Poverty of the Stimulus Without Tears – Sections 1 Introduction & 1.1–1.4

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Poverty of the Stimulus

"'Poverty of the stimulus' is essentially a claim about the data available to children when they're trying to learn certain pieces of knowledge"

Explaining the argument of poverty of the stimulus

- **Data:** External data that the child receives (in this case language)
- **Poverty of the stimulus:** creates more than 1 hypothesis
- **Constrained generalizations:** children can figure out the correct hypothesis
- ***Prior knowledge or abilities:** children must have prior knowledge to have constrained generalization
  - Either language specific or biological?
  - Origin of the debate ← the tears are here!

Figure 1: A visual demonstration of poverty of the stimulus for two-dimensional data. Each X corresponds to an observed data point, and A-F correspond to potential representations that speakers could use to generate the observed data. The correct representation (C) is in dashed lines. Poverty of the stimulus occurs because all these representations are compatible with the data.
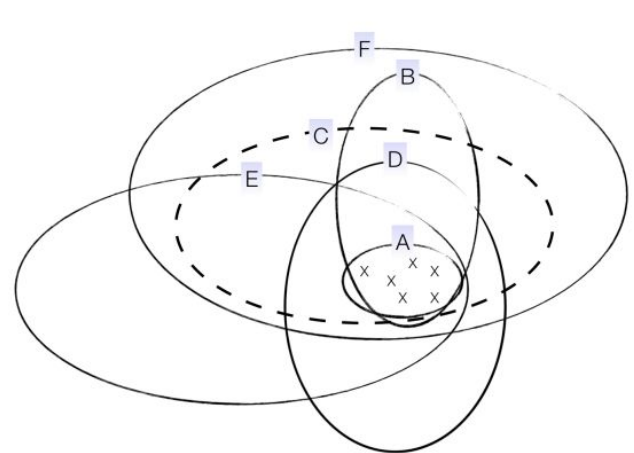
Section 1.2: How do we tell that data are insufficient?

- **Argument #1: Data isn't there**
- **Figure 1**
  - Potential representations are in options A–F
  - **Option C is the correct representation**
- **Example: wh-movement for what (figure on next slide)**
  - Option C = **what** appeared at the front
    - Predicts certain embedded clauses
  - Option F = **what** moves to the front or stays
- **The debate about the composition of the hypothesis**
  - Possibly a behaviorists theory?
    - **Direct positive evidence:** children will produce language based on positive feedback
    - **Negative feedback** (correcting a child's mistake)
      - Child may be likely to ignore correction

(2)   *wh*-word position examples

    a.   Main clause, fronted: *"What did this penguin do?"*
    b.   Embedded clause, fronted: *"I saw [what this penguin did]."*
    c.   Doubly embedded clause, fronted: *"I thought [I saw [what this penguin did]]."*
    d.   *Main clause, in-situ: *"This penguin did what?"*
    e.   *Embedded clause, in-situ: *"I saw [this penguin did what]."*
    f.   *Doubly embedded clause, in-situ: *"I thought [I saw [this penguin did what]]."*

Figure 2: A hypothesis space where there are unambiguous data available for the correct hypothesis C, shown with dashed lines. Unambiguous (direct positive evidence) data points for C are shown with Xs. A negative evidence data point for C is shown with a frowny face.
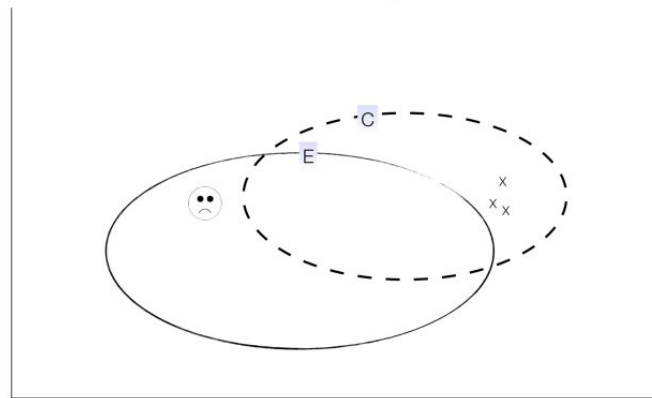
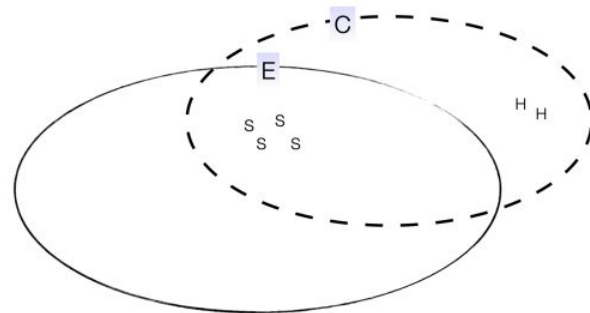**Section 1.2: How do we tell that data are insufficient?**

Figure #3

- **Recasts**
  - Child says **something incorrect** and caretaker responds by recasting incorrect answer to correct answer
    - But this type of feedback is **ineffective**
- **Indirect evidence**
  - Data isn't about correct hypothesis
  - Child **inferred relevant data** to correct the hypothesis
  - This skill is based on a child's capability to make inferences

Figure 3: A hypothesis space with different types of data available for the correct hypothesis C, shown with dashed lines. Data points that are hard to use are shown with an H, while data points that are simpler to use are shown with an S.

