# When the cat you let out of the bag has claws: the role of metaphor in understanding idioms

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# What is this talk about?

- This talk is about **idioms**.

- Not easy to define in terms of necessary and/or sufficient conditions.

- Rather, the class is defined "by pointing at examples" (Egan 2008: 381).

(1) *kick the bucket, shoot the breeze, pull strings, take umbrage at, lay one's cards on the table, the cat's got X's tongue, take a bullet for*, etc.

▶ One important property: idioms are **non-compositional**.

    ▶ Their meanings cannot be computed from the meaning of their parts and their syntax.

▶ So their meaning must be stored.

    ▶ But how?

- To convince you of two things:
    1. that idioms' meanings are stored lexically rather than being inferred via their literal meanings, and
    2. also that they are not.

# Outline

Mapping theories

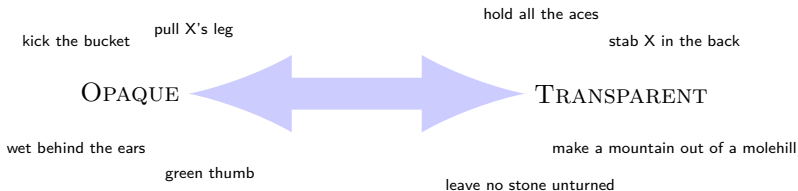Problems with mapping theories

Difficult data

Formalisation

Conclusions

# Mapping theories

▶ Idioms are not lexical items, but rather conventions about meanings.

(2)    Jadzia kicked the bucket.

▶ CONVENTION: when we talk about kicking a contextually salient bucket, we're actually talking about dying.

# Transparency vs. opacity

- Must be conventional, since idiom mappings can be opaque.
- (But can also be more or less transparent.)

hold all the aces

kick the bucket     pull X's leg

stab X in the back

OPAQUE ⟷ TRANSPARENT

wet behind the ears

green thumb

make a mountain out of a molehill

leave no stone unturned

- Pulman (1993): idioms are 'quasi-inference' rules:
  - $\forall x, y.\textbf{cat}(x) \land \textbf{bag}(y) \land \textbf{out-of}(x, y) \approx$
    $\exists a, z.\textbf{secret}(z) \land \textbf{revealed}(a, z)$

- Egan (2008): idioms involve a 'pretence':
  - "If somebody reveals a secret, pretend there's some salient cat that they've let out of a bag."

(3)   a.   Put/lay/spread your cards on the table.
      b.   Give someone a kick up the backside/bum/arse/behind.

▶ Idioms like these are constrained by their literal meaning, not by their form (just as a mapping approach would predict).

▶ Although, not always totally free:

(4)   Throw someone to the wolves/dogs/lions/#tigers/#foxes

# Problems with mapping theories

- A two-step process requires both steps, but a literal meaning is not always forthcoming.

  (5) **Lexical idiosyncrasy** (cranberry *words*):
    a.   He left me in the <u>lurch</u>.
    b.   They took <u>umbrage</u> at that.

  (6) **Syntactic idiosyncrasy**:
    a.   We tripped the [?? light fantastic] all night long.
    b.   This was [?? by and large] a success.
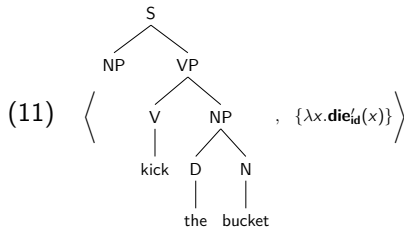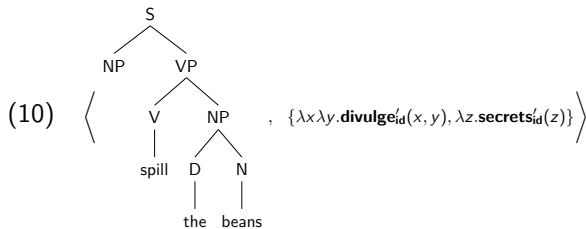    c.   It's no use beating about the bush.

