

# Ostensive Demonstratives in Multimodal Contexts

**Noureddine Elouazizi**

nelouazi@sfu.ca

**Maite Taboada**

mtaboada@sfu.ca

**Nancy Hedberg**

hedberg@sfu.ca

Department of Linguistics  
Simon Fraser University

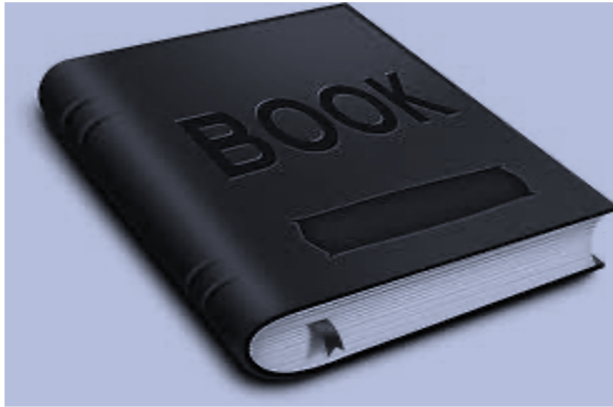
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## 1. Background: ostensive demonstratives



“That book is mine”



“That man is going to be sorry”

Non-deferred ostension	Deferred ostension
<ul style="list-style-type: none"><li>▪ Direct sensory awareness of the object</li></ul>	<ul style="list-style-type: none"><li>▪ Indirect non-sensory awareness of the object</li></ul>
<ul style="list-style-type: none"><li>▪ Introduces a referent</li></ul>	<ul style="list-style-type: none"><li>▪ Retrieves a referent</li></ul>
<ul style="list-style-type: none"><li>▪ No broad world-knowledge is required</li></ul>	<ul style="list-style-type: none"><li>▪ Broader world-knowledge is required</li></ul>

# 1. Background: ostensive demonstratives

## Research questions

- ❖ Q1- Are the referential relations between the object pointed to and the object referred to reinforced by ostension?
- ❖ Q2- Is gesture in the context of ostension codified in grammar or is it the by-product of a multimodal interaction of grammar and production?

## Defining ostension

Ostension is defined as:

- ❖ The demonstrative use of a demonstrative (Kaplan 1979)
- ❖ Deferred indexical reference (Nunberg 1979, 1993)
- ❖ Deferred reference (Quine 1950)

## Observation

Ostension is a complex cognitive process that requires a decompositional approach to understand its nature and function

# 1. Background: ostensive demonstratives

## Decomposing ostension: REFERENCE

- ❖ For Frege (1892), one could grasp a proposition even if there were no references for its constituents.
  - Sense uniquely determines reference.
  - Meaning is invariant and universal
- ❖ For Russell (1905), some propositions actually contain the objects that they are about. One cannot grasp the proposition without grasping that object.
  - direct sensory awareness (being aware of "this")
  - the process of ostension
  - the process of ostensive definition ("*This* is red" or "*That* is blue")

## Decomposing ostension: DEMONSTRATIVES

- ❖ Kaplan (1970)'s Logic of Demonstratives
  - character + context of utterance = content
  - content + circumstances of evaluation = truth-value

# 1. Background: ostensive demonstratives

## Decomposition ostension: GESTURES

- ❖ Lexical Retrieval Hypothesis (Butterworth & Hadar 1989; Krauss 1998)
  - gesture is involved in generating the surface forms of utterances
  - gestures facilitate access to lexical entries that incorporate syntactic and semantic information
  - gestures derive from non-propositional representations in working memory
  
- ❖ Information Packaging Hypothesis (McNeill 1992)
  - gestures, together with language, help constitute thought
  - gestures reflect the imagistic mental representation that is activated at the moment of speaking
  - gesture is involved in the conceptual planning of the message to be verbalised

## 2. Corpus-based analysis: TED videos

### Source of the multimodal data

- ❖ Let the data speak for itself!
- ❖ Choice of video as multimodal data is motivated by the fact that video data enables a more informed examination of linguistic, gestural and contextual features of the conversation.

Video 1



Video 2



### 3. Corpus coding scheme and rationale

#### Rationale

- ❖ TED video enables the examination of the ostension central variables
  - Reference
  - Demonstratives
  - Gestures
- × These variables enable us to examine the interplay between “Reference”, “Ostension act” and “Conceptualization” in the context of a corpus-based analysis of the mutimodality of ostension.

