References for Boundary Detection as Primitive Operation in Concept Formation

Section 1: By Proof Step and Section

Step 1: Define the Problem Space — What is Concept Formation?

A. Developmental & Cognitive Evidence

- Quinn (1987, 1999) - Visual categorization in infants
- Sloutsky (2010) - Developmental trajectory from parsing to categorization
- Nelson (1973) - Early category formation processes

B. Neurological Evidence

- Näätänen (1978) - Mismatch negativity as change detection
- Garrido et al. (2009) - MMN as boundary detection mechanism

Step 2: Identify the Primitive Operation - Parsing as Boundary Detection

A. Developmental & Cognitive Evidence

- Eimas (1994) - Categorical perception of speech boundaries
- Spelke (1990, 1994) - Object individuation through boundary detection
- Needham (1998, 2001) - Physical boundary cues in object segregation
- Baillargeon (1987) - Physical boundary violations in infancy

B. Neurological Evidence

- Hubel & Wiesel (1970) - Visual boundary detection mechanisms
- Zacks et al. (2007) - Neural event segmentation
- Ezzyat & Davachi (2011) - Hippocampal boundary detection
- Chen et al. (2017) - Early developmental emergence of boundary detection

C. Computational & AI Evidence

- Marr & Hildreth (1980) - Edge detection as prerequisite to recognition
- Canny (1986) - Optimal edge detection algorithms
- Ullman et al. (2012) - Visual concept formation through boundary detection

Step 3: Establish the Logical Dependency Chain from Parsing to Concept Formation

A. Developmental & Cognitive Evidence

- Saffran (1996, 2001) - Statistical learning through boundary detection
- Aslin (1998) - Cross-modal statistical boundary detection
- Kirkham (2002) - Visual statistical learning via boundaries
- Smith & Yu (2008) - Cross-situational learning through boundary detection

B. Neurological Evidence

- Friston (2010) - Predictive coding and boundary detection
- Kapur (1999) - Novelty detection and prediction error

C. Computational & AI Evidence

- Rumelhart & McClelland (1986) - Boundary detection prerequisite in neural networks
- Hinton (2006) - Hierarchical boundary detection in deep learning
- Bengio (2013) - Segmentation processes in unsupervised learning

Step 4: Minimal Thought Experiments Illustrating Parsing as Foundational

A. Developmental & Cognitive Evidence

- Fantz (1964) - Newborn change detection capabilities
- Cohen (1973) - Categorical boundary detection in infants
- Hunter (1988) - Progressive boundary detection development

Step 5: Positioning the Thesis Within Scholarly Traditions

A. Developmental & Cognitive Evidence

- Mandler (1992, 2004) - Image schemas and proto-conceptual development
- Quinn (2002) - Spatial categories grounded in boundary detection
- Rakison (2003) - Causal understanding from boundary detection

C. Computational & AI Evidence

- Kohonen (1982) - Self-organizing maps and boundary detection
- Wille (1982) - Formal concept analysis and boundary representations
- Brachman (1979) - Boundary representation systems

Step 6: Objections and Replies

A. Developmental & Cognitive Evidence

- Gentner (1982) - Categorical specialization models
- Carey (1985) - Conceptual bootstrapping
- Gelman (1991) - Conceptual development theories

Step 7: Biological and Developmental Considerations

A. Developmental & Cognitive Evidence

- Werker (1984) - Phoneme boundary discrimination
- Werker & Tees (1984) - Perceptual narrowing in boundary detection
- Maurer (2007) - Face processing boundary specialization
- Scott (2007) - Musical boundary perception narrowing

B. Neurological Evidence

- Cheour et al. (1998) - MMN in newborns
- Trainor (2003) - Developmental MMN changes
- Dehaene-Lambertz et al. (2002) - Infant brain boundary sensitivity
- Nelson (1994) - ERP responses to perceptual boundaries
- de Haan (2003) - Developmental ERP changes
- Knudsen (2004) - Critical periods and boundary detection
- Hensch (2005) - Time-sensitive boundary processing windows
- Johnson (2001) - Neural plasticity in boundary detection
- Karmiloff-Smith (1998) - Experience-dependent boundary refinement

Step 8: Implications Across Disciplines

A. Developmental & Cognitive Evidence

- Meltzoff (1977) - Cross-modal boundary matching
- Rose (1981) - Cross-modal transfer development
- Streri (1987) - Cross-modal object recognition via boundaries
- Ruff (1986) - Attentional bias toward boundaries
- Richards (1997) - Boundary attention facilitating object learning
- Reynolds (2010) - Novelty detection and boundary violations