▶ If idioms were interpreted based purely on their semantics, then the idiomatic meaning should be preserved across syntactic constructions, but often it is not.

(7)  a.  Jadzia kicked the bucket.
     b.  #The bucket was kicked by Jadzia.

(8)  a.  The strings that Benjamin pulled got Ezri promoted.
     b. ?#The beans that Julian spilled caused a lot of drama.

- Swinney & Cutler (1979): subjects recognise sentences with idioms faster than paired controls without.

  (9)  a.  pain in the neck/pain in the foot
       b.  lost his marbles/lost his fortune

- Similar findings reported elsewhere (Estill & Kemper 1982; Cronk 1992, 1993).

- But if idioms involve first recognising the literal meaning, then computing the idiomatic one, they should be *more* computationally taxing, not less.

# Direct access theories

- So, for (at least some) idioms, the mapping approach is not correct.
    - Historical origin, perhaps; but now conventionalised.
- If idioms aren't interpreted via mapping, then they must be understood directly – i.e. they are 'lexically' encoded.
    - At the phrase level, e.g. Abeillé (1995); Findlay (2017).
    - At the word level, e.g. Kay et al. (2015); Bargmann & Sailer (2018).

# Example: phrase-level

(10) $\left\langle \begin{array}{c} S \\ \diagup \diagdown \\ NP \quad VP \\ \diagup \diagdown \\ V \quad NP \\ | \quad \diagup \diagdown \\ spill \quad D \quad N \\ | \quad | \\ the \quad beans \end{array} \quad , \quad \{\lambda x \lambda y.\mathbf{divulge'_{id}}(x, y), \lambda z.\mathbf{secrets'_{id}}(z)\} \right\rangle$

(11) $\left\langle \begin{array}{c} S \\ \diagup \diagdown \\ NP \quad VP \\ \diagup \diagdown \\ V \quad NP \\ | \quad \diagup \diagdown \\ kick \quad D \quad N \\ | \quad | \\ the \quad bucket \end{array} \quad , \quad \{\lambda x.\mathbf{die'_{id}}(x)\} \right\rangle$

(12)   a.    $\langle$spill, $\lambda x \lambda y.\mathbf{divulge}'_{\mathbf{id}}(x, y)\rangle$
        b.    $\langle$beans, $\lambda z.\mathbf{secrets}'_{\mathbf{id}}(z)\rangle$

(13)   a.    $\langle$kick, $\lambda x.\mathbf{die}'_{\mathbf{id}}(x)\rangle$
        b.    $\langle$the, $\lambda \mathcal{Q}_{\langle et, et\rangle}.\mathcal{Q}\rangle$
        c.    $\langle$bucket, $\lambda P_{\langle et\rangle}.P\rangle$

# Difficult data

► Sometimes we can get away with extreme distortions of idioms:

(14) I could be chasing an untamed ornithoid without cause.

(15) Shit finally completes 29-month journey towards fan.

(16) Bandwagons are interesting vehicles to be on and just as interesting to watch drive past if only to see who is on board.

(17) Good gawd it's another porcine flyer.

# 'Inferred' idioms

- ▶ What makes these idioms interpretable?
- ▶ They describe the same situation as the literal meaning of the idiom.
- ▶ A situation which contains porcine flyers is one in which pigs fly.

# 'Inferred' idioms
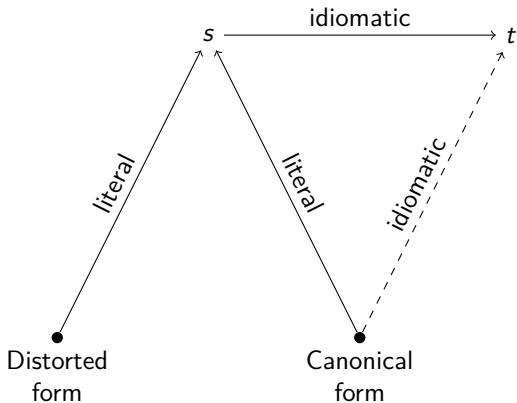


- Two ways of getting to idiomatic meaning …

# Idiom extensions

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▶ 'Idiom extensions' offer a further challenge:

(18) When John let the cat out of the bag it was him who got scratched.