Multimodal data types		
Perceptual channel	Information input	Corpus type
Auditory	Sound	Human speech
	Sound	Environmental sounds
	Sound	Machine sounds
Visual	Vision	Head position
	Vision	Gaze
	Vision	Facial expression
	Vision	Hand gesture
	Vision	Body posture

#### ❖ The data

Corpus-video	Corpus-words	# demonstrative	# ostensives	%
Xx videos/xx min	xx	xx	xx	xx



### 3. Corpus coding scheme and rationale

#### The coding scheme

	Ostension Process and Function								
	TYPE		VISUALIZATION			REFERENCE			
	Referential	Quantificational	Head position	Gaze	Hand gesture	State	Event	Activity	Object
Ostension FORM									
Ostension REFERENT									

	Ostension Process and Function			
	TOPIC		DEMONSTRATUM	
	Abstract	Non-abstract	Whole	Part
Ostension FORM				
Ostension REFERENT				

### 3. Corpus coding examples



“Now before I tell you about the technology, the bad news is that a significant fraction of us in **this room**, if we live long enough, will encounter, perhaps, a brain disorder.”

❖ **Referential, hand gesture, non-abstract, object, whole**

### 3. Corpus coding examples



“So it's a little bit difficult from there to spin in some kind of positive conclusion. But I would say this: I think that sunlight is the best disinfectant. **All of these things** are happening in plain sight, and they're all protected by a force field of tediousness.”

- ❖ **Quantificational, hand gesture, abstract, event/activity, whole**

### 3. Corpus coding scheme and rationale

#### The coding procedure (dis-agreement)

- ❖ Coding of the data was conducted independently by two coders

	% Agreement
Ostension Form	100%
Ostension Referent	76.67%
Ostension Type	86.67%
Ostension Visualization	70%
Ostension Topic	90%
Ostension Reference	90%
Ostension Demonstratum	83.33%

## 4. Results and analysis

### Results

Ostension Function & Process	TED corpus	
	#	%
Ostension Type: Quantificational		
Ostension Type: Referential		
Ostension Topic: Abstract		
Ostension Topic: Non-abstract		
Ostension Demonstratum: Whole		
Ostension Demonstratum: Part		
Ostension Reference: Object		
Ostension Reference: Activity/state/event		

(Note: 13 samples of ostension instances have been discarded because of the disagreement among coders)

## 4. Results and analysis

- ❖ Quantificational ostension, unlike referential ostension, correlates with the occurrence of different types of reference: *as an activity, as an object, as a state, or as an event.*

	Ostension Process and Function					
	Ostension Type		Ostension Reference			
	Referential	Quantificational	State	Event	Activity	Object
Referent-A	√					√
Referent-B		√	√	√	√	√

## 4. Results and analysis

- ❖ There does not seem to be a correlation between quantificational ostension and referential ostension and the process of ostension visualization.
- ❖ In the contexts of ostension visualization, the speaker gazes and uses hand/finger to point, equally in contexts of quantificational and referential ostension.

	Ostension Process and Function				
	Ostension Type		Ostension Visualization		
	Referential	Quantificational	Gaze	Hand gesture	Head tilt
Referent-A	√		√	√	√
Referent-B		√	√	√	√

## 4. Results and analysis

The results presented above indicate that:

- ❖ Referential relations expressed by ostension *can* but *need not* reinforce the relation between the linguistic form and the object this form refers to.
  - ❖ This is clearly instantiated in the context of quantificational ostensives.
- ❖ Referential ostension is less multimodal in nature than quantificational ostension.
  - ❖ Instances of quantificational ostension may refer not only to objects, but also to events, activities and states as well as to wholes and parts of an object.
- ❖ Deferred ostension that is quantificational requires the computing of the referent, the ostensive act and the conceptual ground shared with the addressee.



## 5. Conclusions and remaining questions

Now we are in a position to answer the questions that we raised at the beginning of this study:

- ❖ Q1 - Are the referential relations between the object pointed to and the object referred to reinforced by ostension?

NO, not necessarily.

- ❖ Q2 - Is gesture in the context of ostension codified in grammar or is it the by-product of a multimodal interaction of grammar and production?

On the one hand ostensive acts seem to not reinforce the referential relations, expressed by the demonstrative. However, ostensives seem to mediate the situated and the detached referential relations (in the context of the quantificational ostensives). Ostension bridges the demonstration and the conceptualization of a reference. As such, ostension does not seem to be a pure matter of language production.

- ❖ These results square well with and lend further support to the approaches of “Lexical retrieval hypothesis” and the “information packaging hypothesis”.
- ❖ In future work, we aim to use experimental methods (eye tracking) and extensive corpus analysis to study the details of the visualization and the multimodal nature of ostension in contexts of referential and quantificational ostension.