

# **LSCI 151C: Wednesday Class Session**

## ***Moving Forward***

**Section 4: Introduction and 4.1**

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# Models as we know them

- Investigate **how** acquisition works and **why** children behave as they do

*“...the underlying factors that impact how acquisition works (and therefore why children behave as they do) can be explicitly defined and manipulated within a computational cognitive model.”*

- Build on data from other techniques

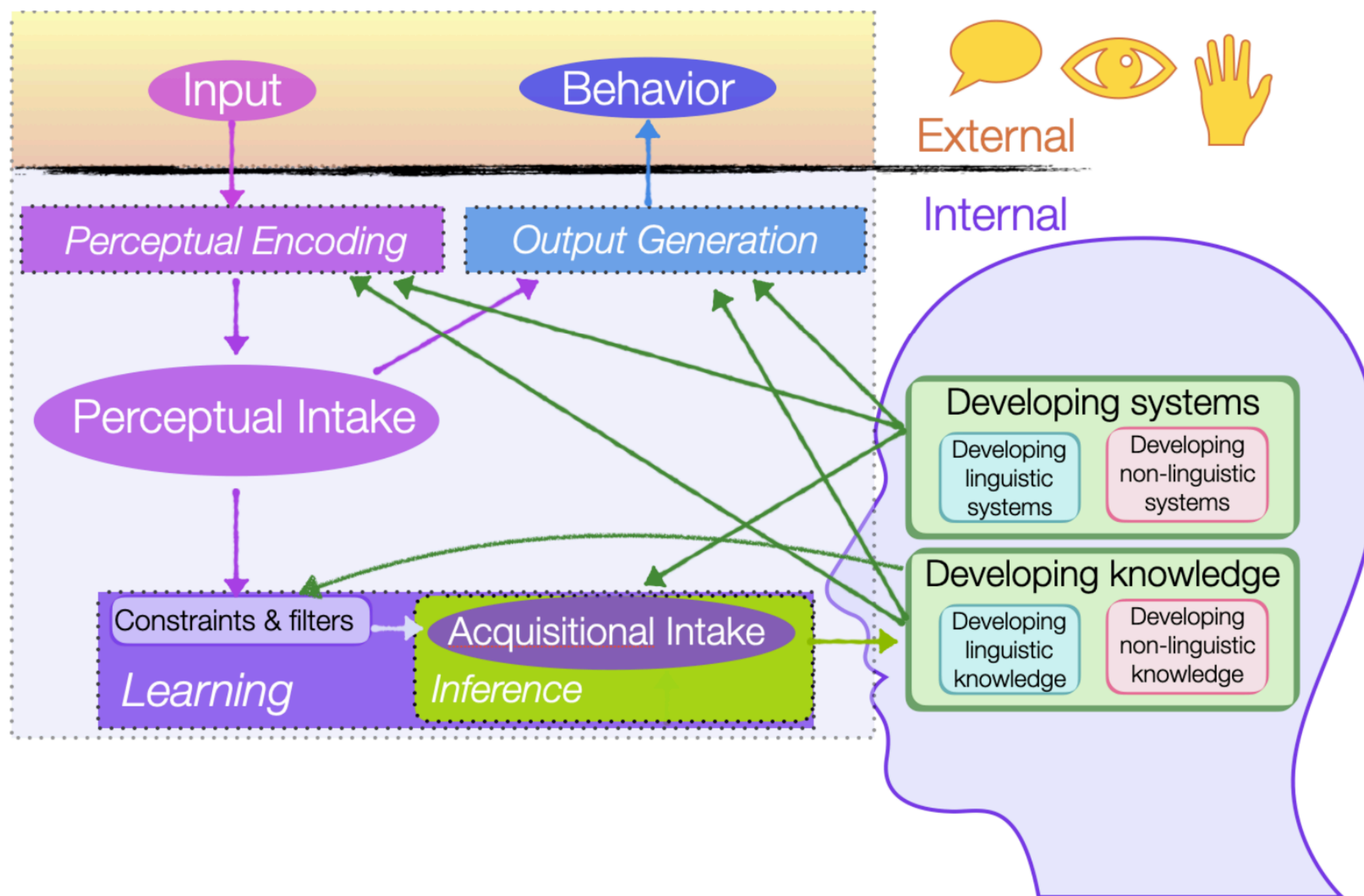
*“Model input is based on estimates of the information children encounter in their language interactions. Model learning mechanisms are based on ideas of what abilities and learning biases children demonstrate at certain ages. Model output is based on data collected from children (or that can be collected in the future), so that the model can explain children’s observed linguistic behavior.”*