B. Neurological Evidence

- Sara (2009) - Neural substrates of novelty detection
- Lisman & Grace (2005) - Neurochemical boundary detection
- Reynolds (2005) - ERP boundary markers predicting cognitive outcomes
- Thomas (2001) - Competitive boundary detection processes

C. Computational & AI Evidence

- Elman (1996) - Temporal boundary detection in neural networks
- Rogers & McClelland (2004) - Boundary detection in category learning
- Xu (2007) - Computational boundary detection bootstrapping
- Lake et al. (2017) - Boundary recognition in few-shot learning
- Prewitt (1970) - Classical edge detection algorithms
- Sobel & Feldman (1968) - Edge detection methods
- Requicha (1980) - Boundary representation in AI systems

Section 2: By Support Level

SUPPORT the Thesis (Boundary Detection as Primitive Operation)

Strong Support:

- Spelke (1990, 1994) - Object individuation through boundary detection precedes conceptual knowledge
- Needham (1998, 2001) - Physical boundaries guide object segregation before conceptual understanding
- Baillargeon (1987) - Boundary violations detected before conceptual principles
- Saffran (1996, 2001) - Statistical boundary detection operates without prior conceptual knowledge
- Zacks et al. (2007) - Neural event segmentation as foundational mechanism
- Ezzyat & Davachi (2011) - Hippocampal boundary detection enhances learning
- Chen et al. (2017) - Early developmental emergence of boundary detection
- Marr & Hildreth (1980) - Edge detection as computational prerequisite
- Canny (1986) - Boundary detection quality determines recognition success
- Hinton (2006) - Hierarchical boundary detection in successful learning systems
- Bengio (2013) - Segmentation processes required for meaningful learning

Moderate Support:

- Quinn (1987, 1999) - Visual categorization based on perceptual boundaries
- Eimas (1994) - Categorical perception through boundary detection
- Fantz (1964) - Newborn change detection capabilities
- Werker (1984) - Phoneme boundary discrimination precedes language
- Garrido et al. (2009) - MMN as automatic boundary detection mechanism
- Friston (2010) - Predictive coding framework linking boundaries to learning
- Kohonen (1982) - Self-organizing systems require boundary detection
- Ullman et al. (2012) - Visual concepts emerge through boundary processing

DISCUSS BUT DO NOT SUPPORT the Thesis

Acknowledge but Don't Emphasize Primacy:

- Mandler (1992, 2004) - Image schemas bridge perception and concepts but don't establish temporal primacy
- Quinn (2002) - Spatial categories grounded in boundaries but focus on categorical outcome
- Rakison (2003) - Causal understanding from boundaries but emphasize causal concepts
- Sloutsky (2010) - Developmental trajectory mentioned but not theorized as foundational
- Nelson (1973) - Early category formation without emphasis on parsing primitives

Assume Rather Than Explain:

- Gentner (1982) - Categorical specialization models assume parsing mechanisms
- Carey (1985) - Conceptual bootstrapping assumes initial segmentation
- Gelman (1991) - Conceptual development theories presuppose discrete units

IGNORE the Thesis (Boundary Detection as Primitive)

Traditional Approaches:

- Similarity-based theories (implied but not explicitly cited)
- Prototype theories (implied but not explicitly cited)
- Classical categorization approaches (implied but not explicitly cited)

Contemporary Theories That Bypass Parsing:

- Direct categorization approaches
- Embodied cognition theories that don't address segmentation
- Social construction theories of concept formation

Key Foundational Works

Historical Foundations:

- Hubel & Wiesel (1970) - Neural basis of boundary detection
- Näätänen (1978) - Mismatch negativity discovery
- Marr & Hildreth (1980) - Computational theory of edge detection
- Spelke (1990, 1994) - Object individuation principles

Contemporary Cutting-Edge:

- Zacks et al. (2007) - Event boundary detection in naturalistic contexts
- Chen et al. (2017) - Developmental neuroscience of boundary processing
- Lake et al. (2017) - Boundary detection in artificial few-shot learning
- Friston (2010) - Predictive coding and boundary detection integration

Critical Gaps in Literature

Missing Direct Support:

- Explicit philosophical treatments of parsing as primitive operation
- Systematic cross-species comparative studies of boundary detection
- Longitudinal studies tracking boundary detection to concept formation
- Computational models directly testing parsing-first vs. similarity-first approaches
- Neuroimaging studies comparing boundary detection vs. conceptual processing timelines