(19) Livia didn't quite kick the bucket, but she took a good strong swing at it.

(20) This month, Meriden City Council's chickens came home to roost, and they laid a big stinky egg on Meriden taxpayers.

(21) Sometimes the person you'd take a bullet for is behind the trigger.

(22) I had butterflies in my stomach and they had big wings on them.

(23) The CEO pulled a rabbit out of the hat, but it left droppings everywhere.

# Direct access does not work

- If we assume that idiom meanings are lexicalised, and so these examples are simply ambiguous, we can't make sense of the extensions.

(18)  When John let the cat out of the bag it was him who got scratched.
⇒ When John revealed the secret it was him who got scratched.
⇒ John got scratched??

# Direct access does not work

(20)  This month, Meriden City Council's chickens came home to roost, and they laid a big stinky egg on Meriden taxpayers.
⇒ This month, Meriden City Council's past wrongdoings returned to negatively affect it, and they laid a big stinky egg on Meriden taxpayers.
⇒ The past wrongdoings laid an egg??

(22)  I had butterflies in my stomach and they had big wings on them.
⇒ *I was nervous and they had big wings on them.

⇒ I felt anxieties inside me and they had big wings on them.
⇒ My anxieties had wings??

# Mapping after all

- These idiom extensions only make sense when viewed via the metaphor the idiom is based on.

- Then we can proceed by analogy:

| | | |
|---|---|---|
| kicking the bucket | :: | dying |
| taking a good strong swing at the bucket | :: | ?? |

- But to do this, we crucially need access to
  1. the literal meaning, and
  2. the (metaphorical) relation between the literal and idiomatic meanings

- That is, we need a mapping theory.

- Isn't this just 'word play' or 'meta-linguistic' in some way?
    - Not meta-linguistic in the conventional sense (talking *about* language).
- Anyway, isn't word play worthy of analysis?
    - Cf. Pig Latin and syllable structure.
    - Just because we lack a decent theory of metaphor, doesn't mean we don't want one (or that one is impossible).

## Two uses of idioms

- Two formally distinct uses of idioms:

| Core | Extended |
|------|----------|
| - Lexically stored | - Computed on-line |
| - Processed faster | - Processed slower |
| - Phenomenologically neutral | - Phenomenologically marked |
| - Syntactically restricted | - Syntactically freer |
| - *Direct access* | - *Mapping theory* |

- By analogy to McGlone et al. (1994).

  (24)  He was barking up the wrong tree. >
        He was clearly using the wrong strategy.

  (25)  He was barking up the right tree. ≈
        He was clearly using the right strategy.

# Syntactic flexibility

- *Kick the bucket* = canonically frozen idiom:

(26)   a.  #The bucket was kicked by Jadzia.
        b.  #The bucket which Jadzia kicked was sudden.
        c.  #Which bucket did Jadzia kick?
           etc.

► But there are attested examples of highly flexible uses
(Bargmann 2017):

(27)    a.    When you are dead, you don't have to worry about death
anymore [. . . ]. The bucket will be kicked.

       b.    For those of you who don't know, my computer's
motherboard finally kicked its last bucket.

       c.    They say famous people die in threes, and I've believed them
since that summer in 1997 when Nusrat Fateh Ali Khan,
Mother Teresa and Lady Di all kicked their respective
buckets in unison and the world ran out of flowers.

       d.    It's clear that Stein's bucket is going to be kicked right from
the start. Despite this, the death still carries emotional
weight.