- **Argument #2: Data is noisy**
  - Consists of a **speaker's speech errors** that the child listens
  - Doesn't cause poverty of the stimulus
  - Results in ambiguity
  - **In a way, children avoid the noisy data ← unclear how?**
- **Figure #4**
  - **C** = correct hypothesis
  - **N** = noisy data
    - Not compatible with C
  - **M** = misleading data
  - **Hypothesis B** = wh- word
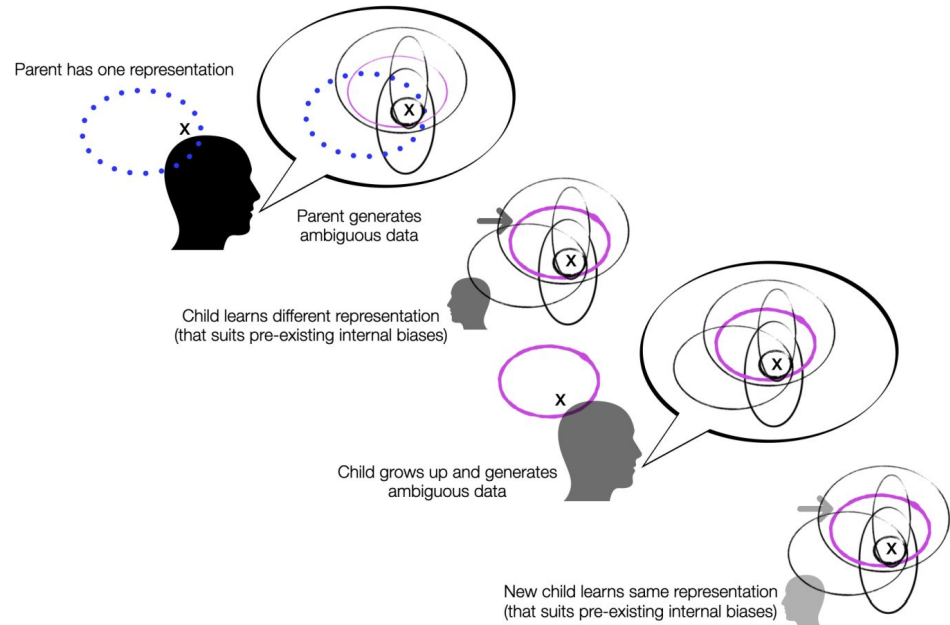   - Front or in-situ main clauses

Figure 4: A visual demonstration of noisy data (left panel) and misleading data (right panel). Each X corresponds to an observed non-noisy data point while each N is a noisy data point in the left panel and each M is a misleading data point in the right panel. The correct representation (C) is in dashed lines.
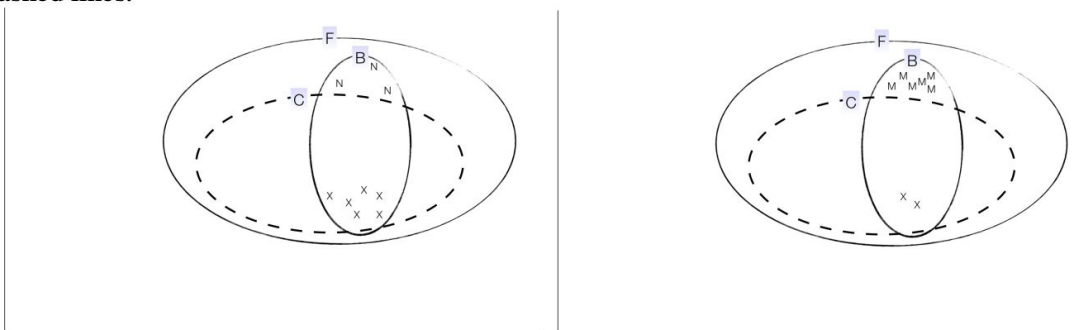
- **Disagreement about the prior knowledge**
  - One way is the external information previously available
    - Before they completed the task

- Learning story
  - Exposure to a **certain linguistic data**
- Nativist = language acquisition based on biology
  - Innate knowledge based on developmental neurobiology and evolutionary biology
- **Figure #5**
  - Evolutionary model by Kirby (2017)
    - Computational modeling on the right innate knowledge
  - **Parent language is based on certain environment**
    - Children inherit parent language and interpret that data
    - Those children grow up and **produce** language data for the next generation

Figure 5: A visual demonstration of how poverty of the stimulus can cause children to have just the right innate biases for learning language from ambiguous data, given parents transmitting language to their children over time.

Parent has one representation

Parent generates ambiguous data

Child learns different representation (that suits pre-existing internal biases)

Child grows up and generates ambiguous data

New child learns same representation (that suits pre-existing internal biases)

Section 1.4: So what *is* that special prior something?

Linguistic Nativism

- **Innate knowledge or abilities are language-specific**
- Not possible in other cognitive domains
- Poverty of stimulus is based on language-specific knowledge
- **Part of children's language development**

Non-linguistic nativism

- Poverty of stimulus and constrained generalization **isn't language specific**
- Prior experience comes from child's environment and no innate knowledge
- Division about type of non-nativist: non-nativism or empiricism
    - Empiricism
        - No innate knowledge

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