil-
3. we-
4. tr-
5. cur-
6. pe-
7. gli-
8. ins-
9. bir-
10. buc-
11. hat-
12. bri-
13. mar-
14. fen-
15. el-
16. poc-
17. te-
18. bl-
19. spa-
20. whi-

APPENDIX 4

idiom meaning (1)/(2) answer sheet: one page, front only

slide # answer ("1" for left, "2" for right)

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

slide # answer

21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	

APPENDIX 5

distractor task answer sheet: one page, front and back

Slide 1

1. Texas _____
2. Hawaii _____
3. Massachusetts _____
4. California _____
5. New York _____

Slide 2

1. fruit _____
2. grass _____
3. cat _____
4. sun _____
5. fire _____

Slide 3

1. pen _____
2. notebook _____
3. computer _____
4. playground _____
5. hamburger _____

Slide 4

1. bed _____
2. college _____
3. mouth wash _____
4. car _____
5. body part _____

APPENDIX 6

word-stem completion answer sheet: four pages; here, an example of the first page only

(stems one through six)

1	<p>-Please write legibly! -Thank you very much for your participation!</p>	2	
3		4	
5		6	

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