# Formalisation

# Formalisation

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- ▶ The intuitions are relatively clear, but how can we formalise them?

- ▶ Our proposal based on pretence theory (Egan 2008).

- ▶ Each idiom provides a *pretence statement*, Π, which links pairs of situations. (On situation semantics see e.g. Kratzer 1989.)

  (28) $[s : \phi] =_{def} \phi$ interpreted with respect to situation $s$.

  (29) $\Pi_{\mathbf{ps}} = \lambda s \lambda t. \forall x, y([s : \mathbf{connection_{id}}(y) \wedge \mathbf{exploit_{id}}(x, y)]$
  $\leftrightarrow [t : \mathbf{string}(y) \wedge \mathbf{pull}(x, y)])$

- ▶ Both direct access and mapping: the idiomatic meaning is encoded, and the pretence statement is included as a CI (Potts 2005), or at some other side-dimension.

- A pretence statement $\Pi$ gives us a set of pairs of situations $\langle s, t \rangle$, where the idiomatic meaning is true in $s$, and the literal meaning is true in $t$.

- Call $\pi$ the relation which determines the single pair of *minimal* situations for which $\Pi$ holds.

- For any pretence statement $\Pi$ of the form $\lambda s \lambda t. \forall x_1 \ldots x_n (\phi \leftrightarrow \psi)$, and any situations $s$ and $t$, there is a $\pi$ such that

  - $\langle s, t \rangle \in \pi$ and
  - $[\![\Pi]\!](s)(t) = 1$
  - for each $s' < s$,
    $[\![\lambda s. \forall x_1 \ldots x_n \phi]\!](s')$ is undefined, and
  - for each $t' < t$,
    $[\![\lambda t. \forall x_1 \ldots x_n \psi]\!](t')$ is undefined.

(30)   Alex tried to pull some strings, but they were frayed.

- $p$ = Alex (tried to) pull some strings.
  $q$ = They were frayed.

- Let $s$ be the actual situation.

- Then $[\![[s:p]]\!] = 1$ but $[\![[s:q]]\!] = 0$
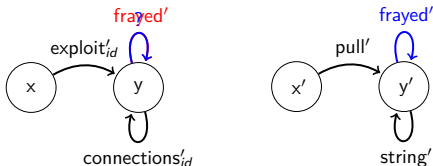


- Extend $\pi_{\mathbf{ps}}(s)$ with $q$ and then extend $s$ **analogously**.

# Analogy

- Gentner (1983) provides a formal theory of analogy.

- **Structure mapping theory**: objects, attributes, and relations are mapped from a *base* situation onto a *target* situation.

- Defined in situation semantic terms:

  - For any situation $s$, $I_s$ is the set of individuals defined in $s$, and $R_s$ is the set of relations defined in $s$.

(31)  For any situations $s$ and $t$, $s$ *is analogous to* $t$ ($s \approx t$) iff

  - $R_s = R_t$, and
  - there is a bijection $\alpha$ from $I_s$ to $I_t$, such that
  1. for each $x \in I_s$, $[s : x] = [t : \alpha(x)]$, and
  2. for each $r \in R_s$ and for each $x_1, \ldots x_n$ such that $[s : \langle x_1, \ldots, x_n \rangle \in r]$, $[t : \langle \alpha(x_1), \ldots, \alpha(x_n) \rangle \in r]$
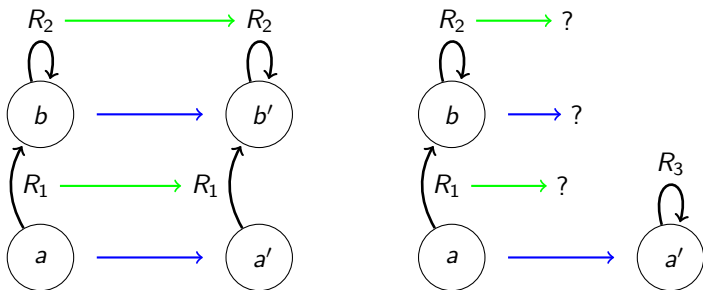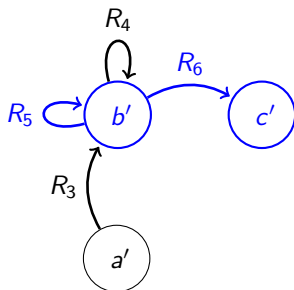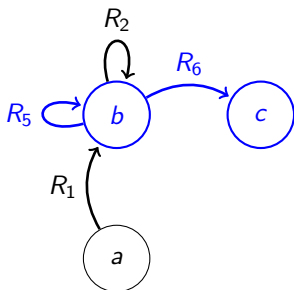
# Analogy

