The dialectical constitution of arithmetic in grocery shopping activity

How to look and What to expect to see
• How shall we think of the environment for action?
• How can we account for the organization of activity?

Some Predictions from the Armchair
• Shoppers decide which item to buy by computing best unit price.
  – People with better math skills are more likely to engage in unit price computations.
  – People with better math skills are more likely to do correct calculations.
• The environment presents problems that shoppers must find solutions to.
• Math problems are represented and solved in shopper’s minds.

Ways to look
• What methods did Lave and her colleagues use to investigate arithmetic practices in grocery shopping?

Behavior and Arena Are these enough?
• Behavior
• Shopping
• Deciding
• Attending a lecture
• Taking notes
• Arena
• Supermarket
• Product display
• Lecture hall
• Your seat environment

Something to see
• Lave and her colleagues claim that
• in order to understand arithmetic practices in the supermarket, it is also necessary to understand “the dialectical constitution of grocery shopping activity in the supermarket setting.”
• What does this claim mean?
Setting

• The arena as experienced by a particular person in activity.
• Shaped by the person’s activity
• Includes body position, patterns of deployment of attention, memory, habits, expectations, plans….

Activity

• Behavior as it emerges from interaction of a particular person with a setting.
• Activity shapes the setting…
• And is shaped by the setting.

The dialectical relation of activity and setting

• It is not possible to understand the organization of either element without reference to the history of interaction among the elements.

Making a point with enchiladas

• Shopper (speaking hesitantly, eyes searching the shelves to find the enchiladas): Now these enchiladas, they’re around 55 cents. They were the last time I bought them, but now every time I come…a higher price.
• Observer: Is there a particular kind of enchiladas you like?
• Shopper: Well, they come in a, I don’t know, I don’t remember who puts them out. They move things around too. I don’t know.
• Observer: What is the kind you’re looking for?
• Shopper: Well, I don’t know what brand it is. They’re just enchiladas. They’re put out by, I don’t know. (discovers the display of frozen Mexican dinners.) Here they are! (speaking vigorously and firmly.) they were 65 the last time I bought them. Now they’re 69. Isn’t that awful?

Recall and Recognition

• Shopper (speaking hesitantly, eyes searching the shelves to find the enchiladas): Now these enchiladas, they’re around 55 cents. They were the last time I bought them, but now every time I come…a higher price.
• Observer: Is there a particular kind of enchiladas you like?
• Shopper: Well, they come in a, I don’t know, I don’t remember who puts them out. They move things around too. I don’t know.
• Observer: What is the kind you’re looking for?
• Shopper: Well, I don’t know what brand it is. They’re just enchiladas. They’re put out by, I don’t know. (discovers the display of frozen Mexican dinners.) Here they are! (speaking vigorously and firmly.) they were 65 the last time I bought them. Now they’re 69. Isn’t that awful?

A narrative schema (interrupted)

• Shopper (speaking hesitantly, eyes searching the shelves to find the enchiladas): Now these enchiladas, they’re around 55 cents. They were the last time I bought them, but now every time I come…a higher price.
• Observer: Is there a particular kind of enchiladas you like?
• Shopper: Well, they come in a, I don’t know, I don’t remember who puts them out. They move things around too. I don’t know.
• Observer: What is the kind you’re looking for?
• Shopper: Well, I don’t know what brand it is. They’re just enchiladas. They’re put out by, I don’t know. (discovers the display of frozen Mexican dinners.) Here they are! (speaking vigorously and firmly.) they were 65 the last time I bought them. Now they’re 69. Isn’t that awful?
Mutual determination of activity and setting

- Shopper (speaking hesitantly, eyes searching the shelves to find the enchiladas): *Now these enchiladas, they’re around 55 cents. They were the last time I bought them, but now every time I come...a higher price.*
- Observer: *Is there a particular kind of enchiladas you like?*
- Shopper: *Well, they come in a, I don’t know, I don’t remember who puts them out. They move things around too. I don’t know.*
- Observer: *What is the kind you’re looking for?*
- Shopper: *Well, I don’t know what brand it is. They’re just enchiladas. They’re put out by, I don’t know. (discovers the display of frozen Mexican dinners.) Here they are! (speaking vigorously and firmly.) they were 65 the last time I bought them. Now they’re 69. Isn’t that awful?*

The dialectic of activity and setting

- The activity of making a point about rising prices frames the search for an illustrating item.
- The search takes place in a setting (one that initially lacks the item sought)
- The activity of searching changes the setting.
- When the item is found, the activity continues in the new setting.
- Setting shapes activity which shapes setting.

The relation of this dialectic to arithmetic activity

- The tension between the abundance of choices and the need to choose.
- Gap filling problem solving: bringing the description of the problem and the solution closer together (smack! They collide in cottage cheese).
- Using the environment as a computational medium
- Problems as snags in routine flow of activity. (and notice the role of memory in the creation of routine activities).

The Predictions from the Armchair

- Shoppers decide which item to buy by computing best unit price. [No. Best price computations are a last resort – a form of rationalization driven by ideology of efficiency]
- People with better math skills are more likely to engage in unit price computations. [No]
- People with better math skills are more likely to do correct calculations. [No, everyone is about 98% correct!]
- The environment presents problems that shoppers must find solutions to. [Not so simple. We need to consider the dialectic of activity and setting to understand how gap-closing problem solving happens. Shoppers encounter problems as snags in routine activity. They choose to engage some and not others.]
- Math problems are represented and solved in shopper’s brains. [No, problems are frequently enacted in activity that manipulates the material aspects of the setting.]