# Building a better model

*“...capture more of the relevant aspects of the acquisition process so that we can better link children’s input to their observable behavior.”*

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1. **Perceptual Encoding** extracts input information to create the **Perceptual Intake**

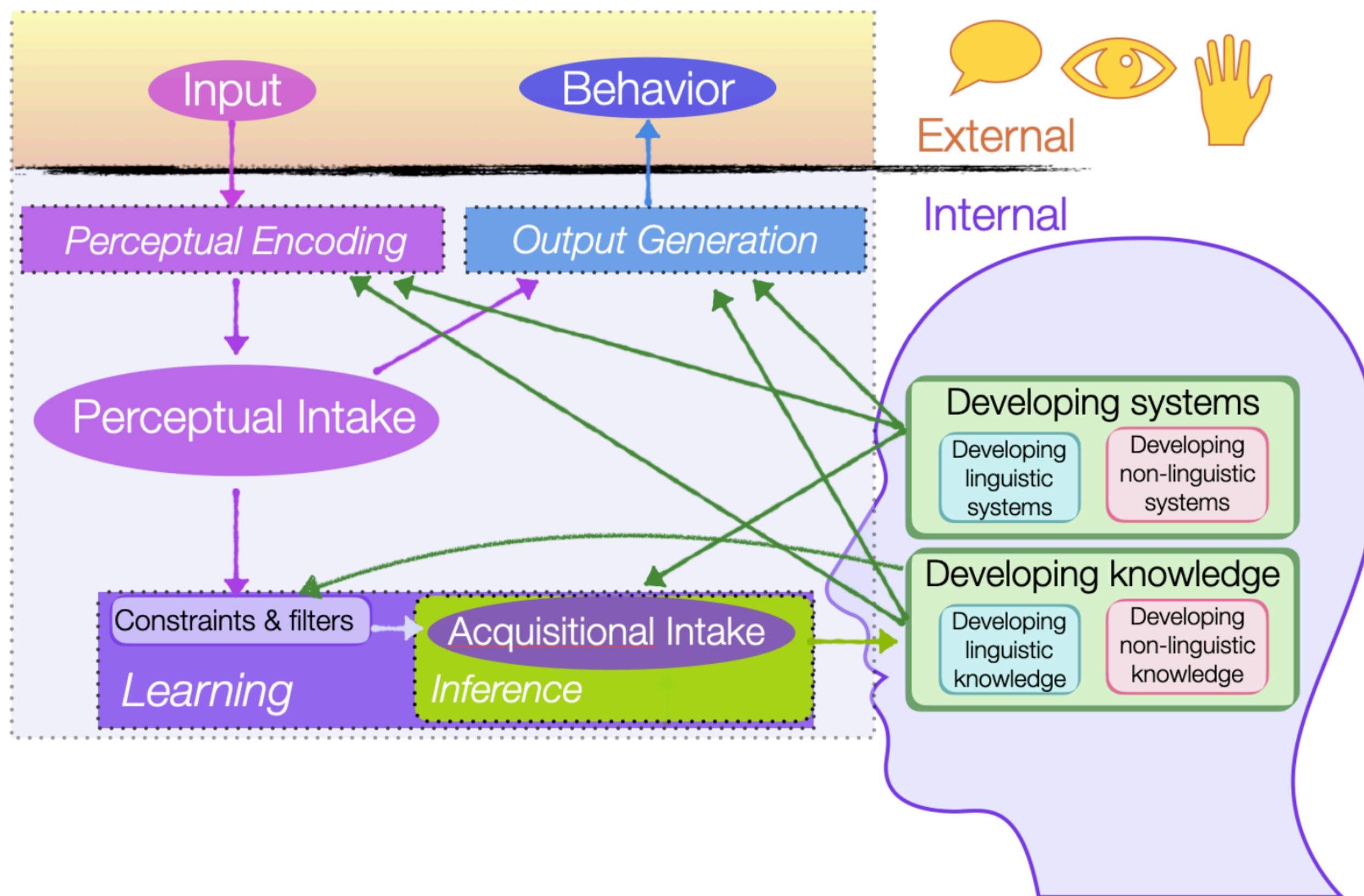
*“...draws on the child’s developing knowledge and systems to extract information.”*

*“What children can perceive depends on what they know about their language ..., what they know about the world ..., and how well they can extract information of different kinds....”*



