

# Keystroke Production of Idiomatic expressions and COVID terminology

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## 1. Background - Idiom Processing (LIBBEN & TITONE, 2008)

- **Idioms:** phrases whose figurative meanings are distinct from their component words (e.g. *kick the bucket*)
- Three classes of theories of idiom processing
  - Idioms are **represented as long words** (noncompositional view)
  - Idioms have an **internal semantic structure** that is necessary for understanding meaning (compositional view)
  - Hybrid view
- **Idioms** are multiword units due to their non-compositional nature and more word-like processing (LIBBEN & TITONE, 2008, AS CITED IN SENALDI, TITONE, JOHNS 2021)

## 2. Background - Typing (CONJIN ET AL, 2019)

- Different categories of content can be extracted from keystroke logs (e.g. **duration, content/revising behaviour, and language bursts**)
- Features related to the time between words or sentences, and the number of revisions differ across tasks, such as planning and revising, are affected by **cognitive demand**
- Keystroke duration within words is not sensitive to task as they are associated with **motor processes**
- **Typing manipulation for the study of language production is novel methodology**

## 3. Stimuli Building

- 3 conditions: idiom in neutral carrier, literal match, textual enhancement

Examples:

- **Neutral:**  
The project managers cleared the deck before starting the new project.
- **Literal match:**  
The project managers cleaned the deck before starting the new project.
- **Textual enhancement:**  
The project managers **cleared the deck** before starting the new project.  
The project managers cleared **the deck before** starting the new project.  
The project **managers cleared the** deck before starting the new project.

- The idiomatic stimuli and filler condition (see section 7) will be randomly shuffled
  - The filler sentences will then become the subject of a different analysis
- **This study will focus on the effects of familiarity and textual enhancement, as well as processing of COVID-related language**

## 3.1. Stimuli Building - Considerations

1. The surrounding context should be as neutral as possible (i.e. does not invoke either the literal or figurative meaning)
  2. The literal match condition should only be different in the verb
  3. Textual enhancement is either directly on the target phrase or offset one word to the left or right
- Textual enhancement was found to have a positive impact on comprehension in transparent idioms in English language learners (CAMPILLO, 2015)

## 4. Hierarchical Control of Typing (LOGAN, CRUMP, 2011)

- Proposed feedback loops:
  - (i) an outer loop starting with language comprehension and generation and produces words to be typed
  - (ii) an inner loop starting with the words the outer loop provides and produces keystrokes
- The two loops are relatively **autonomous** and do not know what the other is doing
- Whereas the **inner loop** relies on the **tactical feedback** from the keyboard...
  - The **outer loop** relies on the **appearance** of the screen

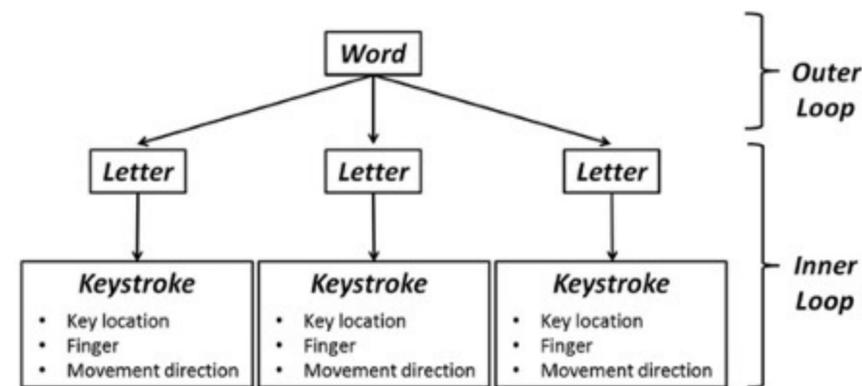


Image from (PINET, ZIEGLER, ALARIO 2016)

## 5. Motor Feedback

- To type correctly, sensory input data generated by touching the keys is crucial (TERZUOLO & VIVANI, 1980)
- **Interacting** with the keyboard is as important as planning (LOGAN, CRUMP, 2010)
- Performance gets progressively worse the more the keyboard differs from a regular one (LOGAN, CRUMP, 2010)
  - Standard Keyboard > Buttons Keyboard > Flat Keyboard > Laser Keyboard

## 6. Questions for Future Study

- Is idiom processing and comprehension reflected in their production? If so, can this be measured in keystroke logs?
- How does keystroke execution differ between idiom phrases and their literal match?
- What is the role of textual enhancement in idiom comprehension? Will this play a role in the outer loop of typing control?
- **We predict that idiomatic stimuli will be typed faster**

## 7. Filler Condition (Adapted from SENALDI, 2021)

- In a future experiment, we aim to compare the typing of COVID-related single words and multiword units against the typing of COVID-unrelated single words and multiwords
- Here, we will look at the emergence of **neologisms** in our mental lexicon
- Examples:
  - covidiot
  - zoom bomb
- Multiword terminology (e.g. "socially distant") should be processed as a whole unit, and will have an advantage over matched uncommonly heard phrases (e.g. "socially detached"; cf. LIBBEN & TITONE, 2008; TITONE, LOVSETH, KASPARIAN & TIV, 2019)
- Differences in language experience predict lexical organization and category knowledge, which influences language processing (JOHNS & JAMIESON, 2019)
- **More experience predicts faster and accurate processing**
  - COVID terms that are more entrenched in speakers' **mental lexicon** are expected to be processed better, which will be reflected in keystroke execution

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## References

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