- Now we can define what it means to analogically extend an idiomatic expression:

(32) A pair of situations $\langle s, t \rangle$ is *analogically extended* (with respect to a pretence $\Pi$) into a pair of situations $\langle s', t' \rangle$ iff
  - $\langle s, t \rangle \in \pi$,
  - $s < s'$, $t < t'$, and
  - $(s' - s) \approx (t' - t)$, and
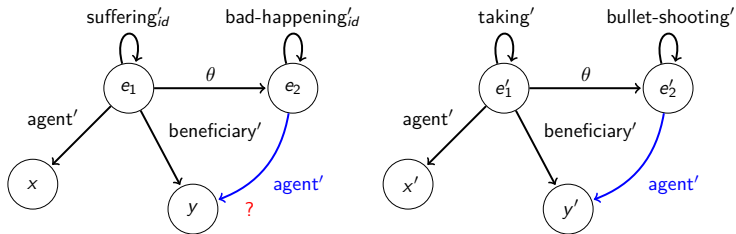  - for some $x \in I_s$, $[s' : x] = [t' : \alpha(x)]$

# Frayed strings

- 'Frayed' makes no sense in the actual situation, so by itself it cannot be the right analogical extension.

- World knowledge: whenever strings are frayed, they are useless. That is, $\mathbf{frayed}'(x) \wedge \mathbf{string}'(x)$ entails $\mathbf{useless}'(x)$.

# Fall Out Boy

(33)  Sometimes the person you'd take a bullet for is behind the trigger.

# Classifying idioms

- Certain facts about idioms are captured in the mappings.

- **Decomposability**: the meaning of the idiom can be distributed across its parts.

  - Nunberg et al. (1994) call such expressions *idiomatically combining expressions*, as opposed to *idiomatic phrases*.

- *spill the beans* = decomposable (*spill* : **divulge**′, *beans* : **secrets**′)

- *shoot the breeze* = non-decomposable.

- An idiom is decomposable iff there are $\langle s, t \rangle \in \pi$ such that $s \approx t$, otherwise it is non-decomposable.

- Transparency/opacity harder to capture – relies on lexical rather than structural properties.

# Conclusions

# Summary

- Two strands of research in the idiom literature can both be right.

- Two formally distinct uses of idioms: **core** and **extended**.

- Formally-minded linguists have tended to opt for a direct access account which privileges the former.

- But it is not impossible to give a formal account of the latter.

  - I have tried to show you the rudiments of such a theory today.

- Inferred idioms.
    - Where does the pretence statement get introduced?
- Conjunction modification (Ernst 1981):

(34) Shepard enjoys pulling Jack's tattooed leg.

(35) With the recession, oil companies are having to tighten their Gucci belts.

(36) The Six Million Dollar Man came over and lent us a helping electronic hand.

# Interesting further questions

- A more general theory of metaphor?

- The idiom mappings Π are lexically encoded.

  - Even where relatively transparent, they're conventionalised:

    (37)    They spilled the beans.

    (38) #They tipped over the peas.

- Is there a theory to be had of how such mappings come to be?

- Can we bring figurative language more fully into the theoretical fold?

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