# Building a better model

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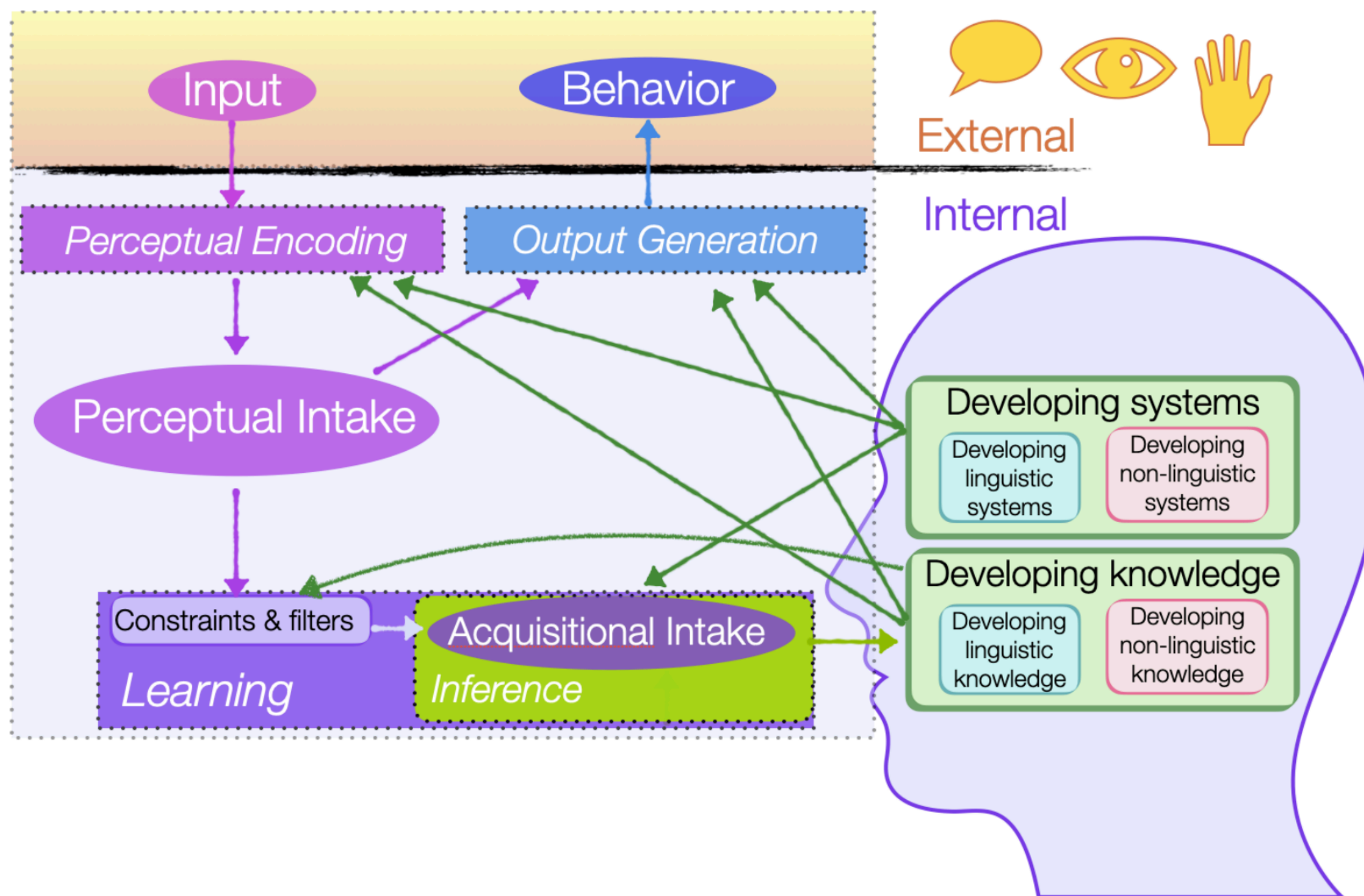
## 2. Behavior Generation

*“...children rely on the information they have been able to perceptually encode (the **perceptual intake**) and their developing systems and knowledge.*

*In particular, children apply their production systems to the perceptual intake in order to generate behavior like speaking.”*

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## 3. Learning

*“...learning occurs over the part of the perceptual intake the child deems relevant to learn from: this is the **acquisitional intake** ... typically not all of the **perceptual intake**.”*

*“...what is relevant is likely some subset of the perceptual intake”*

# Building a better model

## 3. Learning

*“The child’s developing knowledge can filter the perceptual intake down to the relevant information by providing both constraints on possible hypotheses ... and attentional filters...”*

*“Inference then operates over the acquisitional intake, and typically involves non-linguistic abilities like probabilistic inference, statistical learning, or hypothesis testing. The result of this inference can be used to update the developing knowledge – potentially both linguistic knowledge and non-linguistic knowledge”*



# Building